3.10 HAZARDS AND HAZARDOUS MATERIALS

3.10.1 Introduction

This section discusses hazards and hazardous materials as they relate to public health and worker safety. The public health hazards considered include risk of selenium exposure due to consumption of fish from the Species Habitat Conservation (SCH) ponds and waterfowl that have foraged at the ponds, risks from a potential increase in mosquitoes at the SCH ponds and sedimentation basins, and potential for air and dust-borne diseases. The potential for increased wildland fire risks also is considered, as are potential risks to civilian and military aircraft associated with bird airstrikes. Issues associated with hazardous materials include the potential for public and worker exposure to hazardous wastes or hazardous materials. Risks associated with unexploded ordnance are not considered in this analysis because the Salton Sea Test Base (SSTB) and any Salton Sea fixed bomb target sites are outside the SCH Project boundaries (Department of Defense 2009). Issues associated with geological hazards such as earthquake and flooding potential are discussed in Section 3.8. Potential impacts on air quality that could affect public health are discussed in Section 3.3.

The study area encompasses the construction footprint and associated easements, as well as nearby airspace; surrounding communities also are included in the study area because of the potential for an increase in mosquito vectors.

Table 3.10-1 summarizes the impacts of the six Project alternatives on hazard and hazardous materials, compared to both the existing conditions and the No Action Alternative.

Table 3.10-1 Summary of Impacts on Hazards and Hazardous Materials

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact HAZ-1: Hazardous materials used during construction could be released into the environment.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-5: Project construction could increase the risk of wildland fire.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses.	Existing Condition	S	S	S	S	S	S	MM HAZ-1: Worker training will be provided to workers who may be exposed to air-borne

Table 3.10-1 Summary of Impacts on Hazards and Hazardous Materials

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
								diseases during excavation activities. Training will include recognizing symptoms and use of personal protective equipment.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-8: Selenium and dichlorodiphenyldichloroethylene (DDE) levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.10.2 Regulatory Requirements

3.10.2.1 Hazards and Hazardous Materials

Hazards and hazardous materials are generally characterized by chemical and physical properties that cause a substance to be considered hazardous, including toxicity, ignitability, corrosivity, and reactivity. Within typical construction sites, materials that could be considered hazardous include fuels, motor oil, grease and other lubricants, solvents, soldering and welding equipment, and glues. Also, excavation may expose buried hazardous materials resulting from prior use of the site or adjacent property.

Resource Conservation and Recovery Act of 1976 (42 USC Section 6901-6987)

The goal of the Resource Conservation and Recovery Act (RCRA), a Federal statute passed in 1976, is the protection of human health and the environment, the reduction of waste, the conservation of energy and natural resources, and the elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments (HSWA) of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements. The corresponding regulations in 40 CFR sections 260-299 provide the general framework for managing hazardous waste, including requirements for entities that generate, store, transport, treat, and disposed of hazardous waste. In California, the United States Environmental Protection Agency (USEPA) has delegated most of the regulatory responsibilities to the State. In California, the RCRA

program is codified through the Health and Safety Code sections 25100 et seq., and implemented through the CCR, Title 22, Division 4.5, Environmental Health Standards for the Management of Hazardous Wastes.

Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5)

This statute is the basic hazardous waste law for California. The Hazardous Waste Control implements the Federal RCRA cradle-to-grave waste management system in California. California hazardous waste regulations can be found in Title 22, Division 4.5, Environmental Health Standards for the Management of Hazardous Wastes. The program is administered by the Department of Toxic Substances Control (DTSC).

Hazardous Material Release Response Plans and Inventory Law (California Health and Safety Code, Division 20, Chapter 6.95)

This state right-to-know law requires businesses to develop a Hazardous Material Management Plan or a "business plan" for hazardous materials emergencies if they handle more than 500 pounds, 55 gallons, or 200 cubic feet of hazardous materials. In addition, the business plan includes an inventory of all hazardous materials stored or handled at the facility above these thresholds. This law is designed to reduce the occurrence and severity of hazardous materials releases. The administering agency for the SCH Project would be the Certified Unified Program Agency, in this case, the Imperial County. Imperial County Public Health Department, Section of Environmental Health and Consumer Protection Services.

3.10.2.2 Public Health and Safety

Mosquito Abatement and Vector Control District Law (California Health and Safety Code, Sections 2002(j)(k); 2060(b))

This law specifies that the person or agency claiming ownership, title, or right to property or who controls the diversion, delivery, conveyance, or flow of water shall be responsible for the abatement of a public nuisance that is caused by, or as a result of, that property or the diversion, delivery, conveyance, or control of that water. "Public nuisance" means any of the following:

1. Any property, excluding water, that has been artificially altered from its natural condition so that it now supports the development, attraction, or harborage of vectors. The presence of vectors in their developmental stages on a property is prima facie evidence that the property is a public nuisance.

2. Any water that is a breeding place for vectors. The presence of vectors in their developmental stages in the water is prima facie evidence that the water is a public nuisance.

3. Any activity that supports the development, attraction, or harborage of vectors, or that facilitates the introduction or spread of vectors.

"Vector" means any animal capable of transmitting the causative agent of human disease or capable of producing human discomfort or injury, including, but not limited to, mosquitoes, flies, mites, ticks, other arthropods, and rodents and other vertebrates.

California Public Resources Code

The California Public Resources Code includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that has an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire

hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas.

3.10.2.3 Other Applicable State and Local Agencies

Other state and local agencies involved in enforcing public health and safety laws and regulations in the study area include the following.

CalEPA - Office of Environmental Health Hazard Assessment (OEHHA) – Responsible for evaluating the potential public health risks of chemical containments in sport fish and issuing state advisories, when appropriate, OEHHA is also consulted by other agencies interested in assessing the health risk of fish consumption during the process of developing water quality or clean-up "criteria." There are key differences between fish consumption advisories and other environmental risk criteria; advisories consider the significant benefits of fish consumption, while criteria may be strictly risk-based and may not take into account other factors.

California Department of Public Health – Provides resources and information for Public Health concerns in California, which include Hantavirus cardiopulmonary syndrome (HCPS), valley fever, and West Nile virus.

California Occupational Safety and Health Administration (Cal/OSHA) – Has oversight of worker safety. Regulations dealing with worker safety are found in Title 8 California Code of Regulations. These sections require that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to worker safety during construction and operation, fire safety, and hazardous materials use, storage, and handling.

Imperial County Vector Control District (ICVCD) – Responsible for vector control in the study area, including detecting and reducing the spread of mosquito-borne disease through surveillance and abatement activities.

3.10.3 Affected Environment

3.10.3.1 Hazardous Materials

Contamination can result from leaking underground storage tanks, solid waste disposal sites, and historic leaks from pipelines or other industrial sites that were improperly managed. Information concerning the presence and current disposition of hazardous wastes was obtained from the government databases listed in Table 3.10-2. Pesticide use in the surrounding agricultural areas also has resulted in the presence of pesticides, primarily dichlorodiphenyldichloroethylene (DDE), in the sediments at the proposed alternative sites. The highest surface sediment DDE concentrations documented have been at the Alamo River sites (mean sediment concentrations of approximately 13 nanograms per gram [ng/g]). Surface sediment DDE concentrations were lower at the East New River site, and lowest at the Mid and Far West New River sites (mean 1-3 ng/g). The highest subsurface (5-30 cm deep) sediment DDE concentrations were found in East New River (mean approximately 9 ng/g) and immediately adjacent to the Alamo River mouth in Morton Bay (mean approximately 25 ng/g). Lower concentrations of DDE were found at the Middle New River and Alamo River North (Davis Road) sites. The lowest DDE concentrations were found at the Far West New River sites (mean approximately 1 ng/g; Wang et al. 2011). (Refer to Section 3.11, Hydrology and Water Quality for additional detail regarding the presence of pesticides at the New and Alamo river sites).

Table 3.10-2 Online Databases Used to Search for Hazardous Materials Records

Database	Government Department	Type	Description	Link to Source Page
EnviroStor	DTSC	State	Site cleanup, site mitigation, and Brownfields reuse programs	http://www.envirostor.dtsc.ca.gov/public/
CERCLIS	USEPA	Federal	National Priorities List sites and progress	http://www.epa.gov/superfund/sites/cursites/
Geotracker	State Water Resources Control Board	State	Environmental information for Leaking Underground Storage Tanks; Underground Storage Tanks; Spills, Leaks, Investigations, and Cleanups; and land disposal sites in California	https://geotracker.swrcb.ca.gov/
RCRA Information System	USEPA	Federal	Hazardous waste handlers	http://www.epa.gov/enviro/html/rcris/rcris_query_java.html
Solid Waste Information System	California Department of Resources Recycling and Recovery (CalRecycle)	State	Solid waste facilities	http://www.calrecycle.ca.gov/
TRI	USEPA	Federal	Toxic releases reported by state	http://www.epa.gov/tri/tridata/state_data_files.htm

The results of a search of the databases in Table 3.10-2 identified the sites listed in Table 3.10-3 as located within the general Project area. The two CalEnergy geothermal facility sites are located within the area where the SCH Project's brackish water pipeline from the Alamo River could be located. During maintenance operations at the geothermal facility (including high pressure washing of the piping, removal of sediments from the brine ponds, and the removal of filter cake from the clarifiers), these solid scale sediment cake materials were released to on-site surface soils in the vicinity of these maintenance operations. Each of these activities contributed to arsenic and lead contaminated soil impacts on the site at levels that require further cleanup to protect site workers, human health, and the environment. A draft cleanup plan to excavate, remove and transport arsenic and lead contaminated soil at the facility has been prepared by DTSC. DTSC has determined that there is no immediate risk to the public because the facility is fenced, restricted to facility personnel, and not located near residential or commercial areas. DTSC will oversee the proposed soil excavation, removal and transportation activities and ensure work is performed in a manner protective of human health and the environment (DTSC 2010).

Table 3.10-3 Description of Sites with Hazardous Waste Identified from Database Search

Database	Government Dept.	Potential Hazards Site	Site Information	Comments
Geotracker	Colorado River Basin Regional Water Quality Control Board (CRBRWQCB) (Region 7)	No	910 West Vail Road, Calipatria Site borders Project area	Leaking underground fuel tank. Completed, case closed as of 8/25/1992. Potential contaminant was diesel, media affected was soil.
Geotracker	CRBRWQCB (Region 7)	No	JM Leathers Geothermal Plant JM Leathers Powerplant Land Disposal Site 342 West Sinclair Road, Calipatria	Active landfill, no violations. Opened in 1965.
Solid Waste Information System	CalRecycle	No	7015 Brandt Road, Calipatria [a]	Composing operation, permitted since 2002. Last inspection 5/17/21010, no violations or areas of concern.
EnviroStor	DTSC	Yes	CalEnergy Facility, 480 West Sinclair Road, Calipatria [a]	Tiered permit site. Samples taken on site have elevated levels of heavy metals including arsenic, barium, copper, lead and zinc.
EnviroStor	DTSC	Yes	CalEnergy Facility, 342 West Sinclair Road, Calipatria [a]	Tiered permit site. Samples taken on site have elevated levels of heavy metals including arsenic, barium, copper, lead and zinc.

Note:
a. Sites are located within area where the brackish water pipeline from the Alamo River could be located.

3.10.3.2 Public Health

Noncancer Health Risks from Selenium Exposures through Fish and Waterfowl Consumption

Selenium is known to be present in the Salton Sea, and a State health advisory has been issued for human consumption of fish from the Salton Sea. In general, selenium concentrations in the Alamo River are higher than the selenium concentrations in the New River, and both have higher selenium concentrations than the Salton Sea (Amrhein and Smith 2011; C. Holdren, Reclamation, unpublished data).

Selenium is a metalloid found naturally, but highly variably, throughout the environment. Although toxic at relatively low levels, selenium is also a required nutrient. The current Recommended Dietary Allowance (RDA) for selenium is 55 micrograms (µg) per day for the general adult population, 60 µg/day for pregnant women, and 70 µg/day during lactation. Selenium is found in a variety of inorganic and

organic forms; however, in animal tissues, most selenium occurs as the amino acids selenomethionine or selenocysteine. Fish and other food samples are analyzed for total selenium content, as nutritional and toxicity values have not been developed for specific chemical forms of the element (Klasing and Brodberg 2008).

OEHHA has developed Fish Contaminant Goals (FCGs) and Advisory Tissue Levels (ATLs) for evaluating selenium non-cancer risk from fish consumption (Klasing and Brodberg 2008). FCGs are estimates of contaminant levels in fish that pose no significant health risk to individuals consuming sport fish at a standard consumption rate over a lifetime. FCGs are based solely on public health considerations without regard to economic considerations, technical feasibility, or the counterbalancing benefits of fish consumption. The FCG for selenium is 7.4 milligrams per kilogram (mg/kg) wet weight (which equates to 30 mg/kg dry weight), assuming an adult consumption rate of 32 grams per day or one 8-ounce (prior to cooking) fillet per week (Klasing and Brodberg 2008). ATLs, while still conferring no significant health risk to individuals consuming sport fish in the quantities shown over a lifetime, were developed with the recognition that there are unique health benefits associated with fish consumption. The ATL for selenium is 4.9 – 15 mg/kg wet weight (20-61 mg/kg dw) for one 8-ounce serving per week.

Selenium concentrations in fish have been measured and modeled at the Salton Sea. Tilapia collected in 2005 from the Salton Sea (but not at the Project area) had selenium concentrations in muscle tissue of 1.5 to 3.0 mg/kg wet weight, with a mean of 2.0 mg/kg wet weight (California Department of Water Resources [DWR] and California Department of Fish and Game [DFG] 2007), while Moreau et al. (2007) reported a mean of 9.0 mg/kg wet weight. Fillet (muscle tissue) and whole body selenium measurements were very similar for tilapia (Moreau et al. 2007), about 1.11 times greater for fillets than whole body (DWR and DFG 2007, Appendix G).

Each of these measured selenium tilapia tissue concentrations can be used to estimate the total intake of selenium by eating tilapia for comparison to selenium acute and chronic toxicity thresholds. However, because the toxicity of selenium depends on many factors, including the several forms selenium can take (e.g., selinide, selinate, selinomethinanine) regulators and public health officials have resorted to providing more simplistic estimates of the acceptable risk to selenium in fish tissue by estimating the safe number of meals per month using accepted HHRA risk parameters. As can be seen in Table 3.10-4, estimates of the number meals per month, based on the selenium concentration in the tilapia muscle tissue can vary from only 17 to over 60 depending on the suite of risk factors used by the modeler. The designation by OEHHA of the number of tilapia meals (nine per month) is very conservative and is based on their assumption that the selenium concentrations in tilapia from the area may be within the reported ranges, but may also be higher (using conservative uncertainty parameters). Clearly, the number of tilapia meals per month recommended by OEHHA would be well below the likely number of tilapia meals that would result in no significant risk to consumers.

Screening-level human health risk assessments of fish and duck tissue consumption (i.e., maximum safe consumption rates) are discussed in Appendix G of the *Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report* (PEIR) (DWR and DFG 2007). Recreational fishing occurs at the Salton Sea, although it has likely declined compared to the past when the fisheries were more productive (DWR and DFG 2007, Appendix G). Consumption of waterfowl by recreational hunters is another possible selenium exposure pathway. Most waterfowl taken by hunters are from areas supplied by Colorado River water (e.g., at the Imperial Wildlife Area, Sonny Bono Salton Sea National Wildlife Refuge, and private duck clubs), which has a lower selenium concentration than water from the New and Alamo rivers. Current consumption rates and selenium concentrations for duck tissues are unknown. In the absence of site-specific fish and waterfowl consumption rates for the Salton Sea, maximum safe consumption rates that correspond to specific levels of noncancer adverse health effects were estimated for the assessment.

For the Salton Sea, OEHHA's public health advisory limits fish consumption to two servings per week for all consumers (OEHHA 2009). Several other health risk assessments related to selenium exposure from fish consumption have been developed for the Salton Sea, as summarized in Table 3.10-4 (DWR and DFG 2007; Moreau et al. 2007). These safe consumption rates are comparable to the present advisory limit issued by OEHHA.

Table 3.10-4 Comparisons of Estimated Safe Fish and Duck Consumption Rates and Advisories for the Salton Sea Based on Selenium Concentrations in Fish Tissues

Description	Tissue Concentration Selenium (mg/kg wet weight)	Maximum Safe (grams/week)	Consumption Rate (meals/month)	Reference
Adult consumption of tilapia muscle tissue		910-1,330	17-25	Costa-Pierce et al. 2000
Adult consumption of tilapia muscle tissue	1.25 – 3.4[a]	720-1,960	13-34	DWR and DFG 2007, Appendix G
Adult consumption of tilapia muscle tissue	9.0 mean	810-1,190	15-23	Moreau et al. 2007
Adult consumption of Salton Sea fish (tilapia, croaker, sargo, orangemouth corvina) muscle tissue	-	-	9[b]	OEHHA 2009
Adult consumption of duck tissue	1.03 – 2.79	884-2,379	23-62	DWR and DFG 2007, Appendix G

Notes:

a. Tissue concentrations modeled for existing conditions Source: (DWR and DFG 2007).

b. Fish advisory limits stated 2 meals per week which is equivalent to 9 meals per month.

Health Risks from Exposure to Dichlorodiphenyltrichloroethane (DDT) and its Metabolites through Fish Consumption

Dichlorodiphenyltrichloroethane (DDT) and its derivatives dichlorodiphenyldichloroethane (DDD) and DDE can enter the food chain from sediments and bioaccumulate to affect consumers. Poulsen and Peterson (2006) developed sediment bioaccumulation screening levels (SLV_{BH}) for evaluation of human health risks by determining acceptable fish tissue levels of DDE for carcinogens and noncarcinogens, and then using a relationship between fish tissue and sediment concentrations to calculate acceptable sediment concentrations. Two SLV_{BH} were defined, one for the general population (0.24 nanograms per gram [ng/g]) and another more protective standard (0.0038 ng/g) for population segments that consume fish more often (e.g., subsistence, recreational, or Native American users) or consume whole fish. Existing DDE concentrations in surface and subsurface sediments at proposed pond sites (Table 3.10-5) greatly exceed the SLVs for the general population and for more frequent consumers.

Table 3.10-5 Sediment DDE Concentrations (ng/g dry weight) for Existing Conditions/No Action and SCH Project

		Existing Conditions and No Action		SCH Project[2]		Difference between Existing/No Action and Project	
Alternative	Pond Units	Mean	Maximum	Mean	Maximum	Mean	Maximum
1	New East	6.5	23.7	7.2	28.0	0.7	4.3
	New Middle	2.8	8.0	3.5	14.7	0.7	6.7
2	New East	6.5	23.7	7.1	27.6	0.6	3.9
	New Middle	2.8	8.0	3.6	15.7	0.8	7.7
	New Far West	1.1	2.9	1.0	2.7	-0.7	- 0.2
3	New East	6.5	23.7	7.1	27.9	0.6	4.2
	New Middle	2.8	8.0	3.5	14.7	0.7	6.7
	New Far West	1.1	2.9	1.1	2.7	-0.6	- 0.2
4	Alamo Morton Bay	13.7	32.4	15.7	45.0	2.0	12.6
5	Alamo Morton Bay	13.7	32.4	19.2	66.6	5.5	34.2
	Alamo - north	13.4	34.4	12.9	34.8	- 0.5	0.4
6	Alamo Morton Bay	13.7	32.4	17.7	57.3	4.0	24.9
	Alamo - north	13.4	34.4	12.9	34.8	-0 .5	0.4

1. DDE concentrations (mean and maximum values) in undisturbed surface sediments (0 to 5 centimeters deep) measured at each location (Amrhein and Smith 2011; Wang et al. 2011)

2. Expected (calculated) DDE concentrations for each SCH alternative, based on field measurements of surface sediments (0 to 5 centimeters) and subsurface sediments (5 to15 and 15 to 30 centimeters deep) (Wang et al. 2011), and weighted according to proportion of pond area that would remain undisturbed but inundated (surface 0- to 5-centimeter concentrations) and area disturbed by construction [borrow ditches for berms, excavated swales and channels, borrow for habitat islands) (subsurface 5- to 30-centimeter concentrations)]. "Mean" is the area weighted average calculated using mean values for surface and subsurface sediment. "Maximum" average concentrations were also calculated, using maximum observed values of surface and subsurface sediments. This approach was used as a hypothetical upper bound of potential risk, because DDE concentrations below 30 centimeters are unknown and construction could disturb deeper sediments.

Total DDT tissue concentrations measured in fish collected from the New and Alamo rivers regularly exceed the National Academy of Sciences recommended maximum concentration (1,000 ng/g; CRBRWQCB 2002a, b, 2005) and the U.S. Food and Drug Administration Action Level (5,000 ng/g; CRBRWQCB 2002a, b, 2005). The National Academy of Sciences guidelines are meant to protect species that consume DDT at all food chain levels, while Food and Drug Administration Action Levels are intended to protect humans from the chronic effects of DDT consumption, and are based on contaminated food consumption quantity and frequency (CRBRWQCB 2002a, b). USEPA risk analyses indicate that a 70-kg person would be subject to an unacceptable risk from DDT contamination if the individual consumes more than 10 grams per day of tilapia collected near the mouths of the New and Alamo rivers (Costa-Pierce et al. 2000). Studies suggest that DDE concentrations measured in Salton Sea tilapia are unlikely to cause non-cancerous health effects in anglers, but consumption of more than four meals of tilapia per week may result in a 1×10^{-5} increase in cancer risk (Moreau et al. 2007). These

values, however, are based on DDT and DDE concentrations reported from small sample sizes, and further research is required to refine estimates of risk from consumption of Salton Sea fish contaminated with DDT and its metabolites. Following OEHHA's public health advisory limiting fish consumption to two servings per week for all consumers (Table 3.10-4; OEHHA 2009) would result in minimal risk to humans from DDE exposure under existing conditions.

Mosquito Vectors

Another potential public health hazard is the risk of disease transmitted by vectors. Mosquitoes are the primary insect vector of concern in the study area because they are known carriers of human and animal diseases. The most important diseases in the study area associated with mosquitoes are the West Nile virus and the Saint Louis encephalitis virus.

West Nile virus is spread by mosquitoes that feed on the blood of infected birds and other animals and can transmit the virus to humans. While most people infected with West Nile virus exhibit mild or no symptoms, severe infections can lead to encephalitis and can be fatal. West Nile virus first appeared in California in 2002. West Nile virus activity can be detected among dead birds, mosquito pools, and sentinel chickens. In 2004, 58 counties detected West Nile virus activity, with 779 human cases reported and 28 West Nile virus associated fatalities (California Vectorborne Disease Surveillance System [CalSurv] 2010). In 2010, 35 counties detected virus activity, with 105 human cases reported and three fatalities.

Wild birds are the maintenance and amplifying hosts of Saint Louis encephalitis virus, which is transmitted among birds and to humans by mosquitoes. Human infection with Saint Louis encephalitis virus can result in mild to severe illness, with case-fatality rates ranging from 3 percent to 30 percent. Since 1945, 597 human cases of Saint Louis encephalitis virus have been reported in California. The most recent outbreaks occurred in 1984 in the Los Angeles Basin (26 cases) and in 1989 in the southern San Joaquin Valley (29 cases). The last human case reported was in 1997, virus activity has not been detected in mosquito pools or sentinel chickens since 2003 (CalSurv 2010).

Air and Dust-Borne Diseases

Two airborne diseases and public health risks potentially exist within the study area – valley fever (or coccidiomycosis) and HCPS.

Valley fever is a fungal infection caused by coccidioides organisms. It can cause fever, chest pain and coughing, among other signs and symptoms. The coccidioides species of fungi that cause valley fever are commonly found in the soil in certain areas. Coccidiodes organisms can grow under environmental extremes of temperature, salinity and alkaline conditions. These fungi can be stirred into the air by anything that disrupts the soil, such as farming, construction, and wind. Airborne spores can be inhaled into the lungs, where they multiply and grow. Most people who breathe the spores (about 60 percent) develop no symptoms at all. The rest develop flu-like symptoms. Without treatment, valley fever can lead to severe pneumonia, meningitis, and even death. However, when properly treated at the first sign of symptoms, most people will recover without problems. Once infected, the body usually establishes lifetime immunity against future infections. The disease is not contagious, so it cannot spread from one person to another.

HCPS is a rare, but often fatal, disease of the lungs. HCPS was first recognized in 1993 in the southwestern United States. HCPS infections are associated with domestic, occupational, or recreational activities that bring humans into contact with rodents and their excreta, usually in rural settings in poorly ventilated buildings. There have been no reported HCPS cases in Imperial County from 2001-2009

(CPHD 2009). High risk areas and activities are vacant structures and rodent handling. Most outdoor locations are considered low risk (CDC 2004).

3.10.3.3 Bird Airstrike Hazards

Collisions between birds and aircraft are a concern, both for civilian and military aircraft, and can result in the loss of aircraft and personnel or lead to costly repairs. The Federal Aviation Administrative (FAA) Wildlife Strike Database contains records of reported wildlife strikes since 1990 (FAA 2011a). Strike reporting is voluntary; therefore, this database only represents the information the FAA has received from airlines, airports, pilots, and other sources. No airstrikes with civilian aircraft were reported in Imperial County during this time, although a Naval Air Facility (NAF) El Centro lost an F-18 jet to a bird strike in October 1995 (Zakrajsek 2002).

Birds are most frequently found at low altitudes; consequently, the risk of a bird strike is greatest near airfields. Seventy-five to 90 percent of birdstrikes involving civil aircraft occurred near airports, primarily during takeoff and landing. Large birds, such as geese and pelicans, have result in the greatest damage to aircraft. Military aircraft face additional risks because they often engage in low altitude, high speed, and training flights (Zakrajsek 2002).

Civilian airports closest to the Salton Sea include the Imperial County Airport, Brawley Municipal Airport, Cliff Hatfield Memorial Airport in Calipatria, and Salton Sea Airport in Salton City. Information regarding the types of air traffic experienced at each of the local airports, the approximate distance to the proposed New and Alamo river pond sites, and the average number of daily aircraft operations at each airport is summarized in Table 3.10-6.

Table 3.10-6 Public Airports near the Salton Sea

Airport Name	Location	Distance to New River Ponds	Distance to Alamo River Ponds	Uses	Average Daily Aircraft Operations
Brawley Municipal Airport	Brawley, California	12 miles	14 miles	Transient general aviation – 45% Local general aviation – 45% Air taxi – 9%	105
Cliff Hatfield Memorial Airport	Calipatria, California	8 miles	5.5 miles	Transient general aviation – 100%	29
Imperial County Airport	Imperial, California	18.5 miles	23.5 miles	Transient general aviation – 45% Local general aviation – 47% Air taxi – 2% Commercial – 2% Military – 4%	107

Source: AirNav.com 2010

The nearest military installation is Naval Air Facility (NAF) El Centro, located approximately 17 miles south of the Salton Sea. The base is an integral part of military air training missions in the United States, providing realistic training opportunities to active and reserve military units, and it is the winter home of the Blue Angels. Every month, 7 to 12 squadrons and up to 1,600 personnel train at NAF El Centro. NAF El Centro also provides base support to Naval Aviation Squadrons and is associated with R-2510 and R-2512 Restricted Airspace Ranges that provide for critical military operations for weapons and air combat

training (personal communication, R. Thompson 2010). R-2510 encompasses approximately 155,000 acres several miles south and west of the Salton Sea. R-2512 is approximately 63,000 acres and located further east (Figure 3.10-1). The Kane West Military Operations Area (MOA) overlies a portion of the New River sites, and the Kane East MOA overlies the remaining portion of the New River sites, as well as the Alamo River sites. The MOA extends from 30,000 feet above ground level upward (FAA 2011b). Two military training routes, flown at low altitudes by military aircraft, are present in the vicinity of the sites. Visual route (VR 296) bisects the New River sites and VR 1211 runs adjacent to both the New and Alamo river sites.). No evidence of bird strikes has been reported on these two routes for the past year, and they are used only infrequently (three to four times per year on average) (personal communication, J. Nodd 2011).

3.10.4 Impacts and Mitigation Measures

3.10.4.1 Impact Analysis Methodology

The methodology for analyzing exposure to hazardous materials was: 1) to verify the presence of areas of historical contamination in the study area that could be encountered and released during excavation or ground disturbance activities, and 2) to evaluate the relative risk from hazardous materials that would be used, stored, and transported by the SCH Project based on their toxicity, volumes, and potential for release. Impacts related to pesticide exposure were based on the duration of the exposure period.

The method for analyzing the impact to public health from mosquito vectors was related to the potential for the SCH Project to lead to an increase of breeding habitat for the primary vector species, *Culex tarsalis*, as well as the effectiveness of the Mosquito Control Plan prepared for the Project (Appendix F). Impacts from air and dust-borne diseases were analyzed based on their potential presence and the amount of disturbance that could cause a release to the air, thereby increasing human exposure.

The potential human health risk associated with ingestion of fish and waterfowl from the study area was analyzed for selenium and DDE, the most prevalent pesticide documented in sediment. For selenium, the analyses from the PEIR (DWR and DFG 2007, Appendix G) and Moreau et al. (2007) were used to assess human health risk under existing conditions. Selenium concentrations in fish tissue (whole fish, mg/kg dry weight) were estimated from an ecorisk model of selenium impacts on biota (Sickman et al. 2011), and converted to wet weight equivalents according to the methods used in the PEIR (DWR and DFG 2007, Appendix G). Each of the Project alternatives was compared to levels of selenium in fish and waterfowl under existing conditions to determine whether the selenium concentrations would be expected to increase or decrease and whether those increases would be expected to exceed estimated safe fish consumption rates and advisories for the Salton Sea. The probability of human exposure based on the projected level of sport fishing and waterfowl hunting in the study area also was considered.

For DDE, the potential human health risk for fish consumption was analyzed based on existing sediment DDE concentrations (Wang et al. 2011). Because DDT and its metabolites bind to the sediments, construction and operation of habitat ponds on the New River playa would result in increased exposure to subsurface sediments with elevated DDE concentrations. Expected sediment DDE concentrations were calculated for each alternative using the area-weighted approach described in Table 3.10-5. The area-weighted DDE concentration (SCH Project column) of inundated pond sediment (undisturbed playa surface, borrow ditches, habitat swales, and submerged edges of berms and islands) was compared to existing conditions (i.e., DDE concentration of undisturbed surface sediment) to determine whether exposure to DDE would change due pond construction and inundation. These values were also compared to sediment bioaccumulation screening levels (SLV_{BH}) developed by Poulsen and Peterson (2006) for the general population (0.24 ng/g) and more frequent consumers (0.0038 ng/g).

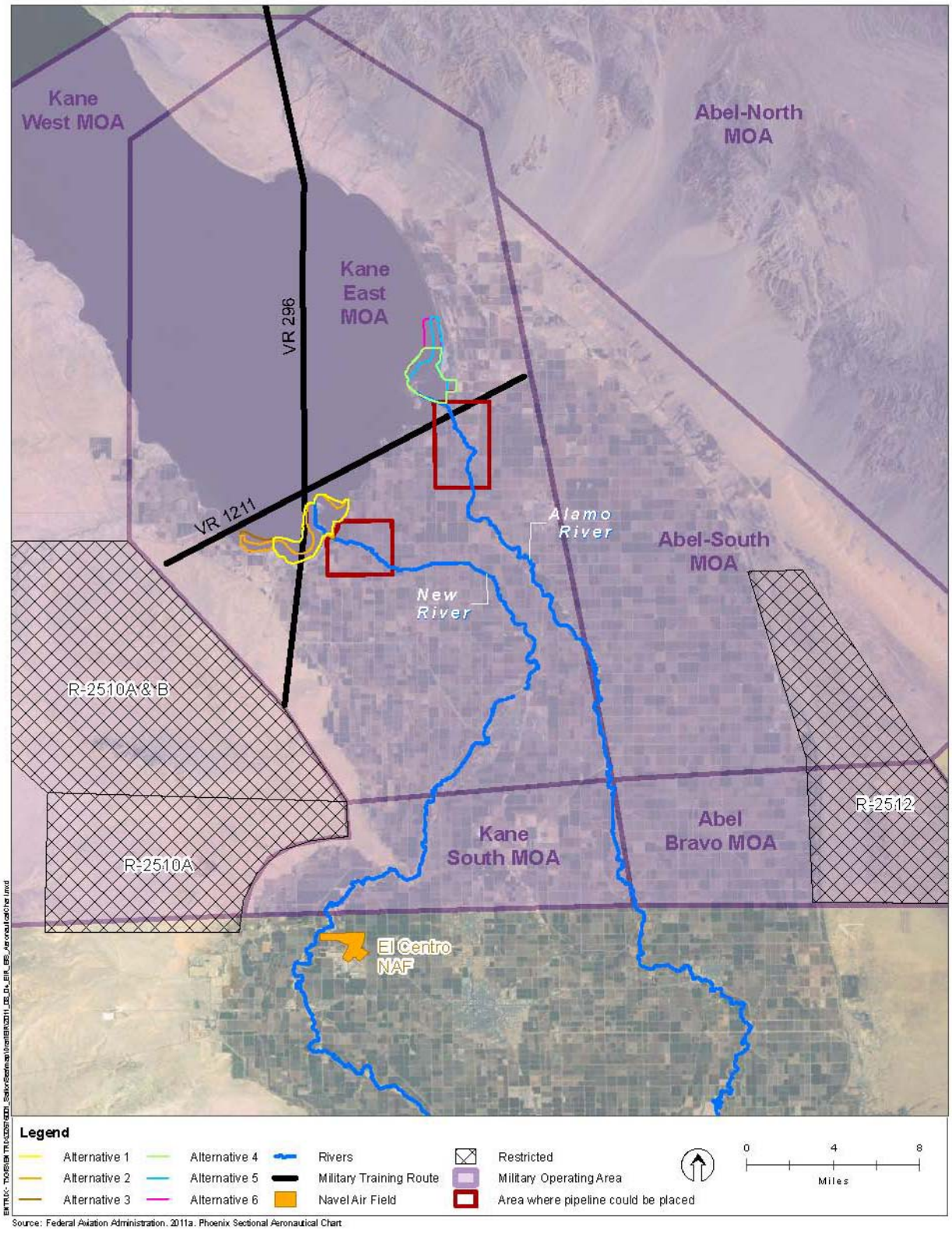

Figure 3.10-1 Military Airspace near the New and Alamo River Sites

The risk of wildland fires was related to ignition or fuel sources introduced by the Project alternatives and the existing wildland fire risk in the study area.

The potential for hazards associated with bird airstrikes to increase as a result of the SCH Project was evaluated by comparing the concentration of birds expected to be present as a result of the Project to those expected under current and future conditions.

3.10.4.2 Thresholds of Significance

Significance Criteria

Impacts associated with hazards and hazardous materials would be significant if the SCH Project would:

- Create a significant hazard to the public or the environment through the routine transport, storage, use, or disposal of hazardous materials; or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; or be located on a site which is included on a list of hazardous materials sites compiled by the Federal or state government, and as a result could create a significant hazard to the public or the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school;
- Be located within an airport land use plan or within 2 miles of a public use or private use airport or airstrip and result in a safety hazard for people residing or working in the area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- Expose people or structures to a significant risk of loss injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands;
- Create sufficient vector habitat to pose a threat to public health; or
- Increase concentrations of potentially harmful substances in sport fish and waterfowl that could result in a substantial new human health risk or new or more severe consumption advisories.

Application of Significance Criteria

The following summarizes the overall methodology used in applying the significance criteria to the Project alternatives:

- **Create a significant hazard through transport, storage, use, exposure, or disposal of hazardous materials or be located on designated hazardous materials site** – The analysis considers whether the SCH Project would expose either the public or workers to risks from exposure to hazardous materials during construction, operations, and maintenance and whether Project construction would occur on a site known to contain hazardous materials.
- **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of a school** – No schools are located within or immediately adjacent to the study area. Therefore, this criterion was not considered in the evaluation.
- **Be located within an airport land use plan or within 2 miles of a public use or private use airport or airstrip and result in a safety hazard –** There are no public or private use airports within 2 miles of the study area, but military training routes and other military aircraft operations occur in the vicinity of both the New and Alamo river ponds, and R-2510 is approximately 6 miles west of the

New River ponds. The potential impact of the SCH Project to increase or attract bird populations that could cause an increase in bird strikes by aircraft from the Naval Air Facility El Centro training ranges was evaluated.

- **Impair the implementation of an adopted emergency response or evacuation plan** – This issue is addressed below.
- **Exposure to wildfires –** The analysis considers whether a Project alternative would contribute an ignition source or a significant source of fuel for a wildland fire.
- **Create sufficient vector habitat to pose a threat to public health** – The analysis considers whether a Project alternative would create new breeding habitat for mosquitoes that posed a threat to public health.
- **Increase concentrations of potentially harmful substances in sport fish and waterfowl** – The analysis considers whether a Project alternative would expose the public to rates of selenium or other contaminants beyond maximum exposures considered protective of human health from the consumption of fish or waterfowl.

3.10.4.3 No Action Alternative

The description of the impacts of the No Action Alternative that is included in the PEIR (DWR and DFG 2007) is applicable to the SCH Project and summarized below. The No Action Alternative would involve construction and operations and maintenance activities for pupfish channels. Additionally, Imperial Irrigation District (IID), as mitigation for the IID Water Conservation and Transfer Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at Salton Sea State Recreation Area, as well as boat launches along the shoreline.

Hazardous Materials and Wastes

The main hazards considered in this analysis include exposure of hazardous materials during construction and operations and maintenance to unexploded ordnance. The risk of exposure during excavation of the Seabed and shoreline soils is related to the extent of the activities. Under the No Action Alternative, about 35,800 acres of land would be disturbed, including 5,050,000 cubic yards of Seabed soils that would be used during construction.

Other than the potential presence of ordnance and explosive waste, no documented hazardous waste occurs near the Salton Sea that would represent a significant risk to public health under the No Action Alternative. This assessment is based on the U.S. Navy's (U.S. Navy 1999, as cited in DWR and DFG 2007) position that all of the Installation and Restoration Program sites at the SSTB have been adequately investigated and closed with respect to hazardous waste. The potential for risk would be associated with the amount of disturbance in the soils.

It is assumed that use, storage, transport, and disposal of such materials would be in accordance with regulatory requirements.

The effectiveness of previous clearance activities for removing ordnance and explosive waste from the Salton Sea is uncertain. It is possible, but not documented, that remnant unexploded munitions remain buried in bottom sediments or shoreline areas of the Salton Sea, especially in areas near historically used bomb targets associated with the SSTB. The U.S. Navy is the lead Federal agency for the ordnance program at SSTB, and its goal is "full and continued protection of human health and the environment in a manner supporting the intended land use" (U.S. Navy 1999, as cited in DWR and DFG 2007).

Public Health

The public health issues considered in the analysis of the No Action Alternative are related to consumption of fish and wildlife tissue with high concentrations of contaminants (i.e. selenium, pesticides) and increased risk of mosquitoes and disease. Results from the screening-level human health risk assessments of fish and duck tissue consumption (i.e., maximum safe consumption rates) are discussed in Appendix G of the PEIR (DWR and DFG 2007). Selenium concentrations in fish fillet tissue from estuary habitats were 2.91 mg/kg wet weight (New River) and 3.4 mg/kg wet weight (Alamo River), which is below the OEHHA thresholds for FCG (7.4 mg/kg wet weight) and ATL (4.9-15 mg/kg wet weight). This results in a safe maximum fish consumption rate of up to 721 grams (Alamo River) and 842 grams (New River) per week. Another risk assessment examined four fish species recently sought by anglers at the Salton Sea (Moreau et al. 2007). Given a mean selenium concentration of 9.0 mg/kg wet weight in tilapia fillets, they concluded that weekly consumption of up to 1,000 grams of tilapia would not present any unacceptable risk for adverse health effects.

For selenium, the safe consumption rates of fish from the estuary habitats under the No Action Alternative are comparable to consumption rates under recent conditions, and indicate minimal risks to humans from selenium exposures under the No Action Alternative. For duck consumption under existing conditions, adults could consume from 23 to more than 60 meals per month of duck muscle from different habitats within the Salton Sea without exceeding the maximum consumption rates based on selenium exposures. For the No Action Alternative, maximum consumption rates range from about 14 to more than 100 meals per month for an adult and from 6 to more than 40 meals per month for a child. Similar to safe consumption rates estimated for fish, these large ranges in safe consumption rates for ducks are due to the high variability among the individual habitat types in the duck diet EPCs, which are, in turn, proportional to the sediment EPCs (DWR and DFG 2007, Appendix G).

For DDT and its derivatives, surface sediment concentrations at the Project Area (Table 3.10-5, Existing Conditions) and fish tissue DDT concentrations measured in the Salton Sea and the New and Alamo rivers are already at levels that represent a risk to human health, with health risks predicted to occur upon consumption of 10 grams per day or 4 meals per week of Salton Sea tilapia (see Section 3.10.3, Affected Environment). Under the No Action Alternative, accordance with OEHHA's public health advisory limiting fish consumption to two servings per week for all consumers (Table 3.10-4; OEHHA 2009) would result in minimal risks to humans from DDE exposure.

Under the No Action Alternative, the salinity of the Salton Sea would remain higher than 20,000 milligrams per liter (mg/L). Few mosquito species can survive in waters with salinity higher than 20,000 mg/L. However, some species, including larvae of the *Culex tarsalis* mosquito, which can be a vector for West Nile virus, are euryhaline (able to live in waters of a wide range of salinity) and can survive in higher salinity habitats. The receding shoreline would likely reduce the acreage of brackish marsh, which would reduce the amount of habitat suitable for mosquito populations. However, mosquitoes may occur in pupfish channels that would contain less saline water. The desert pupfish may eat the mosquitoes or other abatement measures may be required.

Mosquitoes also could breed in the sedimentation/distribution basins that would contain less saline water. Mosquitofish could be used to reduce mosquito populations in the basins.

Earth-moving operations would disturb soils that may contain coccidiomycosis spores, thereby increasing the potential for public health risks associated with valley fever. The risk of potential exposure would be greatest for construction workers and any members of the public within the immediate vicinity that are exposed to dust during the disturbance of 35,800 acres of land and use of 5,050,000 cubic yards of Seabed material. Disturbance also could cause release of ammonia, hydrogen sulfide, and methane.

There also could be a risk of injury to workers and recreationists due to unstable soils as the water recedes and the presence of extremely hot water near geothermal areas.

Under the No Action Alternative, the levels of waterborne bacteria in the Salton Sea are expected to decline due to implementation of the pathogen Total Maximum Daily Load and enforcement of source allocations on the New River.

3.10.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). During the construction phase of the SCH Project, hazardous materials proposed for use include solvents, gasoline, diesel fuel, motor oil, lubricants, and welding gases. No acutely hazardous materials would be used during construction, and none of the materials pose significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and their environmental mobility. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all very low volatility and represent limited off-site hazards. Any impact of spills or other releases of these materials would be limited to the site because of the small quantities involved and storage, handling and spill cleanup procedures. Best management practices, such as spill cleanup, secondary containment and proper storage and handling of hazardous materials during construction would be included as components of the Storm Water Pollution Prevention Plan.

Hazardous materials used during Project operation and maintenance would be lube oils for pumps and possibly small quantities of paints or solvents. These materials are of a very low toxicity and would be of such small volumes they are unlikely to trigger the Business Plan requirements for reporting and developing a Hazardous Material Management Plan. Therefore, handling, storage, usage and transportation of hazardous materials during construction and operation would be temporary and less-than-significant in comparison to both the existing setting and No Action Alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). Pesticides are known to be present in the sediments at the proposed site (Wang et al. 2011), and there is potential for worker exposure to these pesticides during construction. Compliance with the Imperial County Air Pollution Control District's Regulation VIII (Appendix G), which is mandatory, would reduce the potential for fugitive dust emissions at the construction site. This would also reduce the potential for worker exposure. Additionally, the period of exposure would be limited to the time that ground-disturbing activities were occurring, and the entire construction period would be limited to two years. This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

With the exception of pesticides, no significant areas of documented contamination were found in the Project area for Alternative 1, and no buildings, other structures, asphalts or concrete-paved surfaces areas would be demolished during Project construction. Soils would be tested for contaminants prior to excavation, and should testing show the presence of contaminated soil, or if such soil was observed either visually or through smell during construction activities, such material would be handled in accordance with appropriate methods. Any excavated areas that had an odor due to contaminated soil would be covered while one or more samples were being tested to determine the level of contamination. The presence of known or suspected contaminated soil or groundwater would require the supervision of testing and investigation by a licensed professional geologist or engineer, as appropriate to meet state and Federal regulations. The impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative because there would be no public exposure to, or release to the environment of hazardous materials or waste.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). As discussed in Section 3.4, Biological Resources, the Salton Sea ecosystem has become one of the most important habitats for birds in North America and supports some of the highest levels of avian biodiversity in the southwestern United States. The SCH would restore a portion of the habitat that will be lost as the Salton Sea recedes over time and as salinity levels increase. The ponds would be created as the Sea recedes and would replace habitat that was recently available and used extensively by birds. Birds presently tend to be concentrated near the shoreline. The ponds therefore are not expected to attract significantly greater concentrations of birds than currently use the area, and as the Sea recedes over time, it would constitute one of the few remaining areas that provide habitat for fish-eating birds. Bird populations are expected to decline at the Salton Sea regardless of whether the SCH Project is implemented. The Project would not increase the risk of bird airstrikes at civilian airports (the closest of which is approximately 8 miles from the proposed New River pond sites and therefore are too far to be affected by the SCH Project), nor would it increase risks for crop dusters flying over nearby fields because the number of birds in the Project area would not increase over current levels. The SCH Project would not increase risks for military aircraft using the MOAs because their floors begin at 30,000 feet and birds using the ponds would not be present at that altitude. The SCH Project also is not expected to increase risks for those pilots using the military training routes several times a year because these routes are located near the shoreline and the Sonny Bono Salton Sea National Wildlife Refuge, which already are heavily used by birds. Geese may roost or loaf in the proposed SCH ponds, but this would not be different than the existing condition. Based on the expected high salinity of the ponds and the lack of emergent vegetation, these species are not expected to forage in the proposed SCH ponds, nor would the ponds provide nesting habitat for these species, which otherwise could result in a larger population. Gulls and pelicans would use the ponds, but they are already present at the Sea, and over time, the number of birds in general at the Salton Sea would decline. Impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The Project would be located in a sparsely populated rural area. As discussed in Section 3.20, Transportation and Traffic, neither construction nor operations would result in an unacceptable level of service on any roadways, and the amount of traffic that would be generated on the generally lightly traveled local roadways would not delay emergency access. There is a potential for brackish water pipeline installation to occur along existing roadways, but typical roadway safety precautions would be taken (e.g., flaggers, signs warning motorists of roadway work), and at least one travel lane would remain open at all times, thereby ensuring that emergency vehicles and those of the general public could pass. Finally, because emergency vehicles are equipped with sirens, which give advance warning of their approach, construction crews would have the ability to make emergency provisions for safe vehicle passage through construction zones. Impacts therefore would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). Potential sources of ignition include equipment with internal combustion engines, gasoline-powered tools, and equipment or tools that produce a spark, fire, or flame. Such sources include sparks from blades or other metal parts scraping against rock, overheated brakes on wheeled equipment, friction from worn or unaligned belts and drive chains, and burned-out bearings or bushings. Smoking by onsite construction personnel is also a source of ignition during construction. There are no "Very-High Fire Hazard Severity Zone" or "Wildland Area that may Contain Substantial Forest Fire Risk and Hazard" designations within the study area (Imperial County Fire Hazard Map). Although the use of construction could pose a wildland fire risk, the risk is less than significant when compared to both the existing environmental setting and the No Action Alternative due to lack of a source of fuel for wildland fires in

the Project area and because regulations requiring fire suppression equipment would be followed. The impact would occur during construction and is therefore temporary and short-term.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). Construction for Alternative 1 would require excavation for the ponds, brackish water pipelines, and a sedimentation basin. Construction would take place out of doors, and rodent handling would not occur; therefore, exposure to the Hantavirus is unlikely. Earth-moving activities during construction could release air and dust-borne diseases such as valley fever into the air exposing workers; given required dust control measures (refer to Section 3.3, Air Quality and Appendix G1, Imperial County Air Pollution Control District, Regulation VIII, Fugitive Dust Control Measures), impacts would be localized and would not be expected to affect the general public. The impact on workers would be significant.

Mitigation Measures

MM HAZ-1: Worker training will be provided to workers who may be exposed to air-borne diseases during excavation activities. Training will include recognizing symptoms and use of personal protective equipment.

Residual Impact

Implementation of MM HAZ-1 would reduce Impact HAZ-6 to less than significant because workers would be trained how to recognize symptoms (and thus get treatment) as well as how to use personal protective equipment to prevent disease.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). It is expected that the SCH ponds would not be conducive to mosquito production because the configuration of the ponds includes a large proportion of the surface area with open water at a depth less than 2 feet. Open water should reduce the survival of immature mosquitoes because of disturbance and drowning caused by wind-driven waves and high susceptibility to predators. The SCH ponds at the high end of the range of operational salinities are predicted to be too salty for significant mosquito production and colonization by wetland plants. If mosquito production occurs in the SCH ponds, it is likely to be limited to the shallow zones of the upslope periphery of the pond and maybe the berms, if aquatic vegetation and/or inundated grasses (i.e., *Distichlis*) colonize the shallow water and berms. The width of this area may be only 3 feet to 6 feet (1 to 2 meters) which represents only 0.6-1.1 percent of the surface area of a 100-acre pond. If vegetation is found along the periphery of the sedimentation pond, then monitoring for larval mosquito populations would occur at natural openings in vegetation.

The ponds would be managed at a salinity ranging from 20 parts per thousand (ppt) to 40 ppt, which would reduce the potential for vegetation to grow in the ponds because the higher salinities exceed the tolerances of most freshwater macrophytes. Salinities at the lower end of the management range, however, may not limit macrophyte colonization (refer to Appendix F for additional information regarding the potential for mosquitoes to survive in salinities up to 70 percent (24.5 ppt) of full-strength sea water). Vegetation management in the low salinity ponds may be required to reduce or eliminate conditions conducive to mosquito production. A Mosquito Control Plan (Appendix F) has been developed for the SCH Project and its implementation would minimize the potential for public safety risks from the presence of mosquitoes. It would involve monitoring mosquito populations, the surveillance of mosquito-borne pathogens that cause diseases in human and wildlife, and the implementation of a treatment program to control mosquitoes at the SCH ponds and sedimentation basins at the outflows of the New River or Alamo River into the Salton Sea, if needed. Monitoring activities would be used to locate

mosquito life stages (larvae, pupae, and adults), estimate their abundance, and determine species composition for the purpose of making treatment decisions. Disease surveillance would be used to detect the presence of mosquito-borne disease as part of a state-wide program. Mosquito treatments would be used to reduce the abundance of mosquito populations and associated mosquito-borne disease risk, as needed. Given the implementation of this plan, impacts would be less than significant when compared to both the existing environmental conditions and the No Action Alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). Operation of the SCH ponds would require blending of New River water and Salton Sea water. Potential selenium concentrations in fish tissue were estimated for the proposed alternatives and two operating scenarios using a selenium ecorisk model (Sickman et al. 2011).

Estimates of fish muscle selenium concentrations for Alternative 1 were 1.1-1.4 mg-kg-wet weight (Table 3.10-7). These concentrations are well below the OEHHA thresholds for FCG (7.4 mg/kg wet weight) and ATL (4.9-15 mg/kg wet weight), and within the range determined to be safe for expected human consumption (DFG and DWR 2007, Appendix G). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Table 3.10-7 Predicted Selenium Concentrations in Whole Fish Tissue at New and Alamo River Sites under Varying Salinity Ranges

River Source	Salinity (ppt)	Fish (whole, mg/kg dry weight)	Fish (muscle tissue fillet, mg/kg wet weight)
New River (Alternatives 1, 2, and 3)	20 ppt	5.5	1.4
	35 ppt	4.3	1.1
Alamo River (Alternatives 4, 5, and 6)	20 ppt	8.5	2.2
	35 ppt	5.9	1.5

Source: Modeled selenium concentrations of whole fish (dry weight) from Sickman et al. 2011, converted to selenium concentrations in muscle tissue (wet weight) based on conversion factors in DWR and DFG 2007, Appendix G.

Selenium concentration in duck tissue was not estimated in the current ecorisk model. Waterfowl that use the SCH ponds could have higher selenium concentrations than waterfowl taken at typical hunting areas, which are supplied by Colorado River water. However, waterfowl typically move among foraging areas and, therefore, any potential dietary intake at the SCH ponds would be partially offset and diluted by intake from other areas. The risk of human exposure would depend on whether hunters would encounter, hunt, and consume those birds using the ponds. The deep open water SCH ponds would favor diving ducks (e.g., ruddy ducks) over dabbling duck species (e.g., mallards, teal). Dabbling ducks and geese are preferred species for consumption, and they are more often associated with managed wetland habitats (e.g., duck clubs, the Sonny Bono Salton Sea National Wildlife Refuge, and Imperial Wildlife Area). The ponds would not contain vegetation that would serve as cover for the dabbling duck species, and the ponds would not be managed to attract these species. Although some hunting could be allowed at the ponds, they would likely be less desirable hunting locations than other nearby sites, and it is not likely that the increased selenium concentration would adversely affect public health. To provide additional context, for the alternatives considered in the PEIR, which included Early Start Habitat similar to the SCH Project, the reference maximum duck meal consumption rates for the alternatives typically were greater than 20 meals per month for an adult, with the exception of the slightly lower rates associated with the

Marine Sea habitats of Alternatives 5 and 6 (16 and 19 meals per month, respectively) (DWR and DFG 2007). Maximum safe consumption rates for children ranged from about 6 to more than 30 meals per month for various alternative and habitat combinations. Impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Sediment DDE concentrations (Wang et al. 2011) and fish tissue DDT concentrations (CRBRWQCB 2002b; Costa-Pierce et al. 2000) measured in the New River are already at levels that represent a potential risk to human health. Because DDT and its metabolites bind to the sediments, disturbance and re-wetting of sediments during SCH pond construction would result in increased exposure of aquatic organisms, birds, and humans. Under Alternative 1, the estimated sediment DDE concentrations (Table 3.10-5) would exceed the SLVs for the general population and more frequent consumers (Poulsen and Peterson 2006). However, the calculated DDE sediment concentrations would be very similar to existing conditions for that playa area, suggesting that the impacts of DDE exposure from Alternative 1 on human health would be less than significant when compared to the existing environmental setting and the No Action Alternative.

3.10.4.5 Alternative 2 – New River, Pumped Diversion

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased contaminant levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.10.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.10.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative. The brackish water pipeline that would be constructed under this alternative would avoid the CalEnergy site and thus would not be exposed to hazardous materials present at this site.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion of selenium under Alternative 1 is applicable to this alternative, with the exception that the habitat ponds would be supplied with Alamo River water. The Alamo River has higher dissolved selenium levels than the Salton Sea or New River. Modeled estimates of fish muscle selenium concentrations were 1.5 - 2.2 mg/kg wet weight (Table 3.11-7) (Sickman et al. 2011). These modeled concentrations are well below the OEHHA thresholds for FCG (7.4 mg/kg wet weight) and ATL (4.9-15 mg/kg wet weight), and within the range determined to be safe for expected human consumption (DFG and DWR 2007, Appendix G). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

For DDE, the discussion under Alternative 1 is applicable to this alternative, with the exception that ponds would be constructed at Morton Bay beside the Alamo River. DDE concentrations measured in the Alamo River are already at levels that represent a potential risk to human health, both for fish tissue (Costa-Pierce et al. 2000; CRBRWQCB 2002a), and for sediment (Table 3.10-5) based on sediment SLVs (Poulsen and Peterson 2006). The highest sediment DDE concentration documented at both rivers was at Morton Bay (102 ng/g subsurface, Wang et al. 2011). Therefore, the estimated sediment DDE concentrations calculated from that maximum value (which represents a hypothetical maximum exposure) are particularly high when compared to the maximum documented surface value at this site (Table 3.10-5). Given this consideration, the impact of DDE exposure on human health would be less than significant when compared to the existing environmental setting and the No Action Alternative.

3.10.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion under Alternative 4 is applicable to this alternative.

3.10.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion under Alternative 4 is applicable to this alternative.

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