

Attachment 1

# **CEQA Findings and Statement of Overriding Considerations Prepared for Updates to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Watershed for the Sacramento River and its Tributaries, Delta Eastside Tributaries, and Delta**

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## **A1.1 Introduction**

The California Environmental Quality Act (CEQA, Pub. Resources Code, § 21000 et seq.) and the State CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.) require that a public agency consider the environmental impacts of a project before approving a project and make specific findings for identified significant environmental effects. (Pub. Resources Code, § 21081; Cal. Code Regs., tit. 14, § 15091.) This document includes the State Water Resources Control Board's (State Water Board or Board) findings for each of the significant environmental impacts identified in the Staff Report/Substitute Environmental Document (Staff Report). This document also provides a Statement of Overriding Considerations (Statement), which is the rationale in support of the State Water Board's determination that the benefits of the project outweigh its unavoidable significant environmental effects (Cal. Code of Regs., tit. 23, § 3779.5, subd. (c); Pub. Resources Code § 21081, Cal. Code of Regs., tit. 14, §§ 15091, 15093).

The project is the adoption of the Plan amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Watershed (Bay-Delta Plan or Plan) focused on the reasonable protection of fish and wildlife in the Sacramento River and its tributaries, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne Rivers), and Delta (referred to as the Sacramento/Delta watershed). The Plan amendments were developed to improve flow and water quality conditions for fish and wildlife beneficial uses in the Sacramento/Delta. As described in these findings and Statement, the Plan amendments would help address the ongoing declines of native fish and wildlife populations in the Sacramento/Delta watershed. The Plan amendments would support a more comprehensive and coordinated watershed management strategy to protect and restore aquatic ecosystems under current and future conditions. The Plan amendments include a regulatory pathway based on the proposed Plan amendments described in Staff Report Chapter 5, Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta, with modifications, and a voluntary agreement (VA) pathway that would provide a pathway for implementation of VAs (also referred to as the Healthy Rivers and Landscapes [HRL] proposal) that were described and analyzed in Chapter 9, Proposed Voluntary Agreements. The Plan amendments are further evaluated in Staff Report Chapter 13, Revised Proposed Plan Amendments. The VA pathway would apply for the water rights included in the approved VA pathway, and the regulatory pathway would apply for water rights not included as part of the approved VA pathway, with both pathways having regulatory effect. The Plan amendments also incorporate Tribal Beneficial Uses (TBUs), designate the Tribal Tradition and Culture (CUL) beneficial use, and include provisions for tribal outreach and

engagement and incorporation of tribal feedback and Traditional Ecological Knowledge (TEK) into the Bay-Delta Plan update and implementation processes. Additional provisions for developing an implementation methodology and other general provisions are included in the Plan amendments, including requirements for monitoring, evaluation, reporting, and special studies; the development of biological goals; and annual and periodic review.

In conducting its environmental analysis of the Plan amendments, the State Water Board evaluated impacts of reasonably foreseeable compliance measures attributable to the changes in hydrology (e.g., physical changes in instream flow and reservoir levels) and reduced Sacramento/Delta supply to agriculture, municipal and wildlife refuge uses. The environmental analysis considered impacts related to the construction and operation of habitat restoration and other complementary ecosystem projects, such as physical habitat restoration and other ecosystem projects (fish passage improvements, predatory fish control, invasive aquatic species control) that could be proposed as part of adaptive implementation, local cooperative solutions, cold water habitat implementation, and the HRL habitat commitments.

The Board also evaluated reasonably foreseeable response actions to reductions in Sacramento/Delta water supply, including changes in groundwater levels from increased groundwater pumping, and other water management actions (e.g., groundwater storage and recovery, water transfers, water recycling, and agricultural and municipal water conservation using existing infrastructure). In addition, the Board evaluated impacts from construction and operation of new or modified facilities (e.g., new or modified dams/reservoir 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).

The analysis presented in Staff Report Chapter 13, Revised Proposed Plan Amendments, builds upon the analysis of the proposed Plan amendments in Chapter 7, Environmental Analysis, the proposed VAs in Chapter 9, Proposed Voluntary Agreements, and the alternatives presented in the 2023 draft Staff Report, with revisions. Staff Report Section 13.7, Environmental Analysis, provides a supplemental analysis that compares and explains the potential environmental effects that may occur due to implementation of the Plan amendments in the context of the analyses already contained in Chapters 7 and 9 of the 2023 draft Staff Report with any necessary modifications. The supplemental analysis mainly focuses on (1) changes in hydrology, and (2) changes in water supply. Chapter 13 does not repeat the evaluation of certain reasonably foreseeable methods of compliance and response actions categories for which the impact mechanisms and impact conclusions would not be changed by the refinements. These topics include other water management actions to offset reductions in Sacramento/Delta supply, as well as actions evaluated in Staff Report Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Table 13.7.22-1, Impact and Mitigation Measure Summary—Changes to Hydrology and Supply, in the Staff Report identifies the less-than-significant and potentially significant impacts from changes in hydrology and water supply under the Plan amendments, as well as mitigation measures to reduce or avoid potentially significant impacts. Table 13.7.22-2, Impact and Mitigation Measure Summary—Habitat Restoration and Other Ecosystem Projects, in the Staff Report identifies less-than-significant impacts, potentially significant impacts, and mitigation measures for habitat restoration and other ecosystem projects. Table 13.7.22-3, Impact and Mitigation Measure Summary—New or Modified Facilities, in the Staff Report identifies less-than-significant impacts, potentially significant impacts, and mitigation measures for new or modified facilities.

The majority of the potentially significant environmental impacts associated with the potential actions that could be taken to comply with the Plan amendments or in response to the Plan amendments are determined to be potentially significant and unavoidable. However, the impact determinations are conservative, and in many instances can be reduced or avoided through flexibility included in the Plan and through implementation of mitigation measures discussed in the Staff Report. The environmental analyses often consider a range of potential outcomes, including the most conservative for evaluating potentially significant effects on the physical environment. In many cases, there may be no impact or effect; however, for each resource area, the analysis looks to the full potential impacts for the significance determination.

Due to the scope and complexity of Sacramento/Delta water use, and the independent authority of water users, the Staff Report's environmental analyses are necessarily broad. It is not feasible or required to identify specific and detailed response actions for every water district or water diverter. Instead, the Staff Report considers the effects of reasonably foreseeable compliance methods and response actions at a broad level commensurate with the scope of the project. Any further precision in the analysis about future actions taken in response to the Plan amendments is beyond the scope of the Staff Report and would require inappropriate speculation. Accordingly, the Staff Report uses reasonable assumptions regarding the implementation of the Plan amendments and evaluates environmental impacts on a broad level.

Similarly, while the Staff Report identifies mitigation measures throughout the environmental analysis, mitigation measures are broad for two interrelated reasons. First, many mitigation measures are outside the State Water Board's regulatory authority: the State Water Board cannot mandate the construction of new or modified infrastructure to increase water recycling or increase the efficiency of irrigation distribution systems. Second, because the Staff Report cannot predict the particular response actions agencies and individuals will take, it cannot respond with the precise mitigation measures needed to reduce or avoid the environmental impacts of those actions. Instead of precise prescriptions, mitigation measures are designed to provide agencies flexibility in application—flexibility that is necessary for the measures to be effective. This type of mitigation is required by the Staff Report's broad analytical approach. The Staff Report does, however, recognize that it leaves uncertainty: uncertainty in whether agencies will accept their responsibility to implement the identified mitigation, and uncertainty as to whether it will ultimately be effective. For this reason, the Staff Report often concludes that impacts will remain significant and unavoidable despite the identification of feasible mitigation.

Finally, it is important that impact conclusions be understood in the context of the overall nature of the project, which is intended to be a restoration action. CEQA only considers changes that could negatively impact the existing environment and does not recognize or offset negative changes with improvements that could result from an environmentally beneficial project. Here, the impacts that could potentially result from implementation of the restoration action occur in a system that has been highly altered, and the project would be expected to improve conditions for native fish and wildlife in the Sacramento/Delta watershed over time. However, the project will also result in changes in hydrology and supply and response actions to these changes that could result in potentially significant adverse environmental impacts at certain times and locations that must be analyzed under CEQA. These potentially significant environmental impacts should be viewed in light of the overall purpose and goals of the Sacramento/Delta Update to the Bay-Delta Plan.

These findings do not attempt to describe the full analysis of each environmental impact contained in the Staff Report. Instead, a full explanation of these environmental findings and conclusions are

presented in the Staff Report and these findings hereby incorporate by reference the discussion and analysis in the Staff Report supporting the determination regarding the impacts of the Plan amendments and mitigation measures designed to address those impacts. In making these findings, the State Water Board ratifies, adopts and incorporates in these findings the determinations and conclusions of the Staff Report relating to environmental impacts and mitigation measures except to the extent any such determinations and conclusions are specifically and expressly modified by these findings.

The State Water Board further adopts and incorporates all of the mitigation measures set forth in the Staff Report and the Mitigation Monitoring and Reporting Program (MMRP) to substantially lessen or avoid the potentially significant and significant impacts of the Plan amendments. In the event a mitigation measure in the Staff Report has inadvertently been omitted in these findings or the MMRP, such mitigation measure(s) is hereby adopted and incorporated in the findings below by reference. In addition, in the event the language describing a mitigation measure set forth in these findings or the MMRP fails to accurately reflect the mitigation measures in the Staff Report due to a clerical error, the language of the policies and implementation measures, as set forth in the Staff Report control. The impact numbers and mitigation measure numbers used in these findings reflect the information contained in the Staff Report.

In these findings, the State Water Board first addresses the extent to which each significant environmental impact can be substantially lessened or avoided through the adoption of feasible mitigation measures. Some potentially significant impacts can be mitigated to less-than-significant levels. Because the State Water Board has authority to ensure that mitigation is implemented for certain actions, these impacts could be reduced to less-than-significant levels with mitigation incorporated. Several other potentially significant environmental impacts could be reduced to less-than-significant levels with mitigation incorporated; however, due to the large scope of the project and wide range of possible response actions, sufficient information is not available to conclude with certainty that the mitigation measures will reduce all impacts to less-than-significant levels in all circumstances.

Some mitigation activities are within the State Water Board's jurisdiction; however, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the project. For example, local public agencies could restrict groundwater pumping, require agricultural water use efficiencies that would allow less water to irrigate more acreage, deny permits to convert agricultural land to urban uses, or require mitigation measures for construction impacts. The State Water Board cannot assume that those other entities will require mitigation, however, and whether the State Water Board can use its authorities to compel actions that would fully mitigate potential impacts would be speculative. Accordingly, the State Water Board cannot guarantee that measures will always be adopted or applied fully to mitigate potentially significant impacts.

In cases in which a project's significant effects cannot be mitigated or avoided, an agency, after adopting proper findings, may nevertheless approve the project if it first adopts a statement of overriding considerations setting forth the specific reasons why the agency found that the "benefits of the project outweigh the significant effects on the environment." (Pub. Resources Code, § 21081, subd. (b); see also, Cal. Code Regs., tit. 14, §§ 15093, 15043, subd. (b).) In the Statement of Overriding Considerations found at the conclusion of these findings, the State Water Board identifies the specific economic, social, and other considerations that, in its judgment, outweigh the significant environmental effects that may occur as a result of the Plan amendments. The California Supreme

Court has stated that “[t]he wisdom of approving... any development project, a delicate task which requires a balancing of interests, is necessarily left to the sound discretion of the local officials and their constituents who are responsible for such decisions. The law as we interpret and apply it simply requires that those decisions be informed, and therefore balanced.” (Citizens of Goleta Valley v. Board of Supervisors (1990) 52 Cal. 3d 553, 564.)

## **A1.2 Impacts Found to be Less Than Significant or No Impact and Thus Requiring No Mitigation**

State CEQA Guidelines section 15091 does not require specific findings to address environmental effects that an environmental impact report (EIR) identifies as “no impact” or a “less than significant” impact. Nevertheless, the State Water Board hereby finds that, based on substantial evidence in the whole of the record, changes in hydrology and supply under the Plan amendments would have either no impact or a less than significant impact to the following resource areas: hazards and hazardous materials, land use and planning, mineral resources, population and housing, public services, and transportation and traffic. The State Water Board hereby finds that, based on substantial evidence in the whole of the record, habitat restoration and other ecosystem projects and new and modified facilities under the Plan amendments would have either no impact or a less than significant impact to the following resource areas: population and housing, and public services. Therefore, these impacts do not require mitigation. These issues have no potential for significant impacts and required no further environmental review or analysis beyond the discussion in the Staff Report. (CEQA Guidelines, § 15128.)

## **A1.3 Impacts Found to be Potentially Significant**

The State Water Board’s water quality control planning program is certified by the Secretary of Resources as exempt from the requirement to prepare an EIR because the program requires written documentation meeting certain CEQA requirements (Pub. Resources Code, § 21080.5; Cal. Code Regs., tit. 14, § 15251, subd. (g)). The regulations implementing the State Water Board’s exempt regulatory program require that any water quality control plan proposed for State Water Board approval must also contain findings as described in State CEQA Guidelines section 15091. (Cal. Code of Regs., tit. 23, § 3779.5, subd. (c).) State CEQA Guidelines section 15091 states, in part:

- (a) No public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effect of the project unless the public agency makes one or more written finding for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. The possible findings are:
  - (1) Changes or alterations have been required in, or incorporated into, the project, which avoid or substantially lessen the significant environmental effect as identified in the final EIR.
  - (2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
  - (3) Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

The findings required by subsection (a) shall be supported by substantial evidence in the record.

The Staff Report is available on the State Water Board's website.

In accordance with State CEQA Guidelines section 15091, the State Water Board has made findings for each significant environmental effect of the project accompanied by a brief rationale for each finding. The findings described below are organized by resource and impact mechanism. The findings reference the Staff Report and the mitigation measures discussed in the Staff Report. The findings below constitute one or a combination of findings under subdivisions (a)(1), (a)(2), and (a)(3) of State CEQA Guidelines section 15091, as presented above. Where project-specific changes and mitigation measures are within the responsibility and jurisdiction of another public agency and not the State Water Board, finding (a)(2) is made below. Finding (a)(3) is also made as it is infeasible for the State Water Board to impose the project-specific mitigation measures for future projects that are within the responsibility and jurisdiction of another public agency or uncertainty whether the mitigation will reduce impacts to a less-than-significant level. Some of the actions people might take in response to, or to comply with, the Plan amendments may not be subject to discretionary approval and therefore some of the mitigation measures identified in the Staff Report may not be implemented.

## **A1.4 Changes in Hydrology and Water Supply Findings**

The State Water Board evaluated impacts of reasonably foreseeable compliance measures attributable to the changes in hydrology (e.g., physical changes in flow and reservoir levels) and reduced Sacramento/Delta supply to agriculture, municipal and wildlife refuge uses as a result of the Plan amendments. In response to reductions in Sacramento/Delta water supplies, individual water users could choose to increase groundwater pumping as a substitute supply, where available and not locally restricted, and water users may choose to modify their water supply portfolios by maximizing the use of existing water supplies. These other water management actions include groundwater storage and recovery, water transfers, water recycling, and water conservation. As summarized in Table 13.7.22-1, Impact and Mitigation Measure Summary—Changes to Hydrology and Supply, for the Plan amendments, potentially significant impacts on different resources would occur.

The impact determinations are conservative, and in many instances can be reduced or avoided through flexibility included in the Plan and through implementation of mitigation measures. The analysis of environmental impacts is appropriately broad to cover the broad flexibilities provided in the Plan itself. The regulatory pathway includes significant flexibility through adaptive implementation measures that could be used to improve conditions for fish and wildlife with reduced water supply costs. In addition, local cooperative solutions provide a mechanism to utilize Plan flexibility in the form of adaptive implementation and are provided in part to reduce water supply impacts if tailored solutions are available that provide comparable protection for achieving the water quality objectives. The environmental analyses evaluate a complete range of impacts in the event that water users do not utilize adaptive implementation, as well as the potential impacts from implementation of adaptive implementation. Some impacts are inversely proportional to each other: when one impact increases, the other is reduced, and vice-versa. In many cases, there may be no impact or effect; however, for each resource area, the analysis looks to the full potential impacts for the significance determination. The conservative impact determinations also reflect uncertainty in what response actions will actually occur, whether agencies will accept their responsibility to

implement the identified mitigation, and whether it will ultimately be effective. For this reason, the Staff Report often concludes that impacts from changes in hydrology and changes in supply under the Plan amendments will remain significant and unavoidable.

## **A1.4.1 Aesthetics**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.3, Section 9.7.3, Section 13.7.3, each titled 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**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts related to aesthetics. Because the impact mechanisms that inform the analyses of scenic vistas, scenic resources viewed from within a state scenic highway, and visual character and quality are similar, Impacts AES-a, AES-b, and AES-c are combined and addressed together.

### **Changes in Hydrology**

Changes in reservoir levels in the study area may result in significant impacts on aesthetics. At some reservoirs, drawdown could occur more frequently than under normal operations, at times leaving more exposed, barren land along the edges of some reservoirs, potentially substantially affecting scenic vistas, views of reservoirs visible from state scenic highways or national scenic byways, or the visual character or quality of the site and its surroundings during certain times of year. Although surface water elevations for reservoirs normally fluctuate throughout the year and from year to year, with implementation of the Plan amendments elevations for some reservoirs could be lower more frequently than under baseline conditions.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-AES-a-c: 1 will reduce or avoid aesthetics impacts at reservoirs, including export reservoirs. Reservoir operators in the Sacramento/Delta will be required to avoid or reduce aesthetic impacts in their long-term strategies and annual operations plans for implementation of the cold water habitat objective under the regulatory pathway. In addition, all reservoir owners and operators are subject to existing regulatory requirements that protect water quality in reservoirs and streams below reservoirs (Mitigation Measure MM-AQUA-a,d: 1).

Even with the identified mitigation, the impact may be significant, because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, impacts from changes in reservoir storage levels on aesthetics, including reservoirs in the plan area and export reservoirs in

other regions (Bay Area, San Joaquin Valley, Central Coast, and Southern California) that receive Sacramento/Delta supply remain significant and unavoidable.

### **Changes in Water Supply**

Changes in water supply for agricultural use could result in some land being permanently taken out of production and converted to other uses, such as the construction of houses, businesses, or other buildings, which could adversely affect existing scenic vistas and could substantially affect the existing visual character. Structures left to deteriorate on land removed from agricultural production could substantially affect scenic vistas, views visible from state scenic highways or national scenic byways, or the visual character or quality of the site and its surroundings.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, Mitigation Measure MM-AES-a-c: 2, which incorporates Mitigation Measure MM-AG-a,e to reduce the conversion of agricultural land to other uses, would reduce or avoid aesthetic impacts under the Plan amendments, including several mitigation measures for the State Water Board to implement to reduce the impacts of agricultural land conversion, and mitigation measures that other state, federal, and local agencies should implement to reduce impacts on aesthetics that result from agricultural land conversion (MM-AES-a-c: 2 [MM-AG-a,e: 1, 2ii, 3, 4 (MM-GW-b), 5ii, 6, and 7]).

The State Water Board will implement the measures within its authority. Other agencies can and should implement the identified mitigation measures to the degree feasible. However, because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty in the degree to which the measures will reduce potentially significant impacts. Therefore, the State Water Board finds that impacts on aesthetics related to agricultural conversion remain significant and unavoidable.

## **A1.4.2 Agriculture and Forest Resources**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.4, Section 9.7.4, Section 13.7.4, each titled Agriculture and Forest Resources.

**Impact AG-a: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Important Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use**

**Impact AG-e: Involve other changes in the existing environment that, due to their location or nature, could result in conversion of important farmland to nonagricultural use**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on agriculture and forest resources. Because the analyses of conversion of important farmland under Impact AG-a and Impact AG-e are closely related, they therefore are combined and addressed together.

## Changes in Water Supply

Reductions in Sacramento/Delta surface water supplies to agriculture could lead to changes in distribution of crop types and acreage and conversion of important farmland to nonagricultural use in the study area. A conservative threshold of significance for conversion is used that captures the importance of agriculture as a resource in California. Changes in irrigated crop acreage would not be uniform throughout the study area and would depend on several different economic and other factors, including the priority of individual water right diversions, availability of local supplies, and other factors. Growers and/or water suppliers may replace some of the reduced Sacramento/Delta supplies with groundwater; however, there is uncertainty about how much groundwater is available.

Lower groundwater levels from increased groundwater pumping and reductions in incidental groundwater recharge from applied irrigation could lead farmers to convert groundwater-irrigated land to nonagricultural use. These reductions could particularly affect growers who rely on groundwater in areas where groundwater levels are already in decline. In addition, the availability of Sacramento/Delta surface water supply for managed groundwater recharge could decrease under the Plan amendments. Irrigation or water districts that rely on conjunctive use could, over time, have less water available for agricultural purposes both from surface water and from groundwater. Lower groundwater levels could lead to less flexibility for water management because of an inability to get groundwater supply when or where it is needed, leading to potential conversion of agricultural land to nonagricultural uses.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. The program of implementation encourages and allows for local cooperative solutions that may allow flow requirements lower in the range if complementary measures (ecosystem projects) are implemented that provide for equivalent protection of fish and wildlife beneficial uses. Such projects could reduce the potential impacts associated with decreased consumptive water uses, including impacts on agriculture. In addition, implementation of Mitigation Measure MM-AG-a,e: 1 through 5 could avoid or reduce the amount of agricultural conversion as a result of the Plan amendments. Water users can and should diversify their water supply portfolios to the extent possible, in an environmentally responsible manner and in accordance with the law. Diversification includes sustainable conjunctive use of groundwater and surface water, water transfers, water conservation and efficiency upgrades, and increased use of recycled water. Farmers are likely to implement efficiency and conservation measures on their own initiative in response to reduced supply. The State Water Board will continue to work with farmers and districts to develop and implement programs to increase water use efficiency and conservation in order to maximize the beneficial use of Sacramento/Delta supplies, including through conditions on discretionary approvals for funding and other approvals as appropriate. Impacts on agriculture from lower groundwater levels could be reduced through implementation of Mitigation Measure MM-AG-a,e: 4, which incorporates groundwater mitigation measures to avoid or reduce lowering of groundwater levels.

The State Water Board will implement the measures within its authority. In addition, public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible, including imposing conditions on land use approvals to provide the permanent protection of an area of farmland equal to the converted area. However, because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty in the degree to which the

measures will reduce potentially significant impacts on agriculture. Therefore, the State Water Board finds that these impacts on agriculture remain significant and unavoidable.

The use of other water management actions can reduce the magnitude of agriculture impacts associated with changes in surface water supply but could also result in environmental impacts. Increased use of water transfers, both sales and leases, can lead to shifts in cropping patterns, and in some circumstances, to greater conversion of agricultural land to nonagricultural uses. The magnitude of the effect of water transfers on source area agricultural land conversions is unknown, but some conversion would be likely.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, impacts on agriculture related to water transfers could be reduced through implementation of Mitigation Measures MM-AG-a,e: 3 and 5. Local land use agencies could require compensatory preservation of agricultural land to mitigate the impacts of projects that convert agricultural land. Many jurisdictions in the most affected areas are likely to do so, as protection of agriculture is an important policy goal. If they do so, Mitigation Measure MM-AG-a,e: 3 could reduce this impact to a less-than-significant level. However, those agencies, and not the State Water Board, would be responsible for implementing the measure. Transfers approved by the State Water Board and conveyed by facilities operated by the California Department of Water Resources (DWR) and/or U.S. Bureau of Reclamation (Reclamation) generally require environmental review and approval by different agencies that would be expected to analyze and address impacts on agriculture. While this process requires consideration of agricultural impacts, the process cannot ensure protection against agricultural conversion in all cases, and it is possible that transfers could occur outside of the permitting processes. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty in the degree to which the measures will reduce potentially significant impacts on agriculture. Therefore, the State Water Board finds that impacts on agriculture related to water transfers remain significant and unavoidable.

### **Changes in Hydrology**

Changes in hydrology could result in reduced streamflow and water levels at some times and locations. In locations where water users are not coordinating their diversions, reduced water levels below existing diversion intakes could result in inadequate access to water supply for agriculture. Lower water levels could affect the usability of existing diversion intakes to divert water for agricultural use, which could potentially lead to conversion of agricultural land to nonagricultural use. Changes in reservoir levels also could result in conditions where storage levels drop below levels needed for water supply intake diversions and could result in reduced availability of agricultural supply (e.g., at San Luis Reservoir). Increased frequency of water level reductions could lead to construction to modify diversion intake structures to ensure access to water supply. Findings on impacts associated with construction projects are evaluated in Section A1.6, New or Modified Facilities Findings.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, Mitigation Measure MM-AG-a,e: 6 identifies actions to help ensure the effectiveness of diversion intakes under the regulatory pathway, including monitoring and coordination activities among water users and modifying intakes. Private individuals and irrigation districts are strongly

encouraged to implement these actions. To the extent that mitigation measures are within the responsibility and jurisdiction of local agencies, those agencies can and should implement these mitigation measures. However, the Staff Report does not contain any feasible State Water Board action that would require them to do so. Therefore, the State Water Board finds that these impacts on agriculture remain significant and unavoidable.

In addition, changes in hydrology could result in increased inundation of the Sutter and Yolo Bypasses during the planting season (April through June), prompting some farmers in the area to convert land, including important farmland, to nonagricultural uses. Because land in the bypasses is restricted by easements that preclude landowners from building structures that would significantly obstruct floodflows, any potential conversion likely would be to natural habitat and not development.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, Mitigation Measures MM-AG-a,e: 3 and 7 could reduce or avoid disruptions to agricultural operations and associated potential land use conversions from increased inundation in the Sutter and Yolo Bypasses as a result of the Plan amendments. One measure is to communicate and collaborate with farmers to maintain the economic feasibility of continued use of land for agricultural purposes in the bypasses. An interagency coordination group such as the Yolo Bypass and Cache Slough Partnership could serve as a forum for expanding existing efforts and developing additional planning and implementation measures to reduce the impacts on agricultural operations associated with increased floodplain inundation during the planting season. These measures could be implemented in conjunction with planned habitat restoration and other efforts, which could promote multiple beneficial uses within the Yolo Bypass. However, the Staff Report does not contain any feasible State Water Board action that would require them to do so. Therefore, the State Water Board finds that this impact on agriculture remains significant and unavoidable.

### **A1.4.3 Air Quality**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.6.3, Section 9.7.6.3, Section 13.7.6., each titled Air Quality.

**Impact AQ-a: Conflict with or obstruct implementation of the applicable air quality 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 nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on air quality. The analyses of activities that generate emissions that could conflict with applicable air quality plans, contribute to National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) violations, and result in project-level and cumulative air quality

impacts are closely related and are therefore combined and addressed together under Impacts AQ-a through AQ-c.

Reductions in Sacramento/Delta supply could lead to increased groundwater pumping to replace Sacramento/Delta supply. Increases in groundwater pumping would likely be powered by electric pumps and additional electricity to facilitate such pumping would come from either a renewable or nonrenewable energy source that is already permitted, and thus, no new operational air quality emissions would be expected. However, some portion of groundwater pumping may utilize diesel or other fuels. Diesel pumps would generate exhaust-related emissions and toxic air contaminants during operations. Depending on the extent of groundwater pumping, the combined emissions of new groundwater pumping could exceed the applicable air district thresholds.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, to reduce potential air quality impacts from diesel pumps, entities undertaking or agencies approving new groundwater wells would need to implement Mitigation Measure MM-AQ-a-c, which includes provisions such as the use of energy-efficient pumps and equipment alternatives to diesel-fueled pumps, or replacement with electric pumps, that would mitigate criteria air pollutant emissions from groundwater pumping. The authority to determine and require specific mitigation is within the responsibility and jurisdiction of other public agencies with discretionary approval authority. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant impacts on air quality. Therefore, the State Water Board finds that this impact on air quality from increased groundwater pumping remains significant and unavoidable.

## **A1.4.4 Biological Resources**

### **Aquatic Biological Resources**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.6.2, Section 9.7.6.2, Section 13.7.6.2, each titled Aquatic Biological Resources.

**Impact AQUA-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 AQUA-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**

This section describes the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on aquatic biological resources. The discussion of Impact AQUA-a and Impact AQUA-d is combined because fish migration is integral to the discussion of effects on special-status species generally.

## Changes in Hydrology

Changes in flow and reservoir storage could reduce the availability of cold water to protect anadromous salmonids and other native fishes. As described in Section 7.6.2.2, Environmental Setting, and in Chapter 5, Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta, existing temperature protections are in place for some stream reaches and reservoirs, but legal requirements are applied unevenly and, in many locations, not at all. Under the Plan amendments, higher spring flows that more closely resemble the natural hydrologic regime would benefit native anadromous salmonids and other native species; however, higher spring flows also could result in reductions in reservoir storage at the end of spring and a smaller cold water volume in summer and fall months. Regulated tributaries may also experience some reductions in summer and fall flows relative to baseline conditions because the existing flow regime on regulated tributaries can include substantially elevated flows above required flow levels and above unimpaired conditions (i.e., greater than 100 percent unimpaired flow) in summer and fall to supply downstream water diversions. In the spring, increased releases from rim dams could reduce downstream temperatures and improve cold water habitat. In the late summer and early fall, reduced carryover storage and lower flows could reduce cold water habitat and affect special-status fish species in the reaches below these reservoirs.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. The Plan amendments include a cold water habitat objective that applies to all of the Sacramento/Delta tributaries subject to the inflow objective. The owners and operators of reservoirs identified in the Plan that are not part of the VA pathway would be required to develop long-term temperature management and annual operation plans that specify management of cold water storage and releases and/or alternative protection measures to ensure that fish below dams are kept in good condition consistent with California Fish and Game Code section 5937 and the narrative objective. In addition, implementation of Mitigation Measures MM-AQUA-a,d: 1 and 2 will reduce or avoid temperature-related impacts on native cold water species in reservoirs, including reservoirs not subject to the cold water habitat objective, and downstream waterways. Reservoirs are subject to existing regulatory requirements independent of the Bay-Delta Plan, such as California Fish and Game Code section 5937, Federal Energy Regulatory Commission (FERC) license requirements, and federal Endangered Species Act (ESA) and California Endangered Species Act (CESA), including National Marine Fisheries Service (NMFS) biological opinion (BiOp) requirements. Reservoirs and streams below reservoirs may also be subject to future changes that could result from the issuance of new water right orders or decisions, FERC licenses, and other future regulatory requirements. In exercising its regulatory authorities, the State Water Board will consider temperature needs and ensure that any temperature impacts are avoided or reduced. In addition, temperature effects can be minimized through habitat planning and restoration efforts under the federal ESA and CESA. Implementation of relevant NMFS species recovery plans may also help to protect listed cold water species and provide suitable water temperatures downstream of export reservoirs. State and federal resource agencies should continue to develop, refine, and implement species recovery plans to protect aquatic biological resources, including special-status fish species, and the instream flows they require. There is some uncertainty regarding the precise implementation of these measures (including decisions regarding tradeoffs between flows and cold water supplies). It is possible that, in limited instances, temperature impacts could still occur prior. Therefore, the State Water Board finds that temperature impacts on special-status fish species from changes in flows and reservoir levels remain significant and unavoidable.

Increases in exports during April and May would increase the frequency of net negative Old and Middle River (OMR) flows in the interior Delta, which could affect candidate, sensitive, or special-status species (i.e., potential increased risk of outmigrating fish experiencing poor habitat conditions, higher predation, and increased entrainment) and could interfere with the movement of native resident or migratory fish in the Delta. Water diversions at the State Water Project (SWP) and Central Valley Project (CVP) (collectively Projects) export facilities (in combination with other conditions) can cause changes in interior Delta flows, including OMR flows and net flows in the San Joaquin River at Jersey Point (QWEST). The major freshwater source in the Delta, the Sacramento River, enters on the northern side of the Delta while the two major pumping facilities, the SWP and CVP, are in the south near the confluence of the San Joaquin River with the Delta. Pumping at the Project export facilities can cause a net movement of flows across the Delta in a north-south direction along a web of channels including Old and Middle Rivers instead of the more natural pattern from east to west or from land to sea, particularly when exports are high and San Joaquin River flows are low. A negative value, or a reverse flow, indicates a net water movement across the Delta and OMR channels to the export facilities. The Plan amendments include a narrative objective for interior Delta flows to maintain water quality conditions, including flow conditions in the interior Delta, together with other measures in the watershed, sufficient to support and maintain the natural production of viable native fish populations. Consistent with existing CESA and ESA requirements, it is expected that limits on negative OMR flows will continue to be implemented to reduce impacts to listed species. In addition, additional CESA or ESA actions may be implemented in the future to protect native fish species migrating through or inhabiting the Delta from potential changes in interior Delta flows. Habitat restoration in the Delta may reduce the potential impacts associated with net negative flows in the interior Delta by improving other environmental conditions that could support populations of native estuarine and anadromous fish species, including through potentially increasing physical habitat, improving water quality, and increasing food supply.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-AQUA-a,d: 2, 3, 7, 9, and 10 can avoid or reduce impacts of changes in interior Delta flows on native anadromous and estuarine fish species residing in or migrating through the Delta that could occur as a result of implementing the Plan amendments. Mitigation Measure MM-AQUA-a,d: 2 includes habitat protection and restoration actions for special-status aquatic species and coordination between the State Water Board and other state and federal resource agencies to support restoration activities. Mitigation Measure MM-AQUA-a,d: 3 includes special-status species management measures to minimize and avoid impacts on special-status species to encourage the protection, restoration, and management of habitat. Mitigation Measure MM-AQUA-a,d: 7 states that water users can and should diversify their water supply portfolios to the extent possible in an environmentally responsible manner and in accordance with the law to reduce reliance on the Sacramento/Delta. Mitigation Measure MM-AQUA-a,d: 9 requires oversight and approval of water transfers by the State Water Board to ensure that the transfer would not result in unreasonable effects on fish and wildlife, and states that when processing transfers, DWR and Reclamation should require the transferor to show that the transfer would not result in unreasonable effects on fish and wildlife or other instream beneficial uses in the source area. Mitigation Measure MM-AQUA-a,d: 10 includes implementing existing laws to protect and mitigate fisheries impacts from changes in interior Delta flows. CVP and SWP operations are subject to existing regulatory requirements that are intended to avoid jeopardy to species listed under the ESA and CESA. To the extent that mitigation measures are within the responsibility and

jurisdiction of other federal, state and local agencies, those agencies can and should implement these mitigation measures. In exercising its regulatory authorities, the State Water Board may also develop and require specific water right conditions in individual water right proceedings to implement the narrative interior Delta flows objective to ensure protection of native fish species, including non-listed species, if it is determined that additional actions are needed. However, there is some uncertainty regarding the precise implementation and effectiveness of these measures. Therefore, the State Water Board finds that impacts on special-status fish species from changes in interior flows remain significant and unavoidable.

### **Changes in Water Supply**

Reduced Sacramento/Delta supply to agriculture could affect habitat for special status species that depend in part on Sacramento/Delta water supply for habitat (i.e., irrigation runoff in agricultural drain for desert pupfish). It is unknown what actions individual water districts would take in response to reduced Sacramento/Delta water supply, and whether these actions to result in substantial modifications to aquatic habitat may be remote.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, Mitigation Measures MM-AQUA-a,d: 2 and MM-AQUA-a,d: 3 could avoid or reduce potential impacts on aquatic species. Mitigation Measure MM-AQUA-a,d: 2 identifies habitat protection and restoration actions that state and federal and other appropriate entities should continue to implement. Mitigation MM-AQUA-a,d: 3 provides generally for management actions to protect special-status species dependent on Sacramento/Delta water that has been used for irrigation. These mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the revised proposed Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. However, because the jurisdiction and authority to implement mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty in the degree to which the measures will reduce potentially significant impacts on agriculture. Therefore, the State Water Board finds that this impact on habitat for special status species from reduced Sacramento/Delta water supply to agriculture remains significant and unavoidable.

Reduced Sacramento/Delta supply to municipalities, as well as increased water recycling and indoor conservation could alter the flow and chemical constituent concentrations of wastewater treatment plant (WWTP) influent and subsequently affect WWTP effluent discharge to receiving waters which could result in effects on water quality and flow and adversely affect special-status aquatic species occurring in affected streams. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-AQUA-a,d: 4 and 5 will reduce potential violations of waste discharge requirements that could alter instream flows or water quality conditions affecting special-status species. Mitigation Measure MM-AQUA-a,d: 4 incorporates Mitigation Measure MM-SW-a,f: 1 for regulation of waste discharges that is accomplished primarily through the State Water Board and regional water quality control board (regional water board) waste discharge permits, including National Pollutant Discharge Elimination System (NPDES) permits for point-source discharges. A variety of funding programs provide loans and grants for capital improvements to WWTPs. The State Water Board and regional water boards will continue to regulate waste discharges and will continue to promote and support future funding sources as

appropriate. Additionally, to avoid or minimize impacts associated with reduced wastewater instream, when processing wastewater change petitions pursuant to Water Code section 1211, the State Water Board will ensure that the change in wastewater discharge does not affect instream flows or water quality for special-status species. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds these impacts remain significant and unavoidable.

### **Changes in Groundwater**

Reduced Sacramento/Delta surface water supplies could result in an increase in groundwater pumping to replace lost surface water supplies, a reduction in incidental groundwater recharge from applied irrigation water, and agricultural conservation measures that could lower groundwater levels in some locations in the Sacramento/Delta watershed and other regions. Potential changes in groundwater levels could affect stream-aquifer interactions (i.e., streambed seepage) in some locations and negatively affect special-status fish species. The potential for changes in groundwater levels to affect stream-aquifer interactions in any given stream can vary by stream reach and depends on several factors, such as the underlying geology, proximity and connectivity of groundwater wells to the stream, rate and duration of groundwater pumping, and groundwater recharge rates. Under existing conditions, flow in some streams is already affected by high levels of groundwater pumping, including in areas where declining groundwater levels have been observed, and actions taken by water users in response to the Plan amendments could exacerbate the effects of groundwater overdraft on streamflows.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-AQUA-a,d:, 6 through 8 will reduce or avoid potential impacts on aquatic biological resources resulting from changes in stream-aquifer interactions from lower groundwater levels. These measures incorporate groundwater mitigation measures to reduce lowering of groundwater levels. The Sustainable Groundwater Management Act (SGMA) could reduce or eliminate impacts, particularly in medium- and high-priority groundwater basins. In developing and implementing a groundwater sustainability plan, groundwater sustainability agencies are required to avoid undesirable results, including depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of surface water.

In addition, the State Water Board has several authorities that are independent of SGMA, including authority to act to prevent waste, unreasonable use, unreasonable method of use, and unreasonable method of diversion of water. The State Water Board may exercise this authority through quasi-adjudicative or quasi-legislative proceedings as appropriate and necessary to minimize potential impacts on special-status aquatic species from changes in groundwater and surface water supplies. The State Water Board could also act under its public trust authority to regulate depletion of interconnected surface water by groundwater pumping.

More generally, water users can and should diversify their water supply portfolios in an environmentally responsible manner and in accordance with the law to mitigate groundwater impacts and possible changes in stream-aquifer interactions that could affect aquatic biological resources. This includes sustainable use of groundwater and groundwater storage and recovery and

conjunctive use, water transfers, water conservation and efficiency upgrades, and recycled water. The State Water Board will continue efforts to encourage and promote environmentally sound recharge projects that use surplus surface water, increased use of recycled water, sustainable water transfers, and conservation. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. The State Water Board cannot guarantee that measures will always be adopted or applied in a manner that fully mitigates the impact. Therefore, impacts of changes in groundwater levels and stream-aquifer interactions on aquatic biological resources remain significant and unavoidable.

### **Other Water Management Actions**

In response to reductions in Sacramento/Delta surface water supplies attributable to the Plan amendments, water users may implement other water management actions—including groundwater storage and recovery, water transfers, and water recycling—that could reduce the magnitude of supply-related impacts but may also result in other impacts on aquatic species.

Diversion of peak flows for groundwater storage and recovery could reduce flows and adversely affect aquatic species and their habitat because peak flows provide ecological and habitat functions (e.g., floodplain inundation). Increased use of recycled water could decrease the volume of treated wastewater effluent discharged into streams; in some locations, reductions in flow could alter water quality in some streams, particularly in streams with low flows that are dominated by relatively high-quality WWTP effluent and have local input of poor-quality water, which could significantly reduce flows in those migratory corridors. Depending on the volume and timing of these reductions, it is possible that resulting changes in streamflow could adversely affect aquatic biological resources, including special-status fish species.

Changes or alterations have been required in, or incorporated into, the project to avoid lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-AQUA a,d: 8 will mitigate the impacts of groundwater storage and recovery projects to a less-than-significant level. The State Water Board will continue efforts to encourage and promote environmentally sound groundwater recharge projects that use surplus surface water, including prioritizing the processing of temporary and long-term water right permits for projects that enhance the ability of a local or state agency to capture high runoff events for local storage or recovery (Governor's Exec. Order No. B-39-17 [April 6, 2017]). A water right permit is required to capture streamflows, including peak storm events, for groundwater recharge and later beneficial use. In processing water right applications that involve groundwater storage, the State Water Board will consider the need to preserve ecological functions of high-flow events and other relevant factors in accordance with the Water Code to ensure that enough flow remains instream to protect ecological benefits. Implementation of Mitigation Measure MM-AQUA-a,d: 5 will reduce potential impacts on special-status species from increased water recycling to less-than-significant levels. The State Water Board will continue efforts to encourage and promote recycled water projects, including projects that involve use of recycled water for groundwater recharge, through expedited permit processes and funding efforts. When processing wastewater change petitions pursuant to Water Code section 1211, the State Water Board will ensure that the change in wastewater discharge does

not diminish ecological benefits of instream flows or impact water quality (including cold water for special-status fish species), especially in dry seasons and in low flow conditions where the stream is dependent on wastewater discharges. Therefore, impacts on instream ecological benefits from increased capture of flood flows for groundwater recharge and increased recycling is mitigated to a less-than-significant level.

Water transfers could result in altered hydrologic patterns that affect aquatic species and natural ecological processes. For example, native fish species could be affected if the timing of flows for transfers is modified in a way that results in straying, dewatering, or stranding. In addition, some surface water transfers could result in reduced reservoir levels, which could affect cold water supplies for the protection of anadromous salmonids and other native cold water species below reservoirs. Surface water transfers from the Sacramento/Delta to south-of-Delta water users via the SWP and CVP pumping facilities could affect flows in the Delta, which could affect native estuarine-dependent species such as Delta smelt and longfin smelt. These transfers could affect fish if pumping operations related to transfers causes entrainment or impingement. In addition, groundwater substitution transfers could exacerbate the impacts already described related to groundwater levels.

Changes or alterations have been required in, or incorporated into, the project to avoid lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-AQUA-a,d: 9 will avoid or reduce impacts on aquatic biological resources from water transfers. Transfers generally require environmental review and approval by different agencies that would be expected to address impacts on special-status species and their habitats. Water transfers should be carefully planned and coordinated to avoid or minimize impacts on special-status species and their habitats. Transfers based on crop idling approved by the State Water Board and/or facilitated by DWR or Reclamation are required to avoid unreasonable impacts on fish and wildlife and prevent injury to other legal users of water. These approvals generally include the need for CEQA and/or National Environmental Policy Act documentation and federal ESA and CESA consultation to address fish and wildlife resources. To avoid or minimize impacts, when processing petitions for transfers, the State Water Board will ensure that the transfer would not result in diminished habitat for special-status aquatic species and their habitats. Other public agencies with authority can and should implement the mitigation measures to the degree feasible. Because the jurisdiction and authority to implement mitigation measures sometimes lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. The State Water Board cannot guarantee that measures will always be adopted or applied in a manner that fully mitigates the impact. Therefore, impacts of transfers on aquatic biological resources remain significant and unavoidable.

## Terrestrial Biological Resources

These findings rely on the analysis and information presented in the Staff Report, including Section 7.6.1, Section 9.7.6.1, Section 13.7.6.1, each titled Terrestrial Biological Resources.

**Impact TER-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**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on terrestrial biological resources.

### **Changes in Hydrology**

Increased inundation in the Yolo and Sutter Bypasses during the planting season could affect natural communities and agriculture could affect special-status wildlife that utilize these areas (e.g., giant gartersnake, western burrowing owl, white-tailed kite, Swainson's hawk, tricolored blackbird). While direct effects from inundation is expected to be less than significant when compared with baseline flooding conditions, these changes could result in increased floodplain inundation during the planting season that could lead some farmers in the area to convert some land to nonagricultural uses. This could result in a reduction in agricultural habitat for special-status wildlife species.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-a, which incorporates Mitigation Measures MM-AG-a,e: 3 and MM-AG-a,e:7 to reduce or avoid disruptions of agricultural operations and associated potential land use conversions due to increased inundation in the Sutter and Yolo Bypasses, will reduce or avoid impacts on special-status species that use agricultural habitat in the Sutter and Yolo Bypasses. Methods to encourage continued use of land for agricultural purposes in the bypasses include increased acquisition of conservation easements and communicating and collaborating with farmers to maintain economic feasibility of continued use of land for agricultural purposes in the bypasses. An interagency coordination group such as the Yolo Bypass and Cache Slough Partnership could serve as a forum for expanding existing efforts and developing additional planning and implementation measures to reduce the impacts on agricultural operations associated with increased floodplain inundation during the planting season. These measures could be implemented in conjunction with planned habitat restoration and other efforts, which could promote multiple beneficial uses within the Yolo Bypass. However, the Staff Report does not contain any feasible State Water Board action that would require them to do so. Other agencies can and should implement the identified mitigation measures to the degree feasible. However, because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty in the degree to which the measures will reduce potentially significant impacts. Therefore, the State Water Board finds that impacts from increased floodplain inundation on terrestrial biological resources remain significant and unavoidable.

### **Changes in Water Supply**

Reduced Sacramento/Delta supply to agriculture and wildlife refuges could adversely affect habitat for special-status terrestrial species that rely on Sacramento/Delta water supplied to wildlife refuges and certain agricultural lands, which would result in potentially significant impacts on species including but not limited to giant gartersnake, Swainson's hawk, greater sandhill crane, tricolored blackbird, and California black rail.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report.

Specifically, Mitigation Measures MM-TER-a: 2 through 4 could avoid or reduce potential impacts on terrestrial species. The Plan amendments are intended to be implemented in an integrated fashion with habitat restoration and other non-flow measures that would provide benefits for terrestrial species. In addition, management measures exist that agricultural water users can implement to avoid or minimize impacts on special-status species. Mitigation Measure MM-TER-a: 2 identifies habitat protection and restoration actions that state and federal and other appropriate entities should continue to implement to protect terrestrial species. The State Water Board will consult and coordinate with state and federal resource agencies and other appropriate entities to secure and distribute funding to support habitat restoration activities that would benefit terrestrial biological resources including but not limited to, giant gartersnake, Swainson's hawk, greater sandhill crane, tricolored blackbird, California black rail, and other special-status terrestrial species. Mitigation Measure MM-TER-a: 3 and Mitigation Measure MM-TER-a: 4 provides generally for water providers and users and land managers to implement management actions to protect special-status species dependent on Sacramento/Delta water that has been used for irrigation and to diversify their water supply portfolios to mitigate potential impacts on terrestrial resources from reduced water supplies for agricultural uses. While the State Water Board has authority to ensure that some mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the revised Plan amendments. Therefore, the State Water Board finds that impacts on terrestrial biological resources from reduced Sacramento/Delta supply to agriculture and wildlife refuges remain significant and unavoidable.

Reduced Sacramento/Delta supply to municipalities, as well as increased water recycling and indoor conservation, could alter the flow and chemical constituent concentrations of WWTP influent and subsequently affect WWTP effluent discharge to receiving waters, which could result in effects on water quality and flow and adversely affect special-status terrestrial species occurring in association with streams or riparian and emergent marsh habitat in these streams. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-TER-a: 5 and 6 will reduce potential violations of waste discharge requirements that could alter instream flows or water quality conditions affecting special-status species. Mitigation Measure MM-TER: 5 incorporates Mitigation Measure MM-SW-a,f: 1 for regulation of waste discharges that is accomplished primarily through the State Water Board and regional water board waste discharge permits, including NPDES permits for point-source discharges. A variety of funding programs provide loans and grants for capital improvements to WWTPs. The State Water Board and regional water boards will continue to regulate waste discharges and will continue to promote and support future funding sources as appropriate. Additionally, to avoid or minimize impacts associated with reduced wastewater instream, when processing wastewater change petitions pursuant to Water Code section 1211, the State Water Board will ensure that the change in wastewater discharge does not affect instream flows or water quality for special-status species. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the impacts on terrestrial biological resources associated with reduced Sacramento/Delta supply to municipalities, increased water recycling and indoor water conservation remain significant and unavoidable.

## Other Water Management Actions

In response to reductions in Sacramento/Delta surface water supplies attributable to the Plan amendments, water users may implement other water management actions—including groundwater storage and recovery, water transfers, and water recycling—that include several strategies that could be used at the local or regional level by utilizing existing infrastructure to reduce the potential impacts from reduced Sacramento/Delta surface water supplies. Local conditions would determine which actions are most effective. These responses to reduced Sacramento/Delta supply may affect terrestrial biological resources.

Water sources for groundwater storage and recovery primarily include surface water supply during above-average years or treated wastewater. Capturing significant quantities of flood flows for groundwater storage and recovery could diminish to some extent the instream ecological benefits of these high-flow events. Natural flow processes, such as sediment deposition, marsh accretion, nutrient transport, seed dispersal, and flow-related disturbance are important for native wetland and riparian plant species and any special-status plants and wildlife found in these natural communities such as Swainson's hawk, willow flycatcher, and arroyo toad. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER: 7 will reduce potential impacts on instream ecological benefits from increased capture of flood flows for groundwater recharge to less-than-significant levels. Diversion of flood flows would be subject to State Water Board regulation to ensure that enough flow remains instream to protect ecological benefits, including terrestrial species and wetland and riparian habitat. The State Water Board will continue efforts to encourage and promote environmentally sound groundwater recharge projects that use surplus surface water, including prioritizing the processing of temporary and long-term water right permits for projects that enhance the ability of a local or state agency to capture high runoff events for local storage or recovery (Governor's Exec. Order No. B-39-17 [April 6, 2017]). In processing water right applications that involve groundwater storage, the State Water Board will consider the need to preserve ecological functions of high-flow events and other relevant factors in accordance with the Water Code to ensure that enough flow remains instream to protect ecological benefits. Therefore, impacts on instream ecological benefits from increased capture of flood flows for groundwater recharge is mitigated to a less-than-significant level.

Surface water transfers based on cropland idling could affect species that use agricultural fields for forage, cover, and nesting habitat and groundwater substitution transfers could exacerbate agricultural impacts related to reduced groundwater levels. The magnitude and severity of the effects would depend on the duration of the transfer and the location and extent of cropland idling. Some conversion of agricultural land to nonagricultural purposes could result, including conversion of crop types that are important to giant gartersnake, Swainson's hawk, greater sandhill crane, and tricolored blackbird.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-a: 8, will avoid or reduce impacts on terrestrial biological resources from water transfers. Transfers generally require environmental review and approval by different agencies that would be expected to address impacts on biological resources. Transfers based on crop idling approved by the State Water Board and/or facilitated by DWR or Reclamation are required to avoid unreasonable impacts on fish and wildlife and prevent

injury to other legal users of water. To avoid or minimize these impacts, when processing petitions for transfers, the State Water Board will ensure that the transfer would not result in diminished habitat for special-status terrestrial species. Other public agencies with authority can and should implement the mitigation measures to the degree feasible. Because the jurisdiction and authority to implement mitigation measures sometimes lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. The State Water Board cannot guarantee that measures will always be adopted or applied in a manner that fully mitigates the impact. Therefore, impacts of transfers on terrestrial biological resources remain significant and unavoidable.

Increased water recycling could reduce instream flows where wastewater is recycled instead of being discharged to streams. In some locations, reductions in flow could alter water quality in some streams, particularly in streams with low flows that are dominated by relatively high-quality WWTP effluent and have local input of poor-quality water, which could diminish the ecological benefits of instream flow, particularly in dry seasons and in low-flow conditions where streamflow is dependent on wastewater discharges. Depending on the volume and timing of these reduced flows, it is possible that changes in streamflow could adversely affect special-status terrestrial species. Changes or alterations have been required in, or incorporated into, the project to avoid lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-a: 6 will reduce potential impacts on special-status species from increased water recycling to less-than-significant levels. The State Water Board will continue efforts to encourage and promote recycled water projects, including projects that involve use of recycled water for groundwater recharge, through expedited permit processes and funding efforts. When processing wastewater change petitions pursuant to Water Code section 1211, the State Water Board will ensure that the change in wastewater discharge does not diminish ecological benefits of instream flows, especially in dry seasons and in low-flow conditions where the stream is dependent on wastewater discharges. Therefore, impacts on special-status species from increased water recycling is mitigated to a less-than-significant level.

**Impact TER-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 TER-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, hydrological interruption, or other means**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on terrestrial biological resources. Because the impact mechanisms that inform the analyses of sensitive natural communities and federally protected wetlands are similar, Impacts TER-b and TER-c are combined and addressed together.

### **Changes in Hydrology**

Changes in some reservoir levels in the study area may result in significant impacts on terrestrial biological resources related to riparian and wetland habitat. While many reservoirs are constructed in steep terrain and many contain bedrock shorelines, which are not conducive to the establishment

of riparian and wetland vegetation, some reservoirs contain shallow shorelines with associated riparian vegetation and wetlands that are subject to fluctuations in reservoir storage levels.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-b,c: 1 will avoid or reduce potential impacts on riparian and wetland habitat at reservoirs. Reservoir operators in the Sacramento/Delta will be required to avoid or reduce impacts on riparian and wetland habitat and any associated special-status species in their long-term strategies and annual operations plans for implementation of the cold water habitat objective under the regulatory pathway. In addition, all reservoir owners and operators are subject to existing regulatory requirements that protect water quality in reservoirs and streams below reservoirs (Mitigation Measure MM-AQUA-a,d: 1). In exercising its regulatory authorities related to issuance of new water rights orders or decisions, FERC licenses, and other future regulatory requirements, the State Water Board will consider terrestrial biological resources and ensure that any riparian and wetland habitat impacts are avoided or reduced. Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. Due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, impacts from changes in Sacramento/Delta reservoir levels on terrestrial biological resources, including reservoirs in the plan area and export reservoirs in other regions (Bay Area, San Joaquin Valley, Central Coast, and Southern California) that receive Sacramento/Delta supply remain significant and unavoidable.

### **Changes in Water Supply**

Reduced Sacramento/Delta supply to wildlife refuges could result in a decrease in wetland area at these refuges in the Sacramento River watershed and San Joaquin Valley regions. These refuges support sensitive wetland vegetation communities and refuge water supplies typically are used to support seasonally flooded wetlands and summer wetlands at wildlife refuges and areas that provide habitat for waterfowl and other wildlife.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, Mitigation Measure MM-TER-a: 2 will ensure that habitat protection and restoration actions are implemented to reduce this impact, particularly Mitigation Measure MM-TER-a: 2.iii., which identifies the need to prioritize water supplies to refuges. The program of implementation also includes specific provisions related to water supplies provided to refuges, including refuge supplies provided pursuant to the Central Valley Project Improvement Act (CVPIA). The program of implementation would prioritize refuge water supplies and would direct State Water Board staff to take measures to implement that prioritization. While the State Water Board has some authority to ensure that some mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Therefore, the State Water Board finds that impacts of reduced Sacramento/Delta supply to wildlife refuges on terrestrial biological resources remain significant and unavoidable.

Reductions in Sacramento/Delta supplies to agriculture could affect water quality in managed wetlands if those lands receive some or all of their water supply from the Sacramento/Delta, causing reductions in agricultural drainage and lowering of groundwater levels in areas high in salts and

selenium. With less Sacramento/Delta supply, the remaining inflow from agricultural drainage and groundwater could become more degraded, and dilution of this low-quality water with fresh surface water supplies could be reduced. Changes or alterations have been required in, or incorporated into, the project to avoid lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-a: 5, which incorporates Mitigation Measure MM-SW-a,f: 1 for regulation of waste discharge that is accomplished primarily through the State Water Board and regional water board waste discharge permits, Mitigation Measure MM-TER-b,c: 2, which incorporates Mitigation Measures MM-GW-b: 1 through 6 to reduce impacts of lowered groundwater levels (from reduced agricultural discharge) on riparian and wetland habitat, and Mitigation Measure MM-TER-b,c: 3, which incorporates Mitigation Measure MM-SW-a,f: 7 to ensure ongoing implementation of actions to address poor-quality agricultural discharges, will reduce the impacts from changes in water supply to streams and wetlands that receive agricultural discharges. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the impacts on terrestrial biological resources from reductions in Sacramento/Delta supplies to agriculture remain significant and unavoidable.

Reduced Sacramento/Delta supply to municipal and agricultural use, as well as increased water recycling and indoor conservation, could affect sensitive riparian and wetland habitat and other natural communities where agricultural and municipal discharges incidentally supplement flow. Some streams that historically were intermittent are now perennial due to these discharges and other artificial inputs. While the effects of a reduction in discharge related to flow for riparian and wetland habitat and sensitive natural communities would likely be beneficial in some locations from emulating more natural hydrologic conditions, in other locations some riparian and wetland habitat may become reliant on these now perennial systems and could be affected by reduced dilution capacity that worsens water quality in these streams.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-a: 5, which incorporates Mitigation Measure MM-SW-a,f: 1 for regulation of waste discharge that is accomplished primarily through the State Water Board and regional water board waste discharge permits, Mitigation Measure MM-TER-b,c: 2, which incorporates Mitigation Measures MM-GW-b: 1 through 6 to reduce impacts of lowered groundwater levels (from reduced agricultural discharge) on riparian and wetland habitat, and Mitigation Measure MM-TER-b,c: 3, which incorporates Mitigation Measure MM-SW-a,f: 7 to ensure ongoing implementation of actions to address poor-quality agricultural discharges, will reduce the impacts from changes in water supply to streams and wetlands that receive agricultural and municipal discharges. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be

reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the impacts on terrestrial biological resources associated with reduced Sacramento/Delta supply to municipal and agricultural use, as well as increased water recycling and indoor conservation, remain significant and unavoidable.

### **Changes in Groundwater**

Lowered groundwater levels from increased groundwater pumping in the study area may result in significant impacts on sensitive perennial wetland communities, which are groundwater-dependent ecosystems. In some instances, perennial wetlands such as fens, bogs, seeps, and marshes could be affected by increased groundwater pumping, particularly in localized areas if water users choose to respond to the Plan amendments by pumping additional groundwater from wells close to the wetlands. Some perennial wetlands could be affected by lower groundwater levels and could convert from perennial to seasonal wetlands, particularly in localized areas close to groundwater.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-b,c: 2, which incorporates Mitigation Measures MM-GW-b: 1 through 6 to ensure oversight and management of actions that could affect groundwater levels, will reduce impacts of lowered groundwater levels on groundwater-dependent ecosystem habitat. Groundwater impacts and associated impacts on wetlands and sensitive groundwater-dependent natural communities could be reduced by sustainable groundwater management, groundwater storage and recovery, increased use of water recycling from existing facilities, and agricultural and municipal conservation measures. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the impacts on sensitive perennial wetland communities from lowered groundwater levels due to increased groundwater pumping remain significant and unavoidable.

### **Other Water Management Actions**

Capturing significant quantities of flood flows for groundwater storage and recovery could diminish to some extent the instream ecological benefits of these high-flow events. Natural flow processes, such as sediment deposition, marsh accretion, nutrient transport, seed dispersal, and flow-related disturbance are important for wetland, riparian, and other sensitive habitats. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER: 7 will reduce potential impacts on instream ecological benefits from the increased capture of surplus surface water, including flood flows for groundwater storage, to less-than-significant levels. Diversion of surplus surface water, including flood flows (i.e., high runoff events), will be subject to State Water Board regulation to ensure that enough flow remains instream to protect ecological benefits, including terrestrial species and wetland and riparian habitat. The State Water Board will continue efforts to encourage and promote environmentally

sound groundwater recharge projects that use surplus surface water, including prioritizing the processing of temporary and long-term water right permits for projects that enhance the ability of a local or state agency to capture high runoff events for local storage or recovery (Governor's Exec. Order No. B-39-17 [April 6, 2017]). In processing water right applications that involve groundwater storage, the State Water Board will consider the need to preserve ecological functions of high-flow events and other relevant factors in accordance with the Water Code to ensure that enough flow remains instream to protect ecological benefits. Therefore, impacts on instream ecological benefits from increased capture of flood flows for groundwater recharge is mitigated to a less-than-significant level.

Surface water transfers have the potential to affect groundwater-dependent natural communities and some perennial wetlands, and groundwater substitution transfers could exacerbate impacts related to lower groundwater levels. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-a: 8 and Mitigation Measure MM-TER-b,c: 2, which incorporates groundwater management mitigation measures to reduce lowering of groundwater levels, will avoid or reduce impacts on terrestrial biological resources from water transfers. Crop idling transfers approved by the State Water Board and/or facilitated by DWR or Reclamation are required to avoid unreasonable impacts on fish and wildlife and prevent injury to other legal users of water. To avoid or minimize these impacts, when processing petitions for transfers, the State Water Board will ensure that the transfer would not result in diminished habitat for special-status terrestrial species. Further, groundwater impacts and associated impacts on wetlands and sensitive groundwater-dependent natural communities could be reduced by sustainable groundwater management, groundwater storage and recovery, increased use of water recycling from existing facilities, and agricultural and municipal conservation measures.

Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. The State Water Board cannot guarantee that mitigation will be implemented for transfers not subject to State Water Board approval. Therefore, impacts on special-status terrestrial species from water transfers remain significant and unavoidable.

Increased water recycling could reduce instream flows where wastewater is recycled instead of being discharged to streams. In some locations, reductions in flow could alter water quality in some streams, particularly in streams with low flows that are dominated by relatively high-quality WWTP effluent and have local input of poor-quality water, which could diminish the ecological benefits of instream flow, especially in dry seasons and in low-flow conditions where streamflow is dependent on wastewater discharges. Changes or alterations have been required in, or incorporated into, the project to avoid lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-a: 6 will reduce potential impacts on special-status species from increased water recycling to less-than-significant levels. The State Water Board will continue efforts to encourage and promote recycled water projects, including projects that involve use of recycled water for groundwater recharge, through expedited permit processes and funding efforts. When processing wastewater change petitions pursuant to Water Code section

1211, the State Water Board will ensure that the change in wastewater discharge does not diminish ecological benefits of instream flows or impact water quality (including cold water for special-status fish species), especially in dry seasons and in low flow conditions where the stream is dependent on wastewater discharges. Therefore, impacts on special-status species from increased water recycling is mitigated to a less-than-significant level.

**Impact TER-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**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on terrestrial biological resources.

**Changes in Water Supply**

Resident and migratory waterfowl and shorebirds could be affected by reductions in refuge water supplies by decreased amounts of wetland habitat flooded for migratory waterfowl and shorebirds as well as reduced breeding habitat for resident waterfowl and shorebirds over time. Reduced Sacramento/Delta water supplies could result in changes in agricultural land use patterns, which could affect the movement of migratory waterfowl and shorebirds during migration through the Pacific Flyway, and result in a decrease in the acreage of agricultural crops that provide foraging habitat for waterfowl. In addition, changes in water supply could result in decreased acreage of post-harvest flooding of rice fields that provide wetland habitat and foraging for migratory waterfowl and shorebirds.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, Mitigation Measures MM-TER-a: 2 will minimize the effects on terrestrial species resulting from habitat loss from reduced water supply to refuges and agriculture. MM-TER-a: 2 identifies habitat protection and restoration actions that state and federal and other appropriate entities should continue to implement to protect terrestrial species. The Plan amendments are intended to be implemented in an integrated fashion with habitat restoration and other non-flow measures that would provide benefits for terrestrial species, including actions identified in the program of implementation. Specifically, the program of implementation identifies habitat restoration actions, as well as complementary ecosystem measures that others should take to protect fish and wildlife. The program of implementation includes specific provisions related to water supplies provided to refuges, including refuge supplies provided pursuant to the CVPIA. The program of implementation would prioritize refuge water supplies and would direct State Water Board staff to take measures to implement that prioritization. Specific measures include potentially reducing fees and expediting processing for water transfers to refuges, funding mechanisms, and a wildlife refuge provision that would provide for the Executive Director to approve exceptions to curtailments under the implementation methodology for CVPIA wildlife refuge supplies. While the State Water Board has authority to ensure that some mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the revised Plan amendments. Therefore, the State Water Board finds that impacts on resident and migratory waterfowl and shorebirds from reductions in refuge water supplies remain significant and unavoidable.

## Other Water Management Actions

Water transfers based on cropland idling could affect foraging habitat for waterfowl and shorebirds that utilize agricultural lands. The magnitude and severity of the effects would depend on the duration of the transfer and the location and extent of cropland idling and while the magnitude and effect of water transfers on agricultural land conversion are unknown, some conversion could occur.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-TER-d, which incorporates Mitigation Measures MM-TER-a: 2, MM-TER-a: 8, and MM-TER-b,c: 2 to mitigate impacts on the movement of native resident or migratory fish or wildlife species, migratory wildlife corridors, and native wildlife nursery sites, will avoid or reduce impacts on terrestrial biological resources from water transfers. Crop idling transfers approved by the State Water Board and/or facilitated by DWR or Reclamation are required to avoid unreasonable impacts on fish and wildlife and prevent injury to other legal users of water. To avoid or minimize these impacts when processing petitions for transfers, the State Water Board will ensure that the transfer would not result in diminished habitat for special-status terrestrial species, including migratory waterfowl.

Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. The State Water Board cannot guarantee that mitigation will be implemented for transfers not subject to State Water Board approval. Therefore, impacts on special-status terrestrial species from water transfers remain significant and unavoidable.

## A1.4.5 Cultural Resources

These findings rely on the analysis and information presented in the Staff Report, including Section 7.7, Section 9.7.7, Section 13.7.7, each titled 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**

This section discusses the different impact mechanisms through which changes in hydrology from implementation of the Plan amendments could have significant impacts on cultural resources. Because the impact mechanisms that inform the analyses of historical and archaeological resources are similar, Impacts CUL-a and CUL-b are combined and addressed together.

### Changes in Hydrology

Previously inundated cultural resources could be exposed to increased wave action, erosion, and human activity (e.g., looting) with reductions in water surface levels at some reservoirs, particularly during critical and dry water years. Most of the changes in reservoir elevations resulting from the

Plan amendments would be within historical ranges; however, elevations could be lower more frequently, which could increase the potential for exposure and damage to cultural resources.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-CUL-a,b will avoid or reduce cultural resources impacts associated with changes in reservoir levels, including export reservoirs. Reservoir operators in the Sacramento/Delta will be required to avoid or reduce impacts on cultural resources in their long-term strategies and annual operations plans for implementation of the cold water habitat objective under the regulatory pathway. The State Water Board will implement this mitigation when it reviews and approves these plans. In addition, all reservoir owners and operators are subject to existing regulatory requirements that protect water quality in reservoirs and streams below reservoirs (Mitigation Measure MM-AQUA-a,d: 1). Reservoirs may already be subject to resource management plans, independent of the Bay-Delta Plan, that apply cultural resource protection measures for previously recorded sites, as well as procedures to implement in the event of an unanticipated discovery. In exercising its regulatory authorities related to issuance of new water rights orders or decisions, FERC licenses, and other future regulatory requirements, the State Water Board will consider cultural resources and ensure that any cultural resources impacts are avoided or reduced. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report. Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time.

Because the State Water Board cannot guarantee implementation of measures that are in the jurisdiction and control of other agencies, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, impacts from changes in reservoir levels on cultural resources, including reservoirs in the plan area and export reservoirs in other regions (Bay Area, San Joaquin Valley, Central Coast, and Southern California) that receive Sacramento/Delta supply remain significant and unavoidable.

#### **Impact CUL-d: Disturb any human remains, including those interred outside of dedicated cemeteries**

This section discusses the different impact mechanisms through which changes in hydrology from implementation of the Plan amendments could have significant impacts on cultural resources.

#### **Changes in Hydrology**

Changes in reservoir levels at some reservoirs could affect human remains or burials by increasing the exposure of previously inundated land that may yield human burials. This exposure could result in disturbance of the burial and impacts from human activity, such as looting.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-CUL-d, which incorporates mitigation measures from Mitigation Measure MM-CUL-a,b that mitigate historical or archaeological resource impacts, will reduce cultural resources impacts associated with the disturbance of human remains by requiring implementation of or compliance with practices to protect found cultural resources on lands surrounding reservoirs. Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other

feasible mitigation measures at this time. Because the State Water Board cannot guarantee implementation of measures that are in the jurisdiction and control of other agencies, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, impacts on cultural resources associated with disturbance of human remains from changes in reservoir levels remain significant and unavoidable.

## **A1.4.6 Energy**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.8, Section 9.7.8, Section 13.7.8, each titled Energy.

**Impact EN-a: The effects of the project on energy resources**

**Impact EN-b: The effect of the project on peak and base period demands for electricity and other forms of energy**

**Impact EN-c: The effects of the project on local and regional energy supplies and requirements for additional capacity**

**Impact EN-d: The degree to which the project complies with existing energy standards**

Impact EN-e: Energy requirements and energy use efficiencies by amount and fuel type for each stage of the project

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on energy. Because the impact mechanisms that inform the analyses of energy impacts are similar, Impacts EN-a, EN-b, EN-c, EN-d and EN-e are combined and addressed together.

Energy requirements would be affected by changes in hydrology and changes from reduced hydropower generation, reduced energy needed to transport Sacramento/Delta water supply, and by increased energy used to replace reduced Sacramento/Delta water supply. Changes in hydrology would result in a reduction in hydropower generation in the summer months that correspond to peak energy demand. Changes in hydrology would result in a range of hydropower effects at the hydropower facilities in the Sacramento River watershed and Delta eastside tributaries regions with the largest changes in flow and hydropower expected to occur at the rim reservoirs and downstream and a reduction in hydropower generation could occur at a few facilities above the rim reservoirs that depend on interbasin diversions. While changes in hydrology would not result in significant reductions in energy production from reduced hydropower statewide, there could be localized significant impacts for an individual project or community. Although implementation of the Plan amendments would result in energy savings associated with reduced exports and indoor water conservation that could help meet the total energy required, the impact of the net energy cost could exceed those savings. The energy used to replace reduced Sacramento/Delta water supply depends on how water users respond to the decreased Sacramento/Delta water deliveries. Water users may adopt any of a series of options, such as switching to or increasing use of groundwater supplies, employing other water management actions (i.e., groundwater storage and recovery, water transfers, water recycling, and water conservation measures), and operating desalination plants. However, energy to replace Sacramento/Delta water supply could be more energy intensive. This increase in energy use would represent an increase in demand that likely would be largest in the

summer, when water use is greatest, but it could affect both base and peak demand. Although the proposed Plan amendments would be unlikely to hinder the attainment of the objectives of Senate Bill (SB) 100 and SB 1020, the amendments could increase overall per capita energy consumption and could increase reliance on natural gas.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. The program of implementation encourages and allows for local cooperative solutions that may allow flow requirements lower in the range if complementary measures (ecosystem projects) are implemented that provide for equivalent protection of fish and wildlife beneficial uses. Such projects could reduce the potential impacts associated with reduced hydropower generation. Reservoir operators in the Sacramento/Delta will be required to avoid or reduce effects on hydropower in their long-term strategies and annual operations plans for implementation of the cold water habitat objective under the regulatory pathway. Additionally, in exercising its regulatory authorities related to issuance of new water rights orders or decisions, FERC licenses, federal ESA and CESA, including NMFS BiOp requirements (Mitigation Measure MM-AQUA-a,d:1), and other future regulatory requirements, the State Water Board will consider hydropower generation to ensure that any impacts on hydropower are avoided or minimized. In addition, implementation of Mitigation Measure MM-EN-a-e, which incorporates Mitigation Measures MM-GHG-a and MM-GHG-b to reduce energy impacts associated with other water management actions, can reduce the increased energy use associated with replacing Sacramento/Delta supplies. The State Water Board, DWR, California Public Utilities Commission, California Department of Food and Agriculture, and California Energy Commission will continue to implement the response plan to the Governor's Executive Order B-37-16 (May 9, 2016), which includes recommendations and an implementation timeline to (1) use water more wisely; (2) eliminate water waste; (3) strengthen local drought resistance; and (4) improve agricultural water use efficiency and drought planning. The State Water Board will continue to pursue the development of programs that continue to increase water use efficiency and conservation in order to maximize the beneficial use of Sacramento/Delta supplies, including through conditions on discretionary approvals for funding and other approvals, as appropriate. Other public agencies with authority can and should implement the mitigation measures to the degree feasible.

Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. Because the State Water Board cannot guarantee implementation of measures that are in the jurisdiction and control of other agencies, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, impacts from changes in hydrology and changes in water supply on energy remain significant and unavoidable.

## **A1.4.7 Geology and Soils**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.9, Section 9.7.9, Section 13.7.9, each titled Geology and Soils.

**Impact GEO-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 an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse**

This section discusses the different impact mechanisms through which changes in water supply from implementation of the Plan amendments could have significant impacts on geology and soils.

**Changes in Water Supply**

In response to reduced Sacramento/Delta supply to maintain instream flows, increased groundwater pumping, reduced groundwater recharge from applied irrigation, and other water management actions could lower groundwater levels and contribute to ground subsidence in the study area except for the Delta region. On the higher end of the flow range, and under the most conservative estimate of substitute pumping, groundwater declines could result in subsidence in the same areas and of approximately the same amounts as for the 2012–2016 drought and the 2020–2022 drought.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-GEO-c, which incorporates Mitigation Measure MM-GW-b to reduce impacts of lowered groundwater levels that could contribute to subsidence, could reduce impacts related to ground subsidence. Implementation of local agency requirements under SGMA and other actions that may be implemented by municipal water agencies or local irrigation districts to increase groundwater levels or reduce groundwater extraction could reduce or halt subsidence. The State Water Board has SGMA oversight and can intervene if proposed or implemented measures are considered insufficient (.

While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the impacts remain significant and unavoidable.

## **A1.4.8 Greenhouse Gas Emissions**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.10, Section 9.7.10, Section 13.7.10, each titled Greenhouse Gas Emissions.

**Impact GHG-a: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment**

This section discusses the different impact mechanisms through which changes in water supply from implementation of the Plan amendments could have significant impacts related to greenhouse gas (GHG) emissions.

## **Changes in Water Supply**

Increased groundwater pumping in the study area may result in significant impacts related to greenhouse gases. Emissions from diesel-powered pumps would occur locally at the pump source and depending on the extent of groundwater pumping, the combined emissions level of all other groundwater pumping in the study area could exceed the local air district's established threshold of 10,000 MTCO<sub>2</sub>e per year.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-GHG-a requires compliance with applicable air quality plans, programs, rules, and regulations and promotes use of renewable energy sources to minimize GHG emissions, and Mitigation Measure MM-EN-a will reduce potential GHG emissions through implementation of water use efficiency, water conservation, energy efficiency, and irrigation system management strategies. These measures were adapted from agency best practice and mitigation designed to avoid or minimize GHG emissions effects and many are project-level measures appropriate for project-specific development. Individual projects by other public agencies would be subject to the appropriate level of environmental review at the time they are proposed, and site-specific, project-specific mitigation would be identified to avoid or reduce significant effects prior to any project-level action. The authority to determine and require specific mitigation is within the responsibility and jurisdiction of other public agencies with discretionary approval authority. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant impacts on air quality. Therefore, the State Water Board finds that this impact related to greenhouse gas emissions from increased groundwater pumping remains significant and unavoidable.

## **Other Water Management Actions**

Changes in water supply could increase GHG emissions from water users switching to or increasing the use of other water management actions such as groundwater storage and recovery, water transfers, water recycling, or water conservation measures to meet water demand. While there would be energy savings associated with reduced conveyance and water conservation, due to uncertainty in the actions that would be taken to replace reduced Sacramento/Delta water supply in each region, it is difficult to know whether the total energy required for these actions would be greater than the total energy savings; thus, there could be a net energy cost that would result in GHG emissions. The impact of this net energy cost combined with reductions in hydropower generation could exceed the energy savings associated with reduced exports and water conservation, resulting in GHG emissions.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-GHG-a and MM-GHG-b, will reduce potential GHG emissions through implementation of efficiency, conservation, and irrigation system management strategies, as well as compliance with applicable air quality plans, programs, rules, or regulations, and will promote use of renewable energy sources to minimize GHG emissions. The State Water Board will implement the measures within its authority. Other agencies can and should implement the identified mitigation measures to the degree feasible. However, because the

jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty in the degree to which the measures will reduce potentially significant impacts. Therefore, the State Water Board finds that impacts related to greenhouse gases from increased groundwater pumping remain significant and unavoidable.

**Impact GHG-b: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases**

This section discusses the different impact mechanisms through which changes in water supply from implementation of the Plan amendments could have significant impacts related to greenhouse gas emissions.

**Changes in Water Supply**

Increased groundwater pumping in the study area may result in significant GHG emissions impacts from potentially exceeding existing emissions thresholds, which could conflict with the state's long-term emission reduction trajectory. While the Plan amendments support the state's climate resiliency goals and changes in hydrology and water supply would not conflict with the Clean Air Act; increases in use of diesel pumps for groundwater pumping could result in emissions in excess of the local air district's established threshold of 10,000 MTCO<sub>2</sub>e per year that could affect the state's ability to meet the SB 32 (2030) and AB 1279 (2045) GHG reduction goals.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-GHG-a and MM-GHG-b can reduce potential GHG emissions and conflicts with the state's GHG reduction plans from increased groundwater pumping if adopted by local water districts and suppliers, regional groundwater agencies, irrigation districts, local utilities, and local agencies and governments.

Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. The State Water Board will implement the measures within its authority, and other agencies can and should implement the identified mitigation measures to the degree feasible. However, because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty in the degree to which the measures will reduce potentially significant impacts. Therefore, the State Water Board finds that impacts related to greenhouse gases from increased groundwater pumping remain significant and unavoidable.

## **A1.4.9 Hydrology and Water Quality**

### **Surface Water**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.12.1, Section 9.7.12.1, Section 13.7.12.1, each titled Surface Water.

## **Impact SW-a: Violate any water quality standards or waste discharge requirements**

### **Impact SW-f: Otherwise substantially degrade water quality**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on surface water. Because the impact mechanisms that inform the analyses of water quality related to surface water are similar, Impacts SW-a and SW-f are combined and addressed together.

#### **Changes in Hydrology**

Reduced streamflows could result in less dilution and increased concentration of contaminants (e.g., pathogens, trace metals, pesticides) in smaller streams in some areas and result in localized degradation. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-SW-a,f: 1 will reduce or avoid water quality impacts from increased concentration of contaminants that may occur if streamflow is reduced in the summer and early fall. This is accomplished primarily through the State and regional water boards administration of waste discharge permits, including NPDES permits for point-source discharges. Even with this identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the impacts on water quality from changes in hydrology remain significant and unavoidable.

The transfer of water from the Cache Creek watershed into lower Putah Creek has the potential to exacerbate existing water quality concerns in Putah Creek. This transfer of water would be contingent upon Yolo County Flood Control and Water Conservation District (YCFCWCD) HRL participants obtaining a new water right permit to divert water from Cache Creek and would include a separate environmental review process. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Implementation of Mitigation Measure MM-SW-a,f: 12 will reduce potential impacts from implementation of the YCFCWCD HRL flow commitments on degrading water quality conditions in Putah Creek. Prior to releasing any Cache Creek surface water or banked groundwater into Putah Creek, YCFCWCD will develop, in consultation with State Water Board and Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff, a monitoring plan to inform whether releases would result in adverse water quality effects in Putah Creek. The monitoring plan is subject to approval by the Executive Director of the State Water Board, including any conditions of approval. Once approved, YCFCWCD will conduct monitoring in accordance with that approved plan. The monitoring must include provisions to evaluate effects related to boron, nitrates, harmful algal blooms (HABs), and mercury and include monitoring of Cache Creek water quality and banked groundwater quality prior to diversion into Putah Creek, and Putah Creek water quality before releases of Cache Creek water or banked groundwater into Putah Creek. If the monitoring shows no expected significant adverse effects to Putah Creek water quality, YCFCWCD will continue to monitor Putah Creek during and after releasing Cache Creek water or banked groundwater into Putah Creek. If monitoring information indicates possible significant adverse effects to Putah Creek water quality, YCFCWCD will notify the State Water Board and Central Valley Water Board immediately and cease releasing water into Putah Creek until the State Water Board Executive Director, in coordination with Central Valley Water Board staff, determine

that significant adverse effects to water quality in Putah Creek are no longer expected. Therefore, potential impacts on water quality in Putah Creek from the transfer of water from Cache Creek is mitigated to a less-than-significant level.

Increased flows could result in increased input of mercury and methylmercury production downstream in some locations. The extent of this effect would depend on the magnitude of the increase in a particular tributary's flow; the mercury concentration in the tributary; and the flow, mercury concentration, and velocity of the receiving water. The potential negative consequences of this effect could be exacerbated if the receiving water forms intermittent wetlands that are conducive to converting mercury to methylmercury; the Yolo Bypass exemplifies a location where the combination of increased mercury input and transformation to methylmercury could occur due to the existing concentration of mercury in the tributaries and large wetland acreage. In addition, mercury impacts could occur due to increases in water level fluctuation in some reservoirs.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, as part of implementation of Mitigation Measure MM-SW-a,f: 2, the State Water Board will work with the appropriate regional water boards to implement the San Francisco Bay Mercury and the Sacramento-San Joaquin Delta Methylmercury Total Maximum Daily Loads. In addition, the State Water Board will coordinate with the U.S. Army Corps of Engineers (USACE), DWR, and other appropriate agencies to ensure that implementation of flow requirements does not interfere with the functioning of the Cache Creek settling basin in reducing mercury inputs to the Sacramento/Delta. Health-related effects associated with mercury will be limited by issuance of fish consumption advisories from the Office of Environmental Health Hazard Assessment. Even with this identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that mercury impacts from changes in hydrology remain significant and unavoidable.

Changes in flow and reservoir storage could result in increased water temperature in some locations during some times of year. Under the Plan amendments, increased releases from rim dams could reduce downstream temperatures and improve cold water habitat in the spring. However, higher spring flows also could result in reductions in reservoir storage by the end of spring and a smaller cold water volume in summer and fall months. Regulated tributaries may also experience some reductions in summer and fall flows relative to baseline conditions because the existing flow regime on regulated tributaries can include substantially elevated flows to supply downstream water diversions. As a result, in the late summer and early fall, reduced storage and lower flows could reduce cold water habitat in the reaches below some reservoirs. Some upper watershed reaches might also experience temperature effects if they are affected by interbasin diversions or need to release additional water to meet flow requirements of the Plan amendments.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. The Plan amendments include a cold water habitat objective that applies to all of the Sacramento/Delta tributaries subject to the inflow objective. The owners and operators of reservoirs identified in the Plan that are not part of the VA pathway would be required to develop long-term temperature management and annual operation plans that specify management of cold water storage and releases and/or alternative protection measures to ensure that fish below dams are kept in good condition consistent with California Fish and Game Code section 5937 and the narrative objective. In

addition, implementation of Mitigation Measure MM-SW-a,f: 3 will avoid or reduce water temperature impacts. All reservoir owners and operators are subject to existing regulatory requirements that protect water quality in reservoirs and streams below reservoirs, including export reservoirs. In exercising its regulatory authorities, the State Water Board will consider surface water and ensure that any surface water impacts are avoided or reduced. Even with this identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that temperature impacts remain significant and unavoidable.

Changes in hydrology may result in reduced reservoir storage levels in some reservoirs at some times and in associated shallower, warmer, more stable water column conditions in those reservoirs. These conditions could lead to increased reservoir HAB formations; with lower storage levels, blooms could be more likely to be exposed to reservoir outlets, affecting supplies from the reservoir for downstream releases and water supply purposes. In addition, reduced Delta inflows in summer and fall and reduced exports could lead to an incremental increase in the production of HABs and invasive aquatic plants in some Delta channels at some times. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, potential HAB impacts in the Delta and Sacramento/Delta reservoirs can be reduced through implementation of Mitigation Measures MM-SW-a,f: 1, 4, 5, and 7. In addition, all reservoir owners and operators are subject to existing regulatory requirements that protect water quality in reservoirs and streams below reservoirs (Mitigation Measure SW-a,f: 3). Several ongoing activities to address HABs, such as those coordinated by the Freshwater and Estuarine Harmful Algal Bloom (FHAB) Program, also could be employed to mitigate impacts (Mitigation Measure SW-a,f: 4i). The State and regional water boards regulate discharges of nitrogen and phosphorus, which contribute to HAB formation (Mitigation Measures SW-a,f: 1 and 4ii). In addition, the cold water habitat objective is intended to be implemented as part of the Plan amendments to protect cold water supplies for fish, which may also serve to mitigate HAB impacts. While the State Water Board and others are engaged in efforts to address HABs, including developing and adopting HAB and cyanotoxin water quality objectives (Mitigation Measure SW-a,f: 4iii) and developing technologies for preventing and mitigating HABs (Mitigation Measure SW-a,f: 4iv), those efforts will take time and may not fully resolve HAB issues, including the incremental impacts associated with changes in hydrology under the Plan amendments. The State Water Board's Division of Drinking Water (DDW) will continue to enforce Safe Drinking Water Act requirements, oversee compliance and enforcement activities, provide funding and technical assistance to support safe and affordable drinking water access, and require water service providers to adjust treatment operations or water source management as needed to maintain drinking water quality and permit compliance (Mitigation Measure SW-a,f: 5). Lastly, the Central Valley Water Board will continue to implement the Irrigated Lands Regulatory Program, which includes developing and implementing solutions to nitrate water quality concerns, including source control, in the Central Valley (Mitigation Measure SW-a,f: 4ii and 7). Public agencies with authority can and should implement the mitigation measures identified in the Staff Report. Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. Therefore, the State Water Board finds that impacts on water quality from HABs remain significant and unavoidable.

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. Due to the flexibility under the program of implementation, it is uncertain whether, and to what extent, flows would be reduced and if any such reduction would interfere with compliance with water quality standards and waste discharge requirements. However, these impacts could require providers to modify operations or provide additional treatment at WWTPs and drinking water treatment plants to continue to comply with existing or modified waste discharge requirements and drinking water quality standards.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-SW-a,f: 1 and 5 will reduce or avoid violations of waste discharge requirements by wastewater dischargers and water quality standards by drinking water providers. The regulation of water quality constituents is accomplished primarily through waste discharge permits issued by the State and regional water boards, including NPDES permits for point-source discharges, and waste discharge requirements (WDRs) for nonpoint-source discharge. DDW implements the Safe Drinking Water Act through measures such as (1) issuance of permits for public water systems and their sources and treatment to ensure compliance with drinking water standards; (2) inspection of water systems; (3) tracking of monitoring requirements of water systems to determine compliance; and (4) enforcement actions. Continued regulation by DDW will protect municipal drinking water quality. A variety of funding programs provide loans and grants for capital improvements to WWTPs and projects that help provide safe drinking water, including the Safe and Affordable Drinking Water Fund established by SB 200. The State and regional water boards will continue to regulate waste discharges and drinking water standards and will continue to promote and support future funding sources as appropriate. In addition, public agencies with authority can and should implement the mitigation measures identified in the Staff Report. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds impacts on water quality remain significant and unavoidable.

### **Changes in Water Supply**

Reductions in surface water supplies for municipalities could result in the use of alternative sources of water (e.g., groundwater) for municipal use. A change in source water composition could result in some reduction of water quality. New or additional sources of water may cause drinking water treatment facilities to temporarily fall short of drinking water standards if the facility operators are either initially unaware of the problem or unable to address it. Reductions in surface water supplies for municipalities and indoor water conservation could cause a reduction in overall wastewater flow rates. Reduced discharge rates into sewers with the same volume of produced waste could result in increased chemical constituent concentrations in WWTP influents, which could require adjusting operations to ensure continued compliance with NPDES discharge requirements. If operators do not make such changes quickly enough, effluent may violate discharge requirements. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-SW-a,f: 1 and 5 will reduce or avoid violations of water quality standards

or waste discharge requirements for drinking water providers and wastewater dischargers through regulation of waste discharges, which is accomplished primarily through the State Water Board and regional water board waste discharge permits, including NPDES permits for point-source discharges. In addition, continued regulation by DDW pursuant to the Safe Drinking Water Act will protect drinking water quality. State funding programs, including the Safe and Affordable Drinking Water Fund provide financial support for wastewater treatment and drinking water infrastructure improvements. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that this impact remains significant and unavoidable.

Reductions in Sacramento/Delta supplies to agriculture could affect water quality in managed wetlands if those lands receive some or all of their water supply from the Sacramento/Delta, causing reductions in agricultural drainage and lowering of groundwater levels in areas high in salts and selenium. With less Sacramento/Delta supply, the remaining inflow from agricultural drainage and groundwater could become more degraded, and dilution of this low-quality water with fresh surface water supplies could be reduced. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-SW-a,f: 6 and 7 can reduce or avoid water quality impacts on managed wetlands. Mitigation Measure MM-SW-a,f: 6 incorporates Mitigation Measure MM-GW-b, which includes measures to reduce lowering of groundwater levels, such water portfolio diversification, SGMA implementation and oversight, and oversight and approval of water transfers. Implementation of Mitigation Measure MM-SW-a,f: 7, which would ensure ongoing implementation of actions to address poor-quality agricultural discharges, will reduce the impacts from changes in water supply to streams and wetlands that receive agricultural discharges. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. While the State Water Board has authority to ensure that some mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Therefore, the State Water Board finds that water quality impacts on managed wetlands from reductions in Sacramento/Delta supplies to agriculture remain significant and unavoidable.

Increased groundwater pumping to replace reductions in Sacramento/Delta supplies and reduced incidental recharge from applied irrigation water could reduce groundwater levels. Reductions in groundwater levels could reduce streamflow either by increasing surface water percolation to groundwater or by reducing groundwater accretions to surface water. In addition, increased groundwater pumping adjacent to streams could accelerate stream depletions more directly. Potential reductions in groundwater accretions could cause increases in water temperature. They also could cause decreases in water quality due to lower streamflows or improvements in water quality due to less input from low-quality groundwater. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-SW-a,f: 6 and 8 which incorporate groundwater mitigation measures to reduce lowering of groundwater levels. In addition, groundwater impacts and associated impacts on surface water quality can be reduced through diversification of water portfolios that include sustainable groundwater management, groundwater storage and recovery, increased use of recycled water from existing

facilities, and agricultural and municipal water conservation measures. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. While the State Water Board has authority to ensure that some mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Therefore, the State Water Board finds that this impact remains significant and unavoidable.

### **Other Water Management Actions**

Diversion of surface water for groundwater storage and recovery could limit the dilution effect of existing flows and exacerbate existing water quality impairments. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-SW-a,f: 9 will reduce potential water quality impacts associated with using surface water for groundwater storage and recovery. The State Water Board will continue efforts to encourage and promote environmentally sound groundwater recharge projects that use surplus surface water, including prioritizing the processing of temporary and long-term water right permits for projects that enhance the ability of a local or state agency to capture high runoff events for local storage or recovery (Governor's Exec. Order No. B-39-17 [April 6, 2017]). In processing water right applications that involve groundwater storage, the State Water Board will consider the need to preserve ecological functions of high-flow events and other relevant factors in accordance with the Water Code to ensure that enough flow remains instream to water quality. Therefore, potential impacts on water quality from groundwater storage and recovery is mitigated to a less-than-significant level.

If more groundwater-substitution transfers take place, water quality impacts could result from increased pumping in the source area, while more stored-water transfers could result in greater water quality impacts within reservoirs when storage levels are reduced and until reservoirs refill. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-SW-a,f: 10 will avoid or reduce potential water quality impacts associated with water transfers. Transfers approved by the State Water Board and/or facilitated by the CVP/SWP are required to avoid unreasonable impacts on fish and wildlife and prevent injury to other legal users of water. Transfers approved by the State Water Board and/or facilitated by DWR or Reclamation are required to avoid unreasonable impacts on fish and wildlife and prevent injury to other legal users of water. To avoid or minimize these impacts, when processing petitions for transfers, the State Water Board will ensure that the transfer would not result in water quality impacts. Other public agencies with authority can and should implement the mitigation measures to the degree feasible. Even with the identified mitigation, the impact may be significant because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. The State Water Board cannot guarantee that mitigation will be implemented for transfers not subject to State Water Board approval. Therefore, water quality impacts from water transfers remain significant and unavoidable.

Increased use of recycled water could further reduce instream flows if wastewater is recycled instead of being discharged to streams. In some circumstances, reductions in flows could reduce

dilution of local sources of contaminants, particularly in streams with low flows that are dominated by relatively high-quality WWTP effluent and that have local input of poor-quality water. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-SF-a,f: 11 will reduce potential water quality impacts associated with increased use of recycled water previously discharged to surface water. When processing wastewater change petitions, pursuant to Water Code section 1211, the State Water Board will ensure that the change in wastewater discharge does not affect water quality, especially in dry seasons and in low-flow conditions where the stream is dependent on wastewater discharges. Therefore, impacts on water quality from increased water recycling is mitigated to a less-than-significant level.

**Impact SW-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 SW-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**

This section discusses the different impact mechanisms through which changes in hydrology from implementation of the Plan amendments could have significant impacts on surface water. Because the impact mechanisms that inform the analyses of existing drainage patterns are similar, Impacts SW-c and SW-d are combined and addressed together.

Increases in Clear Creek flow downstream of Whiskeytown Lake could increase the risk of adverse erosion and flooding in this area. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-SW-i would establish safe flow levels that would avoid significant erosion or flooding effects. State Water Board staff would coordinate with the DWR Division of Flood Management, Reclamation (owner of Whiskeytown Lake), and local flood management authorities to develop a flow cap that would activate floodplain habitat. This would reduce the impact to a less-than-significant level.

**Impact SW-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**

This section discusses the different impact mechanisms through which changes in hydrology from implementation of the Plan amendments could have significant impacts on surface water.

Clear Creek below Clear Creek Road possesses floodplain habitat that could be activated by flows released from Whiskeytown Dam. Release of new flow requirements in this reach could increase the risk of downstream flooding in this area. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-SW-i would establish safe flow levels that would maintain public safety (e.g., on Clear Creek Road) and protect property (e.g., Win-River Resort and Casino on the Redding Rancheria near the Sacramento River). State Water Board staff would coordinate with the DWR Division of Flood Management, Reclamation

(owner of Whiskeytown Lake), and local flood management authorities to develop a flow cap that would activate floodplain habitat. This would reduce the impact to a less-than-significant level.

## Groundwater

**Impact GW-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 that would not support existing land uses or planned uses for which permits have been granted)**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on groundwater.

### Changes in Hydrology and Water Supply

Increased groundwater pumping to replace reduced Sacramento/Delta surface water supply and reductions in incidental groundwater recharge from applied irrigation could lower groundwater levels and contribute to groundwater overdraft. Lower groundwater levels also could affect drinking water wells and result in an increase in frequency and severity of critical shortages or dry wells occurring in some areas for communities that rely on groundwater, including economically disadvantaged communities (DACs). Localized impacts also may occur on groundwater levels in areas where Sacramento/Delta surface water supplies are used for groundwater storage and recovery projects.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. The program of implementation encourages and allows for local cooperative solutions that may allow flow requirements lower in the range if complementary measures (ecosystem projects) are implemented that provide for equivalent protection of fish and wildlife beneficial uses. Such projects could reduce the potential impacts associated with decreased consumptive water uses, including impacts on groundwater. In addition, implementation of Mitigation Measure MM-GW-b identifies local groundwater management under SGMA to reduce or eliminate impacts, particularly in medium- and high-priority groundwater basins. Drinking water impacts from lowered groundwater levels could be reduced through implementation of Mitigation Measure MM-GW-a.f. Local groundwater management under SGMA implementation may address some of the supply issues faced by DACs, depending on how groundwater sustainability plans (GSPs) are developed and how groundwater sustainability agencies (GSAs) consider impacts on DAC water users from local groundwater management actions. SGMA oversight by the State Water Board will ensure that GSPs are adequate and sufficient. In addition, water users can and should diversify their water supply portfolios in an environmentally responsible manner and in accordance with the law to mitigate groundwater impacts. Diversifying water portfolios may include sustainable use of groundwater and groundwater storage and recovery and conjunctive use, water recycling, water transfers, and water conservation and efficiency upgrades. The State Water Board will continue efforts to encourage and promote environmentally sound groundwater storage and recovery (recharge) projects that use surplus surface water, increased use of recycled water, sustainable water transfers, and conservation. The State Water Board also will continue its commitment to the human right to water through financial assistance, technical assistance, consolidations, and other means, including for

communities that may be affected by reduced groundwater supplies or groundwater quality concerns. The Safe and Affordable Drinking Water Fund established under SB 200 will enable the State Water Board to provide crucial ongoing operations and maintenance support so once-struggling community water systems can provide a sustainable source of safe drinking water. The fund also established the Safe and Affordable Funding for Equity and Resilience (SAFER) program, which supports permanent and sustainable drinking water solutions that ensures all Californians have access to safe, affordable, and reliable drinking water. Rate relief for low-income ratepayers of water utilities remains a priority for the State of California and the State Water Board.

While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that impacts on groundwater levels from increased groundwater pumping to replace reduced Sacramento/Delta surface water supply and reductions in incidental groundwater recharge from applied irrigation remain significant and unavoidable.

Surface water transfers through groundwater substitution could result in lower groundwater levels in basin of origin. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-GW-b will avoid or reduce these impacts. Water transfers approved by the State Water Board and/or facilitated by Reclamation or DWR are required to avoid unreasonable impacts on fish and wildlife and prevent injury to other legal users of water. Groundwater overdraft is a consideration in determining whether a transfer would result in injury to a legal user or unreasonable impacts on fish and wildlife. To avoid or minimize impacts when processing petitions for transfers that involve groundwater substitution, the State Water Board will require petitioners to show that subsequent groundwater use resulting from the transfer is consistent with implementation of SGMA or other local groundwater management efforts. The State Water Board cannot guarantee that mitigation will be implemented for transfers not subject to State Water Board approval. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. Therefore, the State Water Board finds that this impact on groundwater levels from surface water transfers through groundwater substitution remains significant and unavoidable.

Agricultural conservation measures could reduce incidental groundwater recharge and result in lower groundwater levels in some areas. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-GW-b would include implementation of sustainable groundwater management through local SGMA and other management efforts, groundwater storage and recovery, and conjunctive use. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should

implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. Therefore, the State Water Board finds that this impact remains significant and unavoidable.

#### **Impact GW-a: Violate any water quality standards or waste discharge requirements**

#### **Impact GW-f: Otherwise substantially degrade water quality**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts related to groundwater. Because the impact mechanisms that inform the analyses of water quality related to groundwater are similar, Impacts GW-a and GW-f are combined and addressed together.

#### **Changes in Hydrology and Water Supply**

Lower groundwater levels from increase groundwater pumping due to the Plan amendments could result in changes in groundwater flow direction and gradients in localized areas, which could exacerbate the migration of contaminants. In addition, lower groundwater levels could have localized effects on groundwater quality by concentrating pollutants where groundwater contamination already exists. In some locations, lower groundwater levels may concentrate salts and nutrients in groundwater over time through evaporative enrichment. Depending on location, drinking water wells, including in those serving DACs, could be affected by these changes in groundwater quality.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-GW-b and MM-GW-a,f could reduce impacts on groundwater quality and associated drinking water impacts. Local groundwater management under SGMA implementation may address some of the supply issues faced by DACs, depending on how GSPs are developed and how GSAs consider impacts on DAC water users from local groundwater management actions. SGMA oversight by the State Water Board will ensure that GSPs are adequate and sufficient. The State Water Board also will continue its commitment to the human right to water through financial assistance, technical assistance, consolidations, and other means, including for communities that may be affected by reduced groundwater supplies or groundwater quality concerns. While the State Water Board has some authority to ensure that mitigation is implemented for some actions, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the Plan amendments. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that impacts on groundwater quality from lower groundwater levels due to increase groundwater pumping as a result of the Plan amendments remain significant and unavoidable.

## Other Water Management Actions

Groundwater storage and recovery projects that use poor quality water to recharge groundwater basins could contribute to salt and nutrient loading or introduce contaminants to the underlying aquifer. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-GW-b: 4 and MM-GW-a,f could reduce impacts on groundwater quality from groundwater storage and recovery. The State Water Board will continue efforts to encourage and promote environmentally sound groundwater storage and recovery (recharge) projects that use surplus surface water. In processing water right applications that involve groundwater storage, the State Water Board will ensure that water used for groundwater recharge will comply with water quality parameters set by the regional water board for groundwater replenishment, which require treatment, retention, blending, and other measures. Therefore, potential impacts on water quality from groundwater storage and recovery is mitigated to a less-than-significant level.

Surface water transfers implemented through groundwater substitution could result in a lowering of groundwater levels in the source groundwater basin if groundwater is pumped in substitution for surface water transferred out of the basin, which could exacerbate groundwater quality impairments in localized areas if the increased groundwater pumping results in a change in the groundwater flow direction and gradient leading to the spread of groundwater contaminant plumes. Surface water transfers through cropland idling could also affect groundwater quality. Changing irrigation volumes and processes that may occur as a result of water transfers can have various results on groundwater quality. Excess irrigation water can sometimes dilute existing salt and nutrients in the soil but also can cause additional groundwater degradation where excess nutrients are applied as part of agricultural practices. Additional contaminant loading could occur in localized areas. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-GW-b: 6 and MM-GW-a,f will avoid or reduce these impacts. Transfers approved by the State Water Board and/or facilitated by Reclamation or DWR are required to avoid unreasonable impacts on fish and wildlife and prevent injury to other legal users of water. Groundwater quality is a consideration in determining whether a transfer would result in injury to a legal user or unreasonable impacts on fish and wildlife. To avoid or minimize impacts, when processing petitions for transfers, the State Water Board will ensure that the transfer would not result in groundwater quality impacts. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement some mitigation measures lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that impacts on groundwater from surface water transfers remain significant and unavoidable.

Implementation of agricultural and municipal water conservation measures could affect groundwater quality if water conservation measures reduce existing groundwater recharge rates. Potential groundwater quality impacts associated with agricultural water conservation measures vary depending on characteristics such as the crop grown, soil characteristics, depth to groundwater, and irrigation methods. In some areas, reduction in applied irrigation water could improve groundwater quality by reducing the potential for incidental groundwater recharge to induce the migration of salts, fertilizers, or pesticides to the underlying groundwater aquifer.

However, in areas with existing groundwater quality impairments, a reduction in groundwater recharge resulting from increased irrigation efficiencies could worsen existing groundwater contamination by potentially concentrating pollutants. Similarly, implementation of municipal water conservation measures such as more efficient landscape irrigation practices could improve groundwater quality by reducing the potential for incidental groundwater recharge to include the migration of salts, fertilizers, pesticides, or urban contaminants—or could worsen existing groundwater contamination by potentially concentrating pollutants. Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-GW-b and MM-GW-a,f will reduce impacts on groundwater quality. The State Water Board will implement the measures within its authority. In addition, public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement some mitigation measures lies with the discretion of other public agencies, there is uncertainty whether the measures will reduce potentially significant impacts. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that impacts on groundwater quality from agricultural and municipal water conservation measures remains significant and unavoidable.

## **A1.4.10 Noise**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.15, Section 9.7.15, Section 13.7.15, each titled 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-c: A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project**

**Impact NOI-d: A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project**

This section discusses the different impact mechanisms through which changes in water supply from implementation of the Plan amendments could have significant impacts related to noise. Because the impact mechanisms that inform the analyses of activities that could expose persons to noise or generate substantial permanent, temporary, or periodic increases in ambient noise levels are similar, Impacts NOI-a, NOI-c, and NOI-d are combined and addressed together.

### **Changes in Water Supply**

Increased groundwater pumping for replacement water supply, groundwater storage and recovery, or groundwater substitution transfers in the study area may result in significant impacts on noise. Increased groundwater pumping may result in a permanent, temporary, or periodic increase in ambient noise that could be considered substantial on noise-sensitive receptors, depending on the existing ambient noise, the noise generated by the pump, noise levels of future activities, and the proximity to noise-sensitive land uses. Because it is not known where increased pumping will occur, noise impacts in the project vicinity above existing levels could occur.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-NOI-a,c,d by entities or agencies that increase groundwater pumping could reduce noise impacts through compliance with applicable regulations and incorporation of noise-reduction measures such that operational noise does not exceed applicable local noise standards or limits. The authority to determine and require specific mitigation is within the responsibility and jurisdiction of other public agencies with discretionary approval authority. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant noise impacts. Therefore, the State Water Board finds that noise impacts from groundwater pumping remain significant and unavoidable.

### **A1.4.11 Recreation**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.18, Section 9.7.18, Section 13.7.18, each titled 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**

This section discusses the different impact mechanisms through which changes in hydrology from implementation of the Plan amendments could have significant impacts on recreation.

#### **Changes in Hydrology**

Changes in reservoir levels may result in significant impacts on recreation. At some reservoirs during the recreation season (May through September), drawdown could affect boat ramp accessibility that may require construction related to replacement or modification of boat ramps affecting recreation opportunities. While in many locations boat ramps would still be accessible, some boat ramps located at higher elevations may not be accessible as frequently as compared to baseline conditions, particularly during critical and dry water years.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-REC-a: 1 and 2 could reduce or avoid recreation impacts associated with changes in reservoir levels. Mitigation Measure REC-1.i requires reservoir operators in the Sacramento/Delta to include measures to avoid or reduce impacts on recreation in their long-term strategies and annual operations plans for cold water habitat objective implementation under the regulatory pathway. In addition, all reservoir owners and operators are subject to existing regulatory requirements that protect water quality in reservoirs and streams below reservoirs (Mitigation Measure MM-AQUA-a,d: 1), and to further minimize potential impacts, should also implement other recreation management actions. In exercising its regulatory authorities related to issuance of new water rights orders or decisions, FERC licenses, and other future regulatory requirements, the State Water Board will consider recreation and ensure that any recreation impacts are avoided or reduced. The State Water Board will implement the measures within its authority. Other agencies can and should implement the identified mitigation measures to

the degree feasible. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that impacts from changes in reservoir storage levels on recreation remain significant and unavoidable.

Reduction in reservoir storage may result in increased HABs limiting or causing closures to recreation opportunities (i.e., boating, fishing, swimming) in and adjacent to some surface waterbodies in the Delta. While the potential increased frequency of closures is not expected to result in a substantial number of recreationists moving to alternate recreational locations to the extent that it would physically deteriorate those alternate locations, the impact on recreation from incremental increases in HAB production is considered potentially significant because recreational access could be more limited as compared to existing conditions.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, Mitigation Measure MM-REC-a: 3, which incorporates Mitigation Measure MM-SW-a,f: 1, 3–5, and 7 to avoid or reduce HABs, would avoid or reduce recreation impacts under the Plan amendments. There are several ongoing activities to address HABs, such as those coordinated by the FHAB Program, that could be employed by other state and regional agencies to mitigate the impacts of the Plan amendments. The State Water Board will implement the measures within its authority and other agencies can and should implement the ongoing HABs reduction efforts to the degree feasible. Even with the identified mitigation, the impact may be significant, because the mitigation may not fully mitigate the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, impacts on recreation related to HABs remain significant and unavoidable.

**Impact REC-b: Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment**

This section discusses the different impact mechanisms through which changes in hydrology from implementation of the Plan amendments could have significant impacts on recreation.

**Changes in Hydrology**

Some reservoirs could experience periods of lower water elevation that, when compared to baseline conditions, would result in associated boat ramps or docks becoming inaccessible. These locations may require construction or expansion of recreational facilities. Any replacement or modification of ramps would be under the control of individual reservoir operators. Construction related to replacement or modification of boat ramps could result in adverse physical effects on the environment. Findings on impacts associated with construction projects are evaluated in Section A1.6, New or Modified Facilities Findings.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measures MM-REC-b, which incorporates mitigation measures from Section 7.22, New or Modified Facilities to reduce impacts if construction of new or modified boat ramps is necessary, will reduce or avoid recreation impacts associated with construction of new or modified boat ramps. While many impacts could be reduced to a less-than-

significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the impacts on recreation due to lower water elevations at some reservoirs remain significant and unavoidable.

## **A1.4.12 Utilities and Service Systems**

These findings rely on the analysis and information presented in the Staff Report, including Section 7.20, Section 9.7.20, Section 13.7.20, each titled Utilities and Service Systems.

### **Impact UT-a: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on utilities and service systems.

#### **Changes in Hydrology and Supply**

Changes in hydrology and water supply could alter the chemical composition of the existing water supply or could encourage the use of other water supply sources that may be of lower quality, creating the potential for exceedances of discharge requirements. This includes reductions in Sacramento/Delta water supply for municipal use, which could lead to a change in source water composition resulting in some reduction of water quality that could affect WWTPs' effluent. Additionally, reduced Sacramento/Delta supply to municipal use and increased indoor water conservation to respond to a potential reduction in supply could contribute to adverse impacts on WWTP processes and effluent quality. These changes could result in exceedances of discharge requirements and require modification of existing WWTP processes to continue to meet requirements.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-UT-a, which incorporates mitigation measures from Mitigation Measures MM-SW-a,f and MM-GW-a,f to avoid or reduce impacts on surface water and groundwater quality that may contribute to effects on WWTPs, will reduce or avoid exceedances of wastewater treatment requirements. A variety of funding programs provide loans and grants for capital improvements to WWTPs and projects, including the Clean Water State Revolving Fund (CWSRF) where many of the projects funded by the CWSRF program address wastewater discharge violations or enforcement orders. Multiple programs fund solutions to water systems to help provide safe drinking water, including the Drinking Water State Revolving Fund (DWSRF) and the Safe and Affordable Drinking Water Fund established by SB 200. In addition, regulation of drinking water quality will control the quality of water that affects WWTP influent. DDW implements the Safe Drinking Water Act through measures such as (1) issuance of permits for public water systems and their sources and treatment to ensure compliance with drinking water standards; (2) inspection of water systems; (3) tracking of monitoring requirements of water systems to determine compliance; and (4) enforcement actions. The State and regional water boards will continue to regulate waste discharges and drinking water standards and will continue to promote and support future funding sources as appropriate. Increased coordination between water suppliers and wastewater agencies will help WWTPs become better prepared for short- and long-

term changes in WWTP influent characteristics from changes to lower quality water sources, projected indoor water conservation, and other factors. Public agencies with authority can and should implement the mitigation measures to the degree feasible. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds this impacts on utilities and service systems from potential exceedances of discharge requirements due to changes in hydrology and water supply remains significant and unavoidable.

### **Other Water Management Actions**

In response to reductions in Sacramento/Delta surface water supplies attributable to the Plan amendments, water users may implement other water management actions—including groundwater storage and recovery and water transfers—that include several strategies that could be used at the local or regional level by utilizing existing infrastructure to reduce the potential impacts from reduced Sacramento/Delta surface water supplies. Local conditions would determine which actions are most effective. These responses to reduced Sacramento/Delta supply may affect utilities and service systems. Specifically, groundwater storage and recovery and water transfers could contribute to the effects associated with changes in incoming water quality at drinking water treatment plants and WWTPs. Changes in WWTP influent chemical constituent composition may require adjustment of WWTP operation to avoid exceedances of discharge requirements in connection with reduced municipal supply and reduced quality of other supplies. These impacts are described above along with identified mitigation measures. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds that impacts on utilities and service systems from changes in water quality due to groundwater storage and recovery and water transfers remain significant and unavoidable.

### **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**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on utilities and service systems.

#### **Changes in Hydrology and Water Supply**

Changes in hydrology and water supply in the study area could affect the quality of drinking water sources, which could result in the expansion of existing or construction of new drinking water treatment facilities to prevent or mitigate exceedances of drinking water standards and wastewater discharge water quality objectives. Construction of new or modified treatment facilities is considered and evaluated as a reasonably foreseeable response action to the proposed Plan amendments. Construction impacts and mitigation measures are evaluated in Section 7.22, New or Modified Facilities, under Drinking Water Treatment, Wastewater Treatment Plant/Water Recycling Facilities. Findings on impacts associated with construction projects are evaluated in Section A1.6, New or Modified Facilities Findings.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-UT-b, which incorporates mitigation measures from Mitigation Measure MM-UT-a to reduce or avoid exceedances of wastewater treatment requirements, and Section 7.22, New or Modified Facilities to reduce impacts if construction of new water or wastewater treatment facilities or expansion of existing facilities is necessary, will reduce or avoid utilities and service systems impacts resulting from actions responding to changes in hydrology and changes in water supply. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds this construction impacts from new and modified treatment plants remain significant and unavoidable.

**Impact UT-d: Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed**

This section discusses the different impact mechanisms through which changes in hydrology and water supply from implementation of the Plan amendments could have significant impacts on utilities and service systems.

**Changes in Water Supply**

Reduced Sacramento/Delta supplies for municipal use could affect municipal water supplies. While regional assessments indicate that many municipal suppliers are well prepared to address supply reductions of up to 10 percent, potentially significant impacts could occur when agencies rely solely or almost solely on Sacramento/Delta water and have limited water supply portfolios. Communities in the study area including economically disadvantaged communities that rely on groundwater as their primary source of municipal supply could be indirectly affected from reduced groundwater levels and groundwater quality.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. The program of implementation encourages and allows for local cooperative solutions that may allow flow requirements lower in the range if complementary measures (ecosystem projects) are implemented that provide for equivalent protection of fish and wildlife beneficial uses. Such projects could reduce the potential impacts associated with decreased consumptive water uses, including impacts on utilities from changes in water supply. In addition, implementation of Mitigation Measure MM-UT-d; 1 through 5, which incorporates mitigation measures from Mitigation Measure MM-GW-b that will reduce impacts associated with lower groundwater levels, can avoid or reduce impacts on municipal supplies. Water users can and should diversify their water supply portfolios to the extent possible, in an environmentally responsible manner and in accordance with the law, and municipal water users are already implementing efficiency and conservation measures and are likely to implement additional efficiency and conservation measures on their own initiative in response to reduced supply. The program of implementation directs the State Water Board to develop appropriate provisions to address human health and safety needs and other possible reasons for short-term and long-term exceptions to curtailments associated with implementation of the Bay-Delta Plan for specific purposes. Those purposes include provisions to allow continued diversions for minimum human health and safety water supplies where alternate supplies are not

available. The State Water Board will continue to work with municipal suppliers to develop and implement programs to increase water use efficiency and conservation to maximize the beneficial use of Sacramento/Delta supply, including through conditions on discretionary approvals for funding and other approvals as appropriate. Additional mitigation measures may provide assistance to communities with limited supplies or impaired quality. These programs may not reach every community and may not be sufficient to resolve all flawed systems. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds impacts remain significant and unavoidable.

### **Changes in Hydrology**

Changes in flows associated with instream flow and cold water habitat requirements could affect the ability of existing diversion intakes to divert water, which could affect municipal water supplies. In addition, reservoir elevation changes could affect diversions in areas that receive Sacramento/Delta supplies. In the absence of coordination among diverters and, potentially, modifications to diversion intakes at some locations, potentially significant impacts could occur when reduced water volumes in streams during low-flow conditions could bring water levels below intakes, limiting diversions and potentially affecting the amount of water available for municipal supply during some high-demand, low-flow periods.

Changes or alterations have been required in, or incorporated into, the project to avoid or substantially lessen the significant environmental impact as identified in the Staff Report. Specifically, implementation of Mitigation Measure MM-UT-d: 7, which incorporates mitigation measures related to the effectiveness of diversion intakes from Mitigation Measure MM-AG-a,e: 6, identifies actions to help ensure the effectiveness of diversion intakes, including monitoring and coordination activities among water users and modifying intakes. Drinking water suppliers are strongly encouraged to implement these actions. However, the Staff Report does not contain any feasible State Water Board action that would require them to do so. Therefore, the State Water Board finds that these impacts on utilities and service systems remain significant and unavoidable.

## **A1.5 Habitat Restoration and Other Ecosystem Projects Findings**

The Plan amendments identify actions that other entities should take to address other ecosystem stressors and provide a framework under the regulatory pathway to incorporate both flow and complementary ecosystem projects such as physical habitat restoration into local cooperative solutions; in addition, some complementary ecosystem projects may also serve as a compliance method for the proposed cold water habitat objective. The VA pathway includes implementation of non-flow habitat restoration actions targeted at improving spawning and rearing capacity for juvenile salmonids, estuarine species, and other native fish and wildlife on a portion of the Sacramento/Delta tributaries for an initial 8 years (with the possibility to extend the term). Finally, the designation of new CUL beneficial use could result in habitat restoration as a result of enforcement actions, voluntary permit actions, and non-regulatory actions. Habitat restoration and other ecosystem projects evaluated collectively include physical habitat restoration (in-Delta and upstream tributary), fish passage improvements (screens, fishways, water temperature control

devices [TCDs], dam removal), predatory fish control, and aquatic invasive species control. As summarized in Table 13.7.22-2, Impact and Mitigation Measure Summary—Habitat Restoration and Other Ecosystem Projects, for the Plan amendments, potentially significant impacts on different resources would occur. Mitigation measures are identified that would avoid or reduce potentially significant impacts from construction and operation of habitat restoration and other ecosystem projects from implementation of the Plan amendments, including HRL non-flow habitat commitments.

Before a habitat restoration or other complementary ecosystem project can be implemented, permit approval may be required from one or more local, state, federal, or tribal agencies, such as the State Water Board, regional water boards, California Department of Fish and Wildlife (CDFW), California Coastal Commission, USACE, NMFS, U.S. Fish and Wildlife Service (USFWS), State Lands Commission, federally recognized tribes, and various city or county agencies. State and local agency approvals require compliance with the applicable CEQA requirements (Pub. Resources Code, § 21000 et seq.).

Water Code section 13260(a) requires that any person discharging waste or proposing to discharge waste within any region that could affect the quality of the waters of the state, other than into a community sewer system, will file with the regional water board a report of waste discharge containing such information and data as may be required by the regional water board, unless such requirement is waived. Under federal law, section 401 of the Clean Water Act (33 U.S.C. § 1341) requires every applicant for a federal license or permit that may result in a discharge into navigable waters to obtain water quality certification from the state that the project or activity will comply with water quality standards and any other appropriate requirement of state law (33 U.S.C. §§ 1313, 1341(d)). This includes the Porter-Cologne Water Quality Control Act and other state requirements protecting surface waters from both point source and nonpoint source discharges of pollution. (33 U.S.C. § 1313.) Section 401 typically applies to dredge-and-fill activities in wetlands and other waters that require permits from USACE or hydropower projects seeking a license from the FERC. Most water quality certifications are issued by the regional water boards; however, the State Water Board issues water quality certifications for projects that may fall under the jurisdiction of more than one regional board. (Cal. Code Regs., tit. 23, § 3855.)

Depending on the size and scale, projects may fit within a categorical exemption under CEQA. CEQA allows categorical exemptions for classes of projects that have been determined not to have a significant effect on the environment. (Pub. Resources Code, § 21084.) Other larger-scale activities would be subject to a more extensive project-level CEQA analysis, which would entail project-specific identification of any potentially significant environmental impacts and mitigation measures. On August 16, 2022, the State Water Board adopted the Proposed Clean Water Act Section 401 and Waste Discharge Requirements General Order for Restoration Projects Statewide that will expedite the regulatory approval of large habitat restoration projects, including stream crossing and fish passage improvements; small dam, tide gate, floodgate, and legacy structure removal; bioengineered bank stabilization; off-channel/side-channel habitat restoration and enhancement; water conservation projects; floodplain restoration; piling and other in-water structure removal; nonnative invasive species removal and native plant revegetation; tidal, subtidal, and freshwater wetland establishment, restoration, and enhancement; and stream and riparian habitat establishment, restoration, and enhancement. Restoration projects must incorporate specified protection measures (as applicable), such as design guidelines or avoidance and minimization techniques, or other criteria into their project descriptions to qualify within the scope of the proposed General Order. In addition, Governor Newsom signed SB 155, on September 23, 2021, adding section 21080.56 to the California Public Resources Code. This section provides a new CEQA

statutory exemption until January 1, 2025, for fish and wildlife restoration projects that meet certain requirements (statutory exemption for restoration projects). CDFW's Cutting the Green Tape Program is responsible for coordinating with lead agencies seeking Statutory Exemption for Restoration Projects concurrence.

Except for structural modifications that may require waste discharge requirements for construction activities, the State and regional water boards do not have oversight authority for predatory fish control. Direct removal methods such as electrofishing, passive trapping, and active capture methods may require a scientific collecting permit, memorandum of understanding (MOU), and federal authorization (ESA [16 U.S.C. §§ 1531–1544], §§ 4(d), 10(a)(1)(A)) if a take is anticipated to occur. CESA (Fish & G. Code, § 2051) MOUs allow take of state-listed animals for the purposes of science, education, and management activities. California Fully Protected MOUs allow take of fully protected animals under CESA for scientific research purposes. Federal authorization may require a recovery permit and authorization under ESA section 4(d) to take a federally threatened species, such as Chinook salmon, coho salmon, steelhead, and green sturgeon. Predatory fish control through angling requires an annual sportfishing license and report card that are administered by CDFW. Anglers are required to comply with California sportfishing regulations that define unlawful take and set general fishing provisions and conditions.

The California Department of Parks and Recreation, Division of Boating and Waterways (CDBW) is the lead state agency for water hyacinth control and coordinates with other state, local, and federal agencies in controlling water hyacinth. The CDBW administers the Aquatic Invasive Plant Control Program (AIPCP), which covers 11 counties: Alameda, Contra Costa, Fresno, Madera, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Tuolumne, and Yolo. The program is authorized by the Harbors and Navigation Code section 64 and provided authority through SB 1344 (Garamendi), Statutes of 1982, and Assembly Bill (AB) 2193 (Rainey), Statutes of 1996; AB 1540 (Buchanan), Statutes of 2012; and AB 763 (Buchanan), Statutes of 2013. CDBW's control program obtains environmental clearances from NMFS, USFWS, CDFW, the State Water Board, and county agricultural commissioners' offices. The AIPCP is the only program operating in the Delta that is authorized under the ESA to use herbicides and mechanical methods to control aquatic invasive plants in the Delta. In addition, in 2013, the State Water Board adopted the Statewide General NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications (Water Quality Order 2013-0002-DWQ [as amended by Orders 2014-0078-DWQ, 2015-0029-DWQ, and 2016-0074-EXEC]). Except for discharges on tribal lands that are regulated by a federal permit, this General Permit covers the point source discharge to waters of the United States of residues resulting from pesticide applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algicides and aquatic herbicides and adjuvants containing ingredients represented by the surrogate nonylphenol. The permit requires that discharges of residual algicides and aquatic herbicides must meet applicable water quality standards, and implementation of best management practices (BMPs) when applying aquatic algicides and aquatic herbicides must be detailed in an aquatic pesticide application plan.

This section presents the CEQA findings and explains those findings by resource, for potential impacts related to the implementation and operation of habitat restoration and other ecosystem projects, which include fish passage improvements, predatory fish control, and aquatic invasive species control. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. The authority to determine and require specific

mitigation is sometimes within the responsibility and jurisdiction of other public agencies with discretionary approval authority. Public agencies with authority can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts identified and analyzed remain significant and unavoidable.

## **A1.5.1 Aesthetics**

### **Common Construction**

Depending on the location, some habitat restoration and other ecosystem projects could affect scenic vistas, damage scenic resources viewed from within a state scenic highway, degrade the existing visual character of an area, or create light or glare. Potential aesthetic impacts from construction activities include physically damaging scenic resources (e.g., alteration of natural landscape contours), introducing large construction equipment to the landscape, removing vegetation, stockpiling materials (e.g., excavated soil), creating dust, and adding new sources of lighting and glare. Construction activities may be observable temporarily when heavy equipment (e.g., excavators, graders, bulldozers) is used for activities such as grading banks, moving sediment, and planting vegetation around the project site—particularly if sensitive viewers are located close to the project. Construction equipment may be observable for a temporary period when heavy equipment is used to grade banks, move sediment, and install structures. 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 do 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. In addition, some projects could require nighttime lighting for construction site security. 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 size of the project and preproject and postproject conditions. For example, projects that remove human-made structures and replace them with native vegetation would have beneficial impacts, while projects that install artificial elements, such as riprap, could have adverse impacts. In addition, some habitat restoration and ecosystem projects could include a solar panel(s) and/or operational, security, and safety lighting, which could introduce new permanent sources of glare and light.

Aesthetic impacts associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-AES-a-d: A (CMM-AES-a-d). Mitigation can include designing projects to minimize vegetation disturbance, preserving vegetation, screening construction sites, dust control measures, and shielding or directing construction lights away from sensitive receptors. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project,

implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on visual resources remain significant and unavoidable.

## **Physical Habitat Restoration**

Habitat restoration actions could involve permanent landscape-level changes to the visual environment that could affect scenic vistas, views of resources from scenic highways, or the visual character of a site. Post-habitat restoration conditions would evolve as vegetation establishes and hydrologic processes stabilize, resulting in gradual changes to visual character and quality. Conversion of agricultural or developed lands could result in permanent changes to existing visual conditions. While restored habitats would generally blend with adjacent features over time, some projects may include hardscape elements or water infrastructure that could introduce long-term visual contrasts, and activities such as gravel placement or excavation could affect visual quality if visible. If project features contrast with the surrounding landscape, they could substantially alter visual character and quality.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-AES-a-d: B would reduce this impact. Restoration projects should be designed to blend with surrounding scenery. Hardscape elements must be blended or screened and natural vegetation used to the extent possible. Gravel stockpiles should be located in areas that minimize obstruction of public views, and places where gravel is extracted should be recontoured. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on visual resources remain significant and unavoidable.

## **Fish Passage Improvements**

Dam removal projects could result in substantial long-term changes, including alteration of scenic vistas through conversion of reservoir views to natural river, canyon, or valley landscapes. Reservoir drawdown could expose large areas of sediment and rock that may persist until vegetation is reestablished. Where such changes or features contrast with surrounding conditions, they could substantially affect visual character and quality, particularly in publicly visible areas, and may influence decisions regarding partial dam removal.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-AES-a-d: C could reduce aesthetic impacts on visual resources associated with dam removal through incorporation of aesthetic considerations into dam removal planning and design and by restoring disturbed areas through revegetation, landscaping, and screening of visual elements. Entities or agencies designing and/or approving dam removal should implement or require this mitigation to avoid or reduce the severity of these impacts. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval authority can and should implement the

identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. There is inherent uncertainty in the degree of mitigation, including application of the mitigation measures in the Staff Report, which may ultimately be implemented to reduce potentially significant impacts on aesthetics. Therefore, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the impacts on this resource associated with dam removal remain significant and unavoidable.

## **A1.5.2 Agriculture and Forest Resources**

### **Common Construction**

Depending on the location, habitat restoration and complementary ecosystem projects could result in the conversion of farmland, including 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. 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 serves agriculture; disturbance of soil in development footprints, borrow/spoils areas, or staging areas (e.g., soil compaction resulting from heavy equipment storage, soil stockpiling); and dust generation.

Agriculture and forest resource impacts associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-AG-a-e: A (CMM-AG-a-e). Mitigation can include designing projects to avoid or minimize impacts on 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Therefore, potential impacts on agriculture and forest resources remain significant and unavoidable.

### **Physical Habitat Restoration**

Habitat restoration projects could convert agricultural land to natural habitats, potentially affecting important farmland, conflicting with agricultural zoning or Williamson Act contracts, and resulting in permanent land use changes, particularly for floodplain, tidal, or riparian restoration. While such projects may also provide agricultural benefits (e.g., reduced erosion, groundwater recharge, water quality buffering), compatibility with agricultural zoning and Williamson Act contracts would generally be maintained because open space uses are typically allowed; however, conflicts could occur in limited circumstances. Where restoration occurs on Prime, Unique, or Farmland of Statewide Importance, land could be permanently removed from production, with the extent of impact depending on the acreage affected. In addition, restoration activities adjacent to agricultural lands could result in indirect effects, such as increased groundwater levels and soil saturation from

expanded inundation, which could reduce agricultural productivity, as well as potential herbicide drift or runoff affecting nearby crops.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-AG-a-e: B would avoid or reduce agricultural impacts to less than significant. Restoration projects should be designed and sited to avoid or minimize impacts on agricultural lands by focusing on public land and/or working with willing landowners, to the extent possible. Measures are also included that help avoid incidental impacts on agriculture, such as seepage and herbicide drift. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Therefore, potential impacts on agriculture and forest resources from physical habitat restoration remain significant and unavoidable.

## **Fish Passage Improvements – Dam Removal**

Dam and reservoir removal projects could reduce or alter the seasonal availability of water supplies for irrigation. Agricultural diversion headworks downstream of a dam could experience siltation or otherwise be affected during reservoir drawdown, which could reduce irrigators' ability to divert water. Reservoir removal could also affect legal users of water if a diverter is dependent on the reservoir or reservoir infrastructure.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-AG-a-e: C could avoid or reduce impacts to less than significant. Preproject planning requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including feasibility studies for all structures within the impoundment—as well as all upstream and downstream structures that may be affected by removal of the dam, such as pipelines, groundwater wells, and transmission lines. Engineering designs and construction plans will include any special accommodations for existing legal users of water and other infrastructure and minimize potential impacts associated with construction-related in-channel disturbances. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Therefore, potential impacts on agriculture resources remain significant and unavoidable.

## **Invasive Aquatic Vegetation Control**

Invasive aquatic vegetation control projects that occur in the vicinity of agricultural lands could result in some incidental impacts on those agricultural lands. For example, if herbicides are used for aquatic invasive species control, these practices could affect crops if herbicides used for invasive aquatic vegetation enter irrigation water or drift onto nearby crops. Controlling invasive aquatic vegetation could also clog agricultural irrigation intakes if application of herbicides, handpicking, or herding cause plant fragments to break loose. These potential impacts would likely be temporary and incidental. Implementation of Mitigation Measure 7.21 MM-AG-a-e: D (incorporating 7.21 MM-BIO-a-f: G2) would reduce this impact to less than significant by maximizing containment of plant

fragments, collecting those fragments that remain following physical/mechanical treatments, and ensuring that the application of herbicides is done in such a way as to avoid or minimize drift and impacts on water quality. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Therefore, potential impacts on agriculture resources remain significant and unavoidable.

## **A1.5.3 Air Quality**

### **Common Construction**

Habitat restoration and other ecosystem projects could affect air quality through construction actions that generate fugitive dust, as well as emissions from fuel combustion in heavy equipment. Short-term air pollutant 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 could occur as a result of temporary construction activities and fugitive dust emissions from ground disturbance. Construction activity that includes blasting can generate substantial particulate emissions due to fugitive dust. Many of the emissions-generating activities would likely occur in or adjacent to surface waters, where there is a lower probability that sensitive receptors would be in proximity to construction or maintenance activities. If criteria pollutant standards are exceeded during construction and sensitive receptors are in proximity, impacts would be potentially significant.

Construction activities can inadvertently disperse contaminants into the environment. In areas where *Coccidioides* 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. 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 associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-AQ-a-e: A (CMM-AQ-a-e). Emissions would need to comply with the local air district regulations and established thresholds. Mitigation can include emissions and dust control measures that are required under local air district rules and regulations. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of

mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on air quality remain significant and unavoidable.

## **Physical Habitat Restoration**

Some habitat restoration projects could create objectionable odors associated with wetlands. The shallow water or stagnant water commonly found in wetlands can lead to anaerobic decomposition of vegetation (i.e., the decay of plant matter in the absence of oxygen), which can release odorous compounds, such as ammonia and hydrogen sulfide. Shallow or stagnant water can also encourage the growth of algae, which can further exacerbate anaerobic conditions. These odors could affect nearby land uses, such as the closest recreational facilities and residential uses. These odor impacts have the potential to cause nearby recreationists and residents to reduce outdoor activity or take other actions to avoid detection of the odors (e.g., keep windows closed).

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-AQ-a-e: B would reduce odor-related impacts to less than significant by requiring a project-specific odor management plan that includes implementation of odor control measures and protocols for monitoring, reporting, and responding to odor events. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, odor impacts from physical habitat restoration remain significant and unavoidable.

## **Fish Passage Improvements – Dam Removal**

Dam removal could generate some additional odor because these projects would drain existing reservoirs and expose the underlying sediments. Because reservoir sediment deposits can contain unoxidized organic matter from algae detritus, earthy or hydrogen sulfide odors may be evident during or immediately following reservoir drawdown while the exposed sediments dry out and new vegetation is established. These odors could temporarily affect nearby land uses, such as the closest recreational facilities and residential uses. The odors have the potential to cause nearby recreationists and residents to reduce outdoor activity or take other actions to avoid detection of the odors (e.g., keep windows closed). The magnitude of impact would depend on receptors' proximity to the reservoirs and wind patterns during and immediately following reservoir drawdown. Within a relatively short amount of time (i.e., days to a few weeks), the sediment surfaces would oxidize as they are exposed to air, and the organic compounds causing the odors would be broken down.

Construction/demolition activities associated with dam removal 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 could be spread off site via haul trucks as well. In addition, following drawdown of the reservoir and prior to the establishment of ground vegetation, there is also the potential for windblown dust to be generated from exposed sediment deposits remaining in the reservoir (i.e., from the desiccated lakebed).

In addition to common construction mitigation measures, implementation of Mitigation Measures 7.21 MM-AQ-a-e: B and C would help minimize or avoid impacts on air quality associated with dam removal projects. Measures include the development of an odor management plan and a site-specific dust control plan. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, air quality impacts from dam removal remain significant and unavoidable.

## **A1.5.4 Biological Resources**

### **Common Construction**

Habitat restoration and other ecosystem projects would be located in or near waterways, wetlands, floodplains, and riparian areas where sensitive natural communities, habitat for special-status species, and wildlife corridors have a high potential to occur. Constructing a project 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 a project 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 locations, projects 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 plan.

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 affect habitat, result in direct contact to individuals, or result in indirect impacts on individuals 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 (e.g., dams) that provide roosting habitat. Construction activities could result in direct mortality or damage to special-status plant species, or indirect damage by degrading special-status plant habitat or rare 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 rare 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 vegetative species through the movement of topsoil, fill, gravel, and construction equipment.

Construction located in or near river reaches is expected to have high potential for impacts on special-status plants and animal species, associated habitat, and supporting biological resources. 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 may also be disturbed 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 fish. 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.

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. Construction may result in temporary localized adverse effects on special-status plants, animals, and habitat; however, because activities would be temporary and relatively localized, construction would be unlikely to result in adverse population-level effects on any species.

Impacts on biological resources associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-BIO-a-f: A (CMM-BIO-a-f). Mitigation can include seasonal work windows, preconstruction biological surveys, site design to avoid and minimize disruption to sensitive habitat, and invasive species control measures. If mitigation measures are implemented, most, if not all, impacts can be mitigated to less than significant. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Therefore, construction impacts on biological resources remain significant and unavoidable.

## **Physical Habitat Restoration**

Overall, beneficial effects on special-status fish species would be expected following restoration. However, riparian habitat could be lost when creating marsh and other habitat types, and large trees that provide nesting habitat could be killed by flooding required for marsh creation, which could have adverse impacts on 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 and ringtails. Some habitat restoration projects could change some sensitive habitats, such as nontidal perennial aquatic (open water) habitat and nontidal freshwater perennial emergent wetland habitat to tidal perennial aquatic and freshwater emergent wetlands. This potential change of habitat types could adversely affect some species and natural communities while benefiting others.

Some restoration projects could involve the conversion of agricultural land to native riparian and wetland communities. Overall, these actions would be expected to benefit native species, as well as riparian, wetland, and sensitive natural communities but could affect certain species that use agricultural lands for habitat.

A primary goal of floodplain restoration is to benefit juvenile salmonids by providing access to floodplain rearing habitat, which would increase food availability and production for juvenile fish and lead to increased fish growth and subsequent survival. However, if not properly designed, floodplain and other types of restoration could lead to fish stranding. Fish diverted onto the floodplain during high flows could be stranded if the floodplain drainage creates barriers, such as shallow puddles, and does not create flow back to the main channel.

The creation of freshwater wetland and floodplains could facilitate methylmercury production and the bioaccumulation of mercury in fish and other wildlife. Floodplain restoration could also lead to increased predation on sensitive fish species that use shallow-water floodplain habitats because predatory fish and birds also use this habitat. Levee breaches can create areas of turbulence that can disorient small fish; predatory fish are known to congregate in these areas. Although the effects of increased predation would probably be offset by the benefits of floodplain inundation and shallow-water habitat, without proper design and management, shallow-water habitat could provide greater benefits to nonnative predatory fish and piscivorous birds than to native fish species.

In addition, project operations could contribute to the proliferation of invasive plant species, if not properly managed. This could result in the need to apply herbicides. Habitat restoration projects could create mosquito habitat, which could result in the application of pesticides. Certain herbicides and pesticides can be toxic to aquatic and/or terrestrial species (e.g., pyrethroids can be toxic to fish).

Gravel augmentation projects would change aquatic habitat by changing river width, river habitat types (riffles, pools, runs), and hydraulics, which could have beneficial long-term effects on Chinook salmon and steelhead spawning habitat. The addition of coarse sediment and various in-channel activities could affect spawning anadromous fish if instream work is not conducted within appropriate work windows (late-summer, low-flow period). Gravel augmentation could result in percussive impacts on incubating embryos and mortality through compression (crushing) of salmon and steelhead embryos and alevins. Placement of gravel could also cause water quality issues that affect redds and fish if the material used for gravel augmentation contained sand or silt, which can cause increased turbidity.

In addition to common construction mitigation measures, implementation of Mitigation Measures 7.21 MM-BIO-a-f: B and C would help minimize potential biological impacts associated with restoration projects to less than significant and ensure that the restoration area is functioning as designed and benefiting fish and wildlife species once construction is complete. Physical habitat restoration projects must be developed and implemented in consultation with and are subject to approval from applicable state and federal fisheries agencies. Restoration projects must be designed in accordance with specific guidance documents (Mitigation Measure 7.21 MM-BIO-a-f: B) and, where possible, implement ecological process-based recovery of landscape functions as articulated in A Delta Renewed. Adaptive management, including the articulation of biological goals and monitoring, will be required for approval of restoration projects submitted as a part of any local cooperative solution under the Plan amendments (Mitigation Measure 7.21 MM-BIO-a-f: C2). Lead agencies can and should also implement Mitigation Measure 7.21 MM-BIO-a-f: C4, which identifies

measures that should be taken to minimize potential impacts of fish stranding. Fish habitat and passage is a primary goal of such projects, and projects must be designed to take fish habitat drainage needs into account. Gravel augmentation should be timed to avoid affecting spawning spring- and fall-run Chinook salmon, coho salmon, steelhead, or their embryos once in the gravel (late-summer, low-flow conditions) (Mitigation Measure 7.21 MM-BIO-a-f: C8). Restoration projects should be designed to incorporate anti-predation measures and avoid creating hotspots for predation (Mitigation Measure 7.21 MM-BIO-a-f: C7). BMPs or mitigation measures, such as regularly monitoring for and treating invasive plant species, would address the proliferation of these invasive species. Water quality and hazard mitigation measures are cross-referenced to address biological impacts associated with mercury and pesticides (Mitigation Measure 7.21 MM-BIO-a-f: C6). As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Therefore, impacts on biological resources from physical habitat restoration remain significant and unavoidable.

## **Fish Passage Improvements**

Fish passage projects can obstruct and injure species without proper design. Operation of a TCD could draw down the depth of the thermocline in some years, which could cause an increase in the thickness of the warm epilimnion layer and therefore an increase in the reservoir area with warm water temperatures preferred by warm water species. For fish screens, velocities must be measured at the screen to ensure that they fall into the correct range for the fish species that may be present near the fish screen to prevent impingement. For fishway projects, large water level differences between pools, excessive flow velocities and turbulence, large eddies, and velocities and depths that are too low can create barriers for fish. In addition, fish are sensitive to other environmental factors, such as the level of dissolved oxygen, temperature, noise, light, and odor, which can negatively affect migration. Fishways and dam removal can introduce special-status species to inhospitable habitat upstream and/or create conditions to allow invasive species upstream that were previously blocked. Fishways primarily designed for salmonids can be impediments to passage of other aquatic species if they do not have adequate surfaces for attachment, velocities are too high, or there are inadequate places for resting.

In addition to common construction mitigation measures, implementation of Mitigation Measures 7.21 MM-BIO-a-f: D and E would help avoid or reduce potential biological impacts associated with fish passage projects to less than significant and ensure that the project is functioning as designed and benefiting fish and wildlife species once construction is complete. Fish passage projects must be developed in consultation with NMFS, USFWS, and CDFW in accordance with established design, operational, and maintenance criteria and guidelines. Fishway projects should be designed to avoid creation of predator hotspots and avoid introducing invasive species upstream of the barrier. TCDs should be designed to ensure sufficient temperature and dissolved oxygen conditions to support special-status species above and below the reservoir. While many impacts could be reduced to a less-than-significant level, there is uncertainty about whether and how this impact will occur, and whether impacts can be reduced to less than significant in every instance. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the

extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Therefore, potential impacts on biological resources from fish passage improvement projects remain significant and unavoidable.

Dam removal projects can range from relatively small impoundments (e.g., diversion dams) to large-scale construction and removal of larger structures (e.g., reservoirs). Small dams have a relatively small volume of sediment available for release (relevant to the size of the stream channel). When released by storm flows, this sediment would have minimal effects on downstream habitat. The removal of large dams would be likely to result in a more substantial release of sediment to areas downstream. If reservoir sediment is not removed or stabilized prior to dam removal, fine-grained sediment can be resuspended and cause turbidity and sedimentation downstream, which could affect downstream spawning areas. Suspended sediment can adversely affect fish and invertebrate species in multiple ways, including direct lethal impacts or sublethal effects on physiology and behavior. Elevated suspended sediment concentrations resulting from the release of sediment stored behind dams also has the potential to adversely affect or cause mortality of sensitive life stages of other species, such as amphibians, reptiles, and benthic macroinvertebrates occurring downstream of dam removal sites. High levels of sediment and turbidity affect aquatic ecosystems by reducing photosynthetic activity, reducing food availability, burying habitat, and directly harming organisms. Sediment-related effects would tend to diminish with distance downstream of the dam because of tributary inflows of water and sediment along with deposition along the channel. In addition, sediment impacts may diminish with time after dam removal because rates of reservoir sediment erosion diminish with time; however, coarse sediment initially released and deposited in the channel is likely to be subsequently reworked during future high flows. If the sediments contain toxic pollutants (e.g., metals or bioaccumulative compounds, including legacy pesticides and methylmercury), the dam removal impacts can be more significant, at least in the short term. Following dam removal, once the sediment previously trapped behind the dam is redistributed downstream, natural sediment transport levels return; accordingly, constituents typically adsorbed to sediment (e.g., metals), are no longer found in excess, relative to the period before redistribution.

When a reservoir is drawn down too quickly, supersaturation of nitrogen gas can occur as the result of high water velocities in a stream, negatively affecting downstream organisms (e.g., fish lethality due to gas emboli in gills and tissues).

Dam-released sediment may temporarily deposit in pools and other slack water areas (e.g., eddies), at tributary confluences, and potentially along channel margins, where it could have a short-term negative impact on downstream wetland habitat due to temporary burial.

Reservoir removal would eliminate habitat availability for some aquatic species that currently occur within reservoirs. Terrestrial species, such as western pond turtle, that use shoreline habitat in some reservoirs could also be affected as a result of change in habitat availability. Waterbirds that currently use the reservoirs seasonally during migration and/or for overwintering would also be affected by the loss of this aquatic habitat for nesting, foraging, loafing (resting on the water), and roosting. The loss of aquatic reservoir habitat could also reduce foraging opportunities for fish-eating birds, including bald eagle, osprey, merganser, cormorant, egret, and heron. Changes in food availability for birds that consume aquatic vegetation and invertebrates could occur. It is anticipated that birds and bats would continue to use the river for foraging or would use other aquatic habitat. Existing wetland-dependent vegetation along the margins of the reservoirs could die out and

transition to upland communities. Wetland species that occur near confluences are expected to conform to the riparian corridor width of the tributaries and over the subsequent years extend down the newly exposed mainstem river channel riparian corridor.

In addition to common construction mitigation measures and fish passage improvement mitigation measures (Mitigation Measure 7.21 MM-BIO-a-f: D), implementation of Mitigation Measure 7.21 MM-BIO-a-f: E would help minimize or avoid impacts on biological resources associated with dam removal projects. Preproject planning requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including environmental feasibility. A project design would feature restoration project goals and objectives, such as fish passage, connectivity, sustainability, restoration of natural riverine processes, and floodplain function and capacity, which would benefit species and incorporate special accommodations for terrestrial species (Mitigation Measure 7.21 MM-BIO-a-f: E1). Mitigation would minimize potential impacts associated with construction-related in-channel disturbances. The required revegetation plan would provide for the recontouring and revegetation of the formerly inundated area and any disturbed areas (Mitigation Measure 7.21 MM-BIO-a-f: E3). A sediment management and monitoring plan would be required for dams that contain large quantities of sediment to reduce the impacts of the release of reservoir sediment on downstream aquatic resources (Mitigation Measure 7.21 MM-WQ-a-j: G3). For some dam removal projects, a controlled drawdown of reservoir levels could enhance downstream transport of reservoir sediment in a metered fashion without the deleterious impacts of an instantaneous release. With an effective sediment management plan, potential impacts can be substantially reduced or avoided. In some cases, there may be benefits from the controlled release of reservoir sediments, such as the introduction of spawning gravel, wood, and nutrients for the restoration of downstream fish habitats. A project-specific analysis would be necessary to identify the preferred dam removal method for an individual project, and multiple approvals from various federal and state agencies would be required. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Therefore, potential impacts on biological resources from dam removal remain significant and unavoidable.

## **Predatory Fish Control**

Direct methods of predatory fish control, such as electrofishing, hook-and-line fishing, passive trapping (e.g., fyke nets, hoop nets, gill nets), and active capture methods (e.g., trawls, beach seines), could cause some turbidity and could startle native fish. Capture methods (e.g., hook-and-line fishing, traps, electrofishing) could also inadvertently ensnare or stun special-status fish species. The inadvertent capture of native fish relative to the capture of predatory fish is expected to be low but nevertheless would be potentially significant. Implementation of Mitigation Measure 7.21 MM-BIO-a-f: F, which includes appropriate authorization from state and federal fisheries agencies, can reduce impacts to less than significant. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant impacts. Therefore, potential impacts on biological resources remain significant and unavoidable.

## **Invasive Aquatic Vegetation Control**

Physical control methods could affect species through direct contact with workers and equipment or if plant fragments are left to propagate. Chemical treatment of invasive aquatic vegetation could harm sensitive habitats, as well as plant and wildlife species, either by direct contact through overspray or by runoff, leaching, or plant uptake. The potential impact of the herbicide would depend on the concentration and toxicity of the herbicide; the application method; and the habitat, plant species, or wildlife species affected. Herbicides can kill aquatic plant species, and, if the plants are not removed, decompose and decrease dissolved oxygen in the water. It is possible that herbicide spraying could inadvertently extend beyond or below the targeted area and affect other plants. Herbicide exposure could also potentially adversely affect fish and wildlife. Although the risk is generally considered low, and in most cases the exposure would likely be far too diluted for negative effects to occur, the possibility of direct or concentrated exposure exists, particularly to amphibians, who are thought to be more sensitive to chemical exposure.

Implementation of Mitigation Measure 7.21 MM-BIO-a-f: G, which identifies mitigation measures for both physical and chemical control mechanisms, can reduce impacts to less than significant. AIPCP is the only program operating in the Delta that is authorized under the ESA to use herbicides and mechanical methods to control aquatic invasive species in the Delta. In addition, the NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications (Water Quality Order 2013-0002-DWQ) requires that discharges of residual algicides and aquatic herbicides must meet applicable water quality standards, and implementation of BMPs when applying aquatic algicides and aquatic herbicides must be detailed in an aquatic pesticide application plan. CDBW has found that impacts on other plants can be minimized with practices such as following herbicide label instructions, using the largest size spray droplets and the lowest spray pressure that would be effective, and not spraying in windy conditions. Only herbicides approved by the California Department of Pesticide Regulation may be used, and herbicides must be applied by a licensed applicator in accordance with all directions and protective actions listed on the product label of the herbicide being applied. Timing restrictions, water quality measures such as monitoring turbidity and chemicals during removal, and other water quality BMPs must be followed. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. If mitigation measures are implemented, most, if not all, impacts can be mitigated to less than significant. Because the precise location and magnitude of activities required for invasive aquatic species control are not known, impacts on biological resources from predatory fish control cannot be determined with certainty at this time. Therefore, potential impacts on biological resources remain potentially significant.

### **A1.5.1 Cultural Resources**

#### **Common Construction**

Construction of habitat restoration and other ecosystem projects 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 Cal. Code Regs., tit. 14, § 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 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). Impacts could result from ground-disturbing activities, such as impacts on unknown buried or near-surface cultural 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 historic resources, 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 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, 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.

Cultural resources impacts associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-CUL-a-d: A (CMM-CUL-a-d). Mitigation would include regulatory compliance, preconstruction surveys, monitoring during construction, avoidance, unanticipated discovery measures, cultural resources sensitivity training, and dust-control as well as noise- and vibration-reduction measures. 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on cultural resources remain significant and unavoidable.

## **Fish Passage Improvements**

Many dams and other instream structures in the Sacramento/Delta are at or beyond the 50-year age threshold for potential eligibility for national or state historic registers, and their removal or modification could significantly affect cultural resources. Fish passage improvement projects that would result in the removal of dams or major changes to diversion structures would require the identification and evaluation of potentially significant built environment resources that may include dams and diversion structures and whether or how the device may affect a site or structure eligible

under the NRHP or CRHR. California Public Resources Code section 21084.1 and California Code of Regulations section 15064.5 subdivision (a) maintain that the project proponent should consider the eligibility of these structures for listing in the CRHR. In addition to the potential impact on the structures themselves, the drawdown of a reservoir prior to dam removal could result in shifting, erosion, and exposure of known or as-yet-unrecorded previously submerged cultural resources or human remains.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-CUL-a-d: B could reduce the potential impact of fish passage improvement projects (TCDs and large dam removal) on cultural resources. Preproject planning requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including cultural resource impacts and opportunities. A project design may provide opportunities for historic preservation, such as leaving portions of the structure, such as a stone masonry abutment or a concrete thrust block. 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. The dam and appurtenant structures may be protected under the National Historic Preservation Act (54 U.S.C. § 300101 et seq.), and retention of portions of the dam may be desirable to preserve a particular element of the original design for posterity. Measures also include implementing appropriate protocols when cultural resources or human remains are encountered. With timely discovery and appropriate steps to address exposure, shifting, or erosion impacts, many cultural resources can maintain their current level of significance. Additionally, providing a means for the long-term protection or enhancement of affected cultural resources can mitigate certain impacts. Lastly, providing a means for the long-term protection or enhancement of affected cultural resources can mitigate certain impacts. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on cultural resources from fish passage improvement projects remain significant and unavoidable.

## **A1.5.2 Energy and Greenhouse Gas Emissions**

### **Common Construction**

Because of the connection between energy use and GHG emissions, these two resources are addressed together in this section. Habitat restoration or other ecosystem projects would result in energy consumption and GHG emissions primarily from construction activities. Total GHG emissions and the energy required for construction activity 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, concrete). 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 construction (e.g., excavating, grading, transporting materials and construction workers). Construction equipment, such as trucks or barges, earthmoving equipment, and power tools, involve using petroleum products and electricity to operate. These energy demands would be temporary (i.e., limited to the construction period). 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). The primary GHG emissions generated by construction are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). Construction activities could also result in the 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 environment and conflict with an applicable plan, policy, or regulation 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.

Energy and GHG emissions impacts associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-EN-a,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 air quality and GHG emissions would ensure the efficient use of energy during construction. The California Air Resources Board (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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on energy and GHG emissions remain significant and unavoidable.

## **Fish Passage Improvements – Dam Removal**

Removing a renewable source of energy by removing a hydropower dam has the potential to result in increased GHG emissions from nonrenewable alternate sources of power. GHG emissions could occur in the event that the renewable source of power was replaced by other regional power sources (including GHG-emitting fossil fuels). This reduction in generated power would likely be compensated by other existing power plants connected to the power grid. The generation of additional power could result in increased GHG emissions at other power facilities. However, the state's cap-and-trade program sets a limit on GHG emissions at these facilities and allows sources to trade emissions or purchase allowances to meet the emissions limit. Therefore, if additional emissions are generated as a result of a loss of hydropower, these emissions would not exceed emission limits or obstruct the state's compliance with GHG reduction targets. If the reduction in

power were substantial enough to require construction and operation of a new power plant, the new facility would be subject to a new source permitting process and the state's cap-and-trade program and would likely operate more cleanly in terms of emissions than the existing power plant.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-EN-a,b/GHG-a,b: B is expected to reduce the potential energy and GHG emissions impacts of dam removal. For projects that may require the dismantling of existing hydropower facilities the project should be implemented only if feasibility analysis verifies that the project will not result in unacceptable impacts on grid reliability. In addition, lost power should be replaced with renewable energy sources and if increased renewable energy resources cannot be used in the short term, power generation at existing or new facilities should be increased to a degree that ensures grid reliability. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on energy and GHG emissions from hydropower dam removal projects remain significant and unavoidable.

## **A1.5.3 Geology and Soils**

### **Common Construction**

Depending on the location, construction habitat restoration and other ecosystem projects 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 creating substantial risks to life or property; or be located on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems. Construction actions that involve ground disturbance could 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 saturated 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 could result in unsafe working conditions. 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 life or property through structural failure of buildings or roads. Expansive soils are susceptible to shrinking and swelling during rain events and to subsequent drying, which can cause building foundations to crack. In addition, 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.

On-site 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 off site. 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.

Geology and soil impacts associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 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 operations (as applicable) as part of a site-specific Stormwater Pollution Prevention Plan (SWPPP); and implementing site-specific geologic and geotechnical investigations to address the potential for liquefaction, subsidence, ground shaking, and slope failure. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on geology and soils remain significant and unavoidable.

## Physical Habitat Restoration

In addition to construction-related impacts, other possible topsoil and erosion impacts associated with habitat restoration include increased wind and water erosion related to intended levee breaching (e.g., to increase tidal exchange). Breaching levees can increase wind and water erosion at areas adjacent to the breach. The increased inundation associated with breaching can also lead to increased erosion from wind-wave fetch. Further, although the degree of setback of a setback levee would vary by project, narrow setback may result in erosion on the surface of newly established floodplain due to high velocities. In addition to the erosion mitigation for common construction activities, implementation of Mitigation Measure 7.21 MM-GEO-a-e: B would minimize erosion related to intended levee breaching and/or setback levees through levee design, maintenance, and

repair that is consistent with federal and state levee design criteria and guidelines. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on geology and soils from levee breaches and/or setback levees remain significant and unavoidable.

## **Fish Passage Improvements – Dam Removal**

In addition, large dam removal projects may result in soil instability and landslides. Reservoir drawdown would be required prior to dam removal, exposing previously inundated slopes and the sediment deposited in the reservoir. Reservoir drawdown could result in hillslope instability in reservoir rim areas. Erosion of sediment on the slopes would occur during drawdown, and most of this sediment would be retained behind the dam until the dam itself was removed. The rate of dam removal and reservoir drawdown can have a strong influence on the rate that sediments are eroded and transported to the downstream river channel. If the rate of reservoir drawdown is too fast, it could exceed the safe downstream channel capacity and could induce potential landslides along the reservoir margins or a slope failure of an embankment dam and cause additional erosion and sedimentation downstream.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-GEO-a–e: C would avoid or reduce the potential for adverse effects. Site-specific geologic and soil investigations would help determine the appropriate reservoir drawdown rate to manage hillslope instability in reservoir rim areas. The impacts from releasing a large volume of reservoir sediment into the downstream channel can be reduced by slowing the rate of reservoir drawdown. This might be accomplished by incrementally and progressively lowering the reservoir over a period of weeks, months, or years, depending on the size of the dam and the volume of the reservoir sediments. Measures also include slope stabilization, sediment stabilization, sediment management, and sediment release actions within a reservoir footprint and downstream. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on geology and soils from dam removal remain significant and unavoidable.

## **A1.5.4 Hazards and Hazardous Materials**

### **Common Construction**

Depending on the project location, construction of habitat restoration and other ecosystem projects 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. On-site refueling and equipment maintenance could result in the accidental release of hazardous materials. In addition, if equipment is not properly maintained or if on-site construction-related hazardous materials are improperly stored, leakage and inadvertent spills could occur, respectively.

Construction activities also could include excavation, which 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 hazardous 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 (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.

Construction activities could occur within 0.25 mile of a school. A release of hazardous material, potentially exposing school occupants, could result if materials were to become airborne (e.g., gases, asbestos particles) or could occur through ignition of flammable liquids or vapors. Construction also could expose schools 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. 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, work site 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, solvents) and could involve activities that could start a wildfire, depending on the project location. In addition, fires could be caused by other construction-related activities, including welding or parking and starting heavy equipment or vehicles on dry grass. Construction activity that involves blasting requires that special precautions be taken to minimize the fire risks and safety risks (e.g.,

from flying rock fragments) related to the use of any explosive materials on the project site. 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 (as may be required for certain physical habitat restoration projects) could result in a safety hazard for people residing or working in the project area.

Construction could create new disease vector habitat that would 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 represents 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.

Some habitat restoration and other ecosystem projects may include the 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.

Hazards and hazardous materials impacts associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 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 and preparation and implementation of an emergency response plan, a fire prevention and management plan, and a spill prevention and response plan. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts related to hazards and hazardous materials remain significant and unavoidable.

## **Physical Habitat Restoration**

In addition to the potential for hazards related to the use of hazardous materials in heavy equipment during construction, operations, and maintenance, herbicide application may be necessary for the

ongoing control of invasive terrestrial plant species as part of maintenance at some restored habitat sites. Accidental release (e.g., spills) or improper use or storage of herbicides could result in the exposure of the application crews and general public (including children, for sites located within 0.25 mile of a school) to toxic chemicals.

Habitat restoration could create conditions favorable to mosquitos, which could lead to increased transmission of mosquito-borne diseases (e.g., West Nile virus). The practice of flooding previously dry land (e.g., seasonal wetlands) during the early fall for attracting waterfowl for conservation and recreational purposes can create favorable mosquito-breeding habitat. Mosquitoes require standing water to complete their growth cycles, and waterbodies with poor circulation, continual slow-changing water levels, higher temperatures, and higher organic content produce greater numbers of mosquitoes. Although measures would be included in the project design and management to minimize favorable mosquito-breeding conditions, the application of pesticides may be necessary.

Restoration of floodplain, riparian, and tidal habitat could attract waterfowl and other birds. If restored areas are in proximity to existing airport flight zones, there could be the potential for increased bird-aircraft strikes, which would create a potential safety hazard for people residing or working in or near the project area.

An increase in vegetation as part of some types of physical habitat restoration (e.g., riparian restoration) could cause an increase in the risk of wildland fire by increasing the fuel load. Riparian corridors could also act as a corridor for the spread of fire under dry climatic conditions and where dry fuel has accumulated. In addition, for larger habitat restoration projects that attract visitors, the risk for wildfires may be increased due to an increased number of cars and people to the area. For example, hot exhaust pipes and mufflers are capable of igniting dry grass or brush with sustained contact.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-HAZ-a-h: B would help minimize or avoid potentially hazardous impacts on the public or environment from habitat restoration projects. Measures include herbicide application control and mosquito abatement control measures (including safe pesticide application); air traffic safety measures; wildfire prevention measures; and water quality mitigation measures (7.21 MM-WQ-a-j: E) . As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts related to hazards and hazardous materials from physical habitat restoration remain significant and unavoidable.

## **Fish Passage Improvements**

Certain types of TCDs, such as thermal curtains, would increase the reservoir area that would be restricted from use by recreationists. Thermal curtains and associated structures could pose a physical safety hazard (e.g., collision) to recreationists such as water skiers, wakeboarders, and others being towed behind boats and to other water-based recreationists in the vicinity of the TCD. Implementation of Mitigation Measure 7.21 MM-HAZ-a-h: C would require that an area around the

temperature curtain be restricted and posted with warning signs and buoys for the safety of recreationists.

Structure removal limits for large dam removals are based on a wide range of factors, including public safety and liability issues, type of dam and appurtenant structures, and presence of hazardous materials. Public safety and liability issues would require consideration of the potential hazards to the public, if remaining portions of the dam could represent a potential hazard, such as an attractive nuisance on the stream. Construction-related traffic could cause hazards on existing transportation infrastructure (e.g., roadways, bridges, culverts) en route to the dam site.

Removal of fish passage barriers could require the demolition of structures (including mechanical and electrical equipment) containing hazardous materials. Demolition and disposal of structures containing hazardous materials could create a significant hazard to the public or the environment through accidental release. Without proper protections, contaminants could leach into surface water or groundwater and potentially migrate to drinking water sources, posing public health concerns. Construction activities could include drilling and cutting into large quantities of concrete. This could result in the release of a substantial amount of concrete dust, which could pose a hazard to the public or the environment.

Reservoir dam removal projects could result in short-term 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/demolition actions related to removal of a reservoir 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. Removal of reservoirs as a source of water for fire suppression could substantially increase the public's risk of loss, injury, or death associated with wildfires if other sources of water or means of fire suppression are not readily available. In addition, removal of a reservoir could result in an increased source of wildfire fuel in the form of dead trees and other vegetation around the former reservoir shoreline.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-HAZ-a-h: D would reduce or avoid potentially hazardous impacts on the public and environment from dam removal projects. Measures include preproject planning and facility design to ensure that removal of structures would be done so that flooding, fire, and other risks would be controlled. A sediment management and monitoring plan (7.21 MM-WQ-a-j: G3) would be required for natural erosion or handling and disposal of sediment stored behind the barrier. Mitigation Measure 7.21 MM-HAZ-a-h: D2 requires the development and implementation of a hazardous materials management plan. Materials determined to be hazardous would require special handling and disposal at approved facilities. Testing, labeling, manifesting, transporting, and disposing of hazardous materials are regulated by federal and state law. Mitigation Measure 7.21 MM-HAZ-a-h: D4 would also require a fire management plan to identify long-term water sources for helicopter and ground crews and remove dead or dying vegetation around the former reservoir shoreline that could serve as wildfire fuel. A project-specific analysis would be necessary to identify the preferred dam removal method for an individual project, and multiple approvals from various federal and state agencies would be required. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project,

implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts related to hazards and hazardous materials from physical habitat restoration remain significant and unavoidable.

## **Predatory Fish Control**

Electrofishing operations, if not implemented safely (i.e., according to safe electrofishing practices and techniques), could result in electrocution of nearby swimmers, for example, as well as nontarget wildlife species. Implementation of electrofishing safety BMPs under Mitigation Measure 7.21 MM-HAZ-a-h: E would avoid or reduce the impact. Other agencies can and should implement the identified mitigation measures to the degree feasible. Because the jurisdiction and authority to implement mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant impacts related to hazards. Therefore, the State Water Board finds that this impact remains significant and unavoidable.

## **Invasive Aquatic Vegetation Control**

Chemical control of invasive aquatic vegetation could result in the accidental release of herbicides and the exposure of application crews and the general public (including schools within 0.25 mile) to herbicides. Misuse of herbicide or accidental spill 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).

Implementation of BMPs for the safe use of herbicides for chemical control of invasive aquatic vegetation (7.21 MM-BIO-a-f: G2) would avoid or minimize potentially hazardous impacts on the public and environment from the improper application of herbicides. AIPCP is the only program operating in the Delta that is authorized under the ESA to use herbicides and mechanical methods to control aquatic invasive species in the Delta. In addition, the NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications (Water Quality Order 2013-0002-DWQ) requires that discharges of residual algicides and aquatic herbicides must meet applicable water quality standards, and implementation of BMPs when applying aquatic algicides and aquatic herbicides must be detailed in an aquatic pesticide application plan. Only herbicides approved by the California Department of Pesticide Regulation may be used, and herbicides must be applied by a licensed applicator in accordance with all directions and protective actions listed on the product label of the herbicide being applied. Timing restrictions, water quality measures such as monitoring turbidity and chemicals during removal, and other water quality BMPs must be followed. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. If mitigation measures are implemented, most, if not all, impacts can be mitigated to less than significant. Because the precise location and magnitude of activities required for invasive aquatic species control are not known, impacts from predatory fish control cannot be determined with certainty at this time. Until a specific project is proposed and additional site-specific information becomes available, impacts related to hazards and hazardous materials from chemical control of invasive aquatic vegetation remain significant and unavoidable.

## A1.5.5 Hydrology and Water Quality

### Common Construction

Construction activities have the potential to violate water quality standards or 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 the alteration of the course of a stream or river, in a manner that would 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; expose people or structures to a significant risk of loss, injury, or death involving flooding; and 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, other 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, and 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. Excavation and dredging 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, often for structure placement or maintenance. Other types of in-channel activities that could increase movement of sediment include breaching levees, operating heavy equipment, and placement or removal of structures.

Placement of fill (e.g., temporary gravel berms, cofferdams) could affect water quality by increasing turbidity and, depending on the type of fill, introducing 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 and oil from vehicles and equipment), paving materials such as concrete and asphalt (accidental discharge of concrete wash water or wet concrete into a waterway can increase pH), other materials used or stored on site (pesticides, herbicides, fertilizer, detergents, paint, adhesives, solvents), and project waste (litter, debris, hazardous and liquid waste). The use of herbicides to control invasive plant species during construction could affect water quality and violate water quality standards if improperly applied.

Some habitat restoration and other ecosystem projects may include the installation and use of USTs or ASTs for bulk fuel storage and/or construction and maintenance of public restrooms. 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, it can contaminate nearby surface water or groundwater, if located too close to a groundwater well, with excess nutrients and pathogens.

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

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, the surface water quality could become degraded by increased turbidity, dissolved solids, nutrients, metals, or other constituents in the groundwater. The presence of groundwater on a construction site also may increase the likelihood of accidental contamination of groundwater. The quantity of groundwater dewatering associated with construction of restoration projects would likely have minimal effect on groundwater volume. Dewatering of surface water ponded as part of construction (e.g., by use of sheet-pile barriers or check dams) also could affect surface water quality. This ponded water could have elevated temperature, turbidity, or construction contaminants and could affect water quality when it is discharged to a surface waterbody.

Construction could substantially alter drainage patterns of a project site and thereby cause erosion, siltation, or flooding onsite or offsite. 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 water surface elevations, velocities, and erosion. Most habitat restoration and other ecosystem projects would not add large areas of impervious surfaces. Some paved or concreted areas may be necessary for fish passage improvements, for projects such as channel armoring, slope protection with riprap or other materials with low permeability, and construction of roads, which may create larger impervious or semi-impervious areas. These impacts have the potential to occur at any construction site, because stormwater runoff occurs on all land surfaces.

The susceptibility of a project to a seiche, tsunami, or mudflow depends on location. Areas where there would be construction and operations near reservoirs and the ocean could be subject to inundation by seiches and tsunamis, respectively. Construction and operation of any type of habitat restoration projects or other ecosystem measures could be subject to mudflow because any of these could be located at the base of a steep slope.

Impacts on hydrology and water quality associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 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 water quality effects may include preconstruction surveys and analysis, preparation and implementation of site-specific SWPPPs, turbidity compliance monitoring, drainage plans, and erosion control measures. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on hydrology and water quality remain significant and unavoidable.

## Physical Habitat Restoration

Geomorphic changes from habitat restoration could increase long-term rates of erosion or sedimentation. Habitat restoration may modify channels to improve geomorphic function and increase floodplain and tidal habitat, which may alter sediment movement. These geomorphic actions include improving hydrologic connectivity between terrestrial and aquatic habitats for key geomorphic or ecological functions, including the exchange of food, nutrients, and sediment. The landscape may be prepared in a manner that facilitates a more natural geofluvial process that also includes active movement of soils and other material. Fill activities unique to physical habitat restoration could include in-channel placement of large pieces of wood, boulders, and spawning gravel. Placement of these materials could increase the potential for water quality degradation if the material contains sand, silt, or other contaminated materials that could be released into the stream. Placement of fill and gravel has the potential to release turbidity and existing contaminants from in-channel sediment into the water column. Water quality may also be affected in the location where gravel material is obtained. Gravel mining often occurs in or near streams and where the groundwater table is high and, as such, may result in increased turbidity of surface water and release of contaminants to both surface water and groundwater. After mining is completed, pits

often fill with groundwater, which may have relatively low quality compared to surface water originating from runoff.

Water quality objectives for sediment and turbidity provide that sediment load and discharge rate will not be altered in a way that would cause nuisance or adversely affect beneficial uses. In the San Francisco Bay Basin Plan, increases in turbidity are constrained to less than 10 percent in areas where the natural turbidity is already greater than 50 nephelometric turbidity units (NTUs). Controllable water quality factors will not cause a detrimental increase in the concentrations of toxic pollutants in sediment or aquatic life. The Central Valley Basin Plan contains a more specific tiered system with allowable turbidity increases based upon the natural turbidity of the surface water, with exceptions during dredging operations. Large-scale restoration projects may cause significant discharges of waste into waters of the state and may require a longer time to achieve water quality standards.

Habitat restoration projects could alter the existing drainage pattern of the site or area and, if improperly designed, alter hydrology and/or increase erosion and sedimentation. Floodplains allow water to spread across a wider area and relieve constricted channels of flow, whereas constriction of flow typically results in erosion. Floodplain restoration typically increases conveyance capacity, thereby reducing the likelihood of flooding or slowing channel velocity and increasing the chance of sedimentation. Channel constriction, which could be associated with fill activities, could increase channel velocity and the likelihood of erosion. Tidal restoration allows tidal flow into new areas, which may increase flow in and out of the restored site. Physical habitat restoration projects that would change aquatic habitat by changing river width or river habitat types (riffles, pools, runs) could also alter hydrology and/or increase erosion and sedimentation. Even in cases where channel volume is increased, new flow pathways could alter flow patterns and locations of erosion and deposition.

Increases in erosion or sedimentation may often have no deleterious consequences and may just represent relocation of sediment. In some cases, changes in sediment movement may be beneficial, such as when sediment is flushed from spawning gravel or sediment deposits enable growth of riparian vegetation. However, movement of sediment and sedimentation could cause damage to infrastructure due to erosion and reduce conveyance capacity.

Operation of habitat restoration projects (i.e., tidal, floodplain, riparian) could direct water through restoration areas with contaminated soils and organic material. This soil could contain mercury or other metals, organic material, biocides, and other contaminants. By routing water through these areas, contaminants and organic material could enter the water column and be transported off site. Concentrations of some contaminants are unlikely to increase substantially in response to physical habitat restoration because they are already ubiquitous or because they degrade rapidly.

In addition, habitat restoration projects could modify hydrologic and ecological conditions in ways that affect water quality and associated beneficial uses within restoration sites and in connected waterways. Tidal restoration may alter Delta hydrodynamics and could alter salinity, with the effect depending on the location, acreage, and type of restoration. Restoration projects could also affect water quality constituents through natural on-site processes. For example, floodplain and tidal habitat restoration sites generally would have good conditions for primary productivity (algal growth), including the presence of nutrients, warm temperatures, and shallow slow-moving water. It is possible that algae produced at restoration project sites could be a source of dissolved organic carbon to nearby waterways, which could reduce drinking water quality if drinking water intakes

are nearby. In addition, restoration that produces inundation areas during warmer parts of the year could lead to the formation of harmful algal blooms, which could affect beneficial uses.

Habitat restoration projects that involve dredging would remove and rearrange sediment, which could mobilize sediment and contaminants. Potentially contaminated sediments would require containment to the extent feasible and disposal at a waste disposal facility engineered and permitted for contaminated sediment. In some cases, dredged material may be suitable for beneficial reuse, such as for wetland creation and restoration or for levee maintenance, construction fill, or daily cover at sanitary landfills. Surface water quality or groundwater quality could be adversely affected via runoff or leachate from dredged material, respectively, if the material is stored on site or at rehandling facilities.

Methylmercury formation is not expected to increase in areas that already are inundated but could increase in areas of new inundation. The effect of increases in mercury and methylmercury may carry downstream, but the effect would be dissipated by mixing with other water sources, settling of mercury attached to sediment, dredging, accumulation in organisms, and photodegradation of methylmercury back to mercury. On-site natural processes in floodplain and tidal restoration areas could increase methylmercury formation. The creation of freshwater wetlands and floodplains could facilitate methylmercury production and loading. When temporarily flooded, floodplains may also produce methylmercury. Increasing the flow of water leaving wetlands has the potential to increase methylmercury loading into the Delta.

Increased floodplain inundation (either due to floodplain inundation or notching of the Fremont weir) may also affect water quality by reducing water depth and velocity, allowing water temperature to increase farther upstream than it otherwise might if flow is maintained in a narrow, deep, and fast-moving channel. Floodplains located lower in the watershed have warmer temperatures that are closer to equilibrium values and, therefore, would not increase as much as temperatures in the same habitat farther upstream. Smaller floodplain projects are unlikely to have substantial temperature effects.

In addition to common construction mitigation measures, implementation of Mitigation Measures 7.21 MM-WQ-a-j: B-E would help minimize potential water quality impacts associated with habitat restoration projects. Physical habitat restoration projects require extensive analysis and evaluation during both the design and operational phases to ensure proper hydrological functioning and to avoid water quality impacts. These projects must be developed and implemented in consultation with and subject to approval from applicable state and federal fisheries and flood control agencies (Mitigation Measure 7.21 MM-WQ-a-j: B). Restoration projects must be designed in accordance with specific guidance documents, including the ecological process-based guidelines articulated in A Delta Renewed (Mitigation Measures 7.21 MM-WQ-a-j: B and E1). Adaptive management, including the articulation of biological goals and monitoring, would be required for approval of restoration projects submitted as a part of any local cooperative solution under the Plan amendments (Mitigation Measure 7.21 MM-WQ-a-j: E2). Site design would consider existing hydrology and channel geomorphology to ensure that the restoration meets project objectives and provides benefits to intended targeted species (Mitigation Measure 7.21 MM-WQ-a-j: C). Regulatory compliance regarding siting, installation, and maintenance of USTs and ASTs (CMM-HAZ-a-h: 15) would minimize or avoid impacts on water quality associated with marina fueling stations. Regulatory compliance regarding design, siting, and construction of public restrooms at marinas and campgrounds, as well as regular maintenance (CMM-HAZ-a-h: 16) would minimize or avoid impacts on water quality from the inadvertent release of sewage.

Because one of the goals of habitat restoration projects is to improve the hydrologic function of the restored area, these projects should be designed to reduce erosion, siltation, and flooding issues. This would help minimize the likelihood that a floodplain or tidal marsh restoration project would affect drinking water quality. Drinking water treatment plants monitor intake water quality and can respond to water quality degradation, although elevated dissolved organic carbon may still lead to the formation of disinfection byproducts, and harmful algal blooms can lead to taste and odor problems. The State Water Board and regional water boards have authority under existing law to include permit requirements for nonpoint-source discharges and applicants for wetlands projects or dredging activities to control mercury (Mitigation Measure 7.21 MM-WQ-a-j: D). In areas with elevated levels of mercury, the State Water Board and regional water boards may consider requiring wetland design features or management practices to minimize methylation. The State Water Board and regional water boards recognize that wetlands and wetland restoration projects provide valuable water quality, wildlife habitat, and flood control functions and that these types of projects should not be disincentivized due to mercury concerns. Potential water temperature effects can be evaluated and minimized through water temperature and fish habitat suitability modeling. In general, but perhaps not always, fish benefits associated with increased floodplain habitat are likely to outweigh impacts on fish due to increases in water temperature.

On a long-term basis, habitat restoration projects would be expected to benefit riverine habitat and species and improve hydrology and water quality. Projects would need to be monitored to determine and ensure that they are functioning as designed and benefiting native fish species. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on hydrology and water quality from physical habitat restoration remain significant and unavoidable.

## **Fish Passage Improvements**

Fish passage improvements can range from small projects, such as installing a single fish screen or ladder, to large projects, such as removing a dam. The impacts on hydrology and water quality associated with these projects are often related to the size of the project, as well as the magnitude and duration of instream construction required. Sediment issues related to installing fish screens would be fairly minimal, whereas water quality issues associated with dam removal where sediment is trapped behind barriers could be substantial. Fishways aligned in a straight line without bends have high velocities down the center at moderate to high flows, which can cause erosion downstream of the fishway if the channel is narrow or if the fishway is aligned toward a bank.

TCDs could affect the distribution of water temperatures in reservoirs, particularly during the period of summer thermal stratification. Increased withdrawal of water from deeper in the reservoir would reduce the volume of cold water in the deeper layers. It could also simultaneously result in some mixing and increase dissolved oxygen concentrations in upper portions of the hypolimnion. Temperature in the middle depths of a reservoir would be most likely to be affected by TCDs; because fish would be less likely to be found at middle depths rather than near the surface, they are not likely to be adversely affected.

TCDs could also affect water quality by changing the dissolved oxygen concentration of water discharged to downstream surface waters. The dissolved oxygen concentration in the deeper layers of a reservoir is generally lower relative to the concentration nearer the surface. However, oxygen reaeration at discharge outlets would likely rapidly increase dissolved oxygen levels. Dissolved oxygen levels would quickly return to baseline levels as the water is aerated.

In addition to common construction mitigation measures, implementation of Mitigation Measures 7.21 MM-WQ-a-j: B-D and F would help avoid or reduce water quality impacts associated with fish passage projects to less than significant and ensure that the project is functioning as designed and benefiting fish and wildlife species once construction is complete. Fish passage projects must be developed in consultation with NMFS, USFWS, and CDFW in accordance with established design, operational, and maintenance criteria and guidelines. Projects must be carefully designed to ensure proper function and to avoid direct and indirect water quality impacts. TCDs must be designed to ensure sufficient temperature and dissolved oxygen conditions to support special-status species above and below the reservoir. Until mitigation measures are implemented, the impacts remain potentially significant.

Impacts associated with dam removal partially depend on the amount of sediment behind a barrier, which may depend on the size, shape, and age of the barrier. Small dams have a relatively small volume of sediment available for release (relevant to the size of the stream channel); large reservoir removal projects would be likely to result in more substantial short-term effects related to sediment impacts on downstream habitat compared to smaller dam removal projects. If reservoir sediments are not removed or stabilized prior to dam removal, fine-grained material can be resuspended and cause water quality issues downstream. Following dam removal, sediment could initially be deposited in upstream pools or left along streambanks but would be scoured and moved downstream with each high-flow event under normal winter conditions. Sediment effects would tend to diminish with distance downstream of the barrier because of tributary inflows and deposition along the length of the channel.

Barrier removal could affect water quality if contaminants (e.g., legacy pesticides, mercury) are present in the sediment trapped behind the barrier. Removal of the barrier could release these contaminants into downstream environments. Additionally, downstream water users may be affected by increased turbidity (e.g., clogging of water intakes). In addition, high concentration of organic material mixed with the sediment could lead to short-term increases in oxygen demand, and reductions in dissolved oxygen could occur due to release of sediments trapped behind the dam.

Removal of barriers could alter the existing drainage pattern of the site or area such that sediment mobilized upstream of the barrier site could move downstream instead of settling behind the barrier. Removal of a barrier would increase the frequency of high sediment concentrations in the river during high-flow events because sediment previously trapped by the barrier would no longer be trapped. If large amounts of sediment previously had been trapped behind a barrier, sediment management activities could be necessary to maintain channel function and fish passage. Removal of a barrier would allow more sediment and water to move downstream to the lower portions of the watershed, which could result in increased peak flows, more erosion in some areas, and more sediment deposition in other areas, depending on sediment load and flow velocity. In some cases, this increase in deposition and erosion could change the downstream channel geometry, reduce conveyance capacity, or destabilize infrastructure.

In some locations, groundwater levels near existing dams are recharged by seepage from the water stored behind the dam and reservoir removal could result in a reduction in percolation of surface water to the underlying groundwater aquifer(s). Groundwater levels adjacent to a reservoir could decline in response to the decrease in reservoir surface water elevation if the dam is removed. The location, underlying hydrogeologic conditions, and construction characteristics for a groundwater well can influence the potential impact of reservoir removal on well water levels if groundwater wells are present. Removal of the reservoir could cause a substantial decline in groundwater levels and a corresponding reduction in yields in some existing wells, potentially interfering with existing or planned groundwater uses.

For larger dams that provide some attenuation of flood peaks, downstream flow depths and discharges may fluctuate more in the absence of the dam and reservoir and accordingly may require the construction of downstream dikes or levees to reduce potential flood damage. In addition, without the retention of sediment in a reservoir, the river may also tend to migrate or meander, which may result in the need for bank stabilization measures if existing infrastructure is at risk or when downstream turbidity must be controlled. Coarse sediments released from the reservoir area may partially fill the downstream channel, raising the bed and resulting in higher flood stages—in which case, roadways may need to be raised, and new levees may be required. Where barrier removal could substantially increase the movement of sediment into the lower watershed or substantially increase flood flows, the capacity of the channel to hold all flows may be reduced, and the size of the 100-year flood hazard area may expand.

Reservoir drawdown and dam removal could result in short-term increases in downstream surface water flows and result in exposing people and/or structures to a substantial risk of damage, loss, injury, or death involving flooding.

In the long term, removal of large dams and reservoirs could alter the 100-year floodplain inundation area. Changes in peak water surface elevations and the extent of inundation following dam removal could affect people and structures along the river downstream of the dam removal site during a flood event. It is unlikely that a dam removal project would be proposed or constructed if it were likely to result in a significant increase in flood risk to downstream communities. Removal of some barriers could reduce the risk of flooding. Old dams that do not meet modern seismic requirements can pose a threat to downstream communities if they were to fail, as could occur during an earthquake or high flows.

Large volumes of sediment trapped behind dams may be released during failure events, exacerbating flooding. Increased movement of sediment and water from the upper watershed to the lower watershed may restore the natural flow, sediment, and gravel supply to a channel; but monitoring may be needed to ensure that excessive flow, sedimentation, or erosion does not cause conveyance or infrastructure concerns.

In addition, common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-WQ-a-j: G would help minimize or avoid impacts on water quality associated with dam removal projects. Preproject planning requires consideration of a wide variety of technical, environmental, social, political, and economic issues, including environmental feasibility. Facility design would consider existing hydrology and channel geomorphology, and removal of the structures would be done so that erosion or flooding would be controlled. Modeling would help determine whether dam removal could lead to excessive risk. Engineering designs and construction plans would include any special accommodations for existing legal users of water and other infrastructure and minimize

potential impacts associated with construction-related in-channel disturbances. Implementation of Mitigation Measure 7.21 MM-WQ-a-j: G3 would require the development and implementation of a sediment management and monitoring plan to help reduce turbidity-related impacts of dam removal on downstream water quality. The plan must include plans for treatment, stabilization, removal, or downstream release of the accumulated sediment, as well as plans for revegetation and sediment tracking. If downstream siltation is substantial, implementation of Mitigation Measure 7.21 MM- WQ-a-j: E3 (levee protection) could be warranted. A project-specific analysis would be necessary to identify the preferred dam removal method for an individual project, and multiple approvals from various federal and state agencies would be required.

Project proponents would need to coordinate with the Federal Emergency Management Agency for final determination of the future 100-year floodplain after dam removal and implement appropriate plans to move or elevate habitable structures within the 100-year floodplain before dam removal, where feasible, to reduce the risks of exposing people and/or structures to damage, loss, injury, or death due to flooding (Mitigation Measure 7.21 MM-WQ-a-j: G9).

As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on hydrology and water quality from fish passage improvement projects remain significant and unavoidable.

## **Invasive Aquatic Vegetation Control**

Invasive aquatic vegetation control efforts can provide water quality benefits because some invasive aquatic vegetation, such as water hyacinth and Brazilian waterweed, can spread rapidly, clog waterways, increase sedimentation, reduce turbidity (but also reduce light penetration for algal primary productivity), and create low dissolved oxygen conditions. Although invasive aquatic vegetation control efforts could provide overall water quality benefits, invasive aquatic vegetation control may affect water quality, whether the control is mechanical or by use of herbicides.

Mechanical removal involves use of a harvester, which can disturb channel substrate and increase surface water turbidity. In addition, a harvester leaves plant material in the water, which would decay. The decay of large amounts of plant matter can lower dissolved oxygen concentrations because of decomposition of the shredded organic material. If aquatic vegetation is controlled with herbicides, decay of the resulting dead plant matter could also contribute to low dissolved oxygen. Use of herbicides could also affect water quality directly, and water quality standards regarding herbicides could be violated. As a result, aquatic species, including fish and invertebrates, could be adversely affected.

The effect of invasive aquatic vegetation control on dissolved oxygen could be minimized by implementation of Mitigation Measure 7.21 MM-WQ-a-j: H1, which requires reducing the accumulation of dead vegetation in channels susceptible to low dissolved oxygen through measures such as mechanical vegetation removal, reduced herbicide application, increased water circulation, or installation of aeration devices. In addition, where herbicide use may be required for invasive aquatic vegetation control, implementation of Mitigation Measure 7.21 MM-WQ-a-j: H2, which

includes obtaining coverage under and complying with the Statewide General NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, would be expected to reduce potentially significant impacts on water quality from herbicide application. If mitigation measures are implemented, most, if not all, impacts can be mitigated to less than significant. Because the precise location and magnitude of activities required for invasive aquatic species control are not known, impacts from predatory fish control cannot be determined with certainty at this time. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on hydrology and water quality from invasive aquatic vegetation control remain significant and unavoidable.

## **A1.5.6 Land Use and Planning**

### **Common Construction**

Depending on the location, construction of habitat restoration and other ecosystem projects 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. 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. Many habitat restoration and other ecosystem projects would be located within existing riverbanks and channels where communities are not established; and restoration would be consistent and even further the goals of land use plans, policies, and regulations. Nevertheless, 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 and zoning ordinances. In addition, construction may temporarily physically divide an established community primarily by cutting off access to roadways or bridges. 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.

Land use impacts associated with common construction activities would be potentially significant and could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-LU-a,b: A (CMM-LU-a-c). Mitigation for potential construction impacts can include complying with all applicable zoning and land use laws and designing projects to avoid or minimize dividing established communities. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on land use and planning remain significant and unavoidable.

## Physical Habitat Restoration

Most floodplain and riparian restoration projects, including in-channel enhancement and gravel augmentation, would not be expected to physically divide an established community because these projects would be located within existing riverbanks and channels or immediately adjacent to them, and communities are not established in these areas. In addition, many tidal habitat restoration projects would likely be sited on land designated for agriculture or open space and would therefore not physically divide a community. However, tidal habitat restoration projects could be sited in or near an existing community or land designated for future development. Removing roads for construction of a new setback levee might isolate agricultural areas from facilities and communities that provide services and markets to farmers. Also, periodic inundation of roadways from flood widening projects could preclude or inhibit access between communities and services. These projects could be large and could include actions, such as levee breaching and road removal, that could isolate communities from services and markets or cut off access to properties.

Most habitat restoration projects would occur in existing riverbanks and channels or immediately adjacent to them and would not conflict with land use designations or zoning or HCPs/NCCPs. Frequently, these areas are designated natural resource or open space areas by land use plans, and restoration would be consistent with those designations because it would enhance existing habitat for fish and wildlife species. However, some habitat restoration projects could conflict with existing land use plans, policies, or regulations if the projects were incompatible with land use designations that serve to avoid or mitigate an environmental effect. For example, a restoration project could result in the conversion of farmland to nonagricultural use, which could be considered inconsistent with applicable land use plans, policies, or regulations intended to preserve and protect agricultural use of that land. An amendment or variance from the lead agency may be required prior to project approval and construction.

In addition to construction mitigation measures, implementation of Mitigation Measure 7.21 MM-LU-a,b: B would avoid or reduce land use impacts to less than significant by designing and siting a project consistent with local and regional land use plans and applicable HCPs/NCCPs, developing new habitat on public lands, or providing compensation for loss or reduction in environmental value where habitat restoration occurs on land with inconsistent land uses. Most habitat restoration projects would be expected to occur voluntarily; therefore, it is unlikely that a habitat restoration project would be designed in a manner that could isolate communities from services and markets, cut off access to properties, or result in incompatible land use designations. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, land use impacts from physical habitat restoration remain significant and unavoidable.

## Fish Passage Improvements – Dam Removal

Although similar to construction impacts already identified, impacts associated with large dam removal projects could be more substantial given that these projects would take years to complete, taking into account reservoir drawdown, removal of the dam, and site restoration following dam removal. Removal of a dam that provides a river crossing along its crest may physically divide an

established community, requiring a new bridge to restore connectivity. New land use and zoning designations may need to be determined for areas previously inundated by the reservoir.

In addition to construction mitigation measures, implementation of Mitigation Measure 7.21 MM-LU-a,b: C could avoid or reduce land use impacts associated with dam removal to less than significant by requiring a feasibility study to evaluate and address potential land use conflicts, impacts to roads and bridges, and the potential division of established communities associated with dam removal, and reduce disruptions to surrounding communities by identifying off-site locations and haul distances for backfill materials and for disposal of waste materials to avoid or minimize disruptions to communities near the project construction site. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on land use from fish passage improvements remain significant and unavoidable.

## **A1.5.7 Mineral Resources**

### **Common Construction**

Depending on location, construction of habitat restoration and other ecosystem projects 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 habitat restoration 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.

Habitat restoration 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 tidal and floodplain restoration projects 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.

Construction demand for aggregate and/or cement for some habitat restoration and other ecosystem projects could exceed local supplies. For example, constructing setback levees and widening floodways 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 could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-MIN-a,b: A (CMM-MIN-a,b). Mitigation can include designing and locating these types of projects to minimize interference with access to active oil and gas wells and any gravel or sand mines. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on mineral resources remain significant and unavoidable.

## **A1.5.8 Noise**

### **Common Construction**

Construction activities associated with habitat restoration and other ecosystem projects 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. 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 construction sites, 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. Actual exposure levels would depend on the distance between receptors and the vibration source. 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 activities that involve drilling and blasting could result in noise and vibration impacts. While a portion of the energy from a blast detonation would be consumed in material that is blasted, the remaining energy would be dissipated through the ground as vibration and/or through the air as air overpressure or airblast (air vibrations). If any sensitive receptors are nearby (e.g., nearby residents), groundborne vibration and groundborne noise from these construction activities could be considered excessive.

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

Noise and vibration impacts associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-NOI-a,b,d-f: A (CMM-NOI-a,b,d-f). Mitigation for potential construction noise and vibration impacts includes 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. The authority to determine and require specific noise mitigation is within the responsibility and jurisdiction of other public agencies with discretionary approval authority. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant noise impacts. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts from noise remain significant and unavoidable.

## **A1.5.9 Recreation**

### **Common Construction**

Habitat restoration and other ecosystem projects would likely be constructed along waterways—locations popular for many types of recreational activities (e.g., boating, swimming, fishing, hunting, hiking, wildlife viewing). 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).

Recreational activities in the vicinity of the project areas could also be affected by potential access restrictions to these areas during construction, such as temporary closure of recreational areas or trails. Such closures could be short-term for small projects but could last several years for large projects. Due to these potential effects on the quality of people's recreational experience, 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 impact would be more likely to occur due to large restoration or ecosystem projects that require substantially longer than a year (i.e., more than one spring/summer recreational season) to construct and in areas where alternative recreational areas are limited.

Impacts on recreation associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-REC-a,b: A (CMM-REC-a,b). Mitigation can include providing appropriate signage for route relocations rehabilitating or restoring degraded facilities promptly upon completion of construction; siting and designing the construction project to minimize disturbances to or losses of existing recreational areas and associated facilities; and coordinating with public and private recreation providers to direct displaced users to under-utilized recreational facilities. 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on recreation remain potentially significant and unavoidable.

## Physical Habitat Restoration

While many construction-related impacts may be temporary, some other impacts may be long-term and permanent. Habitat restoration projects that require levee breaching, construction of setback levees, and floodplain expansion could adversely affect marinas and other land-based facilities (e.g., picnic areas). Establishing, restoring, or enhancing stream, riparian, or tidal habitats may require permanently relocating or decommissioning existing trails or roads. Infrastructure may be removed or relocated along streams and in riparian areas. The infrastructure affected may include boat docks, boat haul-out locations, campgrounds and campsites, day-use sites, and roads/trails and off-highway/off-road vehicle routes in the areas of the restoration projects. Habitat restoration could require permanent removal of marinas and other recreation facilities, which may cause recreationists to be displaced to other facilities. This displacement would potentially result in increased use of existing alternative recreational facilities, possibly leading to substantial physical deterioration or accelerated deterioration of those facilities.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-REC-a,b: B would avoid or reduce recreational impacts to less than significant. Measures would require that, to the extent feasible, restoration areas would be sited and designed to minimize disturbances to or losses of existing recreational areas, including marinas. 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on recreation from physical habitat restoration remain potentially significant and unavoidable.

## **Fish Passage Improvements – Dam Removal**

Removal of large reservoir dams could result in short-term and long-term effects on recreation in addition to the potential effects related to construction activities described in Common Construction. The expected increase in turbidity during the reservoir drawdown and sediment flushing period could temporarily reduce visibility for boaters, swimmers, and fisherpersons and thus would potentially reduce participation in these activities at these project locations (e.g., swimmers might be less likely to enter the river due to concern about reduced visibility of submerged boulders and logs, fisherpersons might be less successful due to the reduced water clarity). Elevated turbidity would be temporary and potential related effects on recreation would depend on when (relative to the peak outdoor recreational season, which is generally May to September) drawdown and flushing were implemented. Mitigation Measure 7.21 MM-WQ-a-j: G would minimize potential impacts associated with construction-related in-channel disturbances. Implementation of this mitigation would reduce recreation impacts from elevated turbidity by requiring planning, design, permitting, sediment management, monitoring, and revegetation measures that minimize sediment releases and associated water quality degradation during dam removal. By reducing turbidity and suspended sediment concentrations, these measures would help maintain water clarity and visibility for recreational users such as boaters, anglers, and swimmers.

Dam removal could provide new boating opportunities in previously inundated areas. However, flow-dependent activities such as whitewater rafting could be affected in river reaches downstream of a reservoir removal location. Some dam-controlled rivers provide consistent, predictable water flows that whitewater rafters rely upon during the spring/summer recreation season. Potential changes in flows due to dam removal may affect opportunities at certain locations and at certain times of the year. This could increase 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.

Similarly, reservoir dam removal projects would result in the long-term loss of existing opportunities for reservoir-based recreation activities, such as power boating, waterskiing, lake swimming, and flat-water boat angling. In addition, many reservoirs are popular recreational areas for sightseeing, fishing, camping, picnicking, and wildlife viewing; large dam removal projects would reduce some of these opportunities locally. Reservoir drawdown and the return to a natural river from a reservoir could affect recreational facilities associated with the removed reservoir, including roads/trails, boat docks, and campgrounds. There are many lakes and reservoirs in the

Sacramento/Delta, and it is likely that other lakes and reservoirs may be available in the vicinity of the reservoir removal site and would likely provide similar opportunities for recreation. The displacement of recreationists to other locations could result in the accelerated physical deterioration of some recreational facilities (e.g., more popular recreational sites) over time.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-REC-a,b: C could avoid or reduce additional impacts on recreation associated with large dam removals to less than significant. Preproject planning for large dam removal requires consideration of a wide variety of technical, environmental, social, political, and economic issues. Feasibility studies must address impacts on recreation, such as reservoir boating and boat facilities, campground facilities and roads/trails, and other infrastructure that could be affected. New recreation facilities and access roads to the river channel may be required to maintain a similar level of recreation capacity originally provided by the dam and reservoir. 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 dam removal is complete. A project-specific analysis would be necessary to identify the preferred dam removal method for an individual project, and multiple approvals from various federal and state agencies would be required. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on recreation from dam removal remain potentially significant and unavoidable.

## **A1.5.10 Transportation and Traffic**

### **Common Construction**

Construction of physical habitat restoration and other ecosystem projects may result in a temporary and short-term increase in traffic during the construction phase due to additional vehicles (e.g., construction vehicles, construction workers' personal vehicles) on roads near project sites. For example, certain habitat restoration projects may require the import or export of fill material to or from a project site or the import of gravel, and, depending on the volume required to be transported, there could be a relatively substantial temporary increase in the number of trucks at intersections and on road segments that are not designed to accommodate increased traffic levels. Roads may need to be relocated, which would cause new rerouted traffic at an intersection not designed to accommodate additional traffic. Increased traffic congestion 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 transport, for example, roads could be substantially degraded such that repairs are required. Further, some projects could require temporary relocation, 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. Habitat restoration and other ecosystem 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.

Depending on the location, construction of habitat restoration or other ecosystem projects may result in roads being temporary blocked, rerouted, or altered, which could impede and result in inadequate emergency access and delay the response time for emergency vehicles. Although most of these projects would occur in locations typically removed from major roadways and traffic sources, if a project were in a location that would require lane closures during construction, emergency access could be affected. In addition, if construction of habitat restoration and other ecosystem 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 the impacts would depend on several factors, such as the location, size, and duration of the project and the number of vehicles and vehicle trips needed.

Transportation and traffic impacts associated with common construction activities could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-TRA-a,b,d-f: A (CMM-TRA-a,b,d-f). Mitigation can include preparing and implementing a construction Traffic Management Plan (TMP) and, as applicable, a waterway traffic control plan 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. The authority to determine and require specific transportation mitigation is within the responsibility and jurisdiction of other public agencies with discretionary approval authority. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant transportation and traffic impacts. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on transportation and traffic remain potentially significant and unavoidable.

## Physical Habitat Restoration

Habitat restoration projects could have temporary impacts on traffic, circulation, and emergency access during construction. For larger habitat restoration projects, construction-related effects could occur over several years; for larger restoration projects, including floodplain restoration, the location and operation of these projects may result in inundation of roads that could impede use and also cause traffic congestion at intersections or on certain roadway segments. This impact would potentially conflict with an applicable transportation plan, ordinance, or policy. Mitigation Measure 7.21 MM-TRA-a,b,d-f: A (CMM-TRA-a,b,d-f) identifies mitigation measures that lead agencies can and should implement to reduce potentially significant transportation and traffic impacts related to construction and location of a project. In addition, implementation of a roadway detour plan under Mitigation Measure 7.21 MM-TRA-a,b,d-f: B1 would avoid or minimize effects on transportation from large restoration projects and reduce this impact. The authority to determine and require specific transportation mitigation is within the responsibility and jurisdiction of other public agencies with discretionary approval authority. Public agencies with authority can and should

implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant transportation and traffic impacts. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on transportation and traffic remain potentially significant and unavoidable.

## **Fish Passage Improvements – Dam Removal**

Fish passage improvement projects could have temporary construction-related impacts on transportation (including emergency access), as discussed in Common Construction. Although similar, construction impacts on transportation related to dam removal specifically could be more substantial given that large dam removal projects would take years to complete, taking into account reservoir drawdown, removal of the dam, and site restoration following dam removal. Dam removal itself would potentially be the period of highest construction intensity and therefore likely involve the largest workforce and number of worker vehicle trips and haul truck trips. The additional construction-related traffic on local, likely rural, roads may affect local residential and recreational traffic. Existing transportation infrastructure (e.g., roadways, bridges, culverts) en route to the dam site may require improvements over their current conditions in order to withstand construction-related traffic. A dam that provides a river crossing along its crest may require the construction of a new bridge to meet local traffic demands upon its removal. The impacts on transportation could result in a temporary conflict with an applicable transportation plan, ordinance, or policy or congestion management program.

Mitigation Measure 7.21 MM-TRA-a,b,d-f: A (CMM-TRA-a,b,d-f) identifies measures that lead agencies can and should implement to reduce potentially significant transportation and traffic impacts related to construction. In addition, implementation of Mitigation Measure 7.21 MM-TRA-a,b,d-f: C would avoid or minimize effects on transportation from large dam removal by requiring project planning that incorporates traffic management strategies during and after dam removal and by ensuring that any new, relocated, or retained roads are designed in accordance with applicable safety standards. The authority to determine and require specific transportation mitigation is within the responsibility and jurisdiction of other public agencies with discretionary approval authority. Public agencies with authority can and should implement the mitigation measures identified in the Staff Report to the degree feasible. Because the jurisdiction and authority to implement several mitigation measures lies with the discretion of other public agencies, and thus outside the State Water Board's control, there is uncertainty whether the measures will reduce potentially significant transportation and traffic impacts. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on transportation and traffic remain potentially significant and unavoidable.

## A1.5.11 Utilities and Service Systems

### Common Construction

Construction sites can generate stormwater runoff that discharges sediment and potentially 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), groundwater from dewatering activities, and leachate from dredged sediment. If not adequately controlled, construction discharges of waste could exceed wastewater treatment requirements of the applicable regional water board. Wastewater from construction activities is subject to permitting requirements under the Clean Water Act. Adequate toilet facilities are typically placed at construction sites for the duration of construction and 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.

Construction of facilities could temporarily increase the volume of solid waste (e.g., soil, 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 on site 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 could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-UT-a,f,g: A (CMM-UT-a,f,g). Wastewater control measures and any water used for construction must be pursuant to a valid water right or contract with a water provider. For solid waste, mitigation includes compliance with federal, state, and local statutes 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on utilities and service systems remain potentially significant and unavoidable.

## Physical Habitat Restoration

Some habitat restoration projects may initially require a water supply for newly planted vegetation once construction is completed or for temporary irrigation needs in dry years until vegetation is sufficiently established.

In addition to common construction mitigation measures, restoration projects must be operated pursuant to a valid water right if applicable (Mitigation Measure 7.21 MM-WQ-a–j: B). Moreover, habitat restoration projects will generally be designed and implemented to work with existing and augmented flows (Mitigation Measure 7.21 MM-BIO-a–f: C1) in order to reestablish connections between tidal and stream floodplains, restore fluvial processes along streams, and connect riparian areas to fluvial processes. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on utilities and service systems from physical habitat restoration remain potentially significant and unavoidable.

## Fish Passage Improvements – Dam Removal

Dam removal projects, particularly reservoir dam removal, could affect public utilities if water pipelines or electrical transmission lines cross the dam or reservoir or by the loss of a source of hydropower. The removal of a diversion dam may require the design and construction of a new pumping plant or alternative intake configuration to maintain water supplies to existing irrigation canals or pipelines. Water storage tanks may be required for local communities to replace the water supply previously provided by the reservoir for firefighting. Structures located within, upstream, or downstream of the impoundment area may be subjected to higher flow velocities once the impoundment is returned to a natural free-flowing condition.

Dam removal would generate a substantial volume of solid waste, including excavated material and demolition debris, that would require disposal at a landfill. It is possible that potential project needs could exceed permitted landfill capacity.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.21 MM-UT-a,f,g: B would help minimize or avoid impacts on utilities associated with dam removal projects. Preproject planning requires consideration of a wide variety of technical, environmental, social, political, and economic issues. Feasibility studies must address impacts on structures such as water and sewer pipelines, gas transmission lines, and other infrastructure that could be affected by dam removal. Additional fieldwork to confirm the site conditions includes identifying off-site locations and haul distances for backfill materials and for disposal of waste materials. Engineering designs and construction plans will include any special accommodations for existing legal users of water and other infrastructure and minimize potential impacts associated with construction-related in-channel disturbances. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially

significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on utilities and service systems from dam removal remain potentially significant and unavoidable.

## **A1.6 New or Modified Facilities Findings**

Implementation of the 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 Plan amendments are not the driving impetus for sustainable management and water supply diversification efforts, the Plan amendments may accelerate and increase the need for such efforts. Response actions that entities may take could 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 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 WWTPs. New and modified facilities also include other construction projects that entities may undertake in response to changes in hydrology and water supply under the Plan amendments, including new or modified boat ramps, streamflow or temperature monitoring devices, and water conservation projects such as canal lining. Finally, the future designation of TBUs could result in new water quality objectives or site-specific discharge requirements that also could result in the new construction or modification of WWTPs. As summarized in Table 13.7.22-3, Impact and Mitigation Measure Summary—New and Modified Facilities, for the Plan amendments, potentially significant impacts on different resources would occur. Note that operational impacts of groundwater pumping and other water management actions (without new construction) are evaluated as reasonably foreseeable response actions to changes in supply in Sections 7.3 through Section 7.20, with corresponding CEQA findings in Section A1.4 above.

With the exception of new groundwater wells and certain smaller construction projects (such as installation of stream gages), extensive permitting requirements exist for construction and operation 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.

With the exception of new groundwater wells and certain smaller construction projects (such as installation of stream gages), the new or modified facility actions described in this section 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 State Water Board's jurisdiction to less-than-significant levels. If mitigation measures are implemented, many 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,

environmental impacts cannot be determined with certainty at this time. Depending on the specific project, implementing mitigation measures may not fully reduce significant impacts, and until a specific project is proposed, specific impacts are identified and analyzed, and potential mitigation measures are implemented, the impacts remain potentially significant and unavoidable.

## **A1.6.1 Aesthetics**

### **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 could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional

site-specific information becomes available, construction impacts on visual resources remain potentially significant and unavoidable.

## **New or Modified Reservoirs and Points of Diversion**

Construction of reservoirs and points of diversion could result in significant visual impacts due to large-scale, multi-year activities, including excavation, road construction, staging areas, vegetation removal within inundation zones, and nighttime lighting. 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 diversion projects could substantially alter visual quality, potentially affecting scenic resources such as trees, rock formations, and historic features along state scenic highways. New facilities within designated Wild and Scenic Rivers or on-stream reservoir sites could transform natural river canyon landscapes into lake environments, while off-stream reservoirs could inundate farmland or other scenic land cover types. Associated infrastructure could further degrade visual character.

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on visual resources from reservoirs and points of diversion remain potentially significant and unavoidable.

## **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. Long-term visual effects of groundwater well installations would vary by well type, number, and associated infrastructure. Municipal well fields may include small buildings, tanks, and fencing, which could limit visibility but may introduce industrial features, light, or glare in some locations. While many installations would not substantially affect scenic vistas or visual quality, some municipal facilities could alter visual character in urban or suburban settings.

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. 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. Well owners may need to obtain permits from local environmental health agencies or local water districts before construction, modification, or destruction of a well. Agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Because the authority to require project-level mitigation lies with other public agencies for individual projects, there is inherent uncertainty in the degree of mitigation, including application of the mitigation measures in the Staff Report. Therefore, while some impacts could be reduced to a less-than-significant level by other public agency conditions of approval, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the aesthetic impacts associated with construction of groundwater wells remain significant and unavoidable.

## **Water Treatment Facilities**

New water treatment facilities (including desalination) could affect visual resources through siting and construction, introducing buildings, tanks, conveyance infrastructure, and ancillary features (e.g., chemical storage) that may degrade scenic quality, particularly near residential or visually sensitive areas. Associated intake, outfall, and conveyance infrastructure, including aboveground and fenced components, could further affect visual character, although these facilities are typically sited to avoid highly sensitive scenic areas and allow for design considerations.

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.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-AES-a-d: C, which includes project planning, siting and aesthetic design in any postconstruction features, could reduce impacts on visual resources associated with water treatment facilities, including desalination facilities. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on visual resources from water treatment facilities remain significant and unavoidable.

## **A1.6.2 Agriculture and Forest Resources**

### **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 could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on agriculture and forest resources remain significant and unavoidable.

## **Reservoirs and Points of Diversion**

New or modified reservoirs and points of diversion construction may result in temporary or permanent conversion of important farmland or forest land, conflicts with agricultural zoning or Williamson Act contracts, and disruption of agricultural activities (e.g., irrigation interference, soil compaction, and dust). Reservoir inundation and associated facilities could permanently convert 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, while buildings, roads, and infrastructure could result in lasting land use changes. Points of diversion may also convert farmland or forest land, though typically at a smaller scale. In some cases, these projects may affect lands protected under the Williamson Act or Farmland Security Zone contracts, including through conversion or acquisition.

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. Entities or agencies designing and/or approving new reservoirs and points of diversion should implement or require this mitigation to avoid or reduce the severity of these impacts. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on agriculture and forest resources from reservoirs and points of diversion remain significant and unavoidable.

## **A1.6.3 Air Quality**

### **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 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. 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 could 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 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on air quality remain significant and unavoidable.

## **Reservoirs and Points of Diversion**

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.

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, recreational boat emissions minimization plan, and offset criteria pollutant emissions generated by recreational boating, as appropriate. Entities or agencies designing and/or approving new reservoirs and points of diversion should implement or require this mitigation to avoid or reduce the severity of these impacts. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available,

air quality impacts from reservoirs and points of diversion remain potentially significant and unavoidable.

## **Water Treatment Facilities**

WWTPs, including those with water recycling facilities, are known sources of odors. If new WWTPs are constructed, they could result in new odor sources. 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, which references Mitigation Measure 7.22 MM-WQ-a-j: D1, can avoid or reduce potentially significant air quality impacts associated with odors through development and implementation of an odor management plan. Treatment facilities must obtain and comply with all necessary permits and regulations related to waste discharge, including 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, odor impacts from treatment facilities remain significant and unavoidable.

## **A1.6.4 Biological Resources**

### **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 HCP, 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 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 could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on biological resources remain significant and unavoidable.

## **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 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.

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. 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.

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on biological resources from new or modified reservoirs and points of diversion remain significant and unavoidable.

## **Water Treatment Facilities**

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 (e.g., osmotic stress or shock, formation of hypoxic or anoxic zones). Some organisms may move away from areas with high salinity or hypoxia, which would change the structure of the local community; 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 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.

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.

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on biological resources from water treatment facilities remain significant and unavoidable.

## Other Construction Projects

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.

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on biological resources from modification of unlined and/or open canals remain significant and unavoidable.

## **A1.6.5 Cultural Resources**

### **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 Cal. Code Regs., tit. 14, § 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 damage an archaeological site or historic built environment resource, which could alter or diminish its significance under the NRHP or the 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 as impacts on unknown buried or near-surface cultural 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 historic resources, 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 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 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.

Cultural resources impacts associated with common construction activities would be potentially significant and could be avoided or reduced by implementation of Mitigation Measure 7.21 MM-CUL-a-d: A (CMM-CUL-a-d). Mitigation would include regulatory compliance preconstruction surveys, monitoring during construction, avoidance, unanticipated discovery measures, cultural resources sensitivity training, and dust-control as well as noise- and vibration-reduction measures. 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on cultural resources remain significant and unavoidable.

## Reservoirs and Points of Diversion

Reservoir and point of diversion projects can range from small projects (e.g., 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. 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 NRHP. 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.

In addition, 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on cultural resources from reservoirs and points of diversion remain significant and unavoidable.

## **A1.6.6 Energy and Greenhouse Gas Emissions**

### **Common Construction**

Because of the connection between energy use and GHG emissions, these two resources are addressed together in this section. 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 activity 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, concrete). 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 CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O. 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 could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on energy and GHG emissions remain significant and unavoidable.

## **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 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<sub>4</sub>, and CO<sub>2</sub>, 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.

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 complying with all applicable state and federal energy efficiency standards, designing the project to minimize energy consumption, implementing a GHG reduction plan, and removing existing vegetation within the reservoir inundation footprint prior to inundation. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on energy and GHG emissions from reservoirs and points of diversion remain significant and unavoidable.

## **Water Treatment Facilities**

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. Because of the electricity consumed during water treatment, operation of water treatment facilities results in primarily indirect GHG emissions (CO<sub>2</sub>). In addition, water treatment facilities, particularly recycled water facilities, also produce direct GHG emissions (CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O) from biological processes used in the treatment of wastewater. Because of the potentially substantial total GHG emissions, 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, which 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. 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. Facilities that rely on alternative energy sources could be operated as carbon neutral; however, it is unlikely that these energy sources would be able to meet the demand for continuous operation. Because of the potentially substantial total GHG emissions, 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.

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. In addition, through project siting and design, new projects should implement energy efficient measures for new water and wastewater treatment facilities (e.g., use gravity rather than pumps). As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on energy and GHG emissions from water treatment facilities remain significant and unavoidable.

## **A1.6.7 Geology and Soils**

### **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 where unstable soils may be susceptible to lateral spreading, subsidence, liquefaction, or collapse may pose hazards to heavy or tall equipment. In these areas, equipment could sink, tip over, or become difficult to operate safely. 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. 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.

OWTS tanks (including septic systems) 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.

Geology and soils impacts associated with common construction activities and siting would be potentially significant and could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on geology and soils remain significant and unavoidable.

## **Reservoirs and Points of Diversion**

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.

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on geology and soils from reservoirs and points of diversion remain significant and unavoidable.

## **Groundwater Wells and Groundwater Storage and Recovery**

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). 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.

Implementation of project siting and design measures and site-specific geotechnical investigations could reduce impacts related to geologic and seismic hazards. 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. 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. Well owners may need to obtain permits from local environmental health agencies or local water districts before construction, modification, or destruction of a well. Agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Because the authority to require project-level mitigation lies with other public agencies for individual projects, there is inherent uncertainty in the degree of mitigation, including application of the mitigation measures in the Staff Report. Therefore, while some impacts could be reduced to a less-than-significant level by other public agency conditions of approval, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the geology and soils impacts associated with construction of groundwater wells remain significant and unavoidable.

## **Water Treatment Facilities**

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 to 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. Drinking water treatment plants that include groundwater wells could result in the impacts described for new groundwater wells (see Section A1.6.7.3, Groundwater Wells and Groundwater Storage and Recovery).

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on geology and soils from water treatment facilities remain significant and unavoidable.

## A1.6.8 Hazards and Hazardous Materials

### 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. 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, which 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 hazardous 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.

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. 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. 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. 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 could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts related to hazards and hazardous materials remain significant and unavoidable.

## **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.

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. 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.

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. 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. 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 mosquitos.

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.

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. 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, hazards and hazardous materials impacts from reservoir and points of diversion projects remain significant and unavoidable.

## **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 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 in the area.

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. 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. Well owners may need to obtain permits from local environmental health agencies or local water districts before construction, modification, or destruction of a well. Agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Because the authority to require project-level mitigation lies with other public agencies for individual projects, there is inherent uncertainty in the degree of mitigation, including application of the mitigation measures in the Staff Report. Therefore, while some impacts could be reduced to a less-than-significant level by other public agency conditions of approval, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the hazards and hazardous materials impacts associated with construction of groundwater wells remain significant and unavoidable.

## **Water Treatment Facilities**

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, 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. 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 and pathogens, pursuant to 40 C.F.R Part 503.

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 for water treatment facilities and these mitigation measures include regulatory compliance. Implementation of the identified water quality mitigation measures, including regulatory compliance, groundwater monitoring and well protection measures, and desalination facility design and monitoring standards, would substantially reduce the potential for accidental releases, discharges, or migration of hazardous materials and contaminants to surface water and groundwater resources. By requiring protective design features, operational controls, regulatory compliance, monitoring, and corrective actions, these measures would minimize water quality degradation and reduce potential hazards and hazardous materials impacts associated with water treatment facility construction and operation. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, hazards and hazardous materials impacts from water treatment facilities remain significant and unavoidable.

## Other Construction Projects

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. 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. This mitigation would reduce wildfire risk by requiring implementation of a site-specific wildfire prevention plan that includes fire restriction and fire danger signage, parking restrictions, vegetation management, and onsite firefighting equipment and training. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, hazards and hazardous materials impact from new or modified boat ramps, maintenance and calibration of stream gages and other monitoring devices remain significant and unavoidable.

## **A1.6.9 Hydrology and Water Quality**

### **Common Construction**

Construction activities have the potential to violate water quality standards or 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, often for structure placement or maintenance. Other types of in-channel activities that could increase movement of sediment include breaching 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.

Placement of fill (e.g., temporary gravel berms, cofferdams) could affect water quality by increasing turbidity and, depending on the type of fill, introducing 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 and oil 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. 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.

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.

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 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. 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. Siting a project in an area subject to mudflows could result in inundation of the project by a mudflow.

Impacts on hydrology and water quality associated with common construction activities would be potentially significant and could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on hydrology and water quality from new or modified facilities remain significant and unavoidable.

## **Reservoirs and Points of Diversion**

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. Dams and altered flow regimes can reduce or eliminate important geomorphic processes and floodplain inundation, decrease habitat connectivity, alter temperatures to the detriment of cold water species, and alter salinity gradients and circulation patterns in the Delta. 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. 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, cold water 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 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 and with lower levels of primary productivity. 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. 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.

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 nutrient concentrations combined with potentially warm reservoir water temperatures in late spring through summer could create conditions conducive to the development of HABs. The cyanotoxins potentially produced by these blooms can pose risks to human health and may adversely affect recreational and municipal and domestic water supply beneficial uses. High nutrient levels and elevated water temperature may also promote 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 can be introduced inadvertently to reservoirs through recreational boat use and can become established in new reservoirs and be released downstream. Aquatic invasive species 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 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 affect water quality in the reservoir and downstream by resuspending sediment, resulting in temporary increases in turbidity. These effects could extend downstream if reservoir releases occurred during or shortly after 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) 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. 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 (e.g., short-term placement of dredged material during off-loading or discharge of effluent from confined disposal facilities as part of the dewatering process). Discharge of dredging 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. F

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.

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.

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). As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on hydrology and water quality from reservoirs and points of diversion remain significant and unavoidable.

## **Groundwater Wells and Groundwater Storage and Recovery**

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. 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 be 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. 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. 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. This mitigation measure includes regulatory compliance, siting wells appropriately to avoid pollutant sources, exacerbating overdraft conditions, and requiring baseline and ongoing monitoring of nearby groundwater wells to assess project pumping impacts and to implement measures with well owners to restore or replace affected water supplies, as necessary. 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. Well owners may need to obtain permits from local environmental health agencies or local water districts before construction, modification, or destruction of a well. Agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Because the authority to require project-level mitigation lies with other public agencies for individual projects, there is inherent uncertainty in the degree of mitigation, including application of the mitigation measures in the Staff Report. Therefore, while some impacts could be reduced to a less-than-significant level by other public agency conditions of approval, the State Water Board takes a conservative approach in its post-mitigation significance conclusion and finds the water quality impacts associated with groundwater well construction remain significant and unavoidable.

## **Water Treatment Facilities**

All water 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.

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. 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.

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.

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies with discretionary approval can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on hydrology and water quality from water treatment facilities remain significant and unavoidable.

## **A1.6.10 Land Use and Planning**

### **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 could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on land use and planning remain significant and unavoidable.

## **Reservoirs and Points of Diversion**

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.

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific

project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on land use and planning from new or modified reservoirs or points of diversion remain significant and unavoidable.

## **A1.6.11 Mineral Resources**

### **Common Construction**

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 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.

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 could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified

mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on mineral resources remain significant and unavoidable.

## **A1.6.12 Noise**

### **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. 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).

Depending on project location, construction 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 could 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts from noise remain significant and unavoidable.

## **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 could be avoided or reduced by implementation of Mitigation Measure 7.22 MM-NOI-a-f: B (NOI-a,c,d). Implementation of this measure would reduce noise impacts by requiring acoustical studies and incorporation of noise-reduction features into project design and operations, including equipment controls, shielding, and strategic siting of noise-generating activities. This mitigation measure would also include BMPs 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, as applicable. If mitigation measures are implemented, many impacts can be mitigated to less than significant. As a lead or responsible agency, the State Water Board, or

regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, noise and vibration impacts from new or modified facilities remain significant and unavoidable.

## **A1.6.13 Recreation**

### **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 could 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; rehabilitating or restoring degraded facilities promptly upon completion of construction; siting and designing the construction project to minimize disturbances to or losses of existing recreational areas and associated facilities; and coordinating with public and private recreation providers to direct displaced users to under-utilized recreational facilities. 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. 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on recreation remain significant and unavoidable.

## **Reservoirs and Points of Diversion**

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).

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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on recreation from reservoirs and points of diversion remain significant and unavoidable.

## **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. 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. 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. 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on recreation from new WWTPs remain significant and unavoidable.

## **A1.6.14 Transportation and Traffic**

### **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 could 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 avoiding modifications to federal, state, and county highways, local roadways, and bridges that may reduce vehicle capacity; restoring damaged roads and roadway shoulders to preproject or better conditions during (as needed for public safety) and upon completion of construction; and preparing and implementing a 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), fire prevention and management plan (CMM-HAZ-a-h: 9), and spill prevention and response plan (CMM-HAZ-a-h: 1iii) to minimize or avoid causing inadequate emergency access during construction through coordination with emergency response agencies. Because the precise location and magnitude of activities required for habitat restoration and other ecosystem projects are not known, transportation and traffic impacts cannot be determined with certainty at this time. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on transportation and traffic remain significant and unavoidable.

## Reservoirs and Points of Diversion

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.

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). As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on transportation and traffic from reservoirs and points of diversion remain significant and unavoidable.

### A1.6.15 Utilities and Service Systems

#### 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. 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. 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 could 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 statutes 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures to the degree feasible. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, construction impacts on utilities and service systems remain significant and unavoidable.

## **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. 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. 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.

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 DWR's Division of Safety of Dams (see also Mitigation Measure 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. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures. Depending on the specific project, implementation of mitigation measures may not fully reduce all

potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on utilities and service systems from reservoirs and points of diversion remain significant and unavoidable.

## **Groundwater Wells and Groundwater Storage and Recovery**

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. In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-UT-a,c-g: C could reduce impacts on utilities and service systems associated with new groundwater wells. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on utilities and service systems from new groundwater wells remain significant and unavoidable.

## **Water Treatment Facilities**

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.

In addition to common construction mitigation measures, implementation of Mitigation Measure 7.22 MM-UT-a,c-g: D could reduce impacts on utilities and service systems associated with new and modified facilities. As a lead or responsible agency, the State Water Board, or regional water boards, would require implementation of mitigation measures to minimize water quality and other impacts within its jurisdiction to the extent feasible. Other agencies can and should implement the identified mitigation measures. Depending on the specific project, implementation of mitigation measures may not fully reduce all potentially significant impacts to less-than-significant levels. Until a specific project is proposed and additional site-specific information becomes available, impacts on utilities and service systems from new and modified facilities remain significant and unavoidable.

## **A1.7 Cumulative Findings**

The State Water Board, having reviewed and considered the information contained in the administrative record, finds the contributions of the Plan amendments to the following significant cumulative environmental impacts to be cumulatively considerable and unavoidable. This information is provided in Staff Report Section 7.23, Cumulative Impact Analysis, Growth-Inducing Impacts, and Significant Irreversible Environmental Changes, Section 9.7.21, Cumulative Impacts, Growth-Inducing Effects, and Significant Irreversible Environmental Changes, and Section 13.7.21, Cumulative Impacts, Growth-Inducing Impacts, and Significant Irreversible Environmental Changes.

The State Water Board hereby makes findings, as stated in the State CEQA Guidelines section 15091 and as required by Public Resources Code section 21081.

Because California water resource management involves a myriad of individual and collective decisions, the study area represents a large portion of the state. In addition, the range of foreseeable compliance actions and potential responses to the project is already wide reaching and inherently cumulative in many regards. The evaluation of reasonably foreseeable methods of compliance and response actions that may be taken in response to the Plan amendments are organized into categories including changes in hydrology (streamflow and reservoir levels), changes in supply (reduced Sacramento/Delta supply for agricultural, municipal, and wildlife refuge use, increased groundwater pumping, other water management actions that do not involve construction [groundwater storage and recovery, water transfers, water recycling, and water conservation]), habitat restoration and other complementary ecosystem actions, and new or modified facilities that involve construction (e.g., new or modified dams/reservoirs and points of diversion; groundwater wells and groundwater storage and recovery projects; new or modified drinking water treatment plants, including desalination plants and wastewater treatment plants).

There are some redundancies between the projects included on the cumulative project list and those that are discussed in the existing environmental analyses, including Sections 7.21 Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities. Many of the projects or types of projects in the cumulative project list include reasonably foreseeable compliance methods and response actions to the revised proposed Plan amendments but also are considered as past, present, and probable future projects that need to be reviewed cumulatively. The cumulative project list includes relevant projects, programs, and categories of projects focused on projects that involve water supplies, actions in the Delta including restoration, projects that could affect agriculture or municipal water supply, and water quality. The list also focused on projects or project classes with similar goals, or that propose or have taken similar actions to achieve their goals, although some projects may have different goals for the same resources evaluated for the Plan amendments.

### **A1.7.1 Aesthetics**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on aesthetic resources described in Sections 13.7.3, Aesthetics, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in hydrology could result in reservoir level changes that may result in exposure of more unvegetated areas around the edges of reservoirs in some locations. Projects identified in Table 7.23-1 that could alter reservoir levels (e.g., FERC Projects, Water Supply Projects, Flood Control Projects, Habitat Restoration Projects, SGMA, Lower San Joaquin River [LSJR]/Southern Delta Plan Amendments, BiOp/Incidental Take Permit [ITP] Projects), including projects that are growth-inducing (General Plans, High-Speed Rail, Water Supply Projects), could add to impacts of the Plan amendments by further reducing reservoir levels, causing exposure of unvegetated areas over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on aesthetic resources.

Changes in water supply could result in agricultural land conversion, which could affect aesthetic resources if properties are developed or neglected. Projects in Table 7.23-1 (e.g., General Plans, Habitat Restoration Projects, LSJR/Southern Delta Plan Amendments, SGMA, Water Supply Projects, BiOp/ITP Projects) could add to these impacts by causing further conversion resulting in significant cumulative impacts on aesthetic resources.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, may physically damage scenic resources (e.g., alter natural landscape contours), introduce large construction equipment, remove vegetation, stockpile materials (e.g., excavated soil), create dust, or add new sources of lighting (e.g., nighttime lighting) and glare. Permanent installation of artificial elements (e.g., riprap), solar panels, and/or security and safety lighting could affect aesthetics. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in cumulative impacts on aesthetic resources.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could cause long-term changes to the quality of visual resources through the addition of hardscape features (e.g., fence, bench, erosion control structures), additional or modified water infrastructure (e.g., water storage structures and associated delivery lines), or gravel augmentation. Dam removal also could alter scenic vistas, and reservoir drawdown and removal can expose large areas of bare sediment and rock that were previously inundated. Flood Control Projects and Habitat Restoration projects listed in Table 7.23-1 could have similar features and/or lead to additional reservoir drawdowns. The aesthetic impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts. Similarly, reservoir drawdowns could add to impacts of the Plan amendments by causing exposure of unvegetated areas over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts.

New or modified facilities constructed in response to the Plan amendments could include onstream reservoirs that could flood land and convert natural river canyon scenery to lake scenery, thus affecting a scenic vista, damaging scenic resources, or degrading the visual character or quality of the flooded site. The siting of new wells and groundwater storage and recovery projects could change the visual quality or character of an urban or suburban area and introduce new sources of light or glare. Introducing new or expanded built facilities for water treatment (e.g., large buildings, water conveyance infrastructure) to an area could affect the existing visual character and quality of that area. Canal lining or encasement projects also could result in permanent landscape-level changes to the visual environment. Water Supply Projects and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Implementation of the mitigation measures identified in Sections A1.4.1, Aesthetics, A1.5.1, Aesthetics, and A1.6.1, Aesthetics, above would reduce or avoid the Plan amendments' contribution to cumulative aesthetics impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, these cumulative impacts remain significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.7.2 Agriculture and Forest Resources**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on agriculture and forest resources described in Sections 13.7.4, Agriculture and Forest Resources, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in hydrology could reduce streamflow and water levels at some locations, which could affect the ability of existing diversion intakes to divert water for agricultural use. Projects listed in Table 7.23-1 that could lower streamflows (e.g., FERC Projects, Flood Control Projects, Water Supply Projects) could add to the impacts of the Plan amendments by reducing streamflow and water levels over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on agriculture and forest resources.

Changes in water supply would reduce Sacramento/Delta supply to agriculture and could lead to changes in distribution of crop types and acreage and conversion of farmland to nonagricultural use. Increased use of water transfers could further incentivize farmland conversion, particularly in rapidly urbanizing areas. Increased inundation in the Sutter and Yolo Bypasses during the planting season could affect crop acreage. Projects listed in Table 7.23-1 that affect agriculture, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., Habitat Restoration Projects, SGMA, LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to these impacts by causing further conversion, resulting in significant cumulative impacts on agriculture and forest resources.

Lower groundwater levels could reduce groundwater available for agricultural use. Projects listed in Table 7.23-1 that may result in lower groundwater levels, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to these impacts by causing further lowering of groundwater levels, resulting in significant cumulative impacts on agriculture and forest resources.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could result in removal of vegetation and/or topsoil, introduction of invasive weeds, restriction of access to or interference with use of agricultural land, disturbance of existing utilities and infrastructure serving agriculture, or disturbance of soil in development footprints borrow/spoils areas or staging areas (e.g., soil compaction resulting from heavy equipment storage or soil stockpiling), which could affect agricultural resources. 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. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in cumulative agriculture and forest resources.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could cause long-term or permanent changes to agriculture resources through project siting (i.e., converting the land to nonagricultural uses or conflict with existing zoning) and incidental impacts on adjacent agricultural lands (e.g., seepage issues on adjacent land, herbicide use on invasive plant

species). Dam removal projects could reduce or alter availability of water supplies for crop irrigation. Agricultural diversion headworks downstream of a dam also could experience siltation or otherwise be affected during reservoir drawdown. Invasive aquatic vegetation control actions could affect adjacent agricultural lands from herbicide use. Flood Control Projects and Habitat Restoration projects listed in Table 7.23-1 could have similar features. The agriculture impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include filling a new reservoir or expanding an existing reservoir footprint that 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 in part on these land types. Water Supply Projects and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Implementation of the mitigation measures identified in Sections A1.4.2, Agriculture and Forest Resources, A1.5.2, Agriculture and Forest Resources, and A1.6.2, Agriculture and Forest Resources, above would reduce or avoid the Plan amendments' contribution to cumulative agriculture and forest resource impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

### **A1.7.3 Air Quality**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on air quality described in Sections 13.7.5, Air Quality, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Increased groundwater wells and pumping in response to reduced Sacramento/Delta supply under the Plan amendments could result in emissions from using diesel pumps and generators. Projects listed in Table 7.23-1 that may result in increased groundwater pumping, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments by causing more emissions from using diesel pumps and generators, resulting in significant cumulative air quality impacts.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could generate fugitive dust and emissions from fuel combustion of heavy construction equipment and vehicles, and inadvertent dispersal of *Coccidioides* spores (responsible for Valley Fever) and asbestos into the environment. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on air quality.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could cause objectionable odors sometimes associated with wetlands that could affect nearby land uses, such as the closest recreational facilities and residential uses. Dam removal could result in earthy or hydrogen sulfide odors during or immediately following reservoir drawdown and windblown dust from exposure of sediment deposits remaining in the reservoir footprint after dam removal. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features. The air quality impacts of these features, taken together with those of features associated with the Plan amendments by causing objectionable odors over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on air quality.

New or Modified Facilities constructed in response to the Plan amendments could include new reservoirs and associated recreational facilities that could result in generation of emissions from vehicle trips and motorized recreational vehicles (e.g., boats, jet skis). Operation of new WWTPs may result in a new source of odors. Water Supply Projects and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Less-than-significant impacts include exposure to increased fugitive dust from agricultural land fallowing. Projects listed in Table 7.23-1 that could lead to decreases in land under irrigation, which could lead to fallowing, idling, or conversion to nonagricultural uses, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., SGMA, LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments, resulting in cumulative impacts from fugitive dust emissions— especially if in the same air basin.

Implementation of the mitigation measures identified in Sections A1.4.3, Air Quality, A1.5.3, Air Quality, and A1.6.3, Air Quality, above would reduce or avoid the Plan amendments' contribution to cumulative air quality impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.7.4 Biological Resources**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on biological resources described in Sections 13.7.6, Biological Resources, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in reservoir levels and streamflow below reservoirs could affect associated riparian and wetland habitat, and could affect water temperatures below some reservoirs that could affect fish and other species. Increased inundation in flood bypasses during the planting season could affect crop acreage, which could affect special-status wildlife species that use croplands as habitat. Projects listed in Table 7.23-1 that could change streamflows and reservoir levels (e.g. FERC

Projects, Flood Control Projects, Water Supply Projects) could add to the impacts of the Plan amendments by affecting habitat over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on biological resources.

Changes in water supply may reduce Sacramento/Delta supply to municipal use. This, as well as increased use of water recycling and indoor conservation, could alter the flow and chemical constituent concentrations of WWTP influent and subsequently could affect WWTP effluent discharges to receiving waters. This could result in effects on special-status plant and wildlife species. Potential effects on wildlife refuges and agricultural lands from reduced supply could affect habitat for special-status species, including giant gartersnake, Swainson's hawk, greater sandhill crane, tricolored blackbird, and California black rail, and decrease the amount of habitat available for resident and migratory waterfowl and shorebirds. Reductions in supply to refuges also could decrease wetland area and affect water quality. Projects listed in Table 7.23-1 that affect agriculture, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that could reduce water supply (e.g., Habitat Restoration Projects, SGMA, LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments by causing further effects on special-status plant and wildlife species and their habitats, resulting in significant cumulative impacts on biological resources associated with agricultural habitats.

Some water management actions could diminish instream ecological benefits. For example, increased use of recycled water that would otherwise discharge to streams could diminish ecological benefits of instream flows, especially in dry seasons and in low-flow conditions where streamflow is dependent on wastewater discharges, and diverting surface water for groundwater storage and recovery. Water transfers could alter hydrologic patterns, affect aquatic biological resources in some locations, and affect special-status species that use agricultural fields if the transfer is based on cropland idling. Projects listed in Table 7.23-1 that could change streamflows and reservoir levels (e.g., FERC Projects, Flood Control Projects, Water Supply Projects) could add to the impacts of the Plan amendments by causing further effects on special-status plant and wildlife species and their habitats, resulting in significant cumulative impacts on biological resources.

Lower groundwater levels from increased groundwater pumping and reduced incidental recharge could affect stream-aquifer interactions and streamflows in some locations, riparian and wetland habitat and other natural communities that are dependent on groundwater, and sensitive species that are reliant on groundwater-dependent ecosystems. Projects listed in Table 7.23-1 that may result in increased groundwater pumping, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments on riparian and wetland habitat and groundwater-dependent ecosystems, resulting in significant cumulative impacts on biological resources associated with lower groundwater levels.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, 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 may occur from movement of heavy machinery where such species occur and from construction noise and physical vibration. Introduction or spread of invasive vegetative species may occur through the movement of topsoil, fill, gravel, and construction equipment. Removal of riparian vegetation and disturbance to wetlands may occur to facilitate heavy equipment movement and other construction activities, and release of

sediment and possibly hazardous materials (e.g., oil or gas from construction equipment) into waterbodies could result from construction on or near waterways. Creation of noise and vibration could harm fish from activities such as pile driving, blasting, or use of other construction equipment; and release of concrete particles from blasting to surface waters could disturb terrestrial wildlife and harm fish. Take of special-status fish species could occur from construction and installation of cofferdams (resulting in fish stranding) or fish rescue in a dewatered area (seining, electrofishing). Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing the magnitude, duration, and/or frequency, resulting in significant cumulative impacts on biological resources.

Physical habitat restoration projects undertaken pursuant to the Plan amendments could cause changes to habitat types (e.g., non-tidal aquatic habitats to tidal aquatic habitats, conversion of agriculture land to native riparian habitat), create barriers such as shallow puddles leading to fish stranding from floodplain drainage, facilitate methylmercury production and subsequent bioaccumulation in fish and other wildlife species from the creation of freshwater wetlands and floodplains, increase predation on sensitive fish species that use shallow-water floodplain habitats from floodplain restoration, apply toxic herbicides and pesticides due to increased invasive plant species, and create mosquito habitat that could adversely affect aquatic and terrestrial species. Gravel augmentation projects could cause mortality of salmon and steelhead embryos and alevins and could increase turbidity and sedimentation, which could affect salmon and salmon redds. Fish passage improvements could obstruct, injure, or kill fish species if designed improperly; introduce special-status species to inhospitable habitat; create conditions to allow previously blocked invasive species upstream from fishways and dam removal projects; elevate suspended sediment concentrations that can adversely affect or cause mortality of sensitive life stages of special-status fish, amphibians, and reptiles; and increase levels of sediment and turbidity that can adversely affect aquatic ecosystems by reducing photosynthetic activity, reducing food availability, burying habitat, and directly harming organisms. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features and impacts to biological resources. The biological resources impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include new reservoirs that would create aquatic lake habitat and replace existing habitats through flooding, which would result in a change in the flow regime and potentially alter temperature downstream. On-stream reservoir/dams or changed points of diversion could interfere with movement of native resident or migratory fish, and impingement and entrainment may occur at surface water diversions. Operation of a new reservoir could support the establishment and spread of invasive aquatic species, and recreation activities associated with reservoirs could disrupt wildlife movement patterns. Impingement and entrainment may occur at water diversions for treatment facilities, and seawater desalination could affect benthic ecosystems on the ocean floor and can expose aquatic species to toxic concentrations of brine. Water Supply Projects and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Less-than-significant impacts include changes to habitat due to increased winter flows on the Sacramento and Feather Rivers; erosion caused by changes to geomorphic flows on regulated tributaries in the Sacramento/Delta; and changes in reservoir levels, streamflow, and groundwater levels. These changes could affect candidate, sensitive, or special-status species or movement of

native resident or migratory fish or wildlife species. Projects listed in Table 7.23-1 that could change streamflows, reservoir levels, and groundwater (e.g., FERC Projects, Flood Control Projects, Water Supply Projects, General Plans, High-Speed Rail, LJSR/Southern Delta Plan Amendments, BiOp/ITP Project) could add to the impacts of the Plan amendments, resulting in significant cumulative impacts on biological resources.

Another less-than-significant impact identified is reduced water supply that may conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP. As explained in Section 7.6.2, Aquatic Biological Resources, the Plan amendments would not create adjacent incompatible land uses, develop land, or otherwise result in actions incompatible with conservation plans or activities; however, reduced Sacramento/Delta water supply could frustrate certain efforts identified in an HCP or NCCP if Sacramento/Delta water supplies are used to support management actions. It is possible that projects listed in Table 7.23-1 that affect water supply, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., SGMA, LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments, resulting in cumulative biological impacts associated with HCPs and NCCPs that rely on imported water supplies to support management goals.

Implementation of the mitigation measures identified in Sections A1.4.4, Biological Resources, A1.5.4, Biological Resources, and A1.6.4, Biological Resources, above would reduce or avoid the Plan amendments' contribution to cumulative biological resources impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.7.5 Cultural Resources**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on cultural resources described in Sections 13.7.7, Cultural Resources, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in hydrology could expose previously inundated cultural resources and/or significant historic or archaeological resources to increased wave action, erosion, and human activity from changes in reservoir levels. Similarly, changes in reservoir levels could expose previously inundated land containing human burials, which could result in disturbance of the burial and impacts from human activity. These same impacts are identified as less-than-significant impacts for changes in streamflows. Projects listed in Table 7.23-1 that could change streamflows and reservoir levels (e.g., FERC Projects, Flood Control Projects, Water Supply Projects) could add to the impacts of the Plan amendments by exposing previously inundated cultural resources and/or significant historical or archaeological resources over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on cultural resources.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could affect cultural resources. Ground-disturbing activities during construction, including deep excavation, could damage archaeological sites or historic built environment resources; degrade unknown buried or near-surface cultural resources; degrade or otherwise affect near-surface archaeological or built environment resources; and 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 (i.e., large-scale equipment, machinery, vehicles) could diminish the integrity of cultural resources, and unauthorized removal or vandalism of cultural resources could occur if construction enables access to cultural sites that were not previously 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 could result in impacts on cultural resources with an associated landscape or other visual component that contributes to their significance, such as a sacred landscape or historic trail. Pile driving during construction could cause vibration that could physically damage or alter nearby historic built environment resources or linear features. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on cultural resources.

Habitat Restoration and Other Ecosystem Measures undertaken pursuant to the Plan amendments could cause older structures to be removed or modified from TCD and dam removal projects that could be eligible for listing in the National Register of Historic Places or California Register of Historic Places; and reservoir drawdown prior to dam removal could result in shifting, erosion, and exposure of known or as-yet-unrecorded previously submerged cultural resources or human remains. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features and/or lead to similar removals or modifications of older structures. The cultural resources impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts. Similarly, reservoir drawdowns would add to impacts of the Plan amendments by causing shifting, erosion, and exposure of known or as-yet-unrecorded previously submerged cultural resources or human remains over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include new reservoirs that could permanently flood areas that have unique paleontological resources or sites or a unique geologic feature, and reservoir drawdown could expose paleontological resources. Changing water levels and erosion as a result of shoreline wave action and wet-dry cycles could damage paleontological resources and expose previously inundated land containing human burials, which could result in disturbance of the burial and impacts from human activity. Water Supply Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Implementation of the mitigation measures identified in Sections A1.4.5, Cultural Resources, A1.5.5, Cultural Resources, and A1.6.5, Cultural Resources, above would reduce or avoid the Plan amendments' contribution to cumulative cultural resources impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this

cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.7.6 Energy**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on energy described in Sections 13.7.8, Energy, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in hydrology would result in a decrease in hydropower generation in summer that could be significant for an individual project or community. Projects listed in Table 7.23-1 that could change hydropower generation (e.g., FERC Projects, Water Supply Projects) could add to the impacts of the Plan amendments by causing changes in hydropower generation over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on energy.

Changes in water supply could cause an increase in energy use to replace Sacramento/Delta supplies from actions such as increased groundwater pumping and other water management actions. Projects listed in Table 7.23-1 that could increase energy use (e.g., FERC Projects, Water Quality Projects, Water Supply Projects, High-Speed Rail) could add to the impacts of the Plan amendments by causing further increases in energy use, resulting in significant cumulative impacts to energy.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could temporarily increase energy demand from heavy construction equipment (e.g., trucks or barges, earthmoving equipment, power tools) for actions such as excavating, grading, transporting materials, and transporting construction workers to and from the work sites. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on energy.

New or Modified Facilities constructed in response to the Plan amendments could include new reservoirs, points of diversion, and water treatment facilities could increase energy use for water diversion, conveyance, and water treatment. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Implementation of the mitigation measures identified in Sections A1.4.6, Energy, A1.5.6, Energy and Greenhouse Gas Emissions, and A1.6.6, Energy and Greenhouse Gas Emissions, above would reduce or avoid the Plan amendments' contribution to cumulative energy impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## A1.7.7 Geology and Soils

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on geology and soils described in Sections 13.7.9, Geology and Soils, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Lower groundwater levels could exacerbate existing problems associated with groundwater subsistence. Projects listed in Table 7.23-1 that may result in increased groundwater pumping, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments by further exacerbating existing problems associated with groundwater subsidence over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on geology and soils.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, 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 also could occur in areas underlain by soft or loose soils, where high groundwater or seepage may be present, and on sloping grounds. 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. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on geology and soils.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could cause loss of topsoil and soil erosion from intended levee breaching. Large dam removal projects could cause hillslope instability in reservoir rim areas and erosion of slope sediments during reservoir drawdown. The rate of reservoir drawdown also could induce potential landslides along the reservoir margins or a slope failure of an embankment dam and cause additional erosion and sedimentation downstream. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features and/or lead to additional loss of topsoil and soil erosion from intended levee breaching, or hillslope instability and erosion of slope sediments. The geology and soils impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include new reservoirs, dams, points of diversion, and groundwater wells that could fail or be damaged due to seismic-related ground shaking, fault movements, liquefaction, and lateral spreading. Surface springs and seeps due to operation of a new reservoir also could result in unstable soils, landslides, lateral spreading, subsidence, liquefaction, or collapse. Groundwater wells also could make the water table shallow, which could make areas of poorly consolidated geologic material prone to liquefaction. If recharge water is applied at too high of a rate or volume, there is also potential for substantial erosion and/or loss of topsoil. Siting desalination facilities in coastal areas could expose people or structures to potential adverse geology and soil effects. FERC Projects, Water Supply

Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Less-than-significant impacts include a temporary increase in erosion and sedimentation as a result of agriculture fallowing. Projects listed in Table 7.23-1 that could lead to decreases in land under irrigation (which could lead to fallowing, idling, or conversion to nonagricultural uses), including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., SGMA, LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments by causing further changes in erosion and sedimentation, resulting in cumulative impacts on geology and soils.

Implementation of the mitigation measures identified in Sections A1.4.7, Geology and Soils, A1.5.7, Geology and Soils, and A1.6.7, Geology and Soils, above would reduce or avoid the Plan amendments' contribution to cumulative geology and soils impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.7.8 Greenhouse Gas Emissions**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on GHG emissions described in Sections 13.7.10, Greenhouse Gas Emissions, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in water supply could result in generation of additional GHG emissions from increased groundwater pumping from wells with diesel-powered pumps as well as emissions associated with energy use for groundwater storage and recovery, water transfers, and water recycling. These emissions could exceed existing thresholds or conflict with the state's long-term emission reduction trajectory. Projects listed in Table 7.23-1 that may result in increased groundwater pumping and water transfers, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects), projects that reduce water supply (e.g., LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects), and projects that could increase water recycling (e.g., Water Quality Projects), could add to the impacts of the Plan amendments by causing generation of additional GHG emissions over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on GHG emissions.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could result in generation of GHG emissions from heavy construction equipment, haul trucks, and worker vehicles. Construction activities also could remove vegetation that acts to sequester GHGs, such as trees. GHG emissions from construction could conflict with an applicable GHG plan, policy, or regulation. Projects listed in Table 7.23-1 that

contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on GHG emissions.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could cause removal of hydropower dams that could result in increased GHG emissions from replacing the renewable source of power with a non-renewable source. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features and/or lead to additional hydropower dam removal. The GHG emissions impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include new reservoirs, points of diversion, and water treatment facilities that could increase GHG generation and emissions from water diversions, conveyance, and water treatment. If vegetation is present in newly inundated areas, vegetation decay (which produces carbon dioxide and methane gases) could occur. GHG emissions from facility operation also could conflict with an applicable GHG plan, policy, or regulation. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Less-than-significant impacts under the Plan amendments include additional energy generation at fossil-fuel facilities as a result of reductions in hydropower generation. Projects listed in Table 7.23-1 that could lead to reductions in hydropower generation (e.g., FERC Projects, Habitat Restoration Projects, LJSR/Southern Delta Plan Amendments, and BiOp/ITP Projects) could add to the impacts of the Plan amendments by causing additional energy generation at fossil-fuel facilities as a result of reductions in hydropower generation, resulting in significant cumulative impacts on GHG emissions.

Implementation of the mitigation measures identified in Sections A1.4.8, Greenhouse Gas Emissions, A1.5.6, Energy and Greenhouse Gas Emissions, and A1.6.6, Energy and Greenhouse Gas Emissions, above would reduce or avoid the Plan amendments' contribution to cumulative GHG emissions impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.7.9 Hazards and Hazardous Materials**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on hazards and hazardous materials described in Sections 13.7.11, Hazards and Hazardous Materials, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could result in the 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).

Excavation during construction can result in possible damage to underground infrastructure and exposure to or spread of toxic chemicals from areas with existing soil or groundwater contamination, and soils containing *Coccidioides* spores may expose workers and people adjacent to construction sites to fungal spores in fugitive dust. Construction also could lead to accidental hazardous materials spills from airborne materials (e.g., gases, asbestos particles) or ignition of flammable liquids or vapors during construction activities within 0.25 mile of a school. Emergency response services' access or emergency evacuation routing could be impaired or interfered with during construction. Due to accidental releases of hazardous materials, work site fires, and vehicular accidents from construction-related changes in traffic, there could be an increased need for emergency service providers during construction. Electrical or gas-powered equipment and flammable materials used during construction also pose a wildfire risk. Construction project components may encroach on the airspace of airport runways. Construction also can lead to the creation of new disease vector habitat (i.e., mosquito habitat) that can then lead to application of pesticides from stagnant water present in construction areas during the wet season. 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, potential for fire and explosion, exposure of the public to raw sewage, and daylighting of wastewater at the ground surface. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on hazards and hazardous materials.

Physical habitat restoration projects undertaken pursuant to the Plan amendments could expose application crews and the public to toxic chemicals from the accidental release or improper use or storage of herbicides, increase transmission of mosquito-borne diseases (e.g., West Nile virus), and expose application crews and the public to pesticides used to control mosquitos. Increased vegetation could create favorable conditions to mosquitos, increase the risk of wildland fire by increasing the fuel load, and increase wildfire risk due to an increased number of cars and people visiting larger habitat restoration projects. Restoration of floodplain, riparian, and tidal habitat in proximity to existing airport flight zones also could increase bird-aircraft strikes. Regarding fish passage improvements, thermal curtains and associated structures could pose a physical safety hazard (e.g., collision) to recreationists in the vicinity of TCDs, and remaining portions of a dam after dam removal could represent hazards to the public. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features. The hazards and hazardous materials impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include some new reservoirs and points of diversion that may require the 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. Operation and maintenance of new reservoirs could involve removal of contaminated sediment from dredging that could accidentally be released to areas and surface waters. New reservoirs also may release cyanotoxins from HABs; may cause an increase in surface water methylmercury; and may create conditions favorable to mosquitos, which could lead to increased transmission of mosquito-borne diseases (e.g., West Nile virus). Reservoirs constructed close to an airport could create a safety hazard for people (e.g., recreationists) by placing them in proximity to

hazards associated with airport operations. Reservoirs close to an airport also may create potential safety hazards (e.g., aircraft and waterfowl collisions) for air traffic. New reservoirs may pose wildfire risks from the use of vehicles, fire pits and grills, and electrical or gas-powered maintenance equipment. Groundwater wells and groundwater storage and recovery may result in the accidental release of hazardous materials during transport and use where chemical treatment of water may be required at new groundwater wells, during disposal of water treatment waste (e.g., used granular activated carbon filters) if water treatment occurs at new groundwater wells, where diesel-powered pumps are used for groundwater wells, and where water treatment is implemented prior to injection for groundwater storage and recovery. Similar to reservoirs, wells and groundwater storage and recovery operations may increase the potential for transmission of mosquito-borne diseases from the potential creation of mosquito habitat in groundwater recharge ponds or spreading basins. Operation of wastewater treatment facilities also can result in the accidental release of hazardous materials. During transport, use, storage for facility operation, and during disposal of hazardous waste (e.g., used granular activated carbon filters, biosolids) from water treatment. There is also a wildfire risk from improper storage or use of flammable/combustible or incompatible chemicals for facility operation, and use of electrical or gas powered equipment during maintenance activities. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Less-than-significant impacts include possible changes to wildland fire suppression practices as a result of changes in reservoir levels in areas likely to continue experiencing forest fires. Projects listed in Table 7.23-1 that could lead to changes in reservoir levels include projects that reduce water supply (SGMA, LJSR/Southern Delta Plan Amendments, BiOp/ITP Projects) and projects that affect reservoirs and reservoir levels (Flood Control Projects and Habitat Restoration Projects). These could add to the impacts of the Plan amendments, resulting in significant cumulative impacts related to hazards and hazardous materials.

Implementation of the mitigation measures identified in Sections A1.5.8, Hazards and Hazardous Materials, and A1.6.8, Hazards and Hazardous Materials, above would reduce or avoid the Plan amendments' contribution to cumulative hazards and hazardous materials impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.7.10 Hydrology and Water Quality**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on hydrology and water quality described in Sections 13.7.12, Hydrology and Water Quality, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in hydrology could decrease or increase flow, which has the potential to increase concentration of contaminants below some reservoirs and increase input of mercury and methylmercury production downstream, respectively. Increases in Clear Creek flow downstream of Whiskeytown Lake could increase the risk of erosion and flooding in this area. Production of HABs also could increase due to lower summer and fall flows in some Delta channels and changes in reservoir levels. Reservoir levels changes also could result in bioaccumulation of methylmercury in fish and increase water temperature in some locations. Projects listed in Table 7.23-1 that could alter streamflow and reservoir levels (e.g., FERC Projects, Water Supply Projects, Flood Control Projects, Habitat Restoration Projects, SGMA, LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects), including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects), could add to the impacts of the Plan amendments by causing changes in streamflows and water quality over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on hydrology and water quality.

Changes in water supply could result in temporary exceedances of maximum contaminant levels in municipal water supply and site-specific exceedances of waste discharge requirements due to changes in WWTP influent and effluent quality and quantity. Reductions in delivery of Sacramento/Delta supplies to wildlife refuges and managed wetlands also could affect water quality. Some water management actions, such as increased use of water transfers and water recycling, could affect water quality in some locations. Changes in groundwater accretions and diversions of surface water for groundwater storage and recovery could decrease surface water quality associated with lower streamflows, higher temperatures, and limited dilution of existing flows. Projects listed in Table 7.23-1 that could change water supply (e.g., Habitat Restoration Projects, SGMA, Water Supply Projects, LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects), including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects), could add to the impacts of the Plan amendments by causing changes in water quality over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on hydrology and water quality.

Increased groundwater pumping and reductions in incidental groundwater recharge from applied irrigation could lower groundwater levels and contribute to groundwater overdraft. Lower groundwater levels also could affect groundwater quality and potentially affect drinking water wells and result in an increase in frequency and severity of critical shortages or dry wells occurring in some areas for communities that rely on groundwater, including economically disadvantaged communities. Lower groundwater levels also can result in changes in groundwater flow direction and gradients in localized areas, which could exacerbate the migration of contaminants, may concentrate salts and nutrients in groundwater over time through evaporative enrichment, and can concentrate pollutants where groundwater contamination already exists. Additionally, surface water transfers through groundwater substitution and reduced incidental groundwater recharge due to agricultural conservation measures could result in lower groundwater levels. Lower groundwater levels could exacerbate groundwater quality impairments or contribute to contaminant loading in localized areas. Reductions in Sacramento/Delta supplies also could have localized impacts on groundwater storage in areas where Sacramento/Delta supplies are used for groundwater banking. Projects listed in Table 7.23-1 that may result in increased groundwater pumping, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments by causing

lower groundwater levels over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on hydrology and water quality impacts.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, 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 bioavailability of sediment-associated pollutants. Pollutants, such as petroleum products (fuel, oil, grease from vehicles and equipment), paving materials such as concrete and asphalt and other materials used or stored onsite (e.g., paint, adhesives, solvents), and project waste (e.g., litter, debris, hazardous and liquid waste) may accidentally be released and could enter storm drains or streams. Herbicides used to control invasive plant species, if improperly applied or stored, and concrete and other particles released into surface waters from blasting, saw-cutting, and hydraulic hammering could affect water quality and may violate water quality standards. Construction activities also 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 erosion or siltation, or flooding, onsite or offsite. 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 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 also may be located within a 100-year flood hazard area or in areas subject to inundation by seiche, tsunami, or mudflow. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on hydrology and water quality.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could cause geomorphic changes from habitat restoration that could increase long-term rates of erosion or sedimentation. Placement of fill and gravel and gravel mining have the potential to release turbidity and existing contaminants from in-channel sediment into the water column. Habitat restoration projects could alter the existing drainage pattern of the site or area and, if improperly designed, alter hydrology and/or increase erosion and sedimentation. Physical habitat restoration also may alter salinity from tidal restoration, form HABs from algae produced at restoration project sites, mobilize potentially contaminated sediment from dredging activities, and increase methylmercury formation or temperature effects from increased floodplain inundation. Fishways aligned in a straight line without bends have high velocities down the center at moderate to high flows, which can cause erosion downstream of the fishway if the channel is narrow or if the fishway is aligned toward a bank. TCDs could change the distribution of water temperature in reservoirs and dissolved oxygen concentration of water discharged downstream. Dam removal can decrease groundwater levels; increase sediment, contaminants (e.g., PCBs, chlorinated pesticides, mercury), erosion, and turbidity; reduce dissolved oxygen levels downstream, change downstream channel geometry, reduce conveyance capacity, or destabilize infrastructure due to increases in deposition and erosion. Dam removal also can lead to a substantial increase in flood flows and release of sediments and a short-term increase in flooding. Removal of large dams or reservoirs also may increase the 100-year floodplain. Herbicides used for invasive aquatic vegetation control may directly affect water quality. Flood Control Projects and Habitat Restoration Projects listed in Table

7.23-1 could have similar features. The hydrology and water quality impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include new dams and points of diversion that can alter flow regimes and reduce or eliminate important geomorphic processes and floodplain inundation, decrease habitat connectivity, alter temperatures to the detriment of cold water species, and alter salinity gradients and circulation patterns in the Delta. Dams and points of diversion also reduce stream flows, which could injure water right holders, alter water quality, and affect surface water-groundwater interactions and groundwater recharge. Changes to existing water diversions or new water diversions could affect interior Delta flows, Delta outflows, and water quality to varying degrees that could impact aquatic biological resources and hydrology and water quality. The ability of waste discharger or drinking water providers to comply with waste discharge requirements and/or water quality standards may be affected by changes to instream chemical constituent concentrations caused by changes in instream dilution from changes to streamflow. Reservoirs create conditions conducive to HABs, growth of invasive aquatic vegetation, and methylation of mercury. Reservoirs also 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, and reduced sediment supply to downstream waterways due to capture of sediment behind dams could affect habitat and alter the balance between erosion and sedimentation. Construction and modification of reservoirs also may result in impacts on water quality due to dredging, grading, or preparation of land. New groundwater wells located where multiple aquifer zones of varying water quality are cross-connected could cause a general degradation of groundwater quality. Accidental release of water treatment chemicals used at groundwater wells could cause degradation of surface water and/or groundwater quality. 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. 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. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Less-than-significant impacts include moderately elevated turbidity and total suspended solids levels in some areas as a result in changes in flow. Increased floodplain inundation could affect nutrients, organic material, invasive aquatic plants, and HABs. Reduced flows downstream of reservoirs could affect stream-aquifer interactions, and increased water recycling and municipal water conservation measures that reduce incidental groundwater recharge could affect groundwater levels. Projects listed in Table 7.23-1 that could change streamflows (e.g., FERC Projects, Flood Control Projects, Water Supply Projects, Habitat Restoration Projects) could add to the impacts of the Plan amendments, resulting in significant cumulative impacts on hydrology and water quality.

Implementation of the mitigation measures identified in Sections A1.4.9, Hydrology and Water Quality, A1.5.9, Hydrology and Water Quality, and A1.6.9, Hydrology and Water Quality, above would reduce or avoid the Plan amendments' contribution to cumulative hydrology and water quality impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations

and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

### **A1.7.11 Land Use and Planning**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on land use and planning described in Sections 13.7.13, Land Use and Planning, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, may have temporary effects on existing land uses from 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, and siting permanent facilities within an established community (e.g., distribution pipelines, 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. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on land use and planning.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could include actions, such as levee breaching and road removal, that could isolate communities from services and markets or cut off access to properties. Some habitat restoration projects could be incompatible with land use designations, such as plans with exclusive agricultural designations. Removal of dams could physically divide communities, and new land use and zoning designations may need to be determined for areas previously inundated by the reservoirs. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features. The land use and planning impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include the siting of reservoirs or points of diversion and associated facilities that may conflict with existing land uses and require changes to the land use designations in local general and specific plans. Removal of bridges and roads also may result in permanent physical division of an established community. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Implementation of the mitigation measures identified in Sections A1.5.10, Land Use and Planning, and A1.6.10, Land Use and Planning, above would reduce or avoid the Plan amendments' contribution to cumulative land use and planning impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation

measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

### **A1.7.12 Mineral Resources**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on mineral resources described in Sections 13.7.14, Mineral Resources, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, may restrict access to areas with active natural gas, oil, or aggregate production or with the potential to contain untapped reserves of those resources. Construction demand for aggregate and/or cement for construction projects could exceed local supplies. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on mineral resources.

Implementation of the mitigation measures identified in Sections A1.5.11, Mineral Resources, and A1.6.11, Mineral Resources, above would reduce or avoid the Plan amendments' contribution to cumulative mineral resources impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

### **A1.7.13 Noise**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on noise described in Sections 13.7.15, Noise, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Increased groundwater pumping for replacement water supply, groundwater storage and recovery, or groundwater substitution transfers could result in higher noise levels. Projects listed in Table 7.23-1 that may result in increased groundwater pumping, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects), could add to the impacts of the Plan amendments by causing increased groundwater pumping over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on noise.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, 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 that exceed 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 construction crews to excessive noise levels. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on noise.

New or Modified Facilities constructed in response to the Plan amendments could include operation and maintenance that could generate noise, including permanent or periodic increased ambient noise from intakes and conveyance facilities; the use of transformers, generators, fans, groundwater well and other pumps, and alarms; and could increase traffic, particularly for new reservoirs allowing recreation. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Implementation of the mitigation measures identified in Sections A1.4.10, Noise, A1.5.12, Noise, and A1.6.12, Noise, above would reduce or avoid the Plan amendments' contribution to cumulative noise impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

### **A1.7.14 Population and Housing**

The Plan amendments 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. Population and housing impacts from actions related to the Plan amendments would not be significant.

### **A1.7.15 Public Services**

The Plan amendments do not necessitate the need for new or physically altered schools, parks, public facilities, or governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public services. Public service impacts from actions related to the Plan amendments would not be significant.

### **A1.7.16 Recreation**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on recreation described in Sections 13.7.18, Recreation, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in hydrology include changes in reservoir levels that could affect boat ramp accessibility, affecting recreation opportunities at some reservoirs, and could lead to modification of existing or development of new boat ramps in some locations. Projects listed in Table 7.23-1 that could alter reservoir levels (e.g., FERC Projects, Water Supply Projects, Habitat Restoration Projects, SGMA, LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects), including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects), could add to the impacts of the Plan amendments by affecting boat ramp accessibility and affecting recreation opportunities over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on recreation.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could affect recreationists by creating construction-related traffic, visual impacts, water quality effects, noise, fugitive dust, and exhaust emissions from heavy equipment or by short-term or long-term access restrictions that could result in physical deterioration of alternative locations and facilities. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on recreation.

Habitat restoration projects undertaken pursuant to the Plan amendments could require levee breaching, construction of setback levees, and floodplain expansion that could adversely affect marinas and other land-based recreational facilities and infrastructure. Permanent removal of marinas and other recreation facilities could displace recreationists to other locations. Dam removal projects could result in the long-term loss of existing opportunities for reservoir-based recreation activities and could affect flow-dependent activities such as whitewater rafting in river reaches downstream of a reservoir's removal location. Dam removal projects could displace recreationists to other locations. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features. The recreation impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include larger reservoirs and points of diversion facilities that could restrict recreation in the area around them 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. They also could inundate areas previously used for recreation. The displacement of recreationists to other locations could result in accelerated physical deterioration of some recreational facilities over time. Due to odor from new WWTPs, recreationists may choose other recreational locations. This could ultimately result in accelerated physical deterioration of these alternative locations and facilities over time. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Less-than-significant impacts include changes in flows that could affect the boating difficulty of rapids for rafting and kayaking and reduced opportunities for swimming or wading in rivers at some locations. An incremental increase in potential HABs could cause closures to recreation in some waterbodies. Changes in reservoir water surface area and elevation could affect sportfish populations and reduce fishing opportunities at some locations. Reduced deliveries to wildlife refuges also could affect recreational opportunities (e.g., wildlife viewing). Reduced municipal water supply could affect municipal recreational opportunities at parks, playfields, and swimming pools.

Projects listed in Table 7.23-1 that could change streamflows (e.g., FERC Projects, Flood Control Projects, Water Supply Projects, Habitat Restoration Projects) and reservoir levels, including projects that reduce water supply (e.g., SGMA, LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects) and projects that directly affect reservoirs and reservoir levels (e.g., Flood Control Projects and Habitat Restoration Projects), could add to the impacts of the Plan amendments, resulting in cumulative impacts on recreation.

Implementation of the mitigation measures identified in Sections A1.4.11, Recreation, A1.5.13, Recreation, and A1.6.13, Recreation, above would reduce or avoid the Plan amendments' contribution to cumulative recreation impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

### **A1.7.17 Transportation and Traffic**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on transportation and traffic described in Sections 13.7.19, Transportation and Traffic, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could result in temporary and short-term increases in traffic due to additional vehicles on roads near project sites and relocating roads, which could cause new rerouted traffic at an intersection not designed to accommodate additional traffic. Roads also may be temporarily blocked, rerouted, or altered, which could affect emergency access. 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 also could occur during construction. Projects requiring in-channel construction activities could temporarily obstruct boat navigation and cause boat traffic delays. Construction equipment, such as dredges and cofferdams, also could temporarily obstruct boat traffic. Permanent relocation of road segments could require changes that could increase or introduce a hazard to vehicles traveling on that segment. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on transportation and traffic.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could include larger habitat restoration projects, including floodplain restoration, that could cause inundation of roads that could impede use and cause traffic congestion at intersections or on certain roadway segments. Construction-related traffic from dam removal projects may affect local residential and recreational traffic and existing transportation infrastructure (e.g., roadways, bridges, culverts) enroute to the dam sites and may require improvements to their current conditions. Removal of dams that provide river crossings may require construction of a new bridge to meet local traffic demands upon its removal. Flood Control Projects and Habitat Restoration

Projects listed in Table 7.23-1 could have similar features. The transportation and traffic impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include reservoirs that 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 also could attract a substantial number of recreationists, which could cause periodic traffic congestion as well as unplanned wear and tear on rural roads. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Implementation of the mitigation measures identified in Sections A1.5.14, Transportation and Traffic, and A1.6.14, Transportation and Traffic, above would reduce or avoid the Plan amendments' contribution to cumulative transportation and traffic impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.7.18 Utilities and Service Systems**

When the impacts of the Plan amendments are considered in connection with the potential impacts of the past, present, and reasonably foreseeable future projects listed in Table 7.23-1 in Section 7.23, Cumulative Impact Analysis, the combination could result in potentially significant adverse cumulative impacts that are similar to the impacts on utilities and service systems described in Sections 13.7.20, Utilities and Service Systems, 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities.

Changes in hydrology could alter the assimilative capacity of some streams where treated wastewater is discharged and could result in construction to modify or expand existing treatment facilities in order to prevent or mitigate exceedances of drinking water standards and wastewater discharge water quality objectives. Reduced streamflow and water levels at some locations could affect the ability of existing diversion intakes to divert water, which could affect municipal water supplies. Projects listed in Table 7.23-1 that could alter streamflow and reservoir levels (e.g., FERC Projects, Water Supply Projects, Flood Control Projects, Habitat Restoration Projects, SGMA, LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects), including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects), could add to impacts of the Plan amendments by altering streamflow and reservoir levels over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts on utilities and service systems.

Changes in water supply could result in the use of other lower quality water supply sources that affect WWTP influent and effluent. Reduced municipal supply and increased indoor water conservation could lead to a decrease in the production of wastewater and increase chemical constituent concentrations in WWTP influent. Changes in water supply could result in construction

to modify or expand existing treatment facilities in order to prevent or mitigate exceedances of drinking water standards and wastewater discharge water quality objectives. Reduced Sacramento/Delta supply to municipal use also could affect municipal water supplies in a manner that would cause water suppliers to need new or expanded water entitlements. Projects listed in Table 7.23-1 that could affect water supply (e.g., Habitat Restoration Projects, SGMA, Water Supply Projects, LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects), including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects), could add to the impacts of the Plan amendments could add to these impacts by causing further changes in water supply, resulting in significant cumulative impacts on utilities and service systems.

Reduced groundwater levels could affect water supplies for communities that rely on groundwater as their primary municipal water source, including economically disadvantaged communities. Additionally, if the source of stored groundwater or surface water for water transfer is of lower quality, groundwater storage and recovery or water transfers could increase concentrations of some pollutants of concern in WWTP influent. Projects listed in Table 7.23-1 that may result in increased groundwater pumping, including projects that are growth inducing (e.g., General Plans, High-Speed Rail, Water Supply Projects) and projects that reduce water supply (e.g., LSJR/Southern Delta Plan Amendments, BiOp/ITP Projects) could add to the impacts of the Plan amendments by causing reduced groundwater levels and changes in groundwater quality over a greater area, for longer periods, and/or more frequently, resulting in significant cumulative impacts to utilities and service systems.

Construction projects identified in Sections 7.21, Habitat Restoration and Other Ecosystem Projects, and 7.22, New or Modified Facilities, could generate stormwater runoff that discharges sediment and other pollutants, and wastewater from construction could include wastewater from sanitation facilities used by construction crews or wastewater generated directly from construction-related activities. Construction activities also require water supplies for construction workers onsite, manufacture and curing of concrete and mortar, testing for waterproofing, cleaning, dust control, and other activities. Construction activities could temporarily increase the volume of solid waste (e.g., soil, vegetative material, construction debris) disposed of at landfills. Construction activities also could temporarily disrupt existing electric and natural gas utilities and telecommunication lines and damage utility poles or snag suspended utility lines. Projects listed in Table 7.23-1 that contemplate construction could add to these impacts, increasing their magnitude, duration, and/or frequency, resulting in significant cumulative impacts on utilities and service systems.

Habitat Restoration and Other Ecosystem Projects undertaken pursuant to the Plan amendments could include dam removal projects that could affect public utilities if water pipelines or electrical transmission lines cross the dam or reservoir or through the loss of a source of hydropower. Dam removal would generate substantial volumes of solid waste, including excavated material and demolition debris (e.g., concrete, treated wood, other waste), that would require landfill disposal. Flood Control Projects and Habitat Restoration Projects listed in Table 7.23-1 could have similar features and/or lead to similar dam removal projects. The utilities and service systems impacts of these features, taken together with those of features associated with the Plan amendments, could cause significant cumulative impacts.

New or Modified Facilities constructed in response to the Plan amendments could include expansion of existing reservoirs through dredging, which may result in dredged material that cannot be reused for beneficial purposes and thus would require disposal at an appropriate landfill facility. New reservoirs and points of diversion also would require State Water Board approval of a new water

right or a change to an existing right. 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 GSP. Groundwater storage and recovery of surface water would capture a new supply that generally is not subject to existing entitlements; therefore, new entitlement could be required in the form of water right permits from the State 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 GSP, depending on the location. FERC Projects, Water Supply Projects, and Water Quality Projects listed in Table 7.23-1 could have similar features and impacts. These impacts, taken together with those of projects and features associated with the Plan amendments, could cause significant cumulative impacts.

Implementation of the mitigation measures identified in Sections A1.4.12, Utilities and Service Systems, A1.5.15, Utilities and Service Systems, and A1.6.15, Utilities and Service Systems, above would reduce or avoid the Plan amendments' contribution to cumulative utilities and service systems impacts. Even with the identified mitigation, the cumulative impact may be significant, because the mitigation may not fully mitigate the Plan amendments' contribution to the impact in all situations and there are no other feasible mitigation measures at this time. Unless and until the mitigation is implemented, and due to the uncertainty regarding the efficacy of those measures that are in the State Water Board's control, this cumulative impact remains significant and unavoidable and the Plan amendments' contribution is cumulatively considerable.

## **A1.8 Alternatives Findings**

The State Water Board must make findings with respect to the alternatives considered in the Staff Report, evaluating whether these alternatives could feasibly avoid or substantially lessen the unavoidable significant effects. The State Water Board, having reviewed and considered the information contained in the Staff Report and in accordance with Public Resources Code section 21081 and State CEQA Guidelines section 15091(a)(3), finds alternatives with fewer significant environmental impacts than the Plan amendments are infeasible. "Specific economic, legal, social, technological, or other considerations" can make an alternative infeasible. (Ibid.) Other considerations include not meeting a project's purposes and goals, as well as policy considerations.

### **A1.8.1 Alternatives Incorporated into the Project**

The Plan amendments are comprised of elements from the range of alternatives evaluated in the 2023 draft Staff Report. Chapter 7, Environmental Analysis, describes and evaluates the "proposed Plan amendments," which included inflows from the Sacramento River, its tributaries, and Delta eastside tributaries (the Cosumnes, Mokelumne, and Calaveras Rivers) of 55 percent unimpaired flow, with an adaptive range from 45 percent to 65 percent unimpaired flow, cold water habitat provisions for reservoirs to be operated in a manner that provides needed cold water habitat for salmonids and other measures to protect cold water, inflow-based Delta outflows, interior Delta flow measures, and monitoring, reporting, and other general provisions. The 2023 draft Staff Report did not identify a preferred proposal for moving forward with the update to the Bay-Delta Plan, and all alternatives and variations described in the 2023 draft Staff Report were available for consideration and possible adoption during the public planning process; the proposed Plan amendments were one among several proposals. To that end, the 2023 draft Staff Report also

evaluated several additional alternatives, including both stand-alone alternatives and modular alternatives that could be layered onto the stand-alone alternatives.

In addition to the proposed Plan amendments, the stand-alone alternatives include the No Project Alternative (Alternative 1), the Low Flow Alternative (Alternative 2), the High Flow Alternative (Alternative 3), and the Proposed Voluntary Agreements Alternative (Alternative 6). The modular alternatives include modular alternatives for interior flows and fall Delta outflow (Alternatives 4a, 4b, and 4c), modular drought alternatives (Alternatives 5a and 5b), and a modular alternative for the Protection of Voluntary Agreements Flows (Alternative 6a).

In December 2025, the State Water Board released a revised draft of updates to the Bay-Delta Plan and a new Chapter 13, Revised Proposed Plan Amendments, for public review and comment. As described in Chapter 13, the Plan amendments combine several of the previously evaluated alternatives and bring together in the Bay-Delta Plan program of implementation a VA pathway and a regulatory pathway. The regulatory pathway is built from a combination of the original proposed Plan amendments, the Low Flow Alternative (Alternative 2), and the modular Exclusion of Interior Delta Flow and Fall Delta Outflow Related Amendments Alternative (Alternative 4a). The VA pathway is built from a combination of the VA Alternative (Alternative 6) and a variation of the modular Protection of Voluntary Agreement Flows Alternative (Alternative 6a).

Under the starting point for the regulatory pathway, changes in hydrology and supply would generally be smaller and more similar to the Low Flow Alternative due to the addition of new water supply adjustments that reduce water supply impacts and allow more water to be stored in reservoirs at the outset of Plan implementation. Water supply adjustments can be modified after initial implementation and flows could be higher in the range of percent of unimpaired flow in the future on some or all tributaries. In addition, the regulatory pathway excludes new numeric components of the interior Delta flow objectives and fall Delta outflow requirements consistent with modular Alternative 4a. The Plan amendments also include the VA pathway as an implementation pathway for HRL commitments that apply to the HRL water rights identified in Appendix B.1 of the Bay-Delta Plan. The VA pathway is similar to the December 2025 version, with the inclusion of additional provisions for protection of the base flows to which HRL flows are intended to be additive and other changes.

## **A1.8.2 High Flow Alternative**

The High Flow Alternative is similar to the Plan amendments in that it would establish new and modified objectives and implementation measures for the protection of fish and wildlife for: (1) inflows for the Sacramento/Delta tributaries; (2) cold water habitat; (3) Delta outflows; (4) interior Delta flows (flow and water project operational requirements); and (5) other monitoring, special studies, and other associated provisions. However, under the High Flow Alternative, the new numeric inflow objective for the Sacramento/Delta tributaries would require between 65 and 75 percent unimpaired flow. This differs from the numeric inflow objective under the “proposed Plan amendments” evaluated in Staff Report Chapter 7, Environmental Analysis, which would require 55 percent unimpaired flow with an adaptive range from 45 to 65 percent unimpaired flow. The numeric inflow objective and Delta outflow objective under the High Flow Alternative would require a larger amount of inflow to the Delta, and required Delta outflows would be greater than those under the proposed Plan amendments.

The High Flow Alternative would benefit native aquatic and aquatic-dependent species, aquatic and riparian habitats and natural communities, and ecosystem functions in the Sacramento/Delta watershed. In addition, the High Flow Alternative would provide water quality benefits, particularly during periods when streamflows increase compared with baseline conditions. A number of beneficial environmental effects would result from changes in hydrology identified in Table F-3 in Appendix F, Impact Summary Tables for Alternatives 1, 2, and 3. However, these beneficial environmental effects would be limited due to significant challenges in maintaining suitable water temperatures for native cold water species such as Chinook salmon and steelhead on regulated tributaries. There would be similar challenges in maintaining carryover storage needed to maintain water quality during dry periods. In addition, the High Flow Alternative would result in large changes in Sacramento/Delta water supply, including significant reductions to agricultural and municipal uses. Because changes in Sacramento/Delta surface water supply would be larger under the High Flow Alternative, impacts associated with responses actions to reduced supply would be more likely and potentially larger in magnitude, including lower groundwater levels, other water management actions and new and modified facilities. The High Flow Alternative would not reduce environmental impacts compared to the Plan amendments. Instead, the High Flow Alternative would have more significant water supply and related impacts. Moreover, the State Water Board is required to take into consideration all of the demands on waters in the Sacramento/Delta and the factors in Water Code section 13241 including, past, present, and probable future beneficial uses and economic considerations. The High Flow Alternative does not include provisions that adequately account for these considerations. For these reasons, the High Flow Alternative is not feasible.

### **A1.8.3 Modular Alternatives for Interior Flows/Fall Delta Outflow**

Alternative 4 includes modular alternatives that could modify the interior Delta flow and fall Delta outflow provisions of the proposed Plan amendments or the other flow alternatives.

Alternative 4a (Exclusion of Interior Delta Flow and Fall Delta Outflow Related Amendments) would exclude new interior Delta flow and fall Delta outflow components of the flow alternatives, and has been incorporated by the project as described above.

Alternative 4b (Head of Old River Barrier [HORB] Alternative) would require DWR and Reclamation to install and operate a barrier at the head of Old River for an interim period (10 years) to increase survival of outmigrating juvenile salmonids and in the fall to enhance adult migration. This modular alternative would not reduce impacts associated with changes in hydrology and supply; however, it could reduce the impacts of CVP and SWP operations on the survival of migrating San Joaquin River salmonids by blocking flows and fish from entering Old River and moving toward the CVP and SWP export facilities and poor habitats in the southern Delta. However, when HORB is in place, the force of CVP and SWP export operations is redirected from the head of Old River to Turner and Columbia cuts, which increases the effect of CVP and SWP export operations at these locations and the magnitude of OMR reverse flows, and therefore may increase water supply costs to meet OMR reverse flow requirements or cause more negative OMR reverse flows which could to some degree increase the entrainment risk for Delta smelt, longfin smelt, and migrating salmonids in the east and Central Delta. In addition, Alternative 4b could result in construction impacts identified in Section 7.22. and would require associated monitoring and experimental studies to further assess its effectiveness. This alternative could help to meet project purposes and goals by improving juvenile

fish survival, but it could also increase project impacts associated with reduced water supply in order to meet OMR requirements with the HORB in place. Therefore, this modular alternative is determined to be infeasible at this time. The Bay-Delta Monitoring and Evaluation Program includes a special study to assess the possible use of barriers at the Head of Old River to protect outmigrating LSJR salmonids from impacts of SWP and CVP export operations. The special study will investigate the effects and causal mechanisms of different possible barrier designs and operations on the survival of LSJR salmonids migrating through the Delta and will be required to be completed by the first periodic review of the current Plan amendments.

Alternative 4c (Extended Export Constraint Alternative) would expand and extend existing San Joaquin River flow-based export constraints to provide for improved protection of migrating San Joaquin River salmonids and other native species. Under the current Bay-Delta Plan, exports are limited to 100 percent of the flow of the San Joaquin River at Vernalis or 1,500 cubic feet per second, whichever is larger, during the San Joaquin River 31-day pulse flow period of roughly April 15 through May 15 of each year. Alternative 4c would expand this to cover the entire San Joaquin River spring and spring pulse flow period of February through June, which would increase Delta outflow. While changes in Delta interior flows and reduced Delta exports would generally benefit native anadromous and estuarine fish, this alternative could also increase residence time of water in interior Delta channels under some conditions, which could affect HAB production and increase the presence of invasive aquatic vegetation at times. This alternative could also result in reduced water supply for agricultural and municipal uses and increase associated water supply impacts primarily in areas receiving Sacramento/Delta water supplies that are exported from the Delta to the San Francisco Bay Area, Central Coast, San Joaquin Valley, and southern California. Overall, this alternative would result in significant additional water supply impacts; therefore, this modular alternative is infeasible.

#### **A1.8.4 Modular Alternatives for Drought**

Alternatives 5a and 5b, the modular drought alternatives, include two possible implementation provisions that could be applied as part of the Plan amendments during dry periods, such as declared drought emergencies, to address limited water supplies for meeting existing flow-based water quality objectives and related requirements, including instream flows, cold water habitat, and salinity control. Pursuant to State Water Board Decision 1641 (D-1641), DWR's water rights for the SWP and Reclamation's water rights for the CVP are conditioned on meeting Delta flow-dependent water quality objectives included in the Bay-Delta Plan. At times, DWR and Reclamation meet the flow and water quality objectives by bypassing flows and releasing previously stored water, or reducing Delta diversions. When natural and abandoned flows are inadequate to meet Delta flow and water quality requirements, diversions by other water users can also result in the need for the Projects to release previously stored water to meet water quality requirements. During drought conditions, these quantities of water can be significant and can deplete reservoir storage supplies needed for multiple purposes, including meeting water quality and temperature requirements later in the same year or in following years. Both modular alternatives for drought would expand the number of diverters obligated to meet the existing flow requirements for the 1995 Bay-Delta Plan objectives.

Alternative 5a (Instream Flow Protection Provision) would build upon recent drought-related curtailments under emergency regulations that required water right holders to curtail their water diversions when no water was available at their priority of right in order to meet existing Bay-Delta

Plan objectives, similar to existing standard water right Term 91. Alternative 5b (Shared Water Shortage Provision) would require all water users in the Sacramento/Delta watershed to conserve water during times of drought by reducing their consumptive use of water by a specific percentage (e.g., 20 percent) in order to contribute toward meeting the existing Bay-Delta Plan objectives.

Both modular alternatives 5a and 5b would be expected to benefit native fish and wildlife during specified drought conditions by requiring that all water right holders and claimants contribute to meeting Delta flow-dependent water quality objectives, which would be expected to reduce the use of Temporary Urgency Change Petitions (TUCPs) and associated impacts to fish and wildlife.

These modular alternatives could result in higher or lower reservoir levels in different locations and reduced water supply could occur at different times and for different water users under Modular Alternative 5a or 5b. However, the types of impacts and significance determinations would remain similar to those previously analyzed.

Modular Alternatives 5a and 5b would not reduce or avoid the project's significant environmental impacts. The Bay-Delta Plan will undergo annual and periodic reviews to assess and report on progress on implementation by the State Water Board and other entities with responsibility for implementation actions, including the Plan's effectiveness in protecting fish and wildlife beneficial uses, which may include reducing or eliminating TUCPs. The State Water Board could consider additional drought provisions, including Modular Alternatives 5a and 5b in a future Bay-Delta Plan update.

## **A1.8.5 No Project Alternative**

The No Project Alternative assumes the continued implementation of the State Water Board's 2006 Bay-Delta Plan, as implemented by State Water Board Decision 1641 (D-1641) (revised March 15, 2000). The No Project Alternative conditions differ from the existing conditions baseline because existing flows in the Sacramento/Delta watershed, including baseline Delta inflows and outflows, are generally substantially higher than the minimum flows required under D-1641 and other regulatory requirements. Under the No Project Alternative, it is expected that inflows and outflows would decrease over time due to continuation of increasing water demands. This is based on observed historical conditions in the absence of instream flow protections.

Multiple environmental impacts, including impacts associated with reduced water supplies, would be less or would not occur under the No Project Alternative compared with the Plan amendments. However, the No Project Alternative is not feasible because it would not result in beneficial environmental effects and would not satisfy the project purposes and goals, including providing reasonable protection of fish and wildlife beneficial uses. As discussed in the Staff Report, implementation of the 2006 Bay-Delta Plan has not been adequate to protect fish and wildlife throughout the watershed and throughout the year. Staff Report Chapter 3, Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations, discusses that native species in the Bay-Delta ecosystem are experiencing an ecological crisis. For decades, valuable habitat has been disconnected and converted to farmland and urban uses, the quality of water in the channels has been degraded, there has been substantial overall reductions in flows and significant changes in the timing and distribution of those flows, and species have been cut off from natal waters. This has led to severe declines, and in some cases extinctions, of native fish and other aquatic species. Under the No Project Alternative, ecological conditions are expected to continue to degrade, and populations of native fish and other aquatic species are expected to continue to decline.

## A1.9 Statement of Overriding Considerations

CEQA prohibits an agency from approving a project that will have significant, unavoidable environmental impacts unless the agency adopts a statement describing the specific benefits provided by the project that will outweigh its expected unavoidable significant impacts on the environment. (Cal. Code Regs., tit. 14, § 15092, subd. (b).) CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable significant environmental risks when determining whether to approve the project. If a project's benefits outweigh the unavoidable adverse environmental effects, those effects may be considered "acceptable." (Cal. Code Regs., tit. 14, § 15093.) This "statement of overriding considerations" must be supported by substantial evidence (Id.).

The State Water Board recognizes that the Plan amendments would have significant unavoidable impacts on the environment, as addressed in the Staff Report and identified above in the Findings section of this document. The specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of the Plan amendments outweigh the unavoidable significant environmental impacts of the Plan amendments as follows.

The purpose and goals of the project are described in Staff Report Section 7.1.3, Purpose and Goals of the Sacramento/Delta Update to the Bay-Delta Plan. The underlying fundamental purpose of the project is to establish water quality objectives, a program of implementation, and monitoring and special study measures for the reasonable protection of fish and wildlife beneficial uses in the Sacramento/Delta. The regulatory pathway would meet these purposes and goals by providing an interconnected flow regime from upstream natal Sacramento/Delta tributaries, through the Delta, and out to the ocean, along with giving recommendations to other entities for habitat restoration and other actions to improve ecosystem functions. The requirements would provide for the frequency, timing, magnitude, and duration of flows that supports functions and processes for the protection of native fishes and would also provide for local cooperative solutions that can provide for better outcomes with lower water supply costs. The requirements also provide for monitoring and special studies measures to inform decision-making. The requirements were designed to provide transparency in decision-making to the regulated community, tribal nations, environmental justice communities, and other stakeholders.

The starting point for the inflow requirements under the regulatory pathway of the Plan amendments includes water supply adjustments that would apply to water rights existing as of 2025. As described in Staff Report Section 13.3, Revised Proposed Plan Amendments, the water supply adjustments provide for lowering the required percent of unimpaired flow during all but the wettest hydrologic conditions down to 45 or 35 percent of unimpaired flow, with additional tributary-specific water supply adjustments for three rainfall and municipal supply dominated tributaries (the Mokelumne and Calaveras Rivers and Putah Creek). While the flow-abundance relationships presented in Staff Report Chapter 3, Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations, and Section 13.5, Beneficial Environmental Effects, indicate that the population abundance indices of key indicator species of ecosystem health would be expected to be greater at 55 percent of unimpaired flow without the adjustments (see Chapter 3), requiring that flow and including water supply adjustments would also be expected to provide benefits to native fish species, including increases in abundance indices and frequency of exceeding ecological flow thresholds (see Section 13.5). In addition, the water supply adjustments are designed to reduce

water supply impacts and allow more water to be stored in reservoirs on initial implementation which would be expected to assist with maintaining cold water supplies for temperature protection of native cold water fish species. The revised proposed Plan amendments include the possibility of moving up in the range of unimpaired flow under certain conditions and the potential for modifying or removing the water supply adjustments in the future, which could provide additional ecological benefits.

Similar to what is described in Staff Report Section 9.7.23, Ability to Achieve Project Purpose and Goals, the VA pathway provides flow and habitat restoration commitments in the Sacramento/Delta that are intended to provide improved tributary and in-Delta habitat conditions, improved migratory conditions, and increased floodplain inundation, which would promote habitat conditions that favor native fishes over nonnative fishes. The VA pathway provides flexibility for establishing beneficial habitat conditions for native fishes, addressing scientific uncertainty and changing conditions, and developing scientific information that will inform future management of flows. The VA pathway includes monitoring and evaluation provisions to inform adaptive management of flows and future changes to the Plan. As described in Staff Report Section 13.5, the VA pathway would be expected to provide ecological benefits in the form of increases in the area of different habitat types (spawning, rearing, floodplain), increased food production and other habitat improvements and some increases in abundance indices of key indicator species under certain hydrologic conditions.

The revised proposed Plan amendments provide for a range of contingencies with the ability to pivot and adjust in response to new information and changed circumstances. The revised proposed Plan amendments, including both the VA pathway and the regulatory pathway as a backstop to the VA pathway that would apply to the HRL water rights in the event the VA pathway is discontinued, provides an approach that considers all of the demands being made and to be made on waters in the Sacramento/Delta and the factors to be considered for establishing water quality objectives in Water Code section 13241. These factors include, but are not limited to, past, present, and probable future beneficial uses and economic considerations. Annual and periodic reviews provide the opportunity to assess and report on progress on implementation of the Bay-Delta Plan and any needed changes to the Plan or its implementation to provide for the reasonable protection of beneficial uses.