Appendix W Hazards and Hazardous Materials Technical Appendix

This appendix documents the hazards and hazardous materials technical analysis to support the impact analysis in the EIS.

W.1 Background Information

This section describes the following potential public and environmental hazards that could occur in the study area resulting from implementation of the alternatives considered in this EIS.

W.1.1 Mosquito-Borne Disease

There are more than 50 species of mosquitos in California, including members of the four major genera: 24 species of *Aedes*, 5 species of *Anopheles*, 11 species of *Culex*, and 4 species of *Culiseta* (CDPH and MVCAC 2012). Not all of these species are known to transmit mosquito-borne viruses. Approximately 15 mosquito-borne viruses occur in California; however, of those, only St. Louis encephalitis virus (SLEV), western equine encephalomyelitis virus (WEEV), and West Nile virus (WNV) have caused significant human disease (CDPH et al. 2017a). Although malaria, also a mosquito-borne disease, was naturally occurring in parts of the United States, including California, until the mid-20th century, currently over 99% of malaria cases diagnosed in U.S. residents are acquired during travel outside of the United States (CDPH 2017a). The *Culex* genus has been identified as the primary transmitting vector of WNV. The genus also transmits SLEV, and WEEV in some species. The mosquito life cycle requires water for the egg, larva, and pupa stages. Some of the species are more associated with irrigated agriculture, and others are more associated with urban communities (CDPH et al. 2014). Most of the diseases are not treatable and vaccines are not available for humans. Methods to prevent mosquitoes from becoming adults and methods to prevent mosquitos from biting humans are the only available and practical methods to protect public health.

Irrigated agricultural lands, and tidal, riparian, floodplains, and other aquatic habitat can provide suitable breeding habitat for mosquitos (Tick and Mosquito Project 2017). Stagnant water (e.g., ditches, marshy areas, horse troughs), as well as areas of non-stagnant standing water, such as the edges of lakes, and ponds subject to daily tidal flushes or wind-driven wave action can provide optimal conditions for mosquito growth and reproduction. Tidally influenced marshes that lack sufficient tidal flow can also provide suitable breeding habitat for mosquitoes (Rey et al. 2012). Breeding habitat varies depending on the species of mosquito. The majority of mosquito species prefer water sheltered from the wind by grass and weeds. The availability of preferable mosquito breeding habitat in the study area varies by season, and is reduced during dry periods of the year. Available open water habitat can be expected to increase during the wet season. In general, the potential for mosquito breeding habitat increases with more emergent vegetation and within water bodies with water levels that slowly increase or recede compared to water levels that are stable or that rapidly fluctuate.

Climate, primarily high and low temperature extremes, and precipitation patterns, influences mosquito-borne disease transmission. Rising temperatures, changing precipitation patterns, and a higher frequency of extreme weather events have been identified as factors of climate change that will influence the

distribution and abundance of mosquitoes that transmit WNV, for example, by changing the availability of aquatic habitat and the rates of mosquito and viral reproduction. In the U.S., projected temperature increases in spring through fall are likely to increase the total number of days annually when temperatures are ideal for mosquito breeding (i.e., 50°F to 95°F) (Climate Nexus n.d.). Climate change projections for WNV indicate that the disease will increase in the northern and southeastern U.S. as a result of rising temperatures and declining precipitation, respectively, and potentially decrease across the central U.S. (Beard et al. 2016), and that *Culex* species will likely emerge earlier in the year and remain active longer into the fall (Brown et al. 2015).

California Health and Safety Code (Chapter 1, Article 5, §§ 2060–2061) stipulates that landowners are legally responsible to eliminate public nuisances from their properties, including mosquito breeding habitat. Federal, state, and local agencies supplement the preventive activities of individual landowners for the purpose of protecting humans and domestic animals from mosquito-borne diseases. The California Department of Public Health (CDPH) monitors mosquito populations throughout the state. In 1915, the state legislature enacted the Mosquito Abatement Act to allow local mosquito abatement special districts. The local mosquito and vector control districts (MCVDs) monitor mosquito populations and implement best management practices (BMPs) such as eliminating breeding sites, using biological control (predators such as mosquitofish) as well as chemical control to reduce mosquito populations size (CDPH et al. 2017a). MCVDs perform ongoing surveillance of mosquitos and other vectors to determine the threat of disease transmission and lower annoyance levels, and promote cooperation and communication with property owners, residents, social and political groups, duck clubs and other recreational groups, as well as other governmental agencies to help in these efforts. Furthermore, to address public health concerns regarding mosquito production in existing managed wetlands and tidal areas, MVCDs have developed guides and habitat management strategies to reduce mosquito production. MVCDs encourage integrated pest management (IPM), which incorporates multiple strategies to achieve effective control of mosquitoes, including designing wetlands and agricultural operations to be inhospitable to mosquitos; implementing monitoring and sampling programs to detect early signs of mosquito population problems; and biological and chemical control. The Mosquito and Vector Control Association of California (MVCAC) recommends that policymakers, planning officials, and project proponents incorporate relevant considerations from the CDPH and MVCAC publication *Best Management Practices for Mosquito Control for Mosquito Control in California* (CDPH and MCVAC 2012) into the planning and review process. This BMP guidance was developed by the CDPH in collaboration with MVCAC to reduce or eliminate mosquito production from temporary and permanent water sources, and to reduce the transmission of mosquito-borne diseases.

W.1.1.1 *St. Louis Encephalitis*

The SLEV is a mosquito-borne virus that circulates among birds and is transmitted to humans by primarily the *Culex* mosquitos (CalSurv 2019; CDPH 2017b). SLEV infection in humans can cause mild to severe fever and headaches caused by inflammation of the brain (encephalitis). In severe cases, the illness can cause disorientation, coma, and death. Elderly people can become more severely ill than young children with SLEV, in contrast to WEEV. Since the SLEV was first recognized in 1933 in St. Louis, Missouri, outbreaks have been reported throughout the United States, Canada, and northern Mexico, generally between August and October (CalSurv 2019). Seven total reported cases occurred in California in 2016 and 2017 (CDC 2017).

W.1.1.2 *Western Equine Encephalitis*

The WEEV is another mosquito-borne virus that circulates among birds and is transmitted to horses and humans by mosquitoes (SYMVCD 2019). Most cases of western equine encephalitis, like St. Louis encephalitis, occur during mid- to late summer (July and August) (SYMVCD 2019). In general, WEEV outbreaks have occurred in the Central Valley when wet winters are followed by warm summers (CDPH et al. 2017a). Symptoms of western equine encephalitis are similar to St. Louis encephalitis. Infants and small children are more severely afflicted with WEEV, compared to SLEV. There is a vaccine for horses, but not for humans. There have been no recent recorded cases of WEEV in humans in California (CDPH et al. 2017a).

W.1.1.3 *West Nile Virus*

WNV infection can cause mild to severe illness in humans, other mammals, and birds. The virus circulates among birds and is transmitted to humans primarily by *Culex* mosquitoes (CDPH 2016). Human WNV infection was first detected in North America in New York in 1999 (Sejvar 2003), and it has subsequently spread to 48 states (including California), Canada, and Mexico.

In 2017, there were 553 symptomatic and 47 asymptomatic identified WNV infections in California (CDPH 2018a). Of the 553 cases, approximately 50% occurred in Los Angeles County, and the majority of reported cases overall occurred in southern California. In addition to Los Angeles County, there were reported human cases of WNV infection in the following 21 counties of the study area in 2017: Alameda, Butte, Contra Costa, Fresno, Imperial, Kern, Kings, Merced, Orange, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Joaquin, Solano, Stanislaus, Tulare, Ventura, Yolo, and Yuba (CDPH et al. 2017b).

In humans, WNV may not result in any symptoms (approximately 80% of people infected) or only mild viral symptoms (up to 20% of people infected), including mild fever, headache, body aches, skin rash, and swollen lymph glands. Less than 1% of people who are infected with WNV will develop severe neurological illnesses (e.g., encephalitis or meningitis). People over the age of 60 and individuals with existing medical conditions (e.g., cancer, diabetes, donor organ recipients) are more likely to develop serious symptoms from WNV infection (CDPH 2016).

W.1.1.4 *Malaria*

Malaria is a mosquito-borne disease caused by a parasite (*Plasmodium*) that destroys the red blood cells of its host. Malaria symptoms often include fever, chills, and flulike illness that can lead to death (CDPH and MCVAC 2012). Malaria is no longer endemic in California, or in the rest of the United States, because of intense mosquito control efforts and anti-malarial drugs. However, the disease is diagnosed every year, especially in people who have traveled outside the United States. In 2017, 133 confirmed human cases of malaria were reported in California (CDPH 2018a). Of the 133 cases, 130 patients had traveled to malaria-endemic countries (i.e., in Africa, Asia, India, South America, and Central America) (CDPH 2018a). *Anopheles* mosquitoes can transmit the parasite to humans and are prevalent in California (CDPH and MCVAC 2012).

W.1.2 Valley Fever

Valley fever is an illness that is caused by inhaling the spores of a soil-dwelling fungi, *Coccidioides* (CDC 2019a). This fungus lives in the top layers of some soils within 2 to 12 inches from the ground

surface (Cal/OSHA 2017). When the soil is disturbed by digging, vehicles, cultivation, or wind, the fungal spores are dispersed and can be inhaled by people in the area. Irrigated soils are less likely to contain the fungus than dry, previously undisturbed soils.

Coccidioides forms in subsoil strata that are moist during the wet season and dry throughout the rest of the year. Generally, heavy rainfall periods followed by very dry weather conditions create optimal conditions for increased incidence of Valley fever. Airborne *Coccidioides* spores do not generally come from irrigated agriculture land (SJVAPCD 2012), and *Coccidioides* typically does not grow in tilled and irrigated farmland soils (American Geosciences Institute 2017). Rather, it is believed that propagation of the spores and air entrainment occurs on soils that remain unirrigated during dry seasons (e.g., natural environments, undeveloped land, and grazing areas). (SJVAPCD 2012).

Studies indicate that climate influences seasonal and yearly Valley fever infection patterns, and that drought and increased temperature contribute to an expanding geographic range for *Coccidioides.* Accordingly, increasing temperatures, and more intense and prolonged droughts of climate change may be conducive to the spread of *Coccidioides.* (Bell et al. 2016).

Coccidioides is endemic in many areas of the southwestern United States, Mexico, Central America, and South America (CDC 2019a). Although Valley fever cocci grow in localized areas of the southwestern United States, the San Joaquin Valley and Central Coast are the major endemic regions in California (CDPH 2017c). In 2017, there were 14,364 cases of Valley fever in the United States reported to the CDC. Of these cases, there were 6,925 reported cases of Valley fever in California (CDC 2019b). The highest Valley fever incidence in California in 2017 were reported in counties in the San Joaquin Valley and Central Coast regions, including, in descending order of incidence, Kern, Kings, San Luis Obispo, Fresno, Tulare, Madera, and Monterey (CDPH 2018b and 2018c). Incidence of Valley fever in the northern Central Valley and Bay Area is relatively low (CDPH 2018c).

In general, the people who have the highest risk of exposure to the fungus include construction workers, archeologists, geologists, wildland fire fighters, military personnel, mining or gas/oil extraction workers, and agricultural workers in non-irrigated areas (CDPH 2019) known to contain *Coccidioides*. Other employees also may be at risk. For example, members of the cast and crew of a television film became ill with Valley fever after working on an outdoor set in Ventura County (CDC 2014).

Valley fever is difficult to diagnose. It is estimated that approximately 60% of Valley fever infections result in no symptoms or a mild clinical illness that is indistinguishable from other illnesses such as flu or pneumonia, and therefore, a large percentage of cases of Valley fever go undiagnosed. For most cases that are diagnosed, symptoms also include rash, fever, and joint pain. In about 0.5% of diagnosed cases, the fungal infection spreads from the lungs to other parts of the body including the skin, bones, joints, and brain meninges (membranes). There are no vaccines to prevent Valley fever. (SJVAPCD 2012)

W.1.3 Bioaccumulation of Methylmercury in Fish and Shellfish

Appendix G, *Water Quality Technical Appendix*, provides a discussion of mercury and methylmercury as water quality constituents, a description of mercury and methylmercury occurrence in the study area, and identifies the water bodies in the study area that are currently impaired by these water contaminants.

Mercury is a statewide water quality issue and is being addressed through various state and federal water quality efforts. In aquatic environments, sulfur-reducing bacteria convert inorganic mercury to methylmercury, and this process is enhanced by multiple environmental variables in water and sediment

including temperature, pH, oxygen, sulfate, and the presence of organic matter (USGS 2014). Conversion of inorganic mercury to methylmercury occurs in flooded fine sediments subjected to drying-out periods; methylmercury production is greatest in high marshes that experience wet and dry periods over the highest monthly tidal cycles, and production is lower in low marshes that are always inundated and not subject to dry periods (Alpers et al. 2008).Total mercury concentrations in sediment positively correlate with methylmercury levels in sediment and water (Central Valley Water Board 2010). Positive correlations also exist between methylmercury in water and fish tissue. High concentrations of mercury in the form of methylmercury can bioaccumulate in fish and shellfish through food consumption and absorption from water based upon the water quality. Consumption of contaminated fish is the major pathway for human exposure to mercury (via methylmercury from fish tissue). Bioaccumulation is the process by which organisms, including humans, can, over time, accumulate certain contaminants in their tissues (from sources including water, air, and diet) more rapidly than can be eliminated through metabolism and excretion.

Fish and shellfish consumption is the most common route of human exposure to mercury. Nearly all people have at least some methylmercury in their bodies because it is so widespread in the environment; however, generally blood mercury concentrations in most people are lower than those associated with health effects. Exposure to methylmercury at high concentrations can result in effects on the central nervous system. Prenatal exposure to methylmercury can adversely affect the developing central nervous system (USEPA 2018, 2019).

The California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA) evaluates concentrations of potentially toxic substances in edible tissues of fish and shellfish harvested in water bodies in California. Based upon the evaluation, general and specific safe eating guidelines are developed for the fish and shellfish, as summarized in Table W-1.1, Summary of Safe Eating Guidelines for Fish and Shellfish from Water Bodies in the Study Area Based on Mercury and PCB (servings per week). For the water bodies in the study area, the primary water contaminants that have triggered the development of safe eating guidelines are mercury, dieldrin, and/or polychlorinated biphenyls (PCBs). Other contaminants are present, including selenium; however, the concentrations of these contaminants do not exceed thresholds that would trigger safe-eating guidelines. The OEHHA develops two separate guidelines: (1) guidelines for children from 1 to 17 years old and women from 18 to 49 years old; and (2) guidelines for women over 50 years and men 18 years and older (OEHHA 2019). The guidelines recommend the number of servings per week by fish or shellfish harvested from specific waters (Table W.1-1).

Table W.1-1. Summary of Safe Eating Guidelines for Fish and Shellfish from Water Bodies in the Study Area Based on Mercury and PCB (servings[1] per week)

Region	Water Body	Fish and Shellfish[2]	Guidelines for Children (1–17 Years) and Women (18–45 Years)[3]	Guidelines for Men (18+ Years) and Women (46+ Years)[3]
Trinity River Region	Trinity Lake	Rainbow Trout, Brown Trout, Catfish	2	5
		Black Bass species	do not eat	1
	Lewiston Lake	Trout	5	7
Sacramento River Region	Sacramento River and Northern Delta (includes all waterbodies in the Delta north of State Route 12)	American Shad, Rainbow Trout	3[4]	7[4]
		Chinook (king) Salmon, Steelhead Trout	2	7
		Asian Clam (*Corbicula*)	7	7
		Sunfish species, Common Carp, Goldfish, Catfish, Crappie, Crayfish, Hardhead, Hitch, Sacramento Sucker	1	3
		Black Bass species, Sacramento Pikeminnow, White Sturgeon	do not eat	1
		Striped Bass	do not eat	2
Feather River Region	Lake Oroville	Sunfish species	2	5
		Carp, Coho Salmon	1	2
		Black Bass species, Catfish	do not eat	1
	Lower Feather River	American Shad	3	7
		Chinook (King) Salmon, Steelhead Trout	2	7
		Carp, Hardhead, Sucker	1	2
		Sunfish species	1	3
		Black Bass, Catfish, Pikeminnow, White Sturgeon	do not eat	1
		Striped Bass	do not eat	2
American River Region	Folsom Lake	Sunfish species, Rainbow Trout (16 inches or less)	2	5
		Channel Catfish; Chinook (King) Salmon; Black Bass species, Rainbow Trout (over 16 inches)	do not eat	1
	Lake Natoma	Sunfish species, Rainbow Trout (16 inches or less)	2	5
		Chinook (King) Salmon; Black Bass species, Rainbow Trout (over 16 inches)	do not eat	1
		Channel Catfish	do not eat	do not eat

Region	Water Body	Fish and Shellfish[2]	Guidelines for Children (1–17 Years) and Women (18–45 Years)[3]	Guidelines for Men (18+ Years) and Women (46+ Years)[3]
	Lower American River	American Shad,	3	7
		Chinook (King) Salmon, Steelhead Trout	2	7
		Sunfish species, Sacramento Sucker, Catfish	1	2
		Striped Bass	do not eat	2
		Black Bass species, Sacramento Pikeminnow	do not eat	1
San Joaquin River Region	Lower Mokelumne River	American Shad	3	7
		Chinook (King) Salmon, Steelhead Trout	2	7
		Asian Clam (*Corbicula*)	7	7
		Sunfish species, Crayfish, Catfish	1	2
		Striped Bass	do not eat	2
		Black Bass species, Pikeminnow, White Sturgeon	do not eat	1
	San Joaquin River (Friant Dam to Port of Stockton)[4]	Steelhead Trout	2	7
		Sunfish species	2	5
		American Shad	3	7
		Common Carp, Catfish, Sacramento Sucker	1	2
		Striped Bass	do not eat	2
		Black Bass species, White Sturgeon	do not eat	1
		Any fish or shellfish from the Port of Stockton	do not eat	do not eat
Bay-Delta Region	Central and south Delta (includes all waterbodies in the Delta south of State Route 12, except the Sacramento River and San Joaquin River south of Stockton)[4]	American Shad	3	7
		Catfish, Crayfish	2	5
		Steelhead Trout, Sunfish species	2	7
		Asian Clam (*Corbicula*)	7	7
		Black Bass species, Common Carp, Crappie, Sacramento Sucker	1	2
		Striped Bass	do not eat	2
		White Sturgeon	do not eat	1
		Any fish or shellfish from the Port of Stockton	do not eat	do not eat
	San Francisco Bay	Chinook (King) Salmon	2	7
		Brown Rockfish, Red Rock Crab	2	5
		Jacksmelt	2	2

Region	Water Body	Fish and Shellfish[2]	Guidelines for Children (1–17 Years) and Women (18–45 Years)[3]	Guidelines for Men (18+ Years) and Women (46+ Years)[3]
		California Halibut	1	2
		White Croaker	1	1
		Sharks, White Sturgeon	do not eat	1
		Striped Bass	do not eat	2
		Surfperches	do not eat	do not eat
	San Pablo Reservoir	Crappie	2	5
		Rainbow Trout	5	5
		Black Bass species	do not eat	1
		Carp, Channel Catfish	do not eat	do not eat
	Lafayette Reservoir	Channel Catfish	3	7
		Black Bass species	1	2
		Goldfish	do not eat	2
		Rainbow Trout	5	5
	Lake Chabot	Rainbow Trout	7	7
		Sunfish species	2	4
		Channel Catfish	2	7
		Goldfish	do not eat	2
		Black Bass species	do not eat	1
		Common Carp	do not eat	1
Southern California Region	Pyramid Lake	Rainbow Trout	7	7
		Channel Catfish	1	2
		Black Bass species	do not eat	1
		Bullhead	do not eat	do not eat
	Silverwood Lake	Rainbow Trout	7	7
		Tule Perch	1	1
		Black Bass species, Sunfish species, Channel Catfish	do not eat	1
		Striped Bass, Blackfish, Tui Chub	do not eat	do not eat
Statewide	All lakes and reservoirs without site-specific guidelines	Rainbow Trout	2	6
		Bullhead, Catfish, Sunfish species, Brown Trout (16 inches or less)	1	2
		Black Bass species, Carp, Brown Trout (over 16 inches)	do not eat	1

Region	Water Body	Fish and Shellfish[2]	Guidelines for Children (1–17 Years) and Women (18–45 Years)[3]	Guidelines for Men (18+ Years) and Women (46+ Years)[3]
	All rivers estuaries, and coastal waters without site-specific guidelines	American Shad, Chinook (King) Salmon, Steelhead Trout	2 to 3	7
		Striped Bass	do not eat	2
		White Sturgeon	do not eat	1

Sources: OEHHA 2012; 2018a–2018u.

[1] A "serving size" is 4 ounces of fish for an adult and approximately 2 ounces children ages 4 to 7 (OEHHA 2017).

[2] All fish and shellfish names are as they appear in the OEHHA guidelines.

[3] The OEHHA guidelines refer to the total number of servings of fish per week for one water body, not just the total for a specific species. For example, OEHHA guidelines for men eating fish from Trinity Lake would include no more than five servings of rainbow trout, brown trout, or white catfish; or one serving of largemouth bass or smallmouth bass.

[4] Guidelines for children (1–17 years) and women (18–49 years), and men (18+ years) and women (50+ years)

W.1.4 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. In accordance with Public Resources Code Sections 4201–4204 and Government Code Sections 51175–51189, the California Department of Forestry and Fire Prevention (CAL FIRE) has mapped areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. The zones are referred to as Fire Hazard Severity Zones and represent the risks associated with wildland fires. Under CAL FIRE regulations, areas within very high fire-hazard risk zones must comply with specific building and vegetation requirements intended to reduce property damage and loss of life within these areas.

According to CAL FIRE, fires in California are becoming more frequent, larger, and more severe, and this trend is likely to continue (CAL FIRE 2018). Statewide, the Wildland-Urban Interface (WUI), areas where homes are built near or among lands susceptible to wildland fires (IAFC 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) (CAL FIRE 2018); 1 million acres of Interface class areas (dense urban development adjacent to wildland (CAL FIRE 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 (CAL FIRE 2018).

CAL FIRE manages the State Responsibility Areas, and local fire districts manage Local Responsibility Areas. First responders 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.

Firefighting actions frequently involve helicopter transport of water from reservoirs located close to wildfires, including reservoirs owned by U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and the California Department of Water Resources (DWR). Wildfires are also managed by applying chemical fire retardants, 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).

W.1.5 Bird-Aircraft Strikes at or near Airports

"Hazardous wildlife," as defined in the Draft FAA Advisory Circular 150/5200-33C, are wildlife species (birds, mammal, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard (FAA 2019). The presence of hazardous wildlife at or near airports creates a collision hazard to operating aircraft. Bird-aircraft strikes constitute 97% of the reported civil aircraft strikes (FAA 2018). Agricultural fields, grasslands, wetlands, open water, and urban areas near airports all increase the risk of bird-aircraft strikes (USDA 2017). Over the 28-year period from 1990 to 2017, pigeons/doves (14%), raptors (13%), gulls (11%), shorebirds (9%), and waterfowl (5%) are the bird groups most frequently involved in bird-aircraft strikes. During this same 28-year period, waterfowl were involved in a greater percentage of damaging strikes (28%) than the other bird types (FAA and USDA 2019). Most bird strikes (53%) occurred between July and October, which is generally during migration season, and when populations are at their annual peak in North America following the nesting season (FAA and USDA 2019). From 1990 to 2017, there were 33 human fatalities and 313 human injuries caused by wildlife-aircraft strikes; more than half of the human fatalities were the result of bird-aircraft strikes specifically (FAA and USDA 2019).

The Federal Aviation Administration (FAA) discourages the improvement of wildlife habitat in proximity to public-use airports to reduce the risk of bird-aircraft strikes. The FAA recommends a separation distance of 5,000 feet between hazardous wildlife attractants and airports used by piston-powered aircraft and of 10,000 feet for airports used by turbine-powered aircraft. In addition, for all airports, the FAA recommends a distance of 5 miles between an airport's approach or departure space. (FAA 2019)

The FAA requires commercial service airports to maintain safe operations, including conducting hazard assessments for wildlife attractants (Wildlife Hazard Assessment) within 5 miles of an airport. A Wildlife Hazard Assessments is required of any certificated airport when specific "wildlife events" occur, including multiple wildlife-aircraft strikes on or near an airport (14 CFR §139.337 (b)(1–4). Hazard assessments are submitted to the FAA, which determines if it is necessary for the airport to develop a Wildlife Hazard Management Plan (15 CFR Part 139). Wildlife Hazard Management Plans must identify and provide information on wildlife attractants on or near the airport, identify appropriate wildlife management techniques to minimize the wildlife hazard, and identify personnel responsible for implementing each phase of the plan, among other requirements (FAA and USDA 2005).

The FAA Draft Advisory Circular 150/5200-33C provides guidance on land uses that have the potential to attract hazardous wildlife on or near public-use airports (FAA 2019).

W.1.6 Common Hazardous Materials Used During Construction

Construction activities would be expected to involve the transport, handling, and use of a variety of hazardous materials. Typical construction-related hazardous materials include petroleum products (e.g., fuel, oils, solvents) for refueling and maintenance of construction equipment, concrete, paints and other coatings, and cleaning agents. Improper use and onsite storage of these types of materials could result in accidental release to the environment and contaminate soil, surface water, and groundwater.

W.2 Evaluation of Alternatives

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

W.2.1 Methods and Tools

The No Action Alternative and action alternatives may introduce public and environmental hazards to the study area through the following mechanisms.

- Habitat restoration could increase mosquito breeding habitat in restored areas, and thus increase the potential for public exposure to mosquito-borne diseases.
- A reduction in surface water supplies could result in an increase in agricultural land fallowing and a consequent increase in dust, which could increase the potential for exposure to Valley fever fungal spores.
- Habitat restoration could disturb and resuspend sediments containing methylmercury, thereby mobilizing mercury to enter the food chain and bioaccumulate in fish and shellfish, potentially resulting in human exposure via fish and shellfish consumption.
- CVP and SWP operations could affect water and fish tissue methylmercury concentrations.
- Habitat restoration could increase the potential for bird-aircraft strikes, and thus increase potential air safety hazards.
- Construction and operation and maintenance activities related to facility improvements and habitat restoration, and operation and maintenance activities could increase the potential for creating a public or environmental hazard through the use or accidental release of hazardous materials (fuels, oils, lubricants, etc.) or disruption of underground existing infrastructure (e.g., natural gas pipelines).

Reservoirs that store water in the Bay-Delta and CVP and 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. Water available for wildfire firefighting in those areas is not known, and therefore, is not analyzed in this EIS. Stored water in water supply reservoirs is used for fighting wildfires in the California foothills and mountains, including water stored in Central Valley Project (CVP) and State Water Project (SWP) reservoirs. During drier periods, reduced storage levels could affect the availability of water for wildlife firefighting. However, as discussed in Appendix S, *Recreation Technical Appendix,* reservoir levels in the study area would be roughly the same as, or higher than, the No Action Alternative. Given this, and given that there are multiple methods that are used in fighting wildfires (see Section W.1.5, *Bird-Aircraft Strikes at or near Airports*) aside from drawing water from reservoirs via helicopter, particularly to create defensible areas at the wildland urban interface , implementation of the action alternatives would not substantially impair the ability to fight wildfires in the study area. Therefore, this topic is not addressed further in this analysis.

The evaluation of potential effects related to hazards and hazardous materials resulting from implementation of the No Action Alternative and the action alternatives is based on review of conclusions from Appendix G, *Water Quality Technical Appendix*, regarding changes in concentrations of methylmercury in fish tissue in the Delta and Suisun Marsh, and the qualitative assessment related to potential effect of habitat restoration on enhancing mercury bioavailability and risk, and Appendix R,

Land Use and Agricultural Resources Technical Appendix, regarding changes in irrigated agricultural acreage, as well as best professional judgement.

W.2.2 No Action Alternative

Under the No Action Alternative, Reclamation would continue with current operations of the CVP, as described in Chapter 3, *Alternatives*. The proposed operational changes, habitat restoration, and facility improvements, as well as habitat restoration, facility improvements, or intervention measures, under Alternative 1 would not occur under the No Action Alternative.

Potential changes in the potential for mosquito-borne diseases related to habitat restoration.

Under the No Action Alternative, there would be 8,000 acres of tidal habitat restoration in Suisun Marsh and/or the north Delta. It is not likely that the potential for an increase in mosquito-borne diseases because of habitat restoration under the No Action Alternative would differ substantially from existing conditions; Suisun Marsh and the Delta currently provide suitable mosquito breeding habitat and these areas are existing sources of mosquitoes. It is assumed that all restoration activities would be designed to minimize the potential for stagnant water and other conditions favorable to the production of mosquitoes, and that these activities would occur in consultation with applicable MCVDs. Therefore, implementation of the No Action Alternative would not increase the public's risk of exposure to mosquito-borne diseases relative to existing conditions.

Potential changes in the potential for Valley fever related to agricultural land irrigation.

As described in Section W.1.2, *Valley Fever*, *Coccidioides* typically does not grow in tilled, irrigated farmland. Rather, spores are more likely to occur on agricultural land that is idle because of agricultural practices or reduced water supply availability. CVP and SWP operations under the No Action Alternative relative to existing conditions would not result in an increase in nonirrigated agricultural land. Therefore, the potential for creating land conditions conducive to the growth of *Coccidioides* in the study area under the No Action Alternative would be the same as under existing conditions, and there would no adverse effect related to Valley fever.

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

Restoration of approximately 8,000 acres of tidal habitat in Suisun Marsh and/or the north Delta under the No Action Alternative could temporarily mobilize existing mercury and methylmercury within sediments. Mobilization would be expected in varying degrees depending on the location of restoration projects because the study area is generally known to be out of compliance with methylmercury levels. The temporary mobilization of mercury and methylmercury caused by habitat restoration construction would be localized around the area of construction. Once operational, tidal habitat restoration could contribute to methylmercury production as a result of biogeochemical processes and sediment conditions established in tidal wetlands (DWR 2015). Potential methylmercury production would be addressed with minimization measures (e.g., measures to monitor and adaptively manage methylmercury production). Therefore, the potential for increased bioaccumulation of mercury in fish and shellfish and consequent human exposure to mercury under the No Action Alternative would be the same as under existing conditions.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration.

Tidal habitat restoration in Suisun Marsh and/or the north Delta that would occur under the No Action Alternative could potentially attract waterfowl and other birds to areas in proximity to existing airport flight zones, which could increase the potential for bird-aircraft strikes relative to existing conditions. However, where habitat restoration may occur within 5 miles of public-use airport, Reclamation will comply with FAA safety guidelines on wetlands and wildlife attractants as identified in the FAA Draft Advisory Circular 150/5200-33C Sections 1 and 2.4, to avoid or minimize the potential for bird-aircraft strikes because of habitat restoration. As such, there would be no increase in the potential for bird-aircraft strikes relative to existing conditions.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials.

Construction or operation and maintenance of any CVP or SWP projects that are planned or currently under way, or any ongoing operations and maintenance activities that may require the use of heavy equipment (e.g., front loaders, dump trucks, excavators, cranes), which require the use of hazardous materials including fuels, lubricants, and solvents, could create a hazard to the public and environment through the accidental release of those hazardous materials or disruption of existing gas pipelines where deep excavation may be required. For example, the temporary rock barriers in the south Delta at Middle River, Old River near Tracy, and Grant Line Canal would be installed, maintained, and removed annually (as conditions allow) to improve water levels and circulation for agricultural diversions during the irrigation season. The barriers are typically installed between April and September each year. In general, installation of the barriers requires stockpiling of quarry rock on the waterside of the levee crown and use of heavy equipment to place the stockpiled rock and other structures (e.g., culverts, flashboard structures, concrete reinforcing mats) into the channel. As the rock barrier is extended into the channel, heavy equipment can use the top of the barrier to move farther into the channel to place additional material. Construction typically takes 1 to 3 weeks. The barriers are removed in the fall by reversing the installation procedure. Construction of the barriers entails the use of hazardous chemicals such as fuel small amounts of hazardous materials, such as fuel and motor oil to power and maintain construction equipment, respectively. Given the in-water location of the barriers and bankside staging area, there is potential for accidental spills of these hazardous materials, particularly if heavy equipment is fueled and maintained on-site during construction. Were this to occur, there could be temporary adverse effects on water quality.

Therefore, under this alternative, construction and/or operation and maintenance of facilities could create the potential for hazards to the public or environment through the transport, use, accidental release, or disposal of hazardous materials. However, because these projects have already undergone state and/or federal environmental review, it is assumed that any potential impacts related to hazards or hazardous material use, storage, or transport will be avoided or minimized through adherence to current environmental permits. As such, relative to existing conditions, the No Action Alternative would not result in adverse effects related to hazards or hazardous materials.

W.2.3 Alternative 1

W.2.3.1 *Project-Level Effects*

Potential changes in mosquito-borne diseases related to habitat restoration.

No project-level actions related to habitat restoration would increase potential for mosquito-borne diseases under Alternative 1.

Potential changes in the potential for Valley fever related to agricultural land irrigation.

As discussed in Appendix R, SWAP modeling results indicate that relative to the No Action Alternative, in the Sacramento River Region there would be no reduction of irrigated agricultural land in dry/critical years or in years with average precipitation. There would be an increase in irrigated agricultural land in the San Joaquin River region of 2,770 acres in average years, and 23,668 acres in dry/critical years, relative to the No Action Alternative.

As described in Section W.1.2, generally, *Coccidioides* propagation and air entrainment occurs on soils that remain unirrigated during dry seasons, and the San Joaquin Valley and Central Coast are the major endemic regions in California. Because there would be no reduction of irrigated agricultural land in the Sacramento River and San Joaquin River regions under Alternative 1 relative to the No Action Alternative, there would not be in an increased potential for Valley fever due to CVP and SWP operations under this alternative.

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

As discussed in Appendix G, based on the overall lower fish tissue methylmercury concentrations at almost all modeled Delta locations, and modeled water concentrations, water operations under Alternative 1 would not contribute to the additional water quality degradation associated with methylmercury, or increased health risks to humans consuming fish from the Delta, Suisun Bay, and San Francisco Bay relative to the No Action Alternative.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration

No project-level actions related to habitat restoration would result in an increased potential for bird-aircraft strikes under Alternative 1.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials

Under Alternative 1, as under the No Action Alternative, agricultural barriers in the south Delta at Middle River, Old River near Tracy, and Grant Line Canal would be installed, maintained, and removed annually (as conditions allow).The installation of the south Delta agricultural barriers has already undergone environmental review and permitting, and will continue to be implemented pursuant to environmental permit conditions, to avoid or minimize impacts related to hazards or hazardous material use, storage, or transport. Therefore, relative to the No Action Alternative, installation of the agricultural barriers would not result in an adverse effect related to hazards or hazardous materials.

Mechanical and chemical aquatic weed removal and algae treatments would be implemented on an as-needed basis at Clifton Court Forebay (CCF). Chemical weed control and algae treatments would involve the use of toxic herbicides, as described in Chapter 3, *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 would result in an adverse water quality effects. As described in Appendix G, the application of herbicides and algaecides at CCF would require 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 and 2015-0029-DWQ) (SWRCB 2016). To obtain coverage under the General Pesticide Permit, the applicant must submit an Aquatic Pesticides Application Plan that includes BMPs 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. Because weed removal at CCF would not occur under the No Action Alternative, the potential for adverse hazardous effects related to accidental herbicide spills or inappropriate use would be greater under Alternative 1. However, BMP implementation would be required pursuant to the General Pesticide Permit conditions. As such, there would be no adverse effects related to hazards or hazardous materials due to and chemical aquatic weed removal and algae treatments relative to the No Action Alternative.

W.2.3.2 *Program-Level Effects*

Potential changes in mosquito-borne diseases related to habitat restoration.

Tidal habitat and floodplain habitat restoration that would occur under Alternative 1 has the potential to create mosquito breeding habitat. Implementation of spawning and rearing habitat restoration would create and/or restore areas of floodplain habitat in the study area. Tidal wetlands and floodplains provide habitat for mosquito breeding, especially in tidally influenced wetlands with slow-moving water and in floodplains after the majority of the water recedes. Under this alternative, floodplain habitat would be created or modified in locations throughout the study area, including in the American River, upper Sacramento River, and lower San Joaquin River basins, as part of spawning and rearing projects. In addition, as described in Chapter 3, *Alternatives*, as required by the USFWS BO , approximately 8,000 acres of tidal habitat restoration in Suisun Marsh and/or the north Delta, as would also occur under the No Action Alternative. Accordingly, the potential for an increase in the public's risk of exposure to mosquito-borne diseases resulting from increased mosquito breeding habitat under Alternative 1 would be greater than under the No Action Alternative. Implementation of Mitigation Measure HAZ-1 could avoid or minimize the potential for adverse effects related to increased mosquito breeding habitat through Reclamation's coordination with appropriate MCVDs in the study area during all phases of restoration (including design, implementation, and operations) to develop and implement site-specific mosquito management plans, which will include applicable BMPs from *Best Management Practices for Mosquito Control in California* (CDPH and MVCAC 2012).

Potential changes in the potential for Valley fever related to agricultural land irrigation.

As described in Appendix R, some changes in the total irrigated agricultural acreage in the Sacramento River, San Joaquin River, and Delta regions is possible with implementation of program actions of Alternative 1 (e.g., spawning and rearing habitat restoration actions, and Tracy Fish Facility improvements). However, agricultural land could potentially be converted to non-agricultural use not as fallowed or idled land, but to another land use to accommodate these actions. Therefore, it is not expected that these actions would create large areas of open, undeveloped, dry land that may be conducive to the growth of *Coccidioides.*

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

As discussed in Appendix G, newly created tidal habitat areas have the potential to become new sources of methylmercury, and irrigated agricultural land in the Delta can be a substantial source of methylmercury. As discussed in Section W.1.3, *Bioaccumulation of Methylmercury in Fish and Shellfish,*

methylmercury can bioaccumulate in aquatic organisms residing in or near these habitat/land types. Under Alternative 1, some habitat restoration would likely occur on lands in the Delta formerly used for irrigated agriculture. However, it is uncertain the degree to which new tidal habitat areas may be future sources of methylmercury to the aquatic environment of the Delta. The specific siting and design of the restored tidal habitat areas would be factors that affect the potential for methylmercury generation and transport. However, the amount of tidal habitat restoration proposed for Alternative 1 is the same as what would occur under the No Action Alternative. Therefore, the potential for increased bioaccumulation of mercury in fish and shellfish and consequent human exposure to mercury under the Alternative 1 would be the same as under the No Action Alternative, and there would be no adverse effect.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration.

Like the No Action Alternative, 8,000 acres of tidal habitat restoration in Suisun Marsh and/or the north Delta would also occur under Alternative 1. In addition, under Alternative 1, floodplain habitat would be restored at multiple locations in the study area. Increased tidal habitat and floodplain habitat in the study area could potentially attract waterfowl and other birds to these areas. If these restored areas are in proximity to existing airport flight zones, there could be an increase in the potential for bird-aircraft strikes. Because there would be more habitat restoration under Alternative 1 relative to the No Action Alternative, depending on the location of habitat restoration, the potential for bird-aircraft strikes would be greater under Alternative 1. However, for habitat restoration within 5 miles of a public-use airport, Reclamation will implement Mitigation Measure HAZ-2 and comply with FAA safety guidelines on wetlands and wildlife attractants as identified in the FAA Draft Advisory Circular 150/5200-33C Sections 1 and 2.4 (FAA 2019), to avoid or minimize the potential for bird-aircraft strikes resulting from habitat restoration.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials

Certain program-level components of Alternative 1 (e.g., spawning and rearing habitat restoration, small screen program, tidal habitat restoration, and facility improvements) would involve the use of construction equipment in the study area. Potential hazards to the public associated with construction, as well as operation and maintenance activities, would be similar in nature to those discussed for the No Action Alternative. In addition, if digging or deep excavation were required for habitat restoration or facility improvements, underground natural gas pipelines could be damaged and potentially expose construction workers or others in close proximity to gas fumes. However, any construction requiring excavation will be designed to avoid affecting existing pipelines and other facilities.

As described in Appendix G, the State Water Resources Control Board’s (SWRCB’s) National Pollution Discharge Elimination System (NPDES) stormwater program requires permits for discharges from construction activities that disturb one or more acres. SWRCB adopted a general NPDES permit for stormwater discharges associated with construction activity (Construction General Permit). Obtaining coverage under the Construction General Permit requires preparation and implementation of a stormwater pollution prevention plan (SWPPP), which specifies BMPs to reduce or eliminate pollutants in stormwater as well as non-stormwater discharges. The Construction General Permit requires implementation of BMPs that control pollutant discharges using best available technology economically achievable for toxic contaminants, and best conventional technology for conventional contaminants, and any other necessary BMPs to meet water quality standards. Implementation of the necessary BMPs, as required by the Construction General Permit, would reduce potential adverse effects related to the accidental release of hazardous materials during construction.

In addition, as described in Appendix G, implementation of Mitigation Measure WQ-1 (spill prevention, control, and countermeasure plan [SPCCP]) would minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction and maintenance. No hazardous material would be used in reportable quantities (pursuant to California Code of Regulations [CCR], Title 19, Division 2) unless approved in advance by the California Office of Emergency Services (OES), in which case a hazardous materials management plan (HMMP) would be prepared and implemented, as described under Mitigation Measure HAZ-3. Therefore, the potential for Alternative 1 to result in hazards to the public associated with the use of hazardous materials during construction or operation of program components would be similar to the No Action Alternative, and there would be no adverse effects.

W.2.4 Alternative 2

W.2.4.1 *Project-Level Effects*

Potential changes in mosquito-borne diseases related to habitat restoration.

No project-level actions related to habitat restoration would increase potential for mosquito-borne diseases under Alternative 2.

Potential changes in the potential for Valley fever related to agricultural land irrigation.

As discussed in Appendix R, SWAP modeling results indicate that relative to the No Action Alternative, in the Sacramento River Region there would be no reduction of irrigated agricultural land in dry/critical years or in years with average precipitation under Alternative 2. There would be an increase in irrigated agricultural lands in the San Joaquin River region of 4,541 acres in average years and 56,147 acres in dry/critical years, relative to the No Action Alternative.

Because there would be no reduction in irrigated agricultural land in the study area under Alternative 2 relative to the No Action Alternative, there would be no increased potential for Valley fever due to CVP and SWP operations under this alternative.

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

As discussed in Appendix G, based on the overall lower fish tissue methylmercury concentrations at almost all modeled Delta locations, and modeled water concentrations, relative to the No Action Alternative, water operations under Alternative 2 would not contribute to additional water quality degradation with respect to methylmercury, or increased health risks to humans consuming fish from the Delta, Suisun Bay, and San Francisco Bay.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration.

No project-level actions related to habitat restoration would result in an increased potential for bird-aircraft strikes under Alternative 2.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials

No project-level actions would result in potential hazards associated with construction and operation activities under Alternative 2.

W.2.4.2 *Program-Level Effects*

Potential changes in mosquito-borne diseases related to habitat restoration.

Under Alternative 2, there would be no tidal habitat restoration as would occur under the No Action Alternative, and no other habitat types would be restored under this alternative. Accordingly, there would be no increased potential for mosquito-borne diseases in the study area under Alternative 2.

Potential changes in the potential for Valley fever related to agricultural land irrigation.

There are no program-level actions under Alternative 2 that would affect irrigated agricultural land in the study area. Therefore, there would be no change in the potential for Valley fever under Alternative 2 relative to the No Action Alternative.

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

Under Alternative 2, there would be no tidal habitat restoration as would occur under the No Action Alternative, and no other habitat types would be restored under this alternative. Thus, relative to the No Action Alternative, Alternative 2 would not increase the potential for human exposure to mercury in the study area caused by increased bioaccumulation of methylmercury in fish and shellfish.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration.

Under Alternative 2 there would be no habitat restoration as would occur under the No Action Alternative. Accordingly, there would be no increased potential for bird-aircraft strikes in the study area under this alternative relative to the No Action Alternative.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials.

No program-level actions would result in potential hazards associated with construction and operation activities under Alternative 2.

W.2.5 Alternative 3

W.2.5.1 *Project-Level Effects*

Potential changes in mosquito-borne diseases related to habitat restoration.

No project-level actions related to habitat restoration would increase potential for mosquito-borne diseases under Alternative 3.

Potential changes in the potential for Valley fever related to agricultural land irrigation.

As discussed in Appendix R, SWAP modeling results indicate that relative to the No Action Alternative, in the Sacramento River region there would be no reduction of irrigated agricultural land in dry/critical

years or in years with average precipitation under Alternative 3. There would be an increase in irrigated agricultural acreage in the San Joaquin River region of 2,674 acres in average years, and 56,039 acres in dry/critical years).

Because there would be no reduction in irrigated agricultural land in the study area under Alternative 3 relative to the No Action Alternative, there would be no increased potential for Valley fever due to CVP and SWP operations under this alternative.

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

As discussed in Appendix G, based on the overall lower methylmercury fish tissue concentrations at almost all modeled Delta locations, and modeled water concentrations, relative to the No Action Alternative, water operations under Alternative 3 would not contribute to additional water quality degradation with respect to methylmercury, or in increased health risks to humans consuming fish or shellfish from the Delta, Suisun Bay, and San Francisco Bay.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration.

No project-level actions related to habitat restoration would result in an increased potential for bird-aircraft strikes under Alternative 3.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials.

As would occur under the No Action Alternative, the south Delta agricultural barriers would be installed, operated and removed annually (as conditions allow) under Alternative 3. There would be no site-specific habitat restoration or CVP or SWP facility improvements, or any other site-specific actions under Alternative 3 that would require construction activities. As such, Alternative 3 would not result in adverse effects related to hazards or hazardous materials relative to the No Action Alternative.

W.2.5.2 *Program-Level Effects*

Potential changes in mosquito-borne diseases related to habitat restoration.

Tidal habitat and floodplain habitat restoration under Alternative 3 has the potential to create mosquito breeding habitat. Implementing spawning and rearing habitat restoration would create or restore areas of floodplain habitat in the study area. As would occur under Alternative 1, floodplain habitat would be created or modified in locations throughout the study area, including in the American River, upper Sacramento River, and lower San Joaquin River basins, as part of the spawning and rearing projects. In addition, Reclamation would also restore approximately 8,000 acres of tidal habitat restoration in Suisun Marsh and/or the north Delta, as would occur under the No Action Alternative. An additional 25,000 acres of habitat in the Delta would be restored under Alternative 3.

The habitat restoration under Alternative 3 could increase the public's risk of exposure to mosquito-borne diseases due to increased mosquito breeding habitat. This effect would likely be substantially greater than under the No Action Alternative because the habitat restoration that would occur under Alternative 3 is substantially greater in magnitude than would occur under the No Action Alternative. However, it is important to note that the additional 25,000 acres of habitat would be restored where potentially suitable

vector habitat already exists, and this habitat restoration would likely increase the number of mosquito predators as well. Regardless, implementation of Mitigation Measure HAZ-1 could avoid or minimize the potential for adverse effects related to increased mosquito breeding habitat through Reclamation's coordination with appropriate MCVDs in the study area during all phases of restoration (including design, implementation, and operations) to develop and implement site-specific mosquito management plans, which will include applicable BMPs from *Best Management Practices for Mosquito Control in California* (CDPH and MVCAC 2012).

Potential changes in the potential for Valley fever related to agricultural land irrigation.

As described in Appendix S, some changes in the total irrigated agricultural acreage in the Sacramento River, San Joaquin River, and Delta regions is possible with implementation of program actions of Alternative 3 (e.g., Delta Fish Species Conservation Hatchery, and Lower San Joaquin River habitat restoration). However, agricultural land could potentially be converted to non-agricultural use not as fallowed or idled land, but to another land use to accommodate these actions. Therefore, it is not expected that these actions would create large areas of open, undeveloped, dry land that may be conducive to the growth of *Coccidioides.*

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

As discussed in Appendix G, newly created tidal habitat areas and lands formerly used for irrigated agriculture have the potential to become new sources of methylmercury. Under Alternative 3, given that there would be 6,000 acres of tidal habitat restoration and an additional 25,000 acres of habitat restoration implemented in the Delta and Suisun Marsh, it is reasonable to assume that some habitat restoration would likely occur on lands formerly used for irrigated agriculture; thus, the new tidal habitat would not necessarily be a new source of methylmercury to the Delta. However, the degree to which new tidal habitat areas may be future sources of methylmercury to the aquatic environment is uncertain. The specific siting and design of the restored areas would be factors that affect the potential for methylmercury generation, transport and bioaccumulation. OEHHA standards for the consumption of fish in the study area would continue to be implemented and thus would serve to protect people against the overconsumption of fish with increased body burdens of mercury.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration.

Under Alternative 3, the increased tidal habitat and floodplain habitat in the study area, relative to the No Action Alternative, could potentially attract waterfowl and other birds to these restored locations. If these restored locations are in proximity to existing airport flight zones, there could be an increase in the potential for bird-aircraft strikes. Because there would be substantially more habitat restoration under Alternative 3 compared to the No Action Alternative, depending on the location of restored sites, the potential for bird-aircraft strikes would be greater under Alternative 3. However, for habitat restoration within 5 miles of a public-use airport, Reclamation will implement Mitigation Measure HAZ-2 and comply with FAA safety guidelines on wetlands and wildlife attractants as identified in the FAA Draft Advisory Circular 150/5200-33C Sections 1 and 2.4 (FAA 2019), to avoid or minimize the potential for bird-aircraft strikes resulting from habitat restoration.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials.

Certain program-level components of Alternative 3 (e.g., habitat restoration, small screen program, and other facility improvements) would involve the use of construction equipment. Potential hazards to the public associated with construction and operation and maintenance activities would be similar in nature to those discussed in Section W.2.3.1, *Project-Level Effects*, for Alternative 1. In addition, if digging were required for facility improvements, underground natural gas pipelines could be damaged and potentially expose construction workers or others in close proximity to gas fumes. However, any construction requiring excavation will be designed to avoid affecting existing pipelines and other facilities. Access points and staging areas will be established for equipment storage and maintenance. As described for Alternative 1, for construction of facilities (including facility improvements that require construction activities) disturbing one or more acres, BMPs would be implemented under the Construction General Permit to control pollutant discharges. In addition, as described in Appendix G, implementation of Mitigation Measure WQ-1 would minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction and maintenance. No hazardous materials would be used in reportable quantities (pursuant to CCR, Title 19, Division 2) unless approved in advance by the OES, in which case a HMMP would be prepared and implemented, as described under Mitigation Measure HAZ-3. Accordingly, the potential for Alternative 3 to result in hazards to the public associated with hazardous materials would be similar to the No Action Alternative, and there would be no adverse effects.

W.2.6 Alternative 4

W.2.6.1 *Project-Level Effects*

Potential changes in mosquito-borne diseases related to habitat restoration.

No project-level actions related to habitat restoration would increase potential for mosquito-borne diseases under Alternative 4.

Potential changes in the potential for Valley fever related to agricultural land irrigation.

As discussed in Appendix R, SWAP modeling results indicate that relative to the No Action Alternative, in the Sacramento River Region there would be an overall reduction of irrigated agricultural land by 60 acres (less than 0.005% decrease) in average water years, and 2,427 acres (an approximate 0.1% decrease) in dry/critical years. There would be an overall reduction in irrigated agricultural land in the San Joaquin River region of 5,758 acres (an approximate 0.1% decrease) in average water years, and 12,333 acres (an approximate 0.3% decrease) in dry/critical years, relative to the No Action Alternative.

As described in Section W.1.2, generally, *Coccidioides* propagation and air entrainment occurs on soils that remain unirrigated during dry seasons, and the San Joaquin Valley and Central Coast are the major endemic regions in California. As such, because there would be an overall nominal reduction in irrigated acreage in the study area in the Sacramento River region, and because this region is not an endemic area for *Coccidioides*, it is unlikely that CVP and SWP operations in that region under Alternative 4 would result in an increased potential for Valley fever. Similarly, although *Coccidioides* is endemic to the San Joaquin Valley, in both dry/critical and average water year types there would be less than an 0.4% decrease in irrigated agricultural land in the entire San Joaquin River region relative to the No Action Alternative; therefore, it is unlikely that this minor reduction in irrigated land due to CVP and SWP operations would increase the potential for Valley fever in the region. Also, as discussed in Appendix R, Mitigation Measure AG-1 could reduce effects by encouraging water agencies to diversify their water portfolios, thus increasing likelihood that water users would have adequate water for agricultural irrigation.

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption

As discussed in Appendix G, based on the overall lower fish tissue methylmercury concentrations at almost all modeled Delta locations, and modeled water concentrations, relative to the No Action Alternative, water operations under Alternative 4 would not contribute to additional water quality degradation with respect to methylmercury, or increased health risks to humans consuming fish from the Delta, Suisun Bay, and San Francisco Bay.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration

No project-level actions related to habitat restoration would result in an increased potential for bird-aircraft strikes under Alternative 4.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials

As would occur under the No Action Alternative, the south Delta agricultural barriers would be installed, operated and removed annually (as conditions allow) under Alternative 4. There would be no site-specific habitat restoration or CVP or SWP facility improvements, or any other project-level site-specific actions under Alternative 4 that would require construction activities. As such, Alternative 4 would not result in adverse effects related to hazards or hazardous materials relative to the No Action Alternative.

As described for Alternative 1, for construction of facilities disturbing one or more acres, BMPs would be implemented under the Construction General Permit to control pollutant discharges. In addition, as described in Appendix G, implementation of Mitigation Measure WQ-1 would minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction and maintenance. No hazardous materials would be used in reportable quantities (pursuant to CCR, Title 19, Division 2) unless approved in advance by the OES, in which case a HMMP would be prepared and implemented, as described under Mitigation Measure HAZ-3. Accordingly, the potential for Alternative 4 to result in hazards to the public associated with hazardous materials would be similar to the No Action Alternative, and there would be no adverse effects.

W.2.6.2 *Program-Level Effects*

Potential changes in mosquito-borne diseases related to habitat restoration.

Under Alternative 4, there would be no tidal habitat restoration as would occur under the No Action Alternative, and no other habitat types would be restored under this alternative. Accordingly, there would be no increased potential for mosquito-borne diseases in the study area under Alternative 4.

Potential changes in the potential for Valley fever related to agricultural land irrigation.

Program-level actions under Alternative 4 that have the potential to affect irrigated agricultural land in the study area are related to alteration of land use for water efficiency. This may involve the conversion of land with exceptionally high water use or with irrigation problems to a different crop or to nonagricultural use. However, agricultural land could potentially be converted to non-agricultural use not as fallowed or idled land, but to another land use altogether (e.g., developed land). Conversion to another land use could reduce the potential for the growth of *Coccidioides* and thus the risk of Valley fever. Conversion to a

different crop or implementation of other water-use efficiency measures (e.g., recycled water use, or improving pump efficiencies in distribution systems) would not result in a change in the potential for growth of *Coccidioides*. Therefore, there could potentially be a benefit due to agricultural land conversion or no change in the potential for Valley fever relative to the No Action Alternative.

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

Under Alternative 4, there would be no tidal habitat restoration as would occur under the No Action Alternative, and no other habitat types would be restored under this alternative. Thus, relative to the No Action Alternative, Alternative 4 would not increase the potential for human exposure to mercury in the study area caused by increased bioaccumulation of methylmercury in fish and shellfish.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration.

Under Alternative 4 there would be no habitat restoration as would occur under the No Action Alternative. Accordingly, there would be no increased potential for bird-aircraft strikes in the study area under this alternative relative to the No Action Alternative.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials.

Under Alternative 4, agricultural water users would increase irrigation efficiency by implementing efficient water management practices (EWMP). The implementation of some EWMPs could include construction, as well as operation and maintenance activities (e.g., lining irrigation canals, replacing irrigation canals with pipes, spill and tailwater systems).

As described for Alternative 1, for construction of facilities disturbing one or more acres, BMPs would be implemented under the Construction General Permit to control pollutant discharges. In addition, as described in Appendix G, implementation of Mitigation Measure WQ-1 would minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction and maintenance. No hazardous materials would be used in reportable quantities (pursuant to CCR, Title 19, Division 2) unless approved in advance by the OES, in which case a HMMP would be prepared and implemented, as described under Mitigation Measure HAZ-3. Accordingly, the potential for Alternative 4 to result in hazards to the public associated with hazardous materials would be similar to the No Action Alternative, and there would be no adverse effects.

W.2.7 Mitigation Measures

Mitigation Measure HAZ-1: Prepare and implement site-specific mosquito management plans

Reclamation will consult/coordinate with appropriate Mosquito and Vector Control Districts (MVCDs) in the study area prior to implementing tidal and floodplain habitat restoration to develop and implement site-specific mosquito management plans to aid in mosquito management. The mosquito management plans, which will include applicable BMPs from *Best Management Practices for Mosquito Control in California* (CDPH and MVCAC 2012), will address habitat design considerations, water management practices, vegetation management, biological controls, and restored habitat maintenance.

Mitigation Measure HAZ-2: Comply with FAA safety guidelines on wetlands and wildlife attractants as identified in the FAA Draft Advisory Circular 150/5200-33C

For habitat restoration in the study area that is within 5 miles of a public use airport and has the potential to attract waterfowl and other birds, Reclamation will comply with FAA safety guidelines on wetlands and wildlife attractants, as identified in the FAA Draft Advisory Circular 150/5200-33C Sections 1 and 2.4 (FAA 2019), to avoid or minimize the potential for bird-aircraft strikes resulting from habitat restoration.

Mitigation Measure HAZ-3: Prepare and Implement a Hazardous Materials Management Plan for Actions that will Require Handling Hazardous Materials in Reportable Quantities (CCR, Title 19, Division 2)

For actions that will require handling hazardous materials in quantities equal to or greater than 55 gallons of a liquid, 500 pounds of a solid, or 200 cubic feet of compressed gas, or extremely hazardous substances above the threshold planning quantity (40 CFR, Part 355, Appendix A), Reclamation will prepare and implement a HMMP. The HMMP will contain, at minimum, the following:

- A site plan;
- An emergency plan;
- An inventory of hazardous materials;
- A description of preventative measures to be implemented to avoid accidental spills, hazardous materials management, and storage;
- A description of the actions that will be taken in the event of a hazardous material spill;
- A training program for employees on the safe use, storage of hazardous materials on site.

Mitigation Measure AG-1: Diversify Water Portfolios

Please refer to Appendix R, *Land Use and Agricultural Resources Technical Appendix,* for a description of this mitigation measure.

Mitigation Measure WQ-1: Implement a Spill Prevention, Control, and Countermeasure Plan

Please refer to Appendix G, *Water Quality Technical Appendix,* for a description of this mitigation measure.

W.2.8 Summary of Impacts

Table W.2-1, Impact Summary, includes a summary of impacts, the magnitude and direction of those impacts, and potential mitigation measures for consideration.

Table W.2-1. Impact Summary

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
Potential changes in mosquito-borne diseases related to habitat restoration (Project-Level)	No Action	No impact	–
	1	No impact	–
	2	No impact	–
	3	No impact	–
	4	No impact	–
Potential changes in mosquito-borne diseases related to habitat restoration (Program-Level)	No Action	No impact	–
	1	Program-level tidal and floodplain habitat restoration could provide suitable mosquito breeding habitat in the study area, which would potentially increase the public's risk of exposure to mosquito-borne diseases.	MM HAZ-1
	2	No impact	–
	3	Program-level tidal and floodplain habitat restoration components could provide suitable mosquito breeding habitat in the study area, which would potentially increase the public's risk of exposure to mosquito-borne diseases.	MM HAZ-1
	4	No impact	–
Potential changes in the potential for Valley fever related to agricultural land irrigation (Project-Level)	No Action	No impact	–
	1	No impact	–
	2	No impact	–
	3	No impact	–
	4	Irrigated farmland acreage would decrease in the San Joaquin River region, which could change the potential for Valley fever.	MM AG-1
Potential changes in the potential for Valley fever related to agricultural land irrigation (Program-Level)	No Action	No impact	–
	1	No impact	–
	2	No impact	–
	3	No impact	–
	4	Potential beneficial effect as a result of conversion of agricultural land to non-agricultural uses.	–

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption (Project-Level).	No Action	No impact	–
	1	No impact	–
	2	No impact	–
	3	No impact	–
	4	No impact	–
Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption (Program-Level).	No Action	No impact	–
	1	No impact	–
	2	No impact	–
	3	Program-level habitat restoration in the Delta could result in a greater potential for methylmercury generation in the restored areas and bioaccumulation in fish and shellfish, which could increase the potential for human exposure to mercury through fish consumption.	–[1]
	4	No impact	–
Potential changes in the potential for bird-aircraft strikes related to habitat restoration (Project-Level).	No Action	No impact	–
	1	No impact	–
	2	No impact	–
	3	No impact	–
	4	No impact	–
Potential changes in the potential for bird-aircraft strikes related to habitat restoration (Program-Level).	No Action	No impact	–
	1	Program-level habitat restoration of the type that could attract waterfowl and other birds to restored areas within 5 miles of a public-use airport could increase the potential for bird-aircraft strikes.	MM HAZ-2
	2	No impact	–
	3	Program-level habitat restoration of the type that could attract waterfowl and other birds to restored areas within 5 miles of a public-use airport could increase the potential for bird-aircraft strikes.	MM HAZ-2
	4	No impact	–

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials (Project-Level)	No Action	No impact	–
	1	No impact	–
	2	No impact	–
	3	No impact	–
	4	No impact	–
Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials (Program-Level)	No Action	No impact	–
	1	Program-level construction and/or operation and maintenance of facilities could result in the potential for hazards to the public or environment through the transport, use, accidental release, or disposal of hazardous materials, as well as through damage to existing hazardous infrastructure (e.g., natural gas pipelines).	MM HAZ-3 MM WQ-1
	2	No impact	–
	3	Program-level construction and/or operation and maintenance of facilities could result in the potential for hazards to the public or environment through the transport, use, accidental release, or disposal of hazardous materials, as well as through damage to existing hazardous infrastructure (e.g., natural gas pipelines).	MM HAZ-3 MM WQ-1
	4	Program-level construction and/or operation and maintenance of facilities could result in the potential for hazards to the public or environment through the transport, use, accidental release, or disposal of hazardous materials, as well as through damage to existing hazardous infrastructure (e.g., natural gas pipelines).	MM HAZ-3 MM WQ-1

[1] The degree to which new tidal habitat areas may be future sources of methylmercury to the aquatic environment is uncertain. The specific siting and design of the restored areas would be factors that affect the potential for methylmercury generation, transport and bioaccumulation. OEHHA standards for the consumption of fish in the study area would continue to be implemented and thus would serve to protect people against the overconsumption of fish with increased body burdens of mercury.

W.2.9 Cumulative Effects

The following impacts related to hazards and hazardous materials could, when considered with other past, present, and reasonably foreseeable future projects identified in Appendix Y, *Cumulative Methodology*, result in cumulative effects.

- Potential changes in mosquito-borne diseases related to habitat restoration.
- Potential changes in the potential for Valley fever related to agricultural land irrigation.

- Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.
- Potential changes in the potential for bird-aircraft strikes related to habitat restoration.
- Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials.

Potential changes in mosquito-borne diseases related to habitat restoration.

Implementation of the No Action Alternative would add approximately 8,000 acres of tidal habitat relative to existing conditions in Suisun Marsh and/or the north Delta. While it is likely that this type of habitat could provide favorable conditions for mosquito breeding and reproduction and thereby contribute to a cumulative effect, all restoration activities would be designed to minimize the potential for stagnant water and other conditions favorable to the production of mosquitoes, and that these activities would occur in consultation with applicable MCVDs. Therefore, the No Action Alternative would not contribute to an adverse cumulative effect of increasing the public's risk of exposure to mosquito-borne diseases.

Alternatives 1 and 3 would implement tidal and floodplain habitat restoration that could create conditions conducive to mosquito breeding and reproduction (e.g., increase aquatic habitat such that there may be water levels that slowly increase or recede compared to water levels that are stable or that rapidly fluctuate, substantially increase emergent vegetation, or create standing water) in the study area. Similarly, implementation of projects considered in this cumulative analysis, including, but not limited to Sites Reservoir Project, Semitropic Water Storage District Delta Wetlands, Prospect Island Tidal Habitat Restoration Project, and Suisun Marsh Habitat Management, Preservation, and Restoration Plan could also result or have resulted in an increase in habitat suitable for mosquitos. Because mosquitoes can be host to diseases that would affect public health, Alternatives 1 and 3 could contribute to cumulative effect of potentially increasing mosquito-borne diseases in the study area.

The contribution of Alternative 3 to the cumulative effect would be greater because a substantially greater number of acres would be restored under this alternative relative to Alternative 1. However, it is important to note that habitat suitable for mosquito breeding and reproduction is already present in the study area, and programs to prevent mosquitoes from breeding and multiplying are being widely implemented by MVCDs and others. In addition, implementation of Mitigation Measure HAZ-1 is expected to reduce the incremental contribution of Alternatives 1 and 3 to an adverse cumulative effect. As described for Mitigation Measure HAZ-1, Reclamation will consult/coordinate with appropriate MVCDs prior to implementing tidal and floodplain habitat restoration to develop and implement site-specific mosquito management plans to aid in mosquito management and reduce the potential for an increase in mosquito breeding habitat. Therefore, Alternatives 1 and 3, would not contribute substantially to an adverse cumulative effect related to increasing the potential for mosquito-borne diseases in the study area.

Potential changes in the potential for Valley fever related to agricultural land irrigation.

Past, present, and reasonably foreseeable projects that have or would result in the reduction or limitation of the availability of water for irrigation in the study area (e.g., the Bay-Delta Water Quality Control Plan Update, Sustainable Groundwater Management Act), particularly in the San Joaquin Valley and the Central Coast (i.e., the areas where *Coccidioides* is endemic), may create conditions suitable for *Coccidioides* growth and dispersal. Under Alternative 4 there would be an overall reduction in irrigated agricultural land in the San Joaquin River region of approximately 0.1% in average water years and 0.3%

in dry/critical years. Although *Coccidioides* is endemic to the San Joaquin Valley, it is unlikely that this reduction in irrigated agricultural land would substantially contribute to the adverse cumulative effect of Valley fever risk because the irrigated acreage reduction is relatively nominal in all water year types. However, as discussed in Appendix R, Mitigation Measure AG-1 could reduce effects by encouraging water agencies to diversify their water portfolios, thus increasing the likelihood that water users would have adequate water for agricultural irrigation.

Potential changes in methylmercury production and resultant changes in bioaccumulation in fish and shellfish for human consumption.

Tidal habitat restoration under the No Action Alternative could create conditions resulting in increased methylation of mercury within the Delta, increased biotic exposure to and uptake of methylmercury, and therefore increased mercury bioaccumulation in fish and shellfish. Under existing conditions, the Delta is impaired by mercury, and there are a number of regulatory efforts being implemented to control and reduce mercury and methylmercury in the Delta, as discussed in Appendix G. Tidal habitat design and location considerations would minimize increases in the production of methylmercury and thus methylmercury bioaccumulation in fish and shellfish. Thus, the No Action Alternative would have no contribution to the cumulative production and bioaccumulation of methylmercury.

Tidal habitat restoration under Alternative 1 and Alternative 3 could create conditions resulting in increased methylation of mercury within the Delta, which would result in increased exposure to and uptake of methylmercury by fish and shellfish, and mercury bioaccumulation fish tissues. Because more habitat would be restored in the Delta under Alternative 3 relative to Alternative 1, the magnitude of potential increased methylation of mercury would likely be substantially greater. Increased bioaccumulation of methylmercury in fish and shellfish under both Alternative 1 and Alternative 3 would contribute to the adverse cumulative effect of methylmercury in the Delta region. The degree to which newly created tidal habitat will become a new source of methylmercury in the Delta will depend on tidal habitat siting and design. OEHHA standards for the consumption of fish in the study area would continue to be implemented and thus would serve to protect people against the overconsumption of fish with increased body burdens of mercury.

Potential changes in the potential for bird-aircraft strikes related to habitat restoration.

Implementation of tidal and floodplain habitat under Alternatives 1 and 3, and tidal habitat under the No Action Alternative in the study area could potentially attract waterfowl and other birds. If these restored locations are in proximity to existing airport flight zones, there could be an increase in the potential for bird-aircraft strikes, which would contribute to the adverse cumulative effect in the study area. Because there would be substantially more habitat restoration under Alternative 3 relative to Alternative 1, depending on the location of restored sites, the potential for bird-aircraft strikes would be greater under Alternative 3. Any similar type of restoration implemented under past, present, or reasonably foreseeable projects could also create the potential for bird-aircraft strikes if located near an airport. However, because under both Alternative 1 and Alternative 3 Reclamation would comply with FAA safety guidelines on wetlands and wildlife attractants (Mitigation Measure HAZ-2) for any habitat restoration within 5 miles of a public-use airport that may attract waterfowl or other birds, neither of these alternatives would contribute incrementally to a cumulative increase in the potential for bird-aircraft strikes in the study area.

Potential changes in the potential for construction and operation and maintenance activities to result in hazards and effects related to hazardous materials.

Construction and/or operation and maintenance of facilities under the No Action Alternative, as well as under Alternatives 1, 3, and 4, 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, and Alternatives 1 and 3 could damage existing hazardous infrastructure, such as natural gas pipelines. In addition, Alternative 1 would entail herbicide and algaecide application to aquatic weeds and algae at CCF on an as-needed basis. It is reasonable to assume that actions implemented as part of past, present and reasonably foreseeable future projects that involve the use, transport or storage of hazardous materials, or excavation near hazardous infrastructure (e.g., California High- Speed Rail System Merced to Fresno Section, Sites Reservoir Project, North Bay Aqueduct Alternative Intake, Los Vaqueros Reservoir Expansion Phase 2) would result in similar hazards.

Projects under the No Action Alternative have already undergone state and/or federal environmental review, it is assumed that any 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.

To minimize, avoid, and reduce effects related to hazards and hazardous materials, for construction activities under Alternatives 1, 3, and 4 that would disturb one or more acres, BMPs would be implemented under the Construction General Permit to control pollutant discharges. No hazardous materials would be used in reportable quantities (pursuant to CCR, Title 19, Division 2) unless approved in advance by the OES, in which case a HMMP would be prepared and implemented, as described under Mitigation Measure HAZ-3. Mitigation Measure WQ-1 would minimize the potential for, and effects from, spills of hazardous, toxic, and petroleum substances during construction and maintenance. BMPs would be implemented under the General Pesticide Permit, for herbicide and algaecide application at CCF under Alternative 1. Therefore, Alternatives 1, 3, and 4 would not substantially contribute to potential adverse cumulative effects related to hazards and hazardous materials.

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