

Long-Term Operation – Draft Environmental Impact Statement

Appendix V – Hazards and Hazardous Materials Technical Appendix

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Acronyms and Abbreviations

CAL FIRE	California Department of Forestry and Fire Prevention
CHAB	cyanobacteria harmful algal bloom
CVP	Central Valley Project
Delta	Sacramento–San Joaquin Delta
DWR	California Department of Water Resources
FHSZ	Fire Hazard Severity Zone
NPDES	National Pollutant Discharge Elimination System
SWP	State Water Project

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Appendix V Hazards and Hazardous Materials Technical Appendix

V.1 Background Information

This appendix presents an overview of the potential hazards that may affect the public and environment due to implementation of the No Action and action alternatives.

V.1.1 Wildfires

In general, wildfire is a serious hazard in undeveloped areas with extensive areas of nonirrigated vegetation. Complex terrain, Mediterranean climate, productive natural plant communities, and ample natural and aboriginal ignition sources make California a complex wildfire-prone and fire-adapted landscape. While natural wildfires support ecosystem health and are critical to maintaining the structure and function of ecosystems, wildfires pose a significant threat to life, public health, infrastructure, properties, and natural resources.

Wildfires in California are becoming more frequent, larger, and more severe, and this trend is likely to continue with future climate change (California Department of Forestry and Fire Protection 2018; California Air Resources Board 2024). The warming climate has created conditions that raise the risk of fires. In approximately the last 75 years, the area burned by wildfires in the state has been increasing with warmer spring and summer temperatures and earlier spring snowmelt (California Air Resources Board 2024).

Human activity is the primary cause of wildfire ignitions. From 2010 to 2020, approximately 86% of wildfires in California were caused by humans; the remaining 14% resulted from lightning strikes (U.S. Department of Agriculture and U.S. Forest Service 2024). Of the human-caused wildfires during that period, the specific cause of ignition for the majority (approximately 30%) was unknown. The second and third most common ignition causes were attributed to equipment and vehicle use (approximately 18%) and debris and open burning (approximately 16%), respectively (U.S. Department of Agriculture and U.S. Forest Service 2024).

Statewide, the wildland urban interface, areas where homes are built near or among lands susceptible to wildland fires (International Association of Fire Chiefs 2019), spans nearly 18 million acres. This includes 1.3 million acres of Intermix class areas (sparsely developed areas interspersed with areas with wildland characteristics) (California Department of Forestry and Fire Protection 2018); 1 million acres of Interface class areas (dense urban development adjacent to wildland) (California Department of Forestry and Fire Protection 2018); and an approximate 15 million acre *influence zone*, which is the 1.5-mile area around Interface and Intermix classes that has fuels to influence those two class areas (California Department of Forestry and Fire Protection 2018).

In California, lands for which the state has financial responsibility for wildland fire protection are designated as State Responsibility Areas, and the California Department of Forestry and Fire

Prevention (CAL FIRE) is the primary emergency response agency responsible for fire prevention and suppression in these areas. State Responsibility Areas are defined based on land ownership, land use, and population density (California Department of Forestry and Fire Protection 2023a). Areas of the state designated as Local Responsibility Areas are lands for which cities and/or counties, or districts have financial responsibility for preventing and suppressing fires (California Residential Code 2022 § R337.2). First responders in Local Responsibility Areas are typically the local fire districts. The U.S. Forest Service provides wildfire protection both independently and cooperatively with the California Department of Forestry and Fire Protection. In addition, the U.S. Department of the Interior National Park Service and Bureau of Land Management provide resource management and fire protection on portions of federal lands.

In accordance with Public Resources Code Sections 4201–4204 and Government Code Sections 51175–51189, CAL FIRE has mapped areas or zones of significant fire hazards in State Responsibility Areas based on fuels, terrain, weather, and other relevant factors. The zones are referred to as Fire Hazard Severity Zones (FHSZs) and represent the risks associated with wildland fires. FHSZs are classified as *Moderate*, *High*, and *Very High* hazard, and the classification is based on the physical conditions that “create a likelihood and expected fire behavior over a 30- to 50-year period without considering mitigation measures” (e.g., fuel reduction, recent wildfire) (California Department of Forestry and Fire Protection 2023b). Under CAL FIRE regulations, areas within a Very High FHSZ must comply with specific building and vegetation requirements intended to reduce property damage and loss of life within these areas. Most of the Very High and High FHSZs in California are located in the Coast Ranges and the Sierra Nevada foothills with scattered areas of mostly Very High FHSZs in southern part of the state (California Department of Forestry and Fire Protection 2023c).

Reservoirs that store water in the Sacramento–San Joaquin Delta (Delta) and Central Valley Project (CVP) and State Water Project (SWP) export areas are managed to store water supplies as part of short-term conveyance management or storage for regional and local water supplies using water from numerous sources. Stored water in water supply reservoirs, including water stored in CVP and SWP reservoirs, may be used for fighting wildfires in the California foothills and mountains. Firefighting actions in wildland areas frequently involve helicopter transport of water from reservoirs located close to wildfires, including reservoirs owned by the United States Department of the Interior, Bureau of Reclamation and the California Department of Water Resources. Helicopters may also fill their buckets and tanks with water from lakes, ponds and swimming pools (Ting 2021). Wildfires are also managed by applying chemical fire retardants and fire suppressants, controlled or prescribed burning, pumping water from lakes or streams, and placement of containment lines, which are physical barriers that can help inhibit embers from spreading (Brooks 2018). Containment lines can be natural barriers such as rivers or can be created by bulldozers by clearing vegetation to create areas of bare soil (Brooks 2018).

V.1.2 Potential Hazards and Hazardous Materials in the Study Area

Within the study area, which for the purposes of this analysis includes the Trinity River region, Sacramento Valley, San Joaquin Valley, and the Bay-Delta region (i.e., the Delta and Suisun Marsh), there are naturally occurring as well as human-related hazards, including hazardous materials and waste from agricultural, urban and industrial land uses, electrical transmission

infrastructure, oil and gas wells, and pipelines. Historical agricultural, industrial, and urban activities have resulted in the presence of hazardous materials in soils, sediments, and groundwater. Current activities in the study area introduce hazardous materials (e.g., pesticides, fertilizers, industrial waste) and potential hazards (e.g., creating conditions for the spread of vector-borne diseases from mosquitos (e.g., seasonal wetlands). Some surface water bodies within the study area (e.g., lakes and reservoirs) have the potential to grow cyanobacteria harmful algal blooms (CHABs) at certain times of year. The potential for CHABs and mosquitos to affect human health is discussed in Appendix X, *Public Health and Safety Technical Appendix*. (California Department of Water Resources and U.S. Bureau of Reclamation 2023).

V.2 Evaluation of Alternatives

This section describes the technical background for the evaluation of environmental consequences associated with the action alternatives and the No Action Alternative.

V.2.1 Methods and Tools

The impact assessment considers changes in potential hazards related to changes in CVP and SWP operations under the alternatives as compared with the No Action Alternative. This section details methods and tools used to evaluate those effects. Specifically, this qualitative analysis considers whether the action alternatives may expose people or structures, either directly or indirectly, to a substantial risk of loss, injury, or death involving wildfires or increase the potential for creating a public or environmental hazard through the use or accidental release of hazardous materials.

It should be noted that Alternative 2 consists of four phases that could be utilized under its implementation. All four phases are considered in the assessment of Alternative 2 to bracket the range of potential impacts.

V.2.2 No Action Alternative

Under the No Action Alternative, Reclamation would continue with current operation of the CVP, as described in the 2020 Record of Decision and subject to the 2019 Biological Opinions. The 2020 Record of Decision for the CVP and the 2020 Incidental Take Permit for the SWP represent current management direction or intensity pursuant to 43 CFR § 46.30.

Although the No Action Alternative included habitat restoration projects at a programmatic level, the 2020 ROD did not provide environmental coverage for these projects, and all of the habitat projects considered under the No Action required or will require additional environmental documentation. Thus, ground disturbance for habitat restoration projects did not materialize as a result of implementing the No Action Alternative. For the purpose of the analysis, these habitat restoration projects are considered independent projects that will be considered under cumulative effects.

The No Action Alternative is based on 2040 conditions. Changes that would occur over that time frame without implementation of the action alternatives are not analyzed in this technical

appendix. However, the changes to hazards and hazardous materials that are assumed to occur by 2040 under the No Action Alternative are summarized in this section.

Conditions in 2040 would be different than existing conditions because of the following factors:

- Climate change and sea-level rise
- General plan development throughout California, including increased water demands in portions of the Sacramento Valley

Adverse effects on people or structures due to wildfires could occur under the No Action Alternative. Very High and High FHSZs are located throughout California. Construction under the No Action Alternative (e.g., raising the Shasta Dam) increases these wildland fire risks depending on the proximity of construction to FHSZs. Construction activities implemented as part of general plan buildout and water supply projects could involve the use of heavy equipment and entail activities that have the potential to ignite wildfires (e.g., welding, soldering, grinding, use of flammable and combustible materials), particularly in non-urbanized areas and at wildland-urban interfaces. Increase in human presence in a wildland-urban interface also has the potential to increase fire risks (e.g., smoking, handling of combustible chemicals). The potential for adverse effects related to wildfires, however, would likely be the same as under existing conditions because projects would generally occur in the same geographic area and present a similar risk. In the future, higher temperatures and drier conditions due to climate change are likely to increase the number and intensity of wildfires. Wildfire risks are typically assessed during project environmental review, and projects would be required to comply with all pertinent fire prevention laws and regulations to avoid exposing people or structures to impacts from wildfires.

Stored water in water supply reservoirs is used for fighting wildfires in the California foothills and mountains, including water stored in CVP and SWP reservoirs. Water elevations in reservoirs under the No Action Alternative would maintain their current patterns of seasonal variation and fluctuation. By the end of September, the surface water elevations at CVP reservoirs generally decline. It is anticipated that climate change would result in more short-duration high-rainfall events and less snowpack in the winter and early spring months. The reservoirs would be full more frequently by the end of April or May by 2040 than in recent historical conditions. However, as the water is released in the spring, there would be less snowpack to refill the reservoirs. This condition would reduce reservoir storage. Reservoir water levels are also generally lower in dry water years. Should dry years become more common or get worse relative to existing conditions, reservoir storage levels could be lower during wildfire season (generally summer through early fall). However, it is unlikely that lower reservoir storage would entirely prevent access to reservoir water for fighting wildfires. Further, there are multiple methods that are used to suppress wildfires aside from drawing water from reservoirs via helicopter, particularly to create defensible areas at the wildland urban interface (see Section V.1.1, *Wildfires*). Therefore, implementation of the No Action Alternative would not substantially impair the ability to fight wildfires in the study area relative to existing conditions and therefore people or structures would not be exposed to a substantial risk of loss, injury or death involving wildfires.

The No Action Alternative would also rely upon increased use of Livingston-Stone National Fish Hatchery during droughts to increase production of winter-run Chinook salmon. However, this component requires no physical changes to the facility and would have no adverse effect related to hazards or hazardous materials.

V.2.3 Alternative 1

V.2.3.1 Expose People or Structures to a Substantial Risk of Loss, Injury or Death Involving Wildfires

As discussed in Appendix S, *Recreation Technical Appendix*, reservoir levels in the study area under the Alternative 1 would not be substantially different from the No Action Alternative. Further, given that most of the study area, specifically the Sacramento and San Joaquin Valleys, is outside of an area designated as a Very High or High FHSV, and given that there are multiple methods that are used in suppressing wildfires aside from drawing water from reservoirs via helicopter, including fire retardants and suppressants and containment lines, implementation of Alternative 1 would not substantially impair the ability to fight wildfires. Therefore, relative to the No Action Alternative, there would be no adverse effects on people or structures related to wildfire under Alternative 1.

V.2.3.2 Increase the Potential for Creating a Public or Environmental Hazard through the Use or Accidental Release of Hazardous Materials

Typically, impacts related to hazards and hazardous materials are predominantly related to construction activities (e.g., inadvertent chemical spills related to use of heavy construction equipment, wildfire resulting from spark(s) from use of construction equipment, physical interference with implementation of an emergency response plan or emergency evacuation plan due to traffic resulting from construction). There would not be new construction under Alternative 1.

Mechanical and chemical aquatic weed removal and algae treatments would be implemented on an as-needed basis at Clifton Court Forebay. Chemical weed control and algae treatments would involve the use of toxic herbicides, as described in Appendix E, *Draft Alternatives*. These chemicals, if not handled or applied in a manner consistent with product labeling, could be hazardous to those applying the herbicide or those in close proximity. In addition, inadvertent spills into the forebay or over-application of herbicides could result in an adverse water quality effect. The application of herbicides and algaecides at Clifton Court Forebay requires coverage under the *Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications* (General Pesticide Permit; NPDES No. CAG990005; Water Quality Order No. 2013-0002-DWQ, as amended by Orders 2014-0078-DWQ, 2015-0029-DWQ, 2016-0073-EXEC, 2017-0015-EXEC, AND 2020-0037-EXEC) (State Water Resources Control Board 2022). To obtain coverage under the General Pesticide Permit, the applicant must submit an Aquatic Pesticides Application Plan that includes best management practices for applying herbicides at an appropriate rate, preventing spill, coordinating with water diverters so that beneficial uses of water are not impacted, and other measures. Aquatic weed and algae control at Clifton Court Forebay under Alternative 1 would be the same as under the No Action Alternative.

Implementation of Alternative 1 would not result in hazards or hazardous materials impacts as the result of operation- or maintenance-related activities. Relative to the No Action Alternative, Alternative 1 would not entail operational or facility maintenance changes related to the transport, use, or disposal of hazardous materials.

V.2.4 Alternative 2

V.2.4.1 Expose People or Structures to a Substantial Risk of Loss, Injury or Death Involving Wildfires

For the same reasons described for Alternative 1 (most of the study area, specifically the Sacramento and San Joaquin Valleys, is outside of an area designated as a Very High or High FHSV, and there are multiple methods that are used in suppressing wildfires aside from drawing water from reservoirs via helicopter, including fire retardants and suppressants and containment lines), there would be no adverse effects related to wildfires under Alternative 2 relative to the No Action Alternative.

V.2.4.2 Increase the Potential for Creating a Public or Environmental Hazard through the Use or Accidental Release of Hazardous Materials

For the same reasons described for Alternative 1 (there would be no new construction, and herbicides would be applied consistent with regulatory requirements), there would be no adverse effects related to hazards or hazardous materials under Alternative 2 due to operation and maintenance of facilities or chemical aquatic weed removal and algae treatments in Clifton Court Forebay relative to the No Action Alternative.

V.2.5 Alternative 3

V.2.5.1 Expose People or Structures to a Substantial Risk of Loss, Injury, or Death Involving Wildfires

For the same reasons described for Alternative 1 (most of the study area, specifically the Sacramento and San Joaquin Valleys, is outside of an area designated as a Very High or High FHSV, and there are multiple methods that are used in suppressing wildfires aside from drawing water from reservoirs via helicopter, including fire retardants and suppressants and containment lines), there would be no adverse effects related to wildfires under Alternative 3 relative to the No Action Alternative.

V.2.5.2 Increase the Potential for Creating a Public or Environmental Hazard through the Use or Accidental Release of Hazardous Materials

For the same reasons described for Alternative 1 (there would be no new construction, and herbicides would be applied consistent with regulatory requirements), there would be no adverse effects related to hazards or hazardous materials under Alternative 3 due to operation and maintenance of facilities or chemical aquatic weed removal and algae treatments in Clifton Court Forebay relative to the No Action Alternative.

V.2.6 Alternative 4

V.2.6.1 *Expose People or Structures to a Substantial Risk of Loss, Injury, or Death Involving Wildfires*

For the same reasons described for Alternative 1 (most of the study area, specifically the Sacramento and San Joaquin Valleys, is outside of an area designated as a Very High or High FHSV, and there are multiple methods that are used in suppressing wildfires aside from drawing water from reservoirs via helicopter, including fire retardants and suppressants and containment lines), there would be no adverse effects related to wildfires under Alternative 4 relative to the No Action Alternative.

V.2.6.2 *Increase the Potential for Creating a Public or Environmental Hazard through the Use or Accidental Release of Hazardous Materials*

For the same reasons described for Alternative 1 (there would be no new construction, and herbicides would be applied consistent with regulatory requirements), there would be no adverse effects related to hazards or hazardous materials under Alternative 4 due to operation and maintenance of facilities or chemical aquatic weed removal and algae treatments in Clifton Court Forebay relative to the No Action Alternative.

V.2.7 Mitigation Measures

Because there would be no adverse effects under Alternatives 1, 2, 3, or 4, no avoidance and minimization measures or mitigation measures are identified.

V.2.8 Summary of Impacts

Table V-1 includes a summary of impacts, the magnitude and direction of those impacts, and potential mitigation measures for consideration.

Table V-1. Impact Summary

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
Expose people or structures to a substantial risk of loss, injury or death involving wildfires	No Action	No potential increase for wildfire hazards.	–
	Alternative 1	No potential impact compared to the No Action Alternative	–
	Alternative 2	No potential impact compared to the No Action Alternative	–
	Alternative 3	No potential impact compared to the No Action Alternative	–
	Alternative 4	No potential impact compared to the No Action Alternative	–
Increase the potential for creating a public or environmental hazard through the use or accidental	No Action	No potential increase for accidental release of hazardous materials.	–
	Alternative 1	No potential impact compared to the No Action Alternative	–

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
release of hazardous materials	Alternative 2	No potential impact compared to the No Action Alternative	–
	Alternative 3	No potential impact compared to the No Action Alternative	–
	Alternative 4	No potential impact compared to the No Action Alternative	–

V.2.9 Cumulative Impacts

Past, present, and reasonably foreseeable projects, described in Appendix Y, Cumulative Impacts Technical Appendix, may have cumulative effects on hazards, to the extent that people or structures are exposed to a substantial risk of loss, injury, or death involving wildfires or there is an increase in the potential for creating a public or environmental hazard through the use or accidental release of hazardous materials.

Past and present actions contribute to the existing condition of the affected environment in the project area while reasonably foreseeable actions are those that are likely to occur in the future that are not speculative. Past, present, and reasonably foreseeable projects include actions to develop water storage capacity, water conveyance infrastructure, water recycling capacity, the reoperation of existing water supply infrastructure, including surface water reservoirs and conveyance infrastructure, and habitat restoration actions. The projects identified in Appendix Y that have the most potential to contribute to cumulative impact on hazards are:

- B.F. Sisk Dam Raise and Reservoir Expansion Project
- Sites Reservoir
- Pacheco Reservoir/San Luis Low Point Improvement Project
- Bay-Delta Water Quality Control Plan Update
- Los Vaqueros Reservoir Expansion

The No Action Alternative would continue with the current operation of the CVP and is not expected to result in changes to wildfire hazard risks and use and accidental release of hazardous materials during operation of the CVP which was described and considered in the 2020 Record of Decision.

As indicated in Section V.1.1, *Wildfires*, wildfires in California are becoming more frequent, larger, and more severe, and this trend is likely to continue given the exacerbating influence of climate change on wildfires. Actions implemented under the No Action Alternative near FHSZs would be assessed for wildfire risks during environmental review, and project proponents would be required to comply with all pertinent fire prevention laws and regulations to avoid cumulative effects on people and structures from wildfire.

Construction and/or operation and maintenance of facilities under the No Action Alternative could create the potential for hazards to the public or environment through the transport, use, accidental release, or disposal of hazardous materials. Construction activities under the No Action Alternative could damage existing hazardous infrastructure, such as gas pipelines. It is reasonable to assume that actions implemented as part of past, present, and reasonably foreseeable future actions that involve the transport, use, or disposal of hazardous materials, or excavation near hazardous infrastructure (e.g., Del Puerto Canyon Reservoir) would result in similar hazards.

Projects under the No Action Alternative have already undergone state and/or federal environmental review; it is assumed that potential impacts related to hazards or hazardous material use, storage, or transport will be avoided or minimized through adherence to current environmental permits. Therefore, the No Action Alternative would not contribute to potential cumulative effects related to hazards and hazardous materials.

Alternatives 1, 2, 3, and 4, compared to the No Action Alternative, would not result in adverse impact related to wildfires, other hazards, or hazardous materials, as discussed in Section V.2, *Evaluation of Alternatives*. As such, when considered along with past, present, and reasonably foreseeable future actions identified in Appendix Y, Alternatives 1, 2, 3, and 4 would not result in cumulative impacts related to hazards and hazardous materials.

V.3 References

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