offs of both fish and birds began to occur. During the past several years, large die-offs of fish (tens of thousands) have occurred periodically. For instance, in 1997 large die-off events occurred in January, August, and September. Bird die-offs, some caused by Type C avian-botulism, avian cholera, and Newcastle disease, have affected at least one-fifth of the approximately 400 species that frequent the area. These episodic die-offs result in unpleasant odors as the fish and birds decompose on the shoreline, releasing biogases high in hydrogen sulfide.

Odors associated with blooms and die-offs are most common on the south and east sides of the Sea, though they can occur anywhere at anytime. Odors are most prevalent and intense during the summer when temperatures are elevated and prevailing winds are out of the southeast. The predominant wind direction is from the west during the remainder of the year; overall, dominant wind directions are west, west-southwest, west-northwest, and southeast. High winds occur most frequently between April and May.

3.14 PUBLIC HEALTH AND ENVIRONMENTAL HAZARDS

3.14.1 Introduction

The affected environment discussion for public health and environmental hazards includes an overview of public health issues and individual sections addressing biological pathogens, mosquito-borne diseases, and chemical hazards.

3.14.2 Overview of Public Health Issues

For a potential public health hazard to exist, there must be a source, a pathway of exposure, and humans must have contact with the source. For an actual public health hazard to exist, humans must be exposed to a level of the source agent that is capable of creating adverse health effects. Agents that cause disease are referred to as pathogens. A general description of the pathways of exposure and exposed populations is presented below. The pathways and populations relevant to specific disease agents or pathogens are described in the sections discussing those specific agents.

There are six general pathways of exposure that may exist at the Salton Sea: inhalation, dermal (skin) contact, ingestion, vectors, trauma, and physiological stress. Inhalation exposure to agents can occur as a result of airborne particles from wind erosion of land surfaces, aerosols of surface waters and close contact with materials laden with disease agents. Dermal exposure to agents can result from physical contact with substrates having the disease agents at the surface being contacted (water, soil, animal, surface areas, etc.). Ingestion exposure involves the intake of the disease agent in food or water. Vectors transmit disease to humans via bites. Mosquitoes are the primary insect disease vectors of concern at the Salton Sea. Other vector-transmitted disease include venomous reptiles and animal bites. Trauma involves injury or death associated with contract with objects and things in a manner that creates physical injury. The final category of physiological stress is associated with such factors as heat stroke and dehydration due to climatic conditions.

The primary populations that could be exposed to disease agents at the Sea via these existing pathways include residents, recreationists, and people employed at the Sea. Recreationists include anglers, hunters, waterskiers, and swimmers. Employees include researchers studying the Sea and employees at the various recreation areas as well as workers associated with various construction activities. In addition, residents and visitors could be exposed to disease-carrying mosquitoes that breed along the shoreline.

While there have been numerous concerns raised regarding potential public health and environmental hazards within the Salton Sea Basin, this section focuses on those known and potential hazards that are of concern to public health agencies and those that could be affected by implementing the Salton Sea Restoration Program. Chemical and biological contaminants that do not threaten public health but that affect water quality or threaten the health of fish and wildlife are discussed in separate sections.

There are a number of agents and diseases that may be perceived as public heath threats but for the reasons discussed below are not generally accepted as threats. Avian botulism is a disease caused by Type C avian botulism and is one of the main causes of bird deaths at the Salton Sea. Avian botulism is a different disease than the botulism that affects humans, and humans are generally considered resistant to Type C botulinum toxin. Avian cholera is another disease that has killed many birds at the Salton Sea but is not a human health threat. The organism that causes avian cholera (*Pasteurella multocida*) is totally different from the organism that causes human cholera (*Vibrio cholerae*).

Hazards addressed in other sections of this document that are not discussed in this section include earthquakes and other geologic hazards (Section 3.3, Geology and Soils), hazards to fish (Section 3.6, Fisheries and Aquatic Ecosystems), hazards to wildlife (Section 3.8, Vegetation and Wildlife), hazards to birds (Section 3.7, Avian Resources), and airborne hazards (Section 3.4, Air Quality).

3.14.3 Biological Pathogens

Biological pathogens exist in the Salton Sea, its tributaries, and the surrounding area. The primary pathogens of concern include fecal contaminants and Vibrio bacteria.

Fecal Contaminants

No human outbreaks of diseases attributable to fecal contaminants in the Sea have been recorded in either Imperial County or Riverside County (Ackison, D., April 12, 1999, personal communication; Cole, B., August 12, 1999, personal communication). However, due to public health concerns, the Imperial County Public Health Department collects monthly water samples along the shoreline of the Salton Sea to monitor concentrations of *Escherichia coli* bacteria, a common fecal contaminant (Johnston, M., April 7, 1999, personal communication). The samples collected at 11 shoreline locations in 1997 and 1998 had highly variable concentrations of *E. coli* that ranged from zero colonies per 100 milliliters (ml) to 624,000 colonies per 100 ml (Johnston, M., August 12, 1999, personal communication); information on the sampling and analysis protocols, data validation, and peer review of this data was not available.

Between 1980 and 1993, the CRB-RWQCB collected quarterly water samples from the middle of the Sea and tested them for fecal coliform. These samples had fecal coliform concentrations ranging from 2 to 20 colonies per 100 ml (CRB-RWQCB 1999); information on the sampling and analysis protocols, data validation, and peer review of this data was not available. The 1994 Water Quality Control Plan water quality objectives applicable to the Salton Sea include maximum allowable levels of 235 colonies per 100 ml for *E. coli* and 400 colonies per 100 ml for fecal coliform (CRB-RWQCB 1994).

The probable source of fecal contamination in the Sea is municipal wastewater discharged into the New River, Alamo River, and Whitewater River; however, waste excreted by birds at the Sea also may contribute to the concentration of these bacteria. Between 1980 and 1993, the CRB-RWQCB collected quarterly water samples from the mouths of the Alamo River and the Whitewater River and tested them for fecal coliform. The Alamo River samples had fecal coliform concentrations ranging from 170 to 240,000 colonies per 100 ml (CRB-RWQCB 1999); information on the sampling and analysis protocols, data validation, and peer review of this data was not available. The Whitewater River samples had fecal coliform concentrations ranging from 2.0 to 540 colonies per 100 ml (CRB-RWQCB 1999); information on the sampling and analysis protocols, data validation, and peer review of this data was not available. Water samples collected from the New River are discussed below.

Imperial County has posted warning signs along the New River advising people not to consume fish from the river and to avoid contact with the river water; this is primarily due to the high levels of fecal coliform bacteria in the river water (Johnston, M., August 12, 1999, personal communication). In 1977, samples of New River water were collected from 16 locations between the United States-Mexico border and the Salton Sea. The highest fecal coliform level was 2,800,000 colonies per 100 ml at Brockman Road (approximately 52 miles upstream from the Sea), and the lowest level was 1,000 colonies per 100 ml at Lack Road (approximately three and a half miles upstream from the Sea) (Setmire 1984). Between 1980 and 1993, the CRB-RWQCB collected quarterly water samples from the mouth of the New River and tested them for fecal coliform. These samples had fecal coliform concentrations ranging from 500 to 160,000 colonies per 100 ml (CRB-RWQCB 1999); information on the sampling and analysis protocols, data validation, and peer review of this data was not available. The probable source of fecal coliforms is municipal wastewater discharged into the New River; however, waste excreted by birds and discharges from livestock feedlots also may contribute to contamination levels. The CRB-RWQCB plans to develop a TMDL for bacteria in the New River by 2005.

At the Salton Sea, the primary exposure pathway of concern for fecal contaminants is ingestion. People that accidentally ingest Sea water could be exposed to fecal contaminants present in the water.

While not a health threat itself, the presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of

humans or other animals. One of the fecal coliform bacteria that is commonly present in the fecal material of warm-blooded animals is E. coli; while there are certain strains of E. coli that are human pathogens, these strains have not been identified at the Salton Sea. Water containing fecal coliform bacteria also may contain other bacteria and viruses, some of which may be human pathogens. Viral and bacterial gastroenteritis and hepatitis are examples of diseases caused by waterborne pathogens. The presence of high levels of fecal coliforms is an indicator that a potential health risk exists for individuals exposed to this water. Because fecal coliform analysis typically is not done at a level of analysis that differentiates the species of origin for those coliforms, the assumption is made that high levels of coliforms are a threat for human health.

Vibrio Bacteria

No cases of Vibrio infections in the human population have been reported in either Imperial County or Riverside County (Ackison, D., April 12, 1999, personal communication; Cole, B., August 12, 1999, personal communication). However, the Imperial County Environmental Health Department has issued an advisory on fish consumption due to the presence of Vibrio bacteria in several fish species. The advisory provides information on identifying fish potentially infected by Vibrio bacteria and precautions directed at the public to protect the healthy fish they have caught from becoming infected through the handling of diseased fish (Johnston, M., August 12, 1999, personal communication).

The primary pathways for exposure to the Vibrio bacteria are ingestion and dermal contact. People who consume raw or improperly cooked fish could be exposed to Vibrio bacteria present in fish. People with open wounds or sores who handle fish or contact Sea water, including fishermen, swimmers and researchers, could also be exposed to Vibrio bacteria.

While two species of Vibrio, *Vibrio vulnificus* and *V. alginolyticus*, have been isolated from dead and dying fish at the Sea (US Fish and Wildlife Service/Salton Sea National Wildlife Refuge 1997-1998), the probable cause of large scale die-offs at the Sea is anoxia. *V. vulnificus* is a bacterium that naturally occurs in warm seawater and estuary water (Centers for Disease Control and Prevention 1999). It can cause disease in people who eat contaminated seafood or have open wounds that are exposed to seawater containing the bacterium. In healthy individuals, ingesting the bacterium can cause vomiting, diarrhea, and abdominal pain. In persons with compromised immune systems, particularly those with chronic liver disease, *V. vulnificus* can infect the bloodstream, causing a severe and life-threatening illness characterized by fevers and chills, decreased blood pressure, and blistering skin lesions (Centers for Disease Control and Prevention 1999). Persons with wounds infected by the bacterium experience symptoms that include fevers and chills, and the infected wound location is characterized by redness, swelling, pain, and tissue destruction (Oliver 1999). *V. alginolyticus* also occurs in warm salt water environments and can cause localized infections of open wounds that are exposed to seawater containing the bacterium (American Water Works Association Research Foundation 1997).

3.14.4 Mosquito-borne Diseases

The Coachella Valley Mosquito and Vector Control District in Riverside County has identified western equine encephalomyelitis and Saint Louis encephalitis as the two mosquito-borne diseases of greatest concern within the district. Both of these viruses can be transmitted from wild birds to humans by the encephalitis mosquito. However, no cases of mosquito-borne diseases in the human population have been reported in Imperial County or Riverside County (Johnston, M., April 7, 1999, personal communication; Ackison, D., April 12, 1999, personal communication; Cole, B., August 12, 1999, personal communication).

Exposure to these viruses occurs when a person is bitten by a mosquito that has fed on an animal infected with the virus. Residents and visitors to the Salton Sea form the population that could be exposed to these viruses.

The encephalitis mosquito (*Culex tarsalis*) primarily breeds in the brackish marshes present at the Salton Sea (Lothrop, B., December 17, 1999, personal communication). These marsh areas include zones where the freshwater tributaries mix with Sea water, locations where shallow groundwater and Sea water mix, and duck-hunting clubs that rely on freshwater input. This mosquito also breeds in areas where Sea water has collected and marsh vegetation is present. These areas, in addition to the water and wastewater canals within the basin, provide breeding habitat for mosquitoes. *C. tarsalis* is active from March to May and from September to November and can travel up to ten miles from its nesting area. It can be controlled by minimizing the amount of vegetation present in water or by applying an insect growth regulator to water.

Western Equine Encephalomyelitis

This disease has been detected in mosquitoes captured along the northern shoreline of the Salton Sea (Mosquito and Vector Control Association of California 1999). The western equine encephalomyelitis virus initially was isolated from sick horses in 1930 and from a fatal human case in 1938. This virus causes an acute fever-based illness in horses and humans, characterized in its most severe form by signs and symptoms of inflammation and injury of the meninges, brain, and spinal cord. Large outbreaks occurred in the north-central United States in 1941 and in the Central Valley of California in 1952, and both sporadic cases and small epidemics continue to occur throughout the western states.

The incubation period for the virus is usually five to ten days. The onset of the illness can be sudden, especially in adults, or characterized by a two- to four-day period of lethargy, fever, and headache, especially in children (Coachella Valley Mosquito and Vector Control District 1999a). The acute illness is characterized by a spectrum of symptoms and signs related to the central nervous system, reflecting infection and inflammation of the meninges and brain tissues. Fever, sleepiness, headache, anorexia, vomiting, and stiff neck are the most common features of an acute infection. The acute phase lasts three to ten days, after which recovery begins suddenly and proceeds rapidly. Generally, full recovery occurs, with rare instances of permanent neurological

symptoms. However, about half of the affected infants suffer permanent secondary effects, including progressive retardation and major motor disorders.

Saint Louis Encephalitis

Humans infected with the Saint Louis encephalitis virus can develop encephalitis, which is an inflammation of the brain tissue. This disease is sometimes called "sleeping sickness" or "summer flu." The virus was first identified from victims of a 1933 epidemic in St. Louis, Missouri.

The encephalitis mosquito, *C. tarsalis*, is the primary vector of Saint Louis encephalitis virus in California (Coachella Valley Mosquito and Vector Control District 1999b). This mosquito becomes infected while feeding on birds infected with the virus. Once infected, a mosquito can transmit the virus to other birds, humans, or wildlife. The natural cycle of virus transmission in nature involves mosquitoes, birds, and other animals. Humans can be severely affected by the virus but are "dead end" hosts because not enough virus develops in their blood to infect other mosquitoes.

A Saint Louis encephalitis infection can be unnoticeable, acute, or fatal. Most Saint Louis encephalitis cases are unnoticeable infections that are mild or subclinical. Symptoms of infection appear seven to 21 days after a bite from an infected mosquito (Coachella Valley Mosquito and Vector Control District 1999b). Saint Louis encephalitis has three separate syndromes: feverish headache, noninfectious meningitis, and encephalitis. All age groups are susceptible to the disease, but children under nine are less likely to become ill than the elderly; thus, severity of the disease is age dependent.

3.14.5 Chemical Hazards

While many potential chemical contaminants are present within the water of the Salton Sea, as discussed in Section 3.1, Surface Water Resources, this section focuses on those chemical hazards that are potential public health threats of concern, due either to their concentrations or to their characteristics.

Selenium

The Office of Environmental Health Hazard Assessment has issued an advisory on consuming sport fish caught in the Salton Sea, based on elevated selenium levels in the fish (Office of Environmental Health Hazard Assessment 1999). The advisory recommends that no more than four ounces of croaker, orange-mouth corvina, sargo, and tilapia be eaten in any two-week period. In addition, pregnant women, nursing mothers, and children under 15 are advised to consume no fish caught in the Sea. No cases of selenium poisoning attributable to the Salton Sea have been reported in either Imperial County or Riverside County (Ackison, D., April 12, 1999, personal communication; Cole, B., August 12, 1999, personal communication).

At the Salton Sea, the primary exposure pathway is consumption of fish or waterfowl that contain selenium in their tissues. Thus, the population that could be exposed consists of people who consume fish and waterfowl from the Sea. In 1990, Setmire

and others found that the concentration of selenium in water was lower in the Salton Sea than in the New and Alamo rivers and that the concentration of selenium in bottom sediments was higher in the Salton Sea than in the New and Alamo Rivers (Setmire et al. 1990). Selenium can accumulate in organisms as it passes up the food chain from bottom dwelling plants and animals that take in selenium from the sediment to higher food chain organisms such as fish and waterfowl. Fish and waterfowl samples were collected at the Salton Sea and tested for selenium concentrations in 1986 and 1987. Selenium levels in tilapia and corvina ranged from 3.5 micrograms per gram (µg/g) to 20 µg/g; the health advisory level is 8 µg/g for human consumption of fish (Setmire et al. 1990). A composite sample of corvina, the Sea's most popular sportfish, collected near the Alamo River delta had a selenium concentration of 20.0 µg/g in its edible muscle fillet.

The normal intake of selenium in food, about 50 to 150 micrograms per day, is enough to meet the daily need for this essential nutrient (Agency for Toxic Substances and Disease Registry 1989). At these levels, selenium acts as an antioxidant by preventing oxygen from damaging tissues. Selenium compounds can be harmful, however, at daily levels that are only somewhat higher than the beneficial level. If elevated amounts of selenium were consumed over long periods, several health effects could occur, including brittle hair, deformed nails, and, in extreme cases, loss of feeling and control in arms and legs (Agency for Toxic Substances and Disease Registry 1989). Information about the health effects of eating or drinking large doses of selenium over long periods has come from areas in China with very high selenium levels in the soil and in the rice and vegetables people eat. These people had loss of hair, loss of and poorly formed nails, problems with walking, reduced reflexes, and some paralysis. No populations in the United States have been reported with symptoms of serious, long-term selenium poisoning.

Although exposure to high levels of inorganic selenium compounds has been shown to cause birth defects in birds, selenium compounds have not been shown to cause birth defects in humans or in other mammals. People exposed to selenium dust and airborne selenium compounds in the workplace have reported dizziness, fatigue, irritation of mucous membranes, and, in extreme cases, fluid in the lungs (pulmonary edema) and severe bronchitis.

Contaminated Sites

Hazardous Material and Waste Sites

A search was conducted of the US Environmental Protection Agency's database (US Environmental Protection Agency 1997) incorporating data from the following programs: Aerometric Information Retrieval System, Facility Subsystem; Permit Compliance System; Toxic Release Inventory System; Comprehensive Environmental Response, Compensation, and Liability Information System; and, Resource Conservation and Recovery Information System. This search identified no listed sites within 500 feet of the current waterline of the Sea. The search was conducted because hazardous materials or wastes at sites within the Sea level fluctuation zone could be

transported into the Sea by the rising and falling of the Sea. The only other potentially contaminated site is the Navy Salton Sea Test Base, which is discussed below.

Contaminated Sediments

LFR Levine-Fricke sampled sediments in the Salton Sea and its tributaries in December 1998 and January 1999 and published a report of its findings in July 1999 (LFR Levine-Fricke 1999b). The results of this and other sediment studies are discussed in greater detail in Section 3.3, Geology and Soils. The inorganic compounds of potential ecological concern identified in its report were cadmium, copper, molybdenum, nickel, selenium, and zinc. The organic compounds of potential ecological concern identified in its report were acetone, carbon disulfide, and 2-butanone. While the levels of these compounds detected in some sediment samples are of potential ecological concern, it is not known whether these levels present a hazard to human health through exposure pathways. None of these compounds are included in the fish advisory related to consumption of fish from the Salton Sea.

Salton Sea Test Base

The Salton Sea Test Base occupies 7,240 acres of land and 12,180 acres of water in the southwest portion of the Salton Sea ten miles south of Salton City. From 1939 to 1991, the based was used for a variety of military activities, including seaplane operations, torpedo tests, inert atomic bomb tests, ballistic drop and parachute tests, and live-fire training exercises. Activities conducted at the test base resulted in the contamination of various portions of the property. Some of the identified sources of contamination include underground storage tanks, landfills, workshops, small arms range, septic tank, and an explosive ordnance disposal area. The US Navy undertook a site investigation and remediation program to identify potential areas of contamination and to remediate those areas verified as contaminated. All remedial activities were completed by early 1998 (Radecki, M., April 12, 1999, personal communication).

In July 1999, an Ordnance and Explosives Investigation Report (US Army Engineering and Support Center 1999) reported the findings of surveys and sampling at the Salton Sea Test Base. Two former aerial bomb drop targets (used primarily for unarmed aerodynamic test drops) are located within the current footprint of the Salton Sea; due to technological limitations, none of the test base acreage within the Salton Sea was surveyed or sampled. A visual surface survey of all 7,240 land acres was conducted from July 1996 to March 1997. This survey recovered 99 unexploded ordnance (UXO) items from the ground surface; these UXO items included mortar rounds, grenades, missile motors, flares, and fuses. A subsequent subsurface sampling investigation of 300 grids (100 feet by 200 feet) located throughout the base was conducted from April to June 1997. This investigation recovered 16 UXO items from the top three feet of soil within the grids. Based on these investigations and risk analysis modeling, the US Navy selected risk management actions as its preferred program to protect the public from exposure to UXO (US Army Engineering and Support Center 1999). This program would not involve removal of UXO, but would undertake an educational effort to inform the public and the future property owner (US Department of the Interior) of the potential UXO hazards.

3.15 UTILITIES AND PUBLIC SERVICES

3.15.1 Introduction

The affected environment discussion for utilities and public services includes water service, wastewater service, electricity, solid waste disposal, traffic, public education, and police and fire service. For each utility and public service, an overview of the Phase I study area is presented, and detailed information is given for specific service providers that are anticipated to be affected by the Proposed Action or alternatives.

Imperial County. A variety of organizations play a role in providing utility and public services to the residents of Imperial County. Each of the seven incorporated cities in the county (Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland) provides facilities for water treatment, sewage treatment, and police and fire services. Other organizations providing services in Imperial County include school districts, special districts, and private utility companies (Imperial County 1997)

Riverside County. In the eastern portion of Riverside County, the county government provides many of the public services. The city of Coachella provides some of its own public services and contracts with Riverside County for others. Special districts, school districts, and private utility companies provide the remainder of public services and utilities in this portion of Riverside County.

3.15.2 Utilities

Utility systems addressed in this analysis include the facilities and infrastructure used for the following:

- Potable water pumping, treatment, storage, and distribution;
- Wastewater collection and treatment;
- Solid waste disposal; and
- Electrical generation and distribution.

Water Service

Imperial County. The IID distributes water to over 500,000 acres of farmland, as well as to ten communities in Imperial County for domestic purposes: Calexico, Holtville, El Centro, Imperial, Brawley, Westmorland, Calipatria, Niland, Seeley, and Heber. Each of these cities and unincorporated communities has its own water treatment facilities for treating and distributing water within its jurisdiction. Ocotillo is provided water service by private water companies and individual wells, Palo Verde by the Palo Verde County Water District, and Hot Mineral Spa/Bombay Beach by the Coachella Valley Water District (Imperial County 1997).

Imperial Irrigation District. The IID is a community-owned utility that provides water for irrigation, domestic use, and electric power to the Imperial Valley. All of the water received by the IID (approximately three million acre-feet per year) is diverted from the Colorado River. The Imperial Dam diverts Colorado River water to southern

California, Arizona, and Mexico. Colorado River water diverted at the Imperial Dam for use in the Imperial Valley first passes through one of three desilting basins, each of which removes 70,000 tons of silt per day. From the desilting basins, the water is conveyed to the Imperial Valley via the All American Canal.

Three main canals, the East Highline, Central Main, and Westside Main, are used to convey water from the All American Canal to the many lateral canals that exist throughout the Imperial Valley. Farmers divert water directly from these laterals for irrigation. Seven regulating reservoirs and three interceptor reservoirs with a total storage capacity of more than 3,400 acre-feet are an important component of the IID's distribution system.

The total volume of water delivered by the IID for the past five years is shown in Table 3.15-1. Of the water IID transports, 98 percent is used for agriculture; the remaining two percent is used for industrial purposes or is delivered to cities, which treat it to safe drinking water standards and sell it to their residents (Imperial Irrigation District 1998).

Table 3.15-1
Historic Water Volumes (in acre-feet) Delivered by the IID

Category	1993	1994	1995	1996	1997
Agricultural	2,414,113	2,674,282	2,678,768	2,821,987	2,803,640
Industrial	14,897	17,152	17,708	18,130	17,458
Municipal	30,513	31,439	34,052	34,267	31,374
Total	**2,459,523**	**2,722,873**	**2,730,528**	**2,874,384**	**2,852,472**

Source: Imperial Irrigation District 1998

The IID currently uses structural and nonstructural water conservation measures, including canal concrete lining, nonleak gates, system automation, lateral interceptors, and on-farm irrigation water management. The IID and the MWD of southern California have a water conservation and transfer agreement, in which the MWD has financed the cost of construction, operation, and maintenance of certain water conservation projects in exchange for diverting additional water from the Colorado River to its service area.

Riverside County. Water service in the vicinity of the Salton Sea in Riverside County is provided by the CVWD, which provides irrigation and domestic water to areas within its 640,000 acre jurisdiction. The CVWD obtains its water from the Colorado River, State Water Project, and ground water. Colorado River water is obtained from the Coachella Canal, which branches from the All American Canal. Urban water is obtained from up to 80 wells in operation at any one time. CVWD supplements this supply with State Water Project and Colorado River water. Historic water volumes delivered by the CVWD are shown in Table 3.15-2.

Table 3.15-2
Historic Water Volumes (in acre-feet) Delivered by the CVWD

Category	1994-1995	1995-1996	1996-1997	1997-1998
Irrigation	283,187	TBS	286,548	266,125
Domestic	79,920	TBS	92,102	89,446
Total	**363,107**	**TBS**	**378,650**	**355,571**

Source: Coachella Valley Water District 1995, 1998

Wastewater Service

Each of the cities and incorporated communities of Heber, Niland, Seeley, and Winterhaven provide sewage treatment. The California RWQCB issues permits under the National Pollutant Discharge Elimination System (NPDES) program for these sewage treatment plants, which generally provide primary and secondary sewage treatment. Rural residences on existing lots and minor subdivisions use septic tanks and leach line systems, which require a minimum lot size of 20,000 square feet (approximately half an acre) per dwelling for approval by the Imperial County Health Department. Bombay Beach has a public sewage system operated by the CVWD, while Hot Mineral Spa relies on subsurface septic systems or facilities operated by mobile home or RV parks. Ocotillo and Palo Verde have no sewage treatment facilities and rely on subsurface septic systems (Imperial County 1997).

Electrical Service

The IID provides and distributes electricity to approximately 90,000 customers in Imperial County and parts of Riverside and San Diego counties. Because of the extremely hot summers in the region, per capita power consumption in the Imperial Valley is approximately 30 percent higher than the national average (Imperial Irrigation District 1998).

The IID operates nine hydroelectric generation plants, a 180-megawatt (MW) steam plant, eight gas turbines, and an eight-unit diesel plant. In addition, the IID obtains power from outside sources. With the Southern California Public Power Authority, the IID has an ownership interest of 14.6 MW of the Palo Verde Nuclear Generation Station in Arizona. IID is a one-third participant with Southern California Edison and Arizona Public Service Company in a 75-MW steam plant. Also, the utility purchased an interest in the Palo Verde-San Diego 500-kv transmission line, which allows the IID to have access to cheaper imported energy. The IID has an energy supply contract with El Paso Electric Company for 100 MW of electricity, which will increase to 150 MW by 2002. Table 3.15-3 provides information regarding the amount of energy sold by the IID for the past five years.

Table 3.15-3
Historic Electric Power Volumes Delivered by the IID

Category	1993	1994	1995	1996	1997
Residential	830,757	884,516	867,229	942,020	952,866

Commercial/Industrial	1,160,942	1,231,184	1,276,291	1,272,742	1,297,306
Other	144,261	154,823	157,593	167,684	162,161
Total	**2,135,960**	**2,270,523**	**2,301,113**	**2,382,446**	**2,412,333**

Source: Imperial Irrigation District 1998

Geothermal exploration is being conducted in nine KGRAs in Imperial County. There are currently 15 geothermal plants in Imperial County, seven of which are in the Salton Sea KGRA, which generally encompasses the southeastern portion of the Sea and the land area to the east, approximately to the communities of Niland and Calipatria.

3.15.3 Solid Waste Disposal Facilities

Table 3.15-4 summarizes information on permitted landfills in Imperial and Riverside counties in the vicinity of the Salton Sea.

Imperial County. All cities in Imperial County regulate waste storage and disposal and provide for waste collection services within their jurisdictions, using either a city-operated system or a contract with a private firm. Waste collection services are available in some unincorporated areas through contract with private firms.

There are 10 county-operated Class III disposal sites in Imperial County that accept nonhazardous wastes. Three of the county landfills are on land owned by the county (near Brawley, Imperial, and Calexico), six are on BLM property (Holtville, Niland, Salton City, Hot Mineral Spa, Ocotillo, and Palo Verde), and one is on the Quechan Indian Reservation (Picacho landfill, serving the Winterhaven area).

In addition to the public sites, Imperial Republic Acquisitions operates a private Class III waste disposal facility southeast of the Salton Sea, Laidlaw Environmental Services operates a Class I facility west of Westmorland, and the Desert Valley Company operates a Class II solid waste disposal and storage site northwest of Westmorland (Imperial County 1997).

Riverside County. There are two permitted Class III landfills in the vicinity of the Salton Sea: Mecca Landfill II and Oasis Sanitary Landfill (California Integrated Waste Management Board 1999).

3.15.4 Other Public Services

The other key public service examined for this analysis is traffic. Providers for this service are federal, state, regional, and local transportation agencies.

Table 3.15-4
Summary of Solid Waste Facilities

County/ Facility Name	Facility Location	Permitted Site Capacity (cubic yards)	Waste Types
Imperial County			
Brawley Disposal Site	Hovely Road and the New	2,044,000	Construction/demolition, mixed

	River		municipal, other designated
Calexico Disposal Site	New River and Highway 98	850,000	Agricultural, construction/demolition, mixed municipal, other designated
Desert Valley Company	3301 West Highway 86, Westmorland	514,000	Industrial
Holtville Disposal Site	8 miles northeast of Holtville	518,500	Construction/demolition, mixed municipal, other designated
Hot Spa Cut and Fill Site	Bombay Beach	70,000	Construction/demolition, mixed municipal
Imperial Waste Site	Worthington and New River	1,936,000	Construction/demolition, mixed municipal
Mesquite Regional Landfill	5 miles northeast of Glamis	970,000,000	Construction/demolition, mixed municipal
Niland Cut and Fill Site	4 miles northeast of Niland	131,000	Construction/demolition, mixed municipal
Ocotillo Cut and Fill Site	3 miles northwest of Ocotillo	516,267	Construction/demolition, mixed municipal
Palo Verde Cut and Fill Site	3 miles west of Palo Verde	516,000	Construction/demolition, mixed municipal
Picacho Cut and Fill Site	Picacho Road between Winterhaven and Picacho Park	645,333	Construction/demolition, mixed municipal, other designated, tires
Republic Imperial Landfill	Imperial	4,324,200	Agricultural, ash, construction/demolition, industrial, mixed municipal, tires
Salton City Cut and Fill Site	7 miles west of SR-86, south of Salton City	2,581,300	Construction/demolition, mixed municipal
Riverside County			
Mecca Landfill II	Mecca	587,694	Agricultural, construction/demolition, mixed municipal
Oasis Sanitary Landfill	Oasis	8,700,000	Agricultural, construction/demolition, contaminated soil, mixed municipal

Source: California Integrated Waste Management Board 1999

Traffic. Transportation planning for regional highways serving the Salton Sea area is conducted by Caltrans, regional agencies, such as the Southern California Association of Governments (SCAG), Imperial County and Riverside County, and the federal government. As required by the Alquist-Ingalls Act (Assembly Bill 402), Caltrans prepares the State Transportation Improvement Program (STIP) that SCAG uses to develop a Regional Transportation Improvement Program (RTIP). The federal government identifies federally funded projects from the STIP and RTIP that will be included in the Federal Transportation Improvement Program. Riverside County and Imperial County provide transportation planning for roads other than regional highways in the circulation elements of their respective general plans.

Current roadway operating conditions for roadway segments have been identified by Caltrans, SCAG, and Riverside and Imperial counties. These operating conditions are generally expressed in terms of level of service (LOS) developed by comparing roadway capacity to traffic volumes. Table 3.15-5 provides LOS designations and a description of operating conditions that determine LOS. The SCAG Congestion Management Plan (CMP) and the circulation elements of the Riverside County and Imperial County general plans identify the minimum acceptable LOS for road segments in Riverside and Imperial counties.

Table 3.15-5
Road Transportation Level of Service Criteria

Level of Service	Description
A	Free flow with users unaffected by the presence of other users on the roadway.
B	Stable flow, but presence of other users in traffic stream becomes noticeable.
C	Stable flow, but operation of users becomes affected by others in the traffic stream.
D	High-density but stable flow, speed and freedom of movement are severely restricted, poor level of comfort and convenience.
E	High-density with traffic demand usually at capacity, resulting in very long traffic delays.
F	Forced or breakdown flow with traffic demand exceeding capacity, unstable stop-and-go traffic.

State Route (SR) 78, SR-86, and SR-111 provide regional access to the Salton Sea. These roads are described in the following paragraphs.

SR-78 is an east-west route that begins at Interstate (I)-10 at Blythe in Riverside County and continues south of the Salton Sea through Palo Verde, Brawley, and Westmorland before terminating at I-5 in San Diego County. SR-78 is a two-lane highway (one travel lane in each direction). Daily traffic volumes on SR-78 are shown on Table 3.15-6. Outside Brawley, SR-78 carries low traffic volumes. Caltrans is planning improvements to SR-78 in Brawley, at the SR-111 interchange, to relieve congestion. A four-lane expressway bypass is planned from

Table 3.15-6
Traffic Volumes on Key Roads

Road Segment/Location	Number of Lanes	LOS	Peak-hour Traffic[1]	AADT[2]
State Route 78 Segments				
Imperial County Border to Junction of SR-86	2	A	70	630
Junction of SR-86 to Brawley, Third Street	2	D	1,500	18,000
Brawley, Third Street to Brawley, Sixth Street	2	D	1,500	18,000
Brawley, Sixth Street to West Junction SR-111	2	D	1,350	16,500
West Junction SR-111 to Brawley, Tenth Street	2	D	1,550	18,600
Brawley, Tenth Street to Brawley, Eastern Avenue	2	C	910	10,900
Brawley, Eastern Avenue to East Junction SR-111	2	B	680	8,200
East Junction SR-111 to West Junction SR-115	2	A	320	3,450
West Junction SR-115 to East Junction SR-115	2	A	320	3,150
East Junction SR-115 to Glamis	2	A	320	2,200
Glamis to Ogilby Road	2	A	180	1,200
Ogilby Road to Palo Verde, Fourth/Main Street	2	A	280	1,900
Palo Verde, Fourth/Main Street to Riverside County Boundary	2	A	220	2,300
State Route 86 Segments				
South Junction of SR-78 to Brawley, Rio Vista Avenue	4	A	1,250	14,000
Brawley, Rio Vista Avenue to Brawley, Las Flores Drive	4	A	860	9,800
Brawley, Las Flores Drive to Cady Road	4	A	580	6,600
Cady Road to Westmoreland, B Street	4	A	420	4,800
Westmorland, B Street to Westmorland, Center St.	4	A	380	4,350
Westmorland, Center Street to Westmorland, H Street	4	A	770	8,800
Westmorland, H Street to Lack Road	4	A	600	6,900
Lack Road to SR-78	4	A	650	8,500
SR-78 to Air Park Drive	4	A	590	7,600
Air Park Drive to Salton City, South Marina Drive	4	A	600	7,700
Salton City, South Marina Drive to Salton Sea Beach Road (Brawley Road)	4	A	700	9,000

Table 3.15-6
Traffic Volumes on Key Roads *(continued)*

Road Segment/Location	Number of Lanes	LOS	Peak-hour Traffic[1]	AADT[2]
Salton Sea Beach Road (Brawley Road) to Desert Shores Drive	4	A	610	7,600
Desert Shores Drive to Riverside County boundary	4	A	800	9,900
Riverside County boundary to 80th Avenue	4	A	800	11,200
80th Avenue to SR-195	4	A	820	10,300
SR-195 to Polk Street/ 70th Avenue	4	A	730	9,300
State Route 111 Segments				
Brawley, West Junction SR-78 to Brawley, E Street	2	C	780	9,500
Brawley, E Street to Brawley, B Street	2	C	750	9,200
Brawley, B Street to Brawley, A Street	2	D	940	11,500
Brawley, A Street to Brawley, Adler Street	2	C	600	7,300
Brawley, Adler Street to Shank Road	2	C	520	5,500
Shank Road to Rutherford Road	2	C	590	6,200
Rutherford Road to Calipatria South City Limit	2	C	690	7,300
Calipatria South City Limit to SR-115	2	C	690	7,300
SR-115 to Calipatria, California Street	2	C	710	7,500
Calipatria, California Street to Sinclair Road	2	C	600	6,300
Sinclair Road to Niland, Niland Avenue	2	C	570	6,000
Niland, Niland Avenue to Niland, Third Street	2	C	550	5,800
Niland, Third Street to Beal Road	2	C	600	6,300
Beal Road to English Road	2	C	480	5,100
English Road to Bombay Beach Road	2	B	260	2,700
Bombay Beach Road to Riverside County boundary	2	B	270	3,300
Riverside County boundary to Salton Sea State Park Road	2	B	270	3,300
Salton Sea State Park Road to SR-195	2	B	370	3,800
SR-195 to Thermal, Church Street	2	C	620	6,300
Thermal, Church Street to Airport Boulevard	2	D	830	8,500
Airport Boulevard to Coachella, Avenue 52	2	D	880	9,000

Source: Caltrans 1998

Notes: [1] Peak-hour traffic in both directions.
affic (AADT) is the total volume for the year divided by 365 days.

1.5 miles south of the eastern junction of SR-78 and SR-111 to SR-86, north of Brawley. This project is anticipated to be completed by the end of 2004 (Caltrans 1999).

SR–86 is the main north-south access between I-8 and I-10 in Imperial and Riverside counties and is one of the principal farm-to-market routes to the Los Angeles distribution points. SR-86 begins at I-10 in Indio, parallels the western side of the Salton Sea, joins with SR-78 south of Salton City, continues through Westmorland to Brawley, then splits from SR-78 and continues south through Imperial, El Centro, and Heber and terminates at SR-111. Daily traffic volumes on SR-86 are shown on Table 3.15-6. There is a high percentage of large trucks using SR-86, up to 48 percent at times, and heavy recreational traffic on the fall, winter, and spring weekends. SR-86 is being upgraded from a two-lane freeway to a four-lane expressway, with shoulders for emergency parking and with access on and off the road at designated major cross streets in Imperial and Riverside counties. The 20-mile section of SR-86 in Riverside County between Avenue 82 near Oasis and Interstate 10 in Indio will be constructed on a new alignment. The upgrade is estimated to be completed by the summer of 1999 (Caltrans 1999).

SR-111 is a north-south route beginning at I-10 in Indio in Riverside County. The two-lane undivided roadway continues along the eastern side of the Salton Sea through Calipatria and Brawley. At I-8, the road widens to two travel lanes in each direction and ends at the international border at Calexico. Daily traffic volumes on SR-111 are shown on Table 3.15-6. Traffic congestion often occurs on SR-111 because of the high percentage of truck traffic, slow-moving farm equipment, recreational vehicles, and the lack of passing lanes. Caltrans is planning to upgrade SR-111 to a four-lane expressway from Ross Road (just north of I-8) to SR-78. The project will be completed in 2002.

3.16 CULTURAL RESOURCES

3.16.1 Introduction

The term cultural resources is widely used to include a broad range of resources, including archaeological, architectural, and ethnographic resources. All of these types of resources, as defined below, are discussed in the following section. A summary of the cultural background of the Salton Sea region is provided in Appendix D. A more detailed presentation of this information is provided within the *Salton Sea Cultural Resources Class 1 Survey Report* (Smith et al. 1999a).

Archaeological and Architectural Resources. Archaeological resources are generally divided into precontact (prehistoric) and post-contact (historic) resources. Precontact resources are physical properties resulting from human activities that predate the time of European contact in America. Precontact resources reflect aboriginal use of the land and can include village sites, temporary campsites, lithic scatters, fishing sites, roasting pits/hearths, milling features, petroglyphs/pictographs, rock features, and burials. Post-contact resources consist of physical properties, structures, or built items resulting from the activities of colonial Europeans or Americans. These resources are more than

50 years old but date after the time of contact between Native Americans and Europeans. Post-contact resources include both archaeological remains and architectural structures. Archaeological site types include townsites, homesteads, agricultural or ranching features, mining-related features, and refuse concentrations. Architectural resources can include houses, barns, stores, post offices, bridges, and community structures, such as churches, schools, and meeting halls.

Ethnographic Resources. Ethnographic resources are sites, areas, and materials important to Native Americans for religious, spiritual, or traditional reasons. Fundamental to many Native American religions is the belief in the sacred character of physical places, such as mountain peaks, springs, or burial sites. Traditional rituals often prescribe use of particular native plants, animals, or minerals, gathered from specific sources. Therefore, ethnographic resources can include a wide range of resources, such as villages, burials, petroglyphs, rock features, mountain peaks, springs, and traditional gathering areas. Such resources can be formally designated as traditional cultural properties (TCPs)or sacred sites. To be eligible for consideration as a TCP, a resource must meet criteria as presented in National Register Bulletin 38 *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King 1990). A site must meet the definition set forth in Executive Order 13007 to be considered a sacred site by Federal law. Activities that may affect these resources, their accessibility, or availability of materials used in traditional practices are of primary concern in impact analyses. Although some types of ethnographic resources overlap with precontact and post-contact archaeological resources, they require separate recognition as unique cultural resources.

3.16.2 Identification Methods

Archaeological and Architectural Resources. Identification of cultural resources likely to be affected by the restoration of the Salton Sea focused on a buffer zone measuring five miles around the Sea (from the shoreline). Additional areas outside this five-mile radius where restoration actions may occur also were examined. To identify previous investigations that have been conducted and cultural resources that have been recorded within the five-mile radius and specific areas of potential effect (APEs), a record search was conducted through the California Historical Resources Information System (CHRIS). Information on surveys and sites in Riverside County were obtained from the CHRIS Eastern Information Center at the University of California, Riverside. Information on surveys and sites in Imperial County was gathered from the CHRIS Southeast Information Center at the Imperial Valley College Desert Museum in Ocotillo, California. Information on surveys and sites in San Diego County was gathered from the CHRIS South Coastal Information Center at San Diego State University.

Ethnographic Resources. Reclamation sent letters to 29 tribal organizations in California and Arizona to initiate consultation with regard to ethnographic resources important to the tribes that might be affected by the project. As required by CEQA, the Native American Heritage Commission (NAHC) was contacted for a list of tribes with traditional and historical ties to the area. This list was expanded to include 29

groups in accordance with Reclamation's policy to consult broadly. The expanded list was then approved by the BIA Sacramento Area Office and the NAHC. A more complete description of this methodology is presented in the report titled *Salton Sea Restoration Project: Contacts with Native American Groups* (Smith et al. 1999b).

After the initial consultation letters were sent, follow-up phone calls were made by Reclamation's ethnographic contractor to insure that each tribe had an opportunity to directly express their concerns. Questionnaires were faxed to groups that were difficult to contact by phone, as an alternative means for them to express their concerns. Tribal concerns regarding ethnographic resources were documented by the ethnographer for consideration in impact analyses. If follow-up phone calls were thought by a tribe to be insufficient as a means of documenting the tribe's concerns, meetings were scheduled with the tribe to further discuss their concerns regarding impacts to ethnographic resources. Tribes were encouraged to formally document their concerns by submitting written comments to Reclamation. The results of these efforts are summarized in 3.16.3 of this document. Responses are documented in detail in the summary report titled *Salton Sea Restoration Project: Contacts with Native American Groups* (Smith et al. 1999b).

In addition to individual tribal groups and organizations, the Kumeyaay Cultural Repatriation Committee (KCRC) was also contacted during data gathering efforts at the urging of several of the Kumeyaay groups initially contacted. KCRC represents twelve Ipai-Tipai bands of the Kumeyaay Nation: Barona, Campo, Ewiiaapaayp (Cuyapaipe), Inaja, Jamul, LaPosta, Manzanita, Mesa Grande, San Pasqual, Santa Ysabel, Sycuan, and Viejas. Nine of these groups had been formally contacted already by Reclamation and Reclamation's contracted ethnographers.

3.16.3 Known Resources

Archaeological and Architectural Resources. Information on known archaeological and architectural resources is provided here first for the five-mile buffer zone around the Salton Sea, and then specifically for each action.

Five-Mile Buffer Zone. Approximately 899 square miles (575,740 acres) are encompassed by the five-mile buffer zone around the Salton Sea. This figure includes 364 square miles (233,150 acres) that are inundated by the Sea, which are likely to contain submerged archaeological sites, as well as the surrounding 535 square miles (342,590 acres) of dry land. Roughly 47 square miles (30,000 acres) have been surveyed for cultural resources. Surveyed areas represent 5.2 percent of the total area within the buffer zone (including inundated portions), and 8.8 percent of the dry land contained within the buffer zone. Most recorded archaeological sites are concentrated in Imperial County near the southwestern shoreline of the Sea and in a line paralleling the southwestern and western shorelines. The eastern shoreline in Imperial County has a similar linear site distribution, although it appears less dense than that on the western side of the Sea. Rather than accurately reflecting the distribution of precontact and post-contact human activity, however, these patterns seem to represent cultural resource surveys conducted for recent projects, such as improvements to state highways 86 and 111 and the Coachella Canal, and the realignment and closure of the

U.S. Navy's Salton Sea Test Base. Further cultural resource surveys throughout the five-mile buffer zone would yield a larger, more representative data set from which more accurate site density and distribution patterns would emerge.

Within the five-mile buffer zone, 900 archaeological resources have been recorded. These include 802 precontact, 8 contact-era, 58 post-contact, and 22 multi-component resources, as well as 10 sites of unknown age. Table 3.16-1 shows the distribution of these sites by county.

Table 3.16-1
Archaeological Resources by County within the Five-Mile Buffer Zone Surrounding the Salton Sea

Sites	Precontact	Contact-Era	Post-Contact	Multi-Component	Unknown	Total	
Imperial	735	---	49	21	6	811	90.1%*
Riverside	62	7	9	1	4	83	9.2%*
San Diego	5	1	---	---	---	6	0.7%*
Total	**802**	**8**	**58**	**22**	**10**	**900**	**100 %***

*Percentage of total archaeological resources (n=900) recorded within the five-mile buffer zone.

Of the 802 precontact sites recorded within the five-mile buffer zone around the Salton Sea, 519 (64.7%) are activity loci and 283 (35.3%) are habitation sites (Table 3.16-2). Activity loci include nonhabitation sites, such as lithic and pottery sherd scatters, fish traps, milling sites, rock art, ceremonial sites, trails, storage features, and rock features. Habitation sites include temporary camps, limited habitation sites, and large habitation sites. Temporary camps include evidence of a person or group of people having camped for a short time while on a resource gathering or hunting expedition, or while traveling. These sites often contain a hearth(s) and/or sleeping area(s) with artifacts indicative of resource procurement. Limited habitation sites are similar to temporary camps, but exhibit evidence of longer-term or repeated use. Artifact/feature assemblages for limited habitation sites resemble those of temporary camps although they are indicative of a more varied and/or intense use of the site. Large habitation sites often occupy a large area, and are characterized by a high concentration and variety of artifacts, living structures, other features, and middens. Of the 283 precontact habitation sites within the five-mile buffer zone, 192 (67.9%) are temporary camps, 87 (30.7%) are limited habitation sites, and 4 (1.4%) are large habitation sites (Table 3.16-2).

Table 3.16-2
Precontact and Multi-component Site Types Recorded within the 5-Mile Buffer Zone Surrounding the Salton Sea

Precontact and Multi-Component Sites (826)				
Site Type	**Precontact**	**Multi-Component***	**Total**	
Activity Loci	519	11	530	64.3%

Temporary Camps	192	5	197	23.9%
Limited Habitation Sites	87	5	92	11.2%
Large Habitation Sites	4	1	5	0.6%
Total	**802**	**22**	**824**	**100 %**

*The Predominant Component of all of the Multi-Component Sites is Precontact.

Eighty-seven precontact sites, most of which are within the boundaries of the Salton Sea Test Base, have been recommended eligible for listing on the National Register of Historic Places (NRHP). An additional three precontact sites within the five-mile buffer zone have been determined to be potentially NRHP-eligible.

All of the eight recorded contact-era sites within the five-mile buffer zone are habitation sites. Six (75%) are limited habitation sites, and two (25%) are large habitation sites, probably associated with the village of Cabazones.

Of the 58 recorded post-contact archaeological resources recorded within the five-mile buffer zone, 3 (5.2%) consist of structural or residence remains, 3 5.2%) are post-contact camp sites, and 52 (89.7%) are activity loci, such as refuse concentrations, road or trail segments, and railroad, agricultural, or mining sites. Two post-contact sites (2.7%) are of unidentified function (Table 3.16-3).

Twenty-two multi-component sites have been recorded within the five-mile buffer zone. The predominant components of 11 (50%) are precontact habitation sites of various sizes. The predominant components of the remaining 11 multi-component sites (50%) are activity loci (Table 3.16-2). Of the 11 precontact habitation sites represented within the multi-component sites, five (22.7%) are temporary camps, five (22.7%) are limited habitation sites, and one (4.54%) is a large habitation sites. The post-contact components of the 22 multi-component sites are predominantly activity loci. Seven multi-component sites, all of which are on the Salton Sea Test Base, have been recommended eligible for listing on the NRHP.

Nineteen post-contact architectural and engineering resources are located within the five-mile buffer area around the Salton Sea. One of these resources, the NRHP-listed Martinez Historical District, includes three early 20th century Indian Agency

Table 3.16-3
Post-Contact Sites Recorded within the Five-Mile Buffer Zone Surrounding the Salton Sea

Post-contact Sites (74)		
Site Type	**Number of Sites**	**Percentage**
Structural Remains	1	1.7%

Residence	2	3.4%
Camp Sites	3	5.2%
Refuse Concentrations	13	22.5%
Wagon Road or Trail Segments	26	45.0%
Road Maintenance Station	1	1.7%
Wagon Remains	1	1.7%
Railroad-Related Sites	2	3.4%
Mining-Related Sites	3	5.2%
Agriculture-Related Sites	1	1.7%
Roadside Business Sites	2	3.4%
Human Burial Site	1	1.7%
Unknown Function	2	3.4%
Total	**58**	**100 %**

buildings on the Torrez-Martinez Reservation. The 18 remaining resources include 8 houses, 2 ranches, 2 schools, 1 barn, 1 bank, 1 café, 1 canal, 1 water tank, and the post-contact era structural remains of the U.S. Navy Salton Sea Test Base. Of these, 11 have been determined to be not eligible for listing on the NRHP, 1 is considered potentially eligible, and 6 have not been evaluated for NRHP eligibility. All of these resources are discussed in more detail in the *Salton Sea Cultural Resoruces Class 1 Survey Report* (Smith et al. 1999a).

Of the 10 sites of unknown age recorded within the five-mile buffer zone, four (40%) are activity loci, two (20%) are habitation sites, and four (40%) are not described on the archaeological site records on file. The two habitation sites are the remains of rock dwellings. Of the four activity loci, two consist of the remains of unidentifed rock arrangements, and two are trail sites. Assuming the 30,000 acres surveyed for cultural resources are representative of the entire five-mile buffer zone, including land inundated by the Sea, a site density of one site per 36.4 acres, or 18 sites per square mile, can be extrapolated. However, site density is likely to vary from area to area, depending on topography and past availability of natural resources. Site density within the Salton Sea Test Base, primarily reflecting precontact use of the shoreline environment of Ancient Lake Cahuilla, averages only one site per 45.7 acres, or 14 sites per square mile. Site density in the proposed NRHP Southwest Lake Cahuilla Recessional Shoreline Archaeological District within the Test Base is one site per 24.5 acres, or 26 sites per square mile. This is greater than the site density in the surveyed portions of the five-mile buffer zone and in the Test Base as a whole. The low sandstone ridge that is the predominant topographic feature of the district, as well as the focus of the highest concentration of sites, was once a narrow peninsula that extended several hundred meters into Ancient Lake Cahuilla, enclosing a small embayment. Its apparent importance as a habitation and activity area is probably related

to its advantageous position next to thriving fish habitats (Apple et al. 1997). This association suggests that site density throughout the Salton Sea area may be higher in relation to certain types of shoreline features.

In addition to precontact, contact-era, and post-contact resources indicated on historical maps, at least 24 World War II-era U.S. Navy aircraft are reported to have crahsed or made forced landings in and near the Salton Sea. Of the crews of these aircraft, at least 18 men were killed and some of the submerged wreckage may still contain the remains of lost crewmen. The exact locations of the majority of the downed military aircraft are unknown; however, an Avenger torpedo-bomber that crashed in December 1947 was discovered by divers searching for a recently lost private plane. The U.S. Navy restricts diving to these aircraft sites and does not allow photography of human remains, or the disclosure of aircraft serial numbers. These aircraft may also be considered historical archaeological sites, subject to protection or treatment as cultural resources, and may also be subject to U.S. Navy jurisdiction. (Perry 1999; *Los Angeles Times* 1999).

Also, 25 localities consisting of historically documented stands of plants, water sources, or geological formations have been recorded within the five-mile buffer zone. These localities were originally noted by H. S. Washburn of the U.S. General Land Office during a survey of the Salton Sink in 1856. Twenty-one of the localities (84%) are springs, ponds, streams, or locations where water is near the ground surface. Of these 21 localities, 17 (81%) are freshwater, and four (19%) are salt water. Two of the 25 localities (8%) consist of mud cones. One locality (4%) is a mesquite grove, and one (4%) is an extensive salt deposit. Twelve of the 25 localities (48%) are in the vicinity of the southwestern shore of the Salton Sea, 11 (44%) are in the vicinity of the northeastern shore, and two (8%) are near the northwestern shore. No cultural resources have been recorded in association with these features; however, it is likely that they were of some importance to occupants of the area, and the potential exists for precontact or post-contact archaeological materials to be found nearby.

Areas that Would be Affected by the Northwest and Southwest Evaporation Ponds. Two precontact archaeological sites have been recorded within the APE of the Northwest and Southwest Evaporation Ponds. One of the sites is an activity locus, and the other is a temporary camp. These sites have been determined to be eligible for listing on the NRHP. Both sites are within the Northwest Pond area. The Northwest Pond covers approximately 9,894 acres, of which 1.2 percent, or 120 acres, have been surveyed for cultural resources. Of the 16,834 acres that make up the South Pond area, 0.15 percent, or 25 acres have been surveyed. About 98.5 percent of the Northwest and Southwest Evaporation Ponds APE is submerged beneath the Salton Sea. There is a potential for additional archaeological sites to exist, not only in the unsurveyed dry land portions of the APE but in the submerged portions, particularly in the eastern part of the Southwest Pond APE, which is within 4.5 miles of Obsidian Butte, an important precontact lithic source.

In addition to the affected areas in the Northwest and Southwest Evaporation Ponds APE, riprap and embankment material for the evaporation pond dikes will come from borrow areas in three sections west of the western shoreline of the Sea. Archaeological sites have been recorded within these three sections, and it is possible that additional sites will be found. Because riprap sources are in areas of exposed smooth bedrock surfaces, it is also possible that petroglyphs will be encountered.

Riprap will be taken from Section 20, Township 9 South, Range 9 East. None of this section has been surveyed for cultural resources; however, five recorded precontact archaeological sites exist there. Four are habitation sites, and one site is an activity locus. The four habitation sites consist of two temporary camps and two limited habitation sites. The NRHP eligibility of these sites has not been determined. The potential exists for additional archaeological sites to be encountered within the affected area of this section.

Embankment material will come from Sections 28 and 34, Township 9 South, Range 9 East. These sections have not been surveyed for cultural resources; however, 24 precontact archaeological sites have been recorded in Section 28, and one post-contact and 12 precontact sites have been recorded in Section 34. Of the 24 known precontact sites in Section 28, 10 are habitation sites and 14 are activity loci. Five of the habitation sites are temporary camps, three are limited habitation sites, and two are rock-lined house rings. One of the precontact activity locus sites in Section 28 has been determined to be eligible for listing on the NRHP. The eligibility of the remaining sites in Section 28 has not been determined. In Section 34, the known post-contact site is a segment of a wagon road. The 12 known precontact sites in Section 34 consist of one temporary camp and 11 activity loci. The NRHP eligibility of the sites in Section 34 has not been determined. The potential exists for additional archaeological sites to be encountered within the affected areas of these two sections.

Borrow material would be trucked into the construction site by way of a 60-foot-wide temporary haul road. Once construction of the dikes is completed, the road would be restored to pre-construction condition; however, previously unrecorded archaeological sites, which cannot be restored, may be encountered in the path of this road.

Area that Would be Affected by the Pupfish Pond. Approximately 60 acres (4%) of the 1,477-acre APE of the Pupfish Pond have been surveyed for cultural resources. No cultural resources have been recorded. However, the potential exists for archaeological sites to be encountered in both the shoreline and inundated portions of the APE.

To create the pond, additional dikes would be constructed from the north and south ends of the Southwest Evaporation Pond. This would require the import of riprap and embankment material, and construction of a 60-foot-wide temporary haul road. A description of riprap and embankment material sources and the haul road is presented above in the discussion of the Northwest and Southwest Evaporation Ponds.

Area that Would be Affected by North Wetland Habitat. No archaeological or architectural resources have been recorded within the 1,200-acre APE of the North Wetland Habitat. However, none of this area has been surveyed for cultural resources, and the potential exists for archaeological materials to be encountered in both the inundated and shoreline portions of the APE during construction.

Area that Would be Affected by South Shore Displacement Dike. No cultural resources surveys have been conducted within the 15,975-acre APE of the South Shore Displacement Dike. One precontact archaeological site and three geological localities with potential cultural associations have been recorded. The precontact archaeological site is a northwest/southeast-trending ethnographic trail. NRHP eligibility for this site has not been determined. Two of the geological localities are salt deposits recorded by H. S. Washburn of the U.S. General Land Office during a survey of the Salton Sink in 1856. The third geological locality was recorded as a mud volcano by Washburn. No cultural resources have been recorded in association with these localities, one of which is currently inundated by the Sea. However, it is likely that they were of some importance to occupants of the area, and the potential exists for precontact or post-contact archaeological materials to be found nearby.

Obsidian Butte, an important precontact lithic source, is located near the center of the southeastern boundary of the South Shore Displacement Dike APE. The potential exists for precontact archaeological materials to be encountered in the vicinity of this topographic feature.

Construction of the dike would require the import of riprap and embankment material, and construction of a temporary haul road. A description of riprap and embankment material sources and the haul road is presented above in the discussion of the Northwest and Southwest Evaporation Ponds.

Area that Would be Affected by Enhanced Evaporation System (EES) Near Bombay Beach. Seven archaeological sites have been recorded within the EES-Bombay Beach APE. Five of the sites are precontact, one is post-contact, and one is multi-component. One of the precontact sites is an activity locus, and four are habitation sites of various sizes. The multi-component site, which is predominantly precontact, is a limited habitation site. The post-contact site is an activity locus of unknown function. One of the precontact habitation sites has been determined to be eligible for listing on the NRHP. The NRHP eligibility of the other five sites has not been determined.

Of the 10,880 acres that make up the APE for the Bombay Beach EES, only 2.7 percent, or 289.1 acres, have been previously surveyed for cultural resources. The potential exists for additional archaeological sites to be found within the unsurveyed portions of the APE.

The EES system near Bombay Beach would include an intake structure, consisting of a pipe 87 inches in diameter, that would extend into the Sea and be buried between the shoreline and the EES site. The potential exists for additional archaeological sites to be

encountered on the sea bottom in the area to be affected by the intake structure, as well as on dry land where the connecting pipeline will be buried between the shoreline and the EES site. In addition, high-power electrical lines that currently traverse the EES site would have to be relocated. The potential exists for previously unrecorded archaeological sites to be encountered during that operation.

Area that Would be Affected by Flood Flows. Periodic augmentation of inflow into the Salton Sea using Colorado River flood flows would involve using the Alamo River and Salt Creek as conveyance facilities. Increasing the flow of water may result in erosion of river and creek banks. Cultural resources data have not been collected as part of the current project for the majority of this APE, which would lie outside the five-mile buffer zone of the Sea. However, there is a potential for archaeological sites to exist near the banks of both the Alamo River and Salt Creek.

Areas that Would be Affected by EES at Test Base Facility. Approximately 3,624 acres, or 32.6 percent, of the 11,112-acre EES-Test Base APE have been previously surveyed for cultural resources. Of the 172 archaeological sites that have been recorded, 154 (89.6%) are precontact sites, 3 (1.7%) are post-contact sites, 12 (7%) are multi-component sites, and 3 sites (1.7%) are of undetermined age. Of the 154 precontact sites, 87 (56.5%) are activity loci, and 67 (43.5%) are habitation sites. Thirty-three of the 67 habitation sites (49.3%) are temporary camps, 31 (46.3%) are limited habitation sites, and 3 (4.4%) are large habitation sites.

Because the Test Base area has been protected from modern disturbances by being enclosed as a military facility, many of the archaeological sites within its boundaries retain a high degree of integrity. Due to their proximity to the Salton Sea, they also maintain the important relationship to a lakeshore setting (Apple et al. 1997).

Ninety-one precontact sites within the Salton Sea Test Base have been recommended eligible for listing on the NRHP under Criterion A because of their relationship to the periodic filling and recession of Ancient Lake Cahuilla, which is important to regional precontact history. These sites also are eligible under Criterion D for the information they can contribute on regional research issues, including chronology, technology, subsistence, settlement and mobility, and cultural affiliation (Apple et al. 1997).

Seventy-five of the National Register-eligible precontact sites, located on and around a low sandstone ridge roughly parallel to the Salton Sea shoreline near the center of the Test Base, have been recommended as contributing elements to a National Register archaeological district. These sites have good integrity, as well as sufficient data potential to address regionally important research questions. The Southwest Lake Cahuilla Recessional Shoreline Archaeological District would encompass approximately 2,700 acres and would contain, in addition to the 75 NRHP-eligible sites, 35 noncontributing precontact sites. These 35 sites have poor integrity or lack significant data potential. National Register and state district forms have been completed in support of this archaeological district (Apple et al. 1997).

Very little remains of the buildings and other facilities constructed at the Test Base during World War II and the Cold War. Some of the buildings, along with the original runway, were inundated by the rising Sea level during the 1950s. After the base was placed on caretaker status in 1961, the Navy used its buildings for training exercises for several years, resulting in extensive damage. Most of the buildings were demolished because they had become unsafe. The remaining seven buildings—a weapons assembly facility, two magazines, a warehouse, a photography laboratory, and two water treatment structures—were all built between 1948 and 1954. The warehouse and the photography laboratory are half submerged in the Salton Sea. All of the buildings have been badly damaged by training exercises, weather, and neglect. Evaluation of the buildings found them to lack the historic associations, architectural distinction, and integrity necessary to make them eligible for listing on the National Register (Apple et al. 1997).

Area that Would be Affected by EES within Evaporation Pond at Test Base. This action would use the same Northwest Evaporation Pond described above, with the addition of portable blowers to spray Salton Sea water into the air within the pond. Two precontact archaeological sites, consisting of an activity locus and a temporary camp, have been recorded within the APE of the Northwest Evaporation Pond. Additional archaeological sites may be encountered if facilities for the portable blowers are to be constructed.

Construction of the pond would require the import of riprap and embankment material, and construction of a temporary haul road. A description of riprap and embankment material sources and the haul road is presented above in the discussion of the Northwest and Southwest Evaporation Ponds.

Ethnographic Resources. To identify Native American resources that may be affected by the restoration alternatives, Reclamation sent letters regarding the Salton Sea Restoration Project to 29 tribal organizations in California and Arizona. All of the groups received follow-up contacts by Reclamation's ethnographic contractor via telephone, facsimile, electronic mail, and/or letters. Twenty-seven of the contacted groups responded by telephone or letter stating their perspectives regarding proposed activities for the Salton Sea Restoration Project. Of these, 22 groups stated that they have no direct concerns regarding the project, 1 group has stated specific concerns (the Torres Martinez Desert Cahuilla), and 4 have expressed that they may have concerns, but have not formally stated any specific concerns. All of these 27 groups, regardless of their response, still wish to be involved in the consultation process and kept informed of any future project changes or further developments. Several groups have also stated that they would like to participate in monitoring of sensitive areas. Two groups have not yet responded to the consultation letters or follow-up contacts made to them. Table 3.16-4 lists the contacted groups, and their general response.

The Kumeyaay Cultural Repatriation Committee (KCRC) was also contacted during data gathering efforts at the urging of several of the Kumeyaay groups initially contacted. KCRC responded by letter stating that they should be contacted

immediately if human remains or burial goods are found during any construction activities. Five of the members of KCRC (Ewiiaapaayp, Inaja, Manzanita, Santa Ysabel, and Viejas) also responded separately from the committee by stating that they had no comments/concerns at this time, but would like to be kept notified of the project as it proceeds.

The Torres Martinez Desert Cahuilla Indians have expressed several concerns regarding cultural and ethnographic resources in and around the Salton Sea that may be affected by restoration efforts. The Torres Martinez have expressed concern for archaeological sites located on the U.S. Navy Test Base. Although not considered TCPs or TUAs, these sites are considered by the Torres Martinez to be sensitve resources that require preservation. Furthermore, some of their concerns relate to potentially sacred sites that are currently submerged by the Salton Sea. They would like these sites to be protected, but are unsure of the exact locations of the sites.

The Torres Martinez are concerned with the protection of cultural resources located on their reservation that may be a affected by borrow sites, haul roads, and other activities that would involve ground disturbance on the reservation. These sites are also considered Indian Trust Assets and are discussed in Section 3.17.

During this process, Reclamation's ethnographic contractor encouraged the tribal groups to express any additional concerns not necessarily related to cultural resources. These additional concerns, as well as detailed descriptions of the consultation process and issues raised during the process, are documented in the

Table 3.16-4
List of Responses

Tribal Organization	Tribal Affiliation	General Response
Agua Caliente Tribal Council	Cahuilla	No concerns expressed[1]
Augustine Band of Mission Indians	Cahuilla	No concerns expressed[1]
Cabazon Band of Mission Indians	Cahuilla	No concerns expressed[1]
Cahuilla Band of Indians	Cahuilla	No response
Campo Band of Mission Indians	Tipai	No concerns expressed[1]
Chemehuevi Tribal Council	Chemehuevi	May have concerns[2]
Cocopah Tribal Office	Cocopah	May have concerns[2]
Colorado River Indian Tribes	Chemehuevi, Mohave	No concerns expressed[1]
Cuyapaipe Band of Mission Indians	Tipai	No concerns expressed[1]
Ft. McDowell Mohave-Apache Community Council	Apache, Mohave	No concerns expressed[1]
Ft. Mojave Tribal Council	Mohave	No concerns expressed[1]
Inaja-Cosmit Band of Mission Indians	Ipai-Tipai	No concerns expressed[1]
Jamul Indian Village	Tipai	No concerns expressed[1]
Kumeyaay Cultural Repatriation Committee	Kumeyaay	No concerns expressed[1]

La Jolla Indian Reservation	Luiseño	No concerns expressed[1]
La Posta Band of Mission Indians	Tipai	No concerns expressed[1]
Los Coyotes Band of Indians	Cahuilla	No concerns expressed[1]
Manzanita General Council	Tipai	No concerns expressed[1]
Morongo Band	Cahuilla, Cupeño, Serrano	May have concerns[2]
Pala Band of Mission Indians	Ipai, Cupeño, Luiseño	No concerns expressed[1]
Quechan Tribal Council	Quechan	May have concerns[2]
Ramona Band of Indians	Cahuilla	No concerns expressed[1]
Santa Rosa Band of Mission Indians	Cahuilla	No response
Santa Ysabel Band of Diegueno Indians	Ipai-Tipai	No concerns expressed[1]
Soboba Band of Mission Indians	Cahuilla, Luiseño	No concerns expressed[1]
Sycuan Business Committee	Tipai	No concerns expressed[1]
Torres Martinez Desert Cahuilla Indians	Cahuilla	Have specific concerns
Twenty Nine Palms Band of Mission Indians	Chemehuevi, Luiseño	No concerns expressed[1]
Viejas Band of Mission Indians	Ipai-Tipai	No concerns expressed[1]

Notes: [1]While no specific concerns have been expressed, these groups wish to remain involved in the consultuation process. [2]These groups have stated that they may have concerns, but have not indentified any specific concerns and have not provided further information.

summary report titled *Salton Sea Restoration Project: Contacts with Native American Groups* (Smith et al. 1999b).

3.16.4 Regulatory Background

Archaeological and Architectural Resources. Cultural resources are protected primarily through the NHPA of 1966 and its implementing regulation, Protection of Historic Properties (36 CFR § 800); the Archaeological and Historic Preservation Act; the Archaeological Resources Protection Act of 1979, and CEQA. Section 106 of the NHPA (16 USC 470-470w6) requires federal agencies to consider the effects of their actions on properties (i.e., sites, districts, buildings, structures, or objects) that are listed in or eligible for listing in the NRHP. Criteria for inclusion in the NRHP (36 CFR 60.4) are as follows:

- Association with events that have made a significant contribution to the broad patterns of our history;
- Association with the lives of persons significant to our past;
- Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Resources that have yielded or may be likely to yield information important in prehistory or history.

In addition to historic significance, a property must have integrity to be eligible to the NRHP. Integrity is the property's ability to convey its demonstrated historical significance. Seven individual elements make up integrity: location, design, setting, materials, workmanship, feeling, and association. The implementing regulations of the NHPA (36 CFR § 800) require federal agencies to provide the SHPO with an opportunity to comment on any actions that may affect a historic property and to provide the ACHP with an opportunity to comment on any action that will adversely affect a historic property.

CEQA requires state agencies to consider the effects of their actions on historically significant resources, which are those that meet the criteria for listing in the CRHR or a local register of historical resources. Criteria for inclusion in the CRHR are provided in Section 15064.5 of CEQA and are similar to the criteria for inclusion in the NRHP, described above.

Ethnographic Resources. Section 101(d)(6)(A) of the NHPA, as amended (1992), provides for properties of traditional religious and cultural importance to a tribe to be determined eligible for inclusion in the NRHP. National Register Bulletin 38 *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Parker and King 1990) provides guidance on identifying, evaluating, and documenting ethnographic and other cultural resources that may qualify for listing on the National Register as TCPs. In

order for a resource to be eligible for consideration as a TCP it must meet the age criterion for listing and be "…eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1990:1). Some resources may not meet the criteria for consideration as a TCP, but are considered sacred by Native American traditional practitioners. Executive Order (EO) 13007 defines a sacred site as "…any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion." EO 13007 directs Federal agencies, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, to accommodate access to and ceremonial use of such sites, and to avoid adversely affecting their physical integrity. The American Indian Religious Freedom Act (AIRFA) of 1978 states that it is the policy of the United States to protect and preserve for Native Americans the inherent right to believe, express, and exercise their traditional religions, including but not limited to access to religious sites, use and possession of scared objects, and freedom to worship through ceremonials and traditional rites. The courts have determined that there is a compliance element implied within AIRFA that requires Federal agencies to obtain the views of tribal leaders and to consider these when a proposed land use might conflict with traditional religious beliefs or practices. The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, directs Federal agencies to consult with tribes concerning the repatriation or disposition of human remains, funerary objects, sacred objects, and objects of cultural patrimony, in the agency's possession that are housed in museums, or have come under the agency's control as a result of intentional excavation or inadvertent discovery. The procedures established in NAGPRA and its implementing regulations as found at 43 CFR §10, must be followed when remains covered by the Act are found on tribal or Federal lands. If human remains are discovered on land that is not under Federal or tribal jurisdiction, the agency is required to follow state and local law. Provisions for the discovery of Native American human remains in California can be found in Section 15064.5 (d) of the California Environmental Quality Act (CEQA).

3.17 INDIAN TRUST ASSETS

Indian Trust Assets (ITAs) are legal interests in assets held in trust by the federal government for Indian tribes or individuals. Assets can be real property, physical assets, or intangible property rights. ITAs cannot be sold, leased, or otherwise encumbered without the approval of the US government. A trust relationship is established through a congressional act or executive order, as well as by provisions identified in historic treaties. As trustee, the Department of the Interior is legally obligated to fulfill treaty and statutory obligations and to manage, protect, and conserve Indian resources and lands in utmost good faith.

Land associated with a reservation, rancheria, or public domain allotment is an example of an ITA. Resources located within reservations, including timber, minerals, oil and gas, and others, also are considered trust assets. Treaty rights and water rights, as well as

hunting and fishing rights, may also be ITAs. Additional assets consist of financial assets in trust accounts.

The Salton Sea Restoration Project is not likely to affect trust assets that consist of money or financial accounts but may affect land assets or rights associated with land assets. Therefore, the focus of the following section is on land assets or rights that could be affected by restoration activities. Financial assets, such as trust accounts, would not be subject to impacts and are not considered in this document.

3.17.1 Identification Methods

BIA is charged by the Department of Interior with developing inventory listings for the ITAs of all tribes. Due to a lack of funding, these lists are not yet complete. The Bureau of Reclamation Indian Trust Asset Policy and NEPA Implementing Procedures dated August 31, 1994, direct that the following sources should be consulted to obtain information concerning extant ITAs: potentially affected tribes or Indian individuals, the Solicitor's Office, the BIA, the Native American Affairs Office, or the regional Native American Affairs Coordinator. All of these entities have been consulted concerning ITAs in the Salton Sea Restoration Project area.

3.17.2 Existing Conditions

Reservations and Land Assets. One reservation with real property trust assets has been identified within the project scope of Phase 1 of the Salton Sea Restoration Project. The Torres Martinez Desert Cahuilla Indian Reservation has a population of 198 (Torres Martinez Tribal Council 1999a, b) and is located on 24,024 acres along the northwestern shore of the Salton Sea (Tiller 1995). Approximately 11,800 acres of the reservation is currently inundated by the Salton Sea (Cox 1999). The Torres Martinez Desert Cahuilla Indians have sought damages and compensation for lands claimed to be inundated or damaged by the Salton Sea. The Southern California Agency of the BIA Realty Office did not identify any public domain allotments under BIA jurisdiction in Imperial County or within a five-mile radius of the Salton Sea in Riverside County. According to this office, no other lands are held in trust by the Bureau of Indian Affairs for Indian groups in the project area surrounding the Salton Sea. The Arizona BIA also did not identify any ITAs within the project area.

Water Rights. The Torres Martinez Desert Cahuilla Indians may have existing water rights held in trust by the United States. In 1908, the US Supreme Court (Winters v. United States, 207 US 564) ruled that when Congress created Indian reservations, water rights needed to develop and support these reservations were reserved. The Winters Doctrine has been extended by rulings of the US Supreme Court to include ground water rights as well as surface water rights (Foster 1978). Additional Federal and State reserved water rights are provided through Executive Orders, Supreme Court decisions, and statutes and regulations, which may all apply to the Torres Martinez reservation. The Torres Martinez have stated that a lawyer is working on their behalf to examine the issue of potential water rights (Torres Martinez Tribal Council 1999b).

Hunting and Fishing Rights. No specific hunting or fishing rights other than those granted to all citizens with proper permits from the CDFG have been identified in the project area. Under Public Law 280, the CDFG regulates fishing and hunting both on and off reservations. The Torres Martinez report that a lawyer is working on their behalf to identify potential hunting and fishing rights (Torres Martinez Tribal Council 1999b).

Mineral Rights. Significant gold deposits have been located on the Torres Martinez Reservation (Bureau of Indian Affairs 1999). This gold may be accessible via open-pit or underground target methods of extraction. As a trust asset, impacts to these resources should be considered. The Indian Minerals Development Act (PL 97-382, 25 USC 2101) and the Federal Oil and Gas Royalty Management Act of 1982 (PL 97-451) indicate that information relating to mineral development of Indian Trust lands are proprietary to the individual tribe and not to be disclosed without consent.

Cultural Resources. The Torres Martinez Desert Cahuilla Indians have indicated that they consider cultural resources located within the Torres Martinez Reservation to be Indian Trust Assets (Torres Martinez Tribal Council 1999b). Reclamation's Indian Trust Asset Policy and NEPA Implementing Procedures (1994) indicate that cultural resources on tribal lands are frequently considered Indian Trust Assets. Currently, 66 archaeological resources are known to exist on the Torres Martinez Reservation. Of these, 60 (90%) are precontact resources. These consist mainly of fish traps, trails, rock features, lithic scatters, and house pits/rings, as well as 2 rock shelters/caves, 1 petroglyph, and 1 grave circle. Five (8%) of the sites on the reservation consist of post-contact resources, including three wagon roads, one refuse concentration, and portions of the Coachella Canal, built in 1948. The 1 remaining resource (2%) is a multicomponent site containing precontact materials and the Torres Martinez Reservation Agency Building, which is listed on the NRHP as a contributing element to the Martinez Historical District. All 66 of these cultural resources, as well as any unidentified resources, are likely to be considered Indian Trust Assets.

Under the definition of Indian Trust Assets, cultural resources located off the Torres Martinez Reservation are unlikely to be considered trust assets of the Torres Martinez. Such resources, however, may be considered traditional cultural properties or traditional use areas and are discussed separately in Section 3.16 under Ethnographic Resources.

3.17.3 Regulatory Background

The Department of the Interior Order No. 3175 requires all Department of Interior bureaus and offices to explicitly address anticipated effects on ITAs in planning, decision, and operation documents. This order also requires appropriate descriptions of how decisions will conform to the Department's trust responsibilities. On July 2, 1993, Reclamation adopted its Indian Trust Asset Policy, which states that Reclamation would seek to protect or avoid adverse impacts to ITAs. When adverse impacts cannot be avoided, Reclamation will provide for an appropriate mitigation or compensation. This policy also states that Reclamation will not engage in a Fifth Amendment taking of ITAs without statutory authority and adequate compensation. In consultation with the

Office of the American Indian Trust, the Indian Trust Asset Policy was determined adequate to comply with Departmental Order No. 3175.

Reclamation policy (Reclamation 1994) advises that a NEPA document must state clearly the United States' position when a resource in question is not considered an ITA. If disputed by an Indian group, the group's position also must be clearly outlined.

3.18 PALEONTOLOGICAL RESOURCES

Paleontological resources are the recognizable remains of once-living, nonhuman organisms and early hominids. Identified as fossils, these resources represent a record of the history of life on the planet dating as far back as +/- 4 billion years ago. Paleontological resources can include shells, bones, leaves, tracks, trails, and other fossilized floral or faunal materials (National Research Council 1987). These resources provide valuable information on evolution, climatology, and taxonomy and can provide information for measuring time in earth history, as well as for understanding ancient environments and geographies (National Research Council 1987; Science Applications International Corporation 1994).

3.18.1 Identification Methods

Paleontological resources are fossilized remains of once living, non-human organisms and early hominids that have been incorporated into specific geological formations (National Research Council 1987). By understanding where particular geological formations within a project area occur, predictions can be made where fossil resources are likely to be found. Fossil localities, as discussed in this document, are specific locales where fossils have been identified and formally documented. These localities are not the only paleontological resources that may exist within a given area.

To assess where fossil-containing geological formations occur within the project area, published geological maps by Rogers (1965), Jennings (1967), and Morton (1977) were consulted. These maps identified at least four sensitive fossil-bearing geological formations within the project area (Palm Springs, Borrego, and Brawley Formations, and the Lake Cahuilla Deposits). Research was conducted at the University of California at Riverside Science Library and via University of California Internet reference resources. Additionally, the University of California Museum of Paleontology specimen catalog was queried to identify any paleontological specimens that may have been collected from the Salton Sea project area.

A record search was also conducted through the Regional Paleontological Locality Inventory (RPLI) of the San Bernardino County Museum. This computer database contains the contextual data of more than 3,000 fossil localities in California and the southwestern United States. Records were searched for 19 USGS topographic 7.5' quadrangle maps for areas within a five-mile buffer area surrounding the Salton Sea.

3.18.2 Known Resources

Fossil resources near the Salton Sea are predominantly from Pliocene and Pleistocene sediments representing both lake and terrestrial habitats. These sediments contain a

myriad of fossil vertebrate and invertebrate specimens, including terrestrial mammals associated with the transition into the Pleistocene Epoch. Saber-toothed cats (*Smilodon* sp.), mammoths (*Mammuthus* sp.), camels (*Camelops* sp.), horses (*Equus* sp.), ground sloths (*Glossotherium* sp.), and bison (*Bison antiquus*) have been found in these geologic contexts. Lake habitat vertebrates that have been found include fish, turtles, and various kinds of reptiles associated with the ancient lake shoreline. The search of the RPLI revealed 91 known fossil localities on the 19 quadrangles examined within a five-mile buffer area around the Salton Sea shoreline.

Several major geologic formations of the Salton Basin are especially important to the paleontology of this region, including the Palm Springs, Borrego, and Brawley Formations, and the Lake Cahuilla Deposits. These geologic layers bear fossils that relate to the environmental conditions under which they were formed.

The Palm Springs Formation consists of pink-gray laminated sandstone that was formed during the Pliocene and Pleistocene in coastal floodplain conditions. The beds are believed to have been deposited between 4 to 1.5 million years ago. Vertebrate fossils found within the Palm Springs Formation include camels, llamas, horses, donkeys, mammoths, mastodons, sloths, zebras, lions, sabertooth cats, and bears (Scheonherr 1992). RPLI records indicate several Palm Springs Formation Pleistocene fossil localities within the five-mile buffer area surrounding the Salton Sea; however, none of these localities fall directly within the project areas.

The Borrego Formation is composed of gray clay, interbedded sandstone, and fossils of mollusks, ostacods, and Foraminifera (Morton 1977). These fossils are related to ancient lake habitats that existed during the Pliocene and Pleistocene. This formation is thought to be the lacustrine equivalent of the Palm Springs Formation (Jennings 1967).

The Brawley Formation consists of sediments deposited during the Pleistocene in both lake and terrestrial habitats (Downs and Woodard 1961; Morton 1977). Fossils from the Rancholabrean Land Mammal Age have been collected from this formation in several locations in Imperial County. Taxa previously recorded include mammoth, deer (*Cervidae*), horse, camel, and bison (Jefferson 1991b). Other Brawley Formation localities in Imperial County have produced Razorback sucker (*Xyrauchen texanus*), Bonytail (*Gila elegans*), Western Pond Turtle (*Clemmys marmorata)*, Teleosts, and Iguanidae (Jefferson 1991a).

The Brawley Formation extends into the project area in the Bat Caves Buttes area north of Bombay Beach and in the western portion of the Salton Sea Test Base. RPLI records indicate 29 fossil localities are present in the Bat Caves Buttes area. Fossils recovered have been of both vertebrate and invertebrate taxa, including pelecypods, gastropods, freshwater mussel (*Anodonta* sp.), and freshwater clam (*Corbicula* sp.). Five localities containing Brawley Formation fossils have been located inside the Bombay Beach EES project area.

The Lake Cahuilla Deposits consist of deposits formed on the shores and bottom of ancient Lake Cahuilla and are known to contain abundant nonmarine fossils (Jennings 1967). The animals living during this time were similar to those found within the Brawley Formation, some of which still exist today. Shellfish and Colorado River fish, including freshwater mussel, gastropods, freshwater clams, Razorback suckers, and Bonytails were abundant during stands of ancient Lake Cahuilla.

3.18.3 Regulatory Background

Reclamation is required under CEQA to take into consideration the potential impacts from this project on important paleontological resources. If actions of Reclamation affect lands administrated by the BLM, Reclamation must comply with statutes and regulations applying to BLM lands. This includes three statutes (Federal Land Policy and Management Act, Federal Caves Resources Protection Act, and the Crimes and Criminal Procedures 18 U.S.C. 641), and eleven regulations (43 CRF Parts 37, 1610, 3610, 3621, 3622, 3802, 3809, 8200, 8365, 3802, 3809). If an action will effect fossils on lands under the jurisdiction of other Federal agencies, such as the Department of Defense, Reclamation must meet the statutory and regulatory requirements of those agencies. When an action is likely to effect fossils on non-federal lands, Reclamation is required to adhere to the provisions of state and local statutes.

3.19 ENVIRONMENTAL JUSTICE

3.19.1 Introduction

The President of the United States issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-income Populations, on February 11, 1994. Objectives of the executive order include developing federal agency implementation strategies, identifying minority and low-income populations where proposed federal actions could have disproportionately high and adverse human health and environmental effects, and encouraging the participation of minority and low-income populations in the NEPA process. Consideration of Environmental Justice issues is a federal requirement; there is no corresponding CEQA counterpart or significance criterion.

Executive Order 12898 provides minority and low-income populations with an opportunity to comment on the development and design of Reclamation activities. Reclamation issued the Environmental Compliance Memoranda on Environmental Justice and Trust Resources **(Source? TBS**), which revises the NEPA guidance, to require the incorporation of Environmental Justice concerns into the NEPA processes. It makes Environmental Justice a part of the mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority and low-income populations.

A demographic analysis provides information on the approximate locations of minority and low-income populations in areas potentially affected by the proposed action and alternatives. Affected areas could include, for example, a dike construction staging area located adjacent to the Salton Sea.

Geographic boundaries of census block groups have been determined using US Topographically Integrated Geographic Encoding and Referencing files. Data that is associated with each census block group is listed using the 1990 US Census of Population, which reports numbers of both minority residents and residents below poverty levels.

The US Bureau of the Census identifies four racial classifications: white, black, American Indian, Eskimo, or Aleut, and Asian or Pacific Islander. The US Bureau of the Census does not consider Hispanic a race; it is considered an origin.

Low-income populations are those living within a census block group whose income is below the poverty level. Households are classified as being below the poverty level if their total family income or unrelated individual income is less than the poverty threshold specified for the applicable family size. For example, the weighted average threshold for a four-person family is $12,674 for the 1990 census. This reflects the different consumption requirements of families based on their size and composition (US Bureau of the Census 1994).

3.19.2 Existing Conditions

To determine whether the census block groups potentially affected have high minority or low-income populations, the percentage of each of these groups in each census block group around the Salton Sea has been compared to the county population in which it is located (Table 3.19-1). Minority populations and low-income populations are separate groups, and a comparison has been made for each. When the census block group minority or low-income population is higher than the county population, the census block group is considered to be a minority or low-income community for the purpose of this analysis and is shaded in Table 3.19-1.

To establish areas of environmental justice impacts, a preliminary delineation of the potentially affected populations is performed in this section, then potential impacts in all resource areas are analyzed with respect to the potentially affected populations. The significance criteria are as follows:

- Does the potentially affected community include minority or low-income populations?
- Are significantly adverse environmental or human health impacts likely to fall disproportionately on these minority or low-income populations?

Significant Environmental Justice impacts would result only if implementation of the proposed action or an alternative produces disproportionate significant adverse environmental or human health impacts to the low-income or minority population communities that have been profiled.

Table 3.19-1
Census Block Groups
Low-income and Minority Populations
Riverside County and Imperial County*

Counties and Block Groups	Total Population	Below Poverty Line (%)	Black (%)	American Indian, Eskimo, and Aleut (%)	Asian and Pacific Islander (%)	Hispanic Origin (%)
Riverside County	1,170,413	11.5	5.4	1.0	3.6	26.3
650456.02:3	4,242	36.0	0.0	0.2	2.2	94.2
650456.02:2	2,838	46.6	0.6	1.7	3.1	91.2
650456.02:4	631	22.7	0.5	1.0	1.4	32.3
Imperial County	109,303	23.8	2.4	1.7	2.0	65.8
250124.00:3	484	27.1	5.0	0.6	0.4	2.7
250123.02:3	40	0.0	0.0	0.0	0.0	12.5
250123.02:2	541	9.6	2.0	1.5	0.9	6.5
250123.02:1	637	4.6	0.3	0.9	0.2	14.4
250123.02:5	159	18.2	0.6	0.0	1.3	10.7
250123.02:6	325	3.7	1.5	0.0	0.3	3.1
250123.02:9	35	0.0	0.0	0.0	0.0	42.9
250101.00:6	428	38.6	0.2	2.1	4.7	44.9
250124.00:4	337	21.7	13.1	0.6	0.3	2.7
250123.02:4	47	0.0	0.0	0.0	0.0	17.0
250123.02:7	126	34.1	1.6	1.6	0.0	9.5
250123.02:8	43	0.0	0.0	0.0	0.0	4.7
250102.00:1	221	29.9	2.3	0.5	4.1	53.8

*Shaded areas indicate that the US Census block group has a higher percentage of poverty or minority populations than its respective county.
Sources: Hall and Gaquin 1997; US Bureau of the Census 1991, 1993.