3.5 HYDROLOGY AND WATER QUALITY

Based on the analysis undertaken in the Initial Study for the 2008 Owens Valley PM_{10} planning Demonstration of Attainment State Implementation Plan (proposed project),[1] it was determined that the proposed project had the potential to result in significant impacts to mineral resources, thus requiring the consideration of mitigation measures or alternatives, in accordance with Section 15063 of the State of California Environmental Quality Act Guidelines (State CEQA Guidelines).[2] Therefore, this issue has been carried forward for detailed analysis in this Subsequent Environmental Impact Report (EIR). This evaluation considers impacts that may result from all phases of the proposed project in relation to hydrology and water quality, including construction activities, operation, and maintenance.

This analysis of hydrology and water quality consists of a summary of the regulatory framework that guides the decision-making process, a description of the existing conditions at the proposed project area, thresholds for determining if the proposed project would result in significant impacts, anticipated impacts (direct, indirect, and cumulative), mitigation measures, and level of significance after mitigation. The potential for impacts to hydrology and water quality have been analyzed in accordance with the methodologies and information provided by the Inyo County General Plan;[3] the Regional Water Quality Control Board, Lahontan Basin Plan;[4] and the Baseline Data and Approach for Developing the Water and Ecosystems Monitoring Program at Owens Lake.[5]

3.5.1 Regulatory Framework

This regulatory framework identifies the federal, state, and regional statutes and guidelines that govern the conservation and management of natural and manmade drainages and their associated functions and values. The County must consider this regulatory framework when rendering decisions related to the proposed project that have the potential to affect natural and manmade drainages or surface-water or groundwater resources.

Federal

National Environmental Policy Act

The National Environmental Policy Act (NEPA) and its supporting federal regulations establish certain requirements that must be adhered to for any project "…financed, assisted, conducted or approved by a federal agency…." In making a decision on the issuance of federal grant monies or a permit to conduct work on federal lands for components of the proposed project, the federally designated lead agency pursuant to NEPA is required to "…determine whether the proposed action may significantly

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[1] Great Basin Unified Air Pollution Control District. 27 February 2007. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Initial Study*. State Clearinghouse Number 2007021127. Bishop, CA.

[2] Great Basin Unified Air Pollution Control District. 27 February 2007. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Initial Study*. State Clearinghouse Number 2007021127. Bishop, CA.

[3] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA

[4] California Regional Water Quality Control Board, Lahontan Region. 1994. *Water Quality Control for the North and South Basins*. Prepared by: California Regional Water Quality Control Board, Lahontan Region, CA.

[5] City of Los Angeles Department of Water and Power. January 2003. *Baseline Data and Approach for Developing the Water and Ecosystems Monitoring Program at Owens Lake*. Prepared by: CH2M Hill, Santa Ana, CA.

affect the quality of the human environment." Only those portions of the proposed project conducted of Bureau of Land Management (BLM) may require compliance with this regulation.

Section 401 of the Clean Water Act of 1972

The federal Clean Water Act (CWA) of 1972 sets national goals and policies to eliminate discharge of water pollutants into navigable waters and to achieve a water-quality level that will protect fish, shellfish, and wildlife while providing for recreation in and on the water whenever possible.[6] The CWA regulates point-source and non-point-source discharges to receiving waters with the National Pollutant Discharge Elimination System (NPDES) program. The CWA provides for delegating certain responsibilities for water-quality control and planning to the states. The State of California (State) has been authorized by the U.S. Environmental Protection Agency (EPA) to administer and enforce portions of the CWA, including the NPDES program. The State issues NPDES permits through the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The proposed project is regulated by the Lahontan RWQCB.

In 1987, the CWA was amended to state that the discharge of pollutants to waters of the United States from storm water is effectively prohibited, unless the discharge is in compliance with an NPDES permit. The 1987 amendments to the CWA added Section 402(p) and established a framework for regulating industrial, municipal, and construction storm water discharges under the NPDES program. The 1987 amendment was developed from the awareness that storm water runoff, a non-point-source discharge, is a significant source of water pollution. In 1990, the U.S. EPA published final regulations that established application requirements to determine when industrial, municipal, and construction activities require an NPDES permit.

To streamline the permit process, the SWRCB has issued statewide general permits that apply to all storm water discharges from qualifying industrial and construction activities. Of these, the proposed project would be subject to adherence with the requirements of the NPDES General Permit for Storm Water Discharges Associated with Construction (General Permit).

General Construction Activity Storm Water Discharges

Storm water discharges that are composed entirely of runoff from qualifying construction activities may be eligible to be regulated under the General Construction Activity Storm Water Permit issued by the SWRCB rather than an individual NPDES permit issued by the appropriate RWQCB. Construction activities that qualify include clearing, grading, excavation, reconstruction, and dredge-and-fill activities that result in the disturbance of at least 5 acres of total land area. The proposed project would be required to conform to the Standard Urban Stormwater Management Plan (SUSMP) as part of compliance with the NPDES General Construction Activity Storm Water Permit to reduce water quality impacts to the maximum extent practicable. A SUSMP is a report that includes one or more site maps, an identification of construction activities that could cause pollutants to enter the storm water, and a description of measures or best management practices (BMPs) to control these pollutants to the maximum extent practicable. A BMP is defined by the Stormwater Quality Task Force as any program, technology, process, siting criteria, operating method, measure, or device that controls, prevents, removes, or reduces storm water pollution.

[6] 33 U.S.C. 1341: "A Certification."

Executive Order 11988

The objective of Executive Order 11988, dated May 24, 1977, is the avoidance of, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of the base floodplain (100-year floodplain) and the avoidance of direct and indirect support of development in the base floodplain wherever there is a practicable alternative. Under the Executive Order, the U.S. Army Corps of Engineers must provide leadership and take action to:

- Avoid development in the base floodplain unless it is the only practicable alternative
- Reduce the hazard and risk associated with floods
- Minimize the impact of floods to human safety, health, and welfare
- Restore and preserve the natural and beneficial values of the base floodplain

The proposed project would be subject to Executive Order 11988 if it would result in adverse impacts to the 100-year floodplain.

State

Section 13260 California Water Code

Section 13260 of the California Water Code states that persons discharging or proposing to discharge waste that could affect the quality of the waters of the State, other than into a community sewer system, shall file a Report of Waste Discharge (ROWD) with the appropriate RWQCB. Following the filing of a ROWD, if applicable, the RWQCB adopts Waste Discharge Requirements (WDR) specifying water quality limitations for the waste discharge reported. Pursuant to California Water Code 13267, a Monitoring and Reporting Program may be required by the RWQCB as a condition of the WDR.

Regional

Lahontan RWQCB Basin Plan

The CWA is administered and enforced by the SWRCB, which develops regulations to execute water-quality control programs mandated at the federal and state levels. As stated above, the State has nine RWQCBs that implement these water quality programs. The Lahontan RWQCB has prepared a Water Quality Control Plan that includes a combination and revision of two separate Water Quality Control Plans, for the North and South Lahontan Basins, which were adopted in 1975. The proposed project area is located within the South Lahontan Basin Plan (the Basin Plan). The Basin Plan, which was established under the requirements of California's 1969 Porter-Cologne Water Quality Control Act (Section 13000 [Water Quality] et seq. of the California Water Code), went through a number of amendments between 1975 and 1991, but was never reprinted with amendments integrated into the text.[7]

The Basin Plan identifies beneficial uses for surface and groundwater, such as municipal water supply and water-contact recreation for all waters in the basin. It also sets water-quality objectives (subject to approval by the EPA) intended to protect designated beneficial uses. These objectives apply to specific parameters (numeric objectives) and general characteristics of the water body (narrative objectives). An example of a narrative objective is the requirement that all waters must remain free of toxic substances

[7] California Regional Water Quality Control Board, Lahontan Region. 1994. *Water Quality Control for the North and South Basins*. Prepared by: California Regional Water Quality Control Board, Lahontan Region, CA.

in concentrations producing detrimental effects on aquatic organisms. Numeric objectives specify concentrations of pollutants that are not to be exceeded in ambient waters of the basin.

Local

Inyo County Groundwater Ordinance

In 1991, Inyo County (County) adopted an ordinance requiring that any person proposing to transfer water pursuant to California Water Code Section 1810 et seq. first obtain a conditional use permit from the County. The ordinance required that no permit could be issued unless the County finds that the transfer would not unreasonably affect the overall economy or environment of the County.

In 1997, the ordinance was repealed and replaced by a more comprehensive ordinance. The new ordinance applies to any of the following transfers or transports of water:

- A water transfer from the unincorporated area of Inyo County undertaken pursuant to Water Code Section 1810 et seq.
- A sale to the City of Los Angeles, or an acquisition by the City of Los Angeles by means other than a sale, of surface water or groundwater extracted or diverted from within Inyo County
- A transfer or transport of groundwater extracted from a groundwater basin located in whole or in part within the boundaries of Inyo County, for use in an area outside of the groundwater basin
- A transfer or transport of groundwater extracted from within Inyo County from a groundwater basin partially located within Inyo County, for use in an area within the same basin, but outside the boundaries of Inyo County

The new ordinance requires any person proposing to undertake a water transfer or transport first obtain a conditional use permit from the County. The ordinance requires that no permit be issued unless the County finds that the transfer will not unreasonably affect the overall economy or environment of the County. The new ordinance does not apply to groundwater extraction by the City of Los Angeles since such extractions are regulated under the Inyo/Los Angeles Long Term Agreement.[8]

Inyo County General Plan

The Inyo County General Plan contains the goal to "provide an adequate and high quality water supply to all users within the County." This goal is supported by the following policies relevant to the proposed project[9]:

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[8] Inyo County. 1991. "Agreement between Inyo County and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County." Superior Court of California, County of Inyo, Case No. 12908. Available at: http://www.inyowater.org/Water_Resources/long_term_water_agreement.pdf

[9] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA

Policy WR-1.2

Domestic Groundwater

Support sustainable groundwater extraction for domestic use in rural areas.

Policy WR-1.3

Water Reclamation

Encourage the use of reclaimed wastewater, where feasible, to augment groundwater supplies and to conserve potable water for domestic purposes.

Policy WR-1.4

Regulatory Compliance

Continue the review of development proposals and existing uses pursuant to the requirements of the Clean Water Act, Lahontan Regional Water Quality Control Board, and local ordinances to reduce polluted runoff from entering surface waters.

The Inyo County General Plan also contains the goal to "protect and preserve water resources for the maintenance, enhancement, and restoration of environmental resources." This goal is supported by the following policy relevant to the proposed project:[10]

Policy WR-2.1

Restoration

Encourage and support the restoration of degraded water surface and groundwater resources.

The Inyo County General Plan also contains the goal to "protect and restore environmental resources from the effects of export and withdrawal of water resources." This goal is supported by the following policies relevant to the proposed project:[11]

Policy WR-3.1

Watershed Management

Protect, maintain and enhance watersheds within Inyo County.

[10] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA

[11] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA

Policy WR-3.2

Sustainable Groundwater Withdrawal

The County shall manage the groundwater resources within the County through ordinances, project approvals and agreements, ensure an adequate, safe and economically viable groundwater supply for existing and future development within the County, protect existing groundwater users, maintain and enhance the natural environment, protect the overall economy of the County, and protect groundwater and surface water quality and quantity.

Policy WR-3.3

Water Resolutions

Support the implementation of the Long Term Groundwater Management Agreement between the County and City of Los Angeles Department of Water and Power (LADWP), the Memorandum of Understanding between LADWP, the County, the California Department of Fish and Game, the California State Lands Commission, the Sierra Club and the Owens Valley Committee, and the Inyo County Groundwater Ordinance.

Policy WR-3.4

Return of Water Rights

If environmental restoration or economic development opportunities arise where additional private land or water rights are required and held by LADWP, the County should work with LADWP to regain landownership and water rights in the Owens Valley.

3.5.2 Existing Conditions

The proposed project is located at the southern end of the Owens Valley, an elongated north-south trending valley, bounded by a series of north-south mountain ranges. Owens Valley is approximately 80 miles long and 15 miles wide. Owens Valley is bordered on the west by the Sierra Nevada Mountain range, with the Inyo and White Mountains to the east. The southern end of the Owens Valley is bounded by the Coso Mountains. The floor of the Owens Valley ranges in elevation from a low of approximately 3,550 feet above mean sea level (MSL) on the Owens Lake bed to the south to approximately 4,100 feet above MSL near Bishop to the north. Topographically, the bed of Owens Lake is relatively flat with only 50 feet of topographic relief from the historic shore to the lowest portion of the lake bed.

The lake bed can be divided into two main areas: the brine pool (below an elevation of 3,553.53 MSL) and the playa (that area between the brine pool and the historic shoreline at 3,500 MSL). The playa generally consists of laustrine and alluvial sediments ranging in size from fine gravels to clays and containing a high salt content. The brine pool is the remnant portion of the Owens Lake and contains a high accumulation of mineral salts. The brine pool is generally wet during part of the year, depending on the amount of precipitation and runoff from the surrounding mountains. Distinct surficial areas occur within the lake bed, including the Owens River delta, sand sheets, crusted clay, evaporative salt pans, brine pools, etc.[12,13]

The LADWP began withdrawal of water from Owens Valley via the Los Angeles Aqueduct in 1913 and created the current dry Owens Lake bed. The effects of surface water diversions on Owens Lake were described in the 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (SIP) EIR and are also included in Section 1, *Project Description*, of this Subsequent EIR.[14]

Drainage

The Owens Valley is a naturally closed hydrologic basin. Prior to the construction of the Los Angeles Aqueduct, the water that drained from the surrounding mountain ranges flowed via tributary streams and creeks directly into Owens Lake, or flowed to the Owens River, which emptied into Owens Lake. The Coso Mountains and Haiwee Gap topographically close the basin to the south, and prevent surface water from flowing to the south. Extensive alluvial fans surround the Owens Lake bed. Coarse-grained sediments are transported from the mountain ranges surrounding Owens Lake and deposited on alluvial fans in a radial pattern from the mouths of the canyons. As the fans increase in size, they tend to join laterally.[15]

Current surface water inflow to Owens Lake primarily includes water from the Lower Owens River and a few springs along the shoreline. Additional surface water inflow occurs during periodic mountain runoff and flash flood events. Most of the perennial creeks that flow from the Sierra Nevada are diverted into the Los Angeles Aqueduct before reaching Owens Lake.

Surface water from the upper Owens River flows to a diversion dam near Aberdeen. At the diversion dam, water is diverted into the Los Angeles Aqueduct. In accordance with the Lower Owens River Project (LORP), the City is required to provide a base flow of 40 cubic feet per second (cf/s) and an annual seasonal habitat flow of up to 200 cf/s from the river intake to the pump station near the Owens River delta where most of the flows will either be pumped back to the Los Angeles Aqueduct or diverted onto Owens Lake for dust control. A small flow will be released onto the Owens River delta where it will flow seasonally out across a raised vegetated delta and then into the brine pool.

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[12] Lopes, Thomas Jose. 1987. *Hydrology and Water Budget of Owens Lake, California*. Reno, NV: Water Resources Center of the Desert Research Institute, University of Nevada.

[13] Great Basin Unified Air Pollution Control District. June 1997. *Report on the 1988, 1991, and 1992 Shallow Soil Core Project on the Owens Lake Playa*. Bishop, CA.

[14] Great Basin Unified Air Pollution Control District. 2 July 1997. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report*. State Clearinghouse Number 96122077. Bishop, CA.

[15] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

Located in the west central area of the playa (topographically lowest portion) is a brine pool of approximately 25.5 square miles. The brine pool, which is the remnant of Owens Lake, consists of a shallow body of water with high salt content. The water depth typically ranges from more than 1 foot to a few inches. Crystalline salts precipitate a crust that blankets the bottom of the brine pool and frequently covers the surface of the brine pool. There are two main surface water sources that supply water to the brine pool. These consist of the Owens River and Cottonwood Springs. Occasionally the Cartago Creek drainage also supplies surface water to the brine pool. Much of the water in the brine pool is red in color due to the presence of salt-tolerant algae and bacteria.

In the Owens Lake basin, five perennial streams on the eastern side of the Sierra Nevada (Braley, Ash, Cottonwood, Carroll, and Lubken) previously discharged into Owens Lake prior to their diversion into the Los Angeles Aqueduct. The mean annual diversion from these streams adjacent to Owens Lake to the Aqueduct is approximately 22,515 acre-feet per year (ac-ft/yr). Three other streams (Walker, Olancha, and Cartago) also discharge into Owens Lake during high runoff, but are normally consumed by irrigated agriculture in the Olancha-Cartago area or completely infiltrate as they flow down the alluvial fan.[16]

In addition, three streams (Lone Pine, Tuttle, and Diaz) flow up to 6.5 miles on the portion of the alluvial fan between the Sierra Nevada and the Alabama Hills. These creeks have cut deep drainages through the Alabama Hills where the water is collected and distributed between the aqueduct and various irrigation ditches in the Lone Pine region.[17]

The southern Inyo and northern Coso mountains form the northeastern and southeastern boundaries of the Owens Lake hydrographic basin, respectively. Runoff from these mountains occurs only periodically when ephemeral streams flow in response to significant precipitation events. There are no perennial streams in the Inyo and Coso Mountains that reach the lake bed.[18]

Surface Water Quality

Several water bodies within the Lower Owens River Hydrologic Unit, listed in the Water Quality Control Plan for the South Lahontan Region (Basin Plan) as having specific water quality objectives, are located within the proposed project area. These water bodies include: Dirty Socks Hot Spring, Cottonwood Springs, Keeler Springs, Owens Lake, minor wetlands, and surface waters. Specific objectives for these water bodies are included for ammonia, bacteria (Coliform), biostimulatory substances, chemical constituents, chlorine (total residual), color, dissolved oxygen, floating materials, oil and grease, non-degradation of aquatic communities and populations, organochlorine and organophosphate pesticides, pH, radioactivity, sediment, settleable materials, taste and odor, temperature, toxicity, and turbidity.

[16] T.M. Mihevc and G.F. Cochran. 1992. *Simulation of Owens Lake Water Levels*. Reno, NV: Water Resources Center of the Desert Research Institute, University of Nevada.

[17] T.M. Mihevc and G.F. Cochran. 1992. *Simulation of Owens Lake Water Levels*. Reno, NV: Water Resources Center of the Desert Research Institute, University of Nevada.

[18] Conway, Chris. 1997. *"Observation of Ephemeral Flows and Estimation of Recharge from the Inyo and Coso Mountains, Owens Dry Lake, California."* Thesis. Reno, NV: University of Nevada.

Salinity, as represented by TDS,[19] was evaluated as a constituent of potential concern. The brine pool has a TDS range of 250,000 to 470,000 milligrams per liter (mg/L) depending on seasonally variable freshwater input.[20] For comparison, the average TDS of ocean water is generally 35,000 mg/L. When storm flows partially refill the lake, TDS concentrations range from 120,000 mg/L to over 200,000 mg/L. Prior to diversion of the Owens River in the 1920s, the water in Owens Lake was estimated to have an average TDS on the order of 100,000 mg/L. Water in the upper Owens River comes from groundwater discharge and mountain runoff. The water quality in the Owens River fluctuates seasonally, with the best water quality conditions in the spring months, and the poorest in the fall months. The average TDS measure in the Owens River is 300 mg/L, and the water is generally classified as Ca-Mg-HCO3 type water. Runoff from the Coso Mountains has an average TDS of 508 mg/L, and is classified as $Na\text{-}HCO_3$ type water. Runoff from the Inyo Mountains has an average TDS of 532 mg/L, and is also classified as $Na\text{-}HCO_3$ type water.[21]

Ecological monitoring at the proposed project area has been undertaken in order to determine water chemistry and the potential ecological risk to birds and other wildlife. Results were compiled as part of an initial screening of ecological risk (further discussed in Section 3.2, *Biological Resources*) and also included as an appendix (Appendix D, *Biological Resource Technical Report*). It was determined that the water samples collected from peripheral streams and Shallow Flooding project features from 2002–2006 showed elevated concentrations of aluminum, arsenic, barium, boron, iron, lead, lithium, molybdenum, silver, and vanadium at project and background spring locations (Appendix D) when compared to published screening levels that are used as guidelines for determining the potential of ecological risk. The concentrations of aluminum, arsenic, barium, boron, iron, lead, lithium, molybdenum, silver, and vanadium observed at project features have been consistent with peripheral springs and seeps.

Groundwater

The hydrologic balance of the Owens Lake basin is characterized by inflows from precipitation, surface flows, and subsurface flows; and outflows from evaporation, evapotranspiration, spring and seep discharge, surface water diversion, and withdrawal from pumping. Table 3.5.2-1, *Estimated Surface and Groundwater Inflows*, and Table 3.5.2-2, *Estimated Surface and Groundwater Outflows*, summarize the reported estimated inflows and outflows to and from the basin.[22,23]

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[19] Salinity is a measure of the mass of dissolved solids in a given mass of solution. The term "salinity" includes all dissolved salts. For fresh water, the terms salinity and total dissolved solids (TDS) are often used interchangeably. Salinity is not precisely equivalent to TDS content, but the two terms are closely related; for most purposes, they can be considered equivalent. TDS is usually expressed in units of milligrams per liter (mg/L); although irrigation and drainage engineers, agronomists, and soils scientists typically express salinity in parts per million (ppm) (equivalent to mg/L) or as electrical conductivity (EC) deciSiemens per meter (ds/m), with a regression relationship, which can be converted to TDS.

[20] Saint-Amand, P., Mathews, Gaines, C., and Reinking, R. 1986. *Dust Storms from Owens and Mono Valleys, California. Naval Weapons Center, China Lake, California, NWCTP 6731*. China Lake, CA: Naval Weapons Center.

[21] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[22] Conway, Chris. 1997. *"Observation of Ephemeral Flows and Estimation of Recharge from the Inyo and Coso Mountains, Owens Dry Lake, California."* Thesis. Reno, NV: University of Nevada.

[23] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

TABLE 3.5.2-1
ESTIMATED SURFACE AND GROUNDWATER INFLOWS

Inflow	Average Range	Average (Acre Feet Per Year)
Precipitation (Over an estimated area of 70,000 acres)	Average 5.2 inches per year	30,333 ac-ft/yr
Owens River	3,840 to 7,800 ac-ft/yr	5,820 ac-ft/yr
Subsurface flows from the north	5,000 to 20,000 ac-ft/yr	12,500 ac-ft/yr
Groundwater Recharge - Mountain Block (East and west sides combined)	5,400 to 13,000 ac-ft/yr	9,200 ac-ft/yr
Total Average Input	**44,573 to 71,133 ac-ft/yr**	**57,853 ac-ft/yr**

TABLE 3.5.2-2
ESTIMATED SURFACE AND GROUNDWATER OUTFLOWS

Outflow	Average Range	Average (Acre Feet Per Year)
Bare Soil Evaporation - Sand Areas	7,590 to 11,390 ac-ft/yr	9,490 ac-ft/yr
Bare Soils Evaporation - Silt/Clay Areas	8,560 to 12,840 ac-ft/yr	10,700 ac-ft/yr
Free Water Surface Evaporation (brine pool)	14,080 to 21,120 ac-ft/yr	17,600 ac-ft/yr
Vegetated Area Evapotranspiration	6,300 to 12,000 ac-ft/yr	9,150 ac-ft/yr
Groundwater Withdrawal/Diversions	N/A	5,173 ac-ft/yr
Total Average Output	**41,703 to 62,523**	**52,113 ac-ft/yr**

Investigations performed by the United States Geological Survey (USGS) in Owens Valley north of Owens Lake have shown that the general trend of groundwater flow is toward the center of the valley and to the south.[24] Subsurface flows to the Owens Lake basin from the north are estimated to range between approximately 5,000 and 20,000 ac-ft/yr. Groundwater recharge occurs from either snowmelt or rain from the mountains and ephemeral streams. Estimates of groundwater recharge volumes from these components range from 5,400 to 13,000 ac-ft/yr.[25,26,27]

[24] Hollett, K., Danskin, W., McCaffrey, W., and Walti, G. 1991. *Geology and Water Resources of Owens Valley, California*. United States Geological Survey Water Supply Paper 2370-B. Denver, CO: U.S. Geological Survey.

[25] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[26] Schultz, B.W. 1996. *Evaluation of Change in Wetlands at Owens Lake Playa between 1977 and 1992 Using MSS Satellite Imagery and Color Infrared Photography*. Publication No. 41154. Draft Report Submitted to Great Basin Unified Air Pollution Control District. Reno, NV: Desert Research Institute.

[27] Wirganowicz, M. 1997. "Numerical Simulation of the Owens Lake Groundwater Basin, California." Unpublished Thesis. Reno, NV: University of Nevada.

Groundwater pumping from the Owens Lake basin occurs to supply the potable water needs of nearby communities, as well as the exportation for commercial uses. The estimated average annual Owens Lake basin groundwater pumpage is approximately 5,173 ac-ft/yr.[28]

The general hydrologic gradient in the shallow groundwater is toward the brine pool over most of Owens Lake. However, local changes are present with a hydraulic gradient from the brine pool out into the lake bed clays during periods of low piezometer head. The gradients in the deeper aquifers are generally to the southern portion of the lake. However, due to the lack of data points available, the gradients present in the deep confined aquifers are not precisely known. Groundwater is stored in both confined and unconfined aquifer units. The deeper groundwater under the lake bed is confined, and has an upward hydrologic gradient. Four aquifer bodies have been mapped in the upper 1,000 feet below the lake bed.[29,30] The pressures in the confined aquifers range from approximately 2 to 22 pounds per square inch above the ground surface, depending on the aquifer and the elevation of the monitoring well measured.[31] The deep groundwater system along the west, east, and southeast edges of the Owens Lake basin are largely unconfined. The exact nature of how the unconfined system transitions to the confined units mapped under the lake bed is not known at this time. More information is needed to determine how these aquifers transition to those mapped under the lake bed itself.

Groundwater Quality

The groundwater quality directly underlying Owens Lake is generally classified as non-potable, due to elevated levels of TDS well above the secondary drinking water standards (1,000 mg/L).

Groundwater that occurs along the edges of Owens Lake, where springs and seeps are present, is generally of higher quality, but is still not classified as potable. Water quality generally decreases due to increasing salinity toward the center of the lake bed. The TDS measured in the Keeler Community Services District Well averages 830 mg/L.[32] Since there is no surface water discharge from Owens Valley, groundwater within the aquifers is expected to be relatively stagnant and variations in shallow groundwater chemistry are likely controlled by the chemistry of the historic lake water. The deep groundwater system is isolated from the lake water, and its chemistry is controlled more by the sediments in the aquifers.

The water quality of Owens Lake prior to surface water diversions reportedly had an average TDS of 100,000 mg/L, and was characterized as sodium-chloride-bicarbonate-sulfate type water. Reported groundwater test results indicate that shallow groundwater has an average TDS value of approximately 130,000 mg/L. However, variations in TDS of the groundwater occur both laterally and with depth

[28] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[29] Great Basin Unified Air Pollution Control District. 1997. *Final Report, Phase 3-4 Seismic Program, Owens Lake, Inyo County California*. Prepared by: Neponset Geophysical Corporation. Bishop, CA.

[30] Great Basin Unified Air Pollution Control District. 1997. *Characterization of the Owens Lake Basin Hydrology System, Inyo County, California*. Prepared by: Neponset Geophysical Corporation. Bishop, CA.

[31] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[32] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

across the playa. The highest TDS generally occurs within and proximal to the brine pool. TDS concentrations in the shallow groundwater generally decrease with depth and toward the historic shoreline. Data from observation wells indicated that the high salinity groundwater extends to a depth of at least 20 to 30 feet below the surface on the eastern and southeastern portions of the lake bed. The existing brine pool has a TDS range of approximately 250,000 to 470,000 mg/L, depending on the seasonal amount of fresh water input.[33,34]

Floodways and 100-Year Flood Zone

According to the Federal Emergency Management Agency (FEMA) flood maps, Owens Lake and part of the proposed project site are within the 100-year flood hazard area (Figure 3.5.2-1, *100-year Flood Zone Map*).[35]

General Location from Pacific Ocean

The proposed project site is located more than 200 miles east and on the eastern side of the Sierra Nevada mountain range, away from the Pacific Ocean shoreline. The topography of the proposed project site is relatively flat ranging from elevations between approximately 3,880 and 3,554 feet above MSL (Figure 2.1-2, *USGS 7.5-Minute Map Index*).

3.5.3 Significance Thresholds

The potential for the proposed project to result in impacts to hydrology and water quality was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. The proposed project would normally be considered to have a significant impact to hydrology and water quality if the proposed project would:

- Violate of any water quality standards or waste discharge requirements
- Substantially deplete groundwater supplies or interference with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)
- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on site or off site
- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on site or off site

[33] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[34] Great Basin Unified Air Pollution Control District. 2001 (Revised 2003). *Archive of Groundwater and Hydrology Data, Owens Lake*. Bishop, CA.

[35] Federal Emergency Management Agency. 1986. *Flood Insurance Rate Map, Inyo County, California*. Map Number 0600731275C and 0600731475C. Washington, DC.

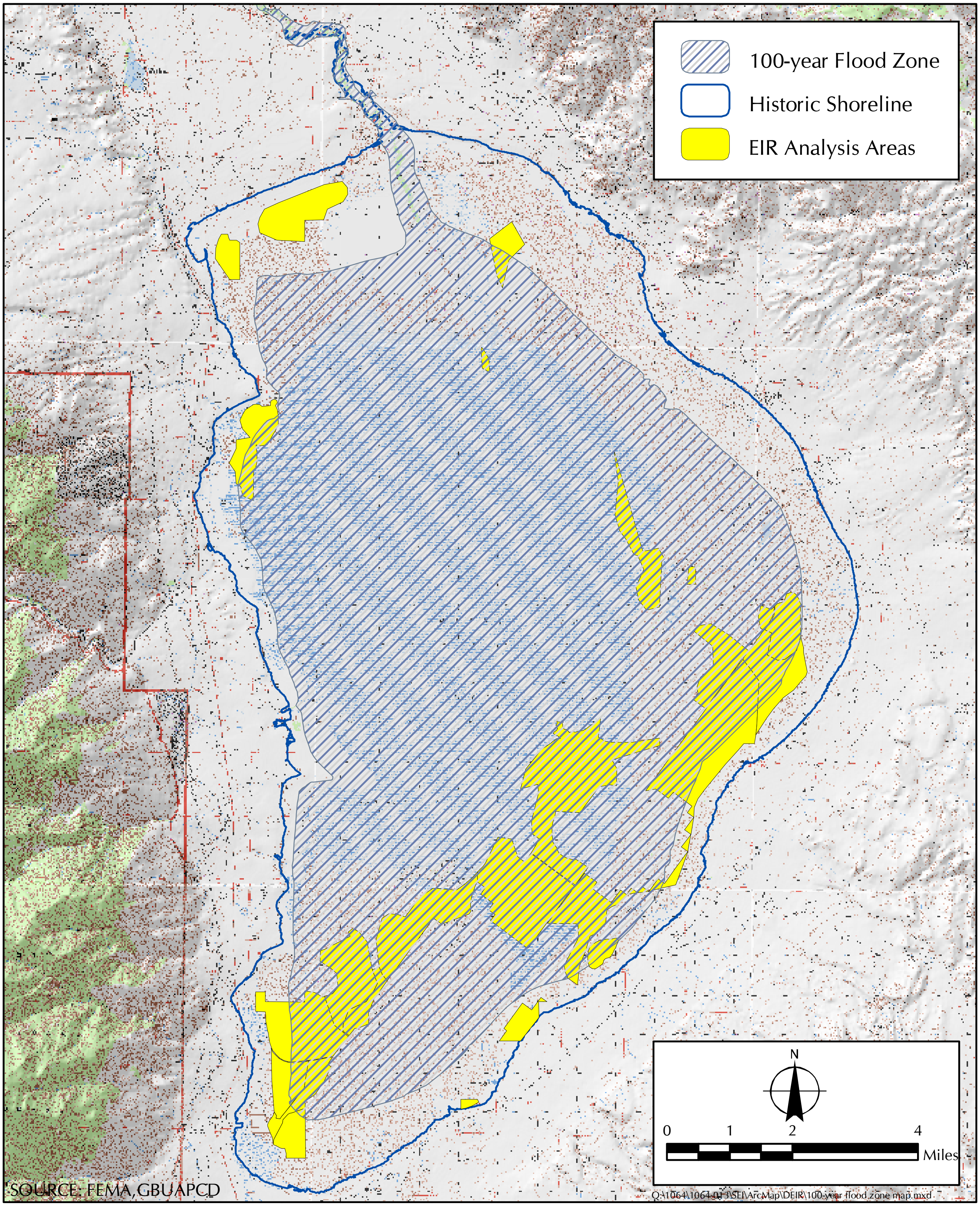

FIGURE 3.5.2-1
100-year Flood Zone Map

- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

- Otherwise substantially degrade water quality

- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

- Place structures within a 100-year flood hazard area that would impede or redirect flood flows

- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

- Result in inundation by seiche, tsunami, or mudflow

3.5.4 Impact Analysis

The transport, storage, mixing, and utilization of water have been planned to allow flexible water quality management to satisfy multiple program constraints to avoid or mitigate environmental impacts. Groundwater and surface water would maintain the same chemical profile that has dominated since water was diverted by the City of Los Angeles and that has been present during the five previous years of dust control measures (DCMs). During the initial six seasons, no significant water quality impacts have been observed.[36,37,38,39] Some changes in the Owens Lake system accompany implementation of the additional DCMs, including the following:

- 55,000 ac-ft/yr of freshwater from the Los Angeles Aqueduct are currently used annually in DCMs. The supplemental dust control areas will require up to 28,000 ac-ft/yr of additional freshwater from the Los Angeles Aqueduct. Efficient use of this water in the dust control measures dictates that most or all of this water is evaporated from water, plant and soil surfaces. The residual minerals resulting from the evaporation of the freshwater is deemed to be insignificant given the extremely high salinity of existing surface waters, groundwater, and underlying soils
- Collection and storage of subsurface drainage
- Application of mixture of aqueduct and storage water to the lake bed surface
- Evaporation from wet soil (Shallow Flooding) and evapotranspiration from Managed Vegetation
- Increase in evaporation of shallow groundwater from Moat & Row areas

[36] City of Los Angeles Department of Water and Power. April 2003. *Annual Monitoring Report Southern Zones Dust Control Project: Owens Lake Dust Mitigation Project.* Prepared by: CH2MHill, Sacramento, CA.

[37] City of Los Angeles Department of Water and Power. April 2004. *Annual Monitoring Report Southern Zones Dust Control Project: Owens Lake Dust Mitigation Project.* Prepared by: CH2MHill, Sacramento, CA.

[38] City of Los Angeles Department of Water and Power. April 2005. *Annual Monitoring Report Southern Zones Dust Control Project: Owens Lake Dust Mitigation Project.* Prepared by: CH2MHill, Sacramento, CA.

[39] City of Los Angeles Department of Water and Power. April 2006. *Annual Monitoring Report Southern Zones Dust Control Project: Owens Lake Dust Mitigation Project.* Prepared by: CH2MHill, Sacramento, CA.

- Additions of low concentrations of fertilizers, soil amendments, and irrigation system treatment additives

Surface Water Quality

Direct and Indirect Impacts

The proposed project has the potential to result in significant impacts to hydrology and water quality, related to the violation of water quality standards or waste discharge requirements.

During the construction phase of the proposed project, excavation of trenches for pipeline placement, excavation for moats, and placement of material for rows and elevated roads would occur. During this phase, shallow groundwater may be encountered requiring dewatering. Dewatering could potentially cause contamination of groundwater as a result of an accidental release of hazardous materials used during the construction, including fuels, oils, and solvents. The application of BMPs included in the project specific Stormwater Pollution Prevention Plan (SWPPP), such as sediment and erosion control measures like silt fences or sandbag barriers, in addition to conforming with objectives in place in the Basin Plan and compliance with the federal CWA and the California Water code would reduce possible impacts to hydrology and water quality related to the violation of water quality standards or waste discharge requirements to below the level of significance.

Naturally occurring salts, along with abundant soluble, solid salt minerals in sediments dominate the Owens Lake environment. The water solutions or the composition of the salts would not be significantly altered by the proposed project. The salts that are currently present on the lake bed would unavoidably become part of the project. The amounts, concentrations, and significance of added materials are comparatively insignificant contrasted to the amounts, concentrations, and significance of naturally occurring lake substances. For example, water garnered from the Owens River reportedly has an average TDS of approximately 300 mg/L. In comparison, shallow groundwater underlying the area of the proposed project is reported to have average TDS concentration of 130,000 mg/L, 40 times more concentrated.[35] In addition to the salts found in solution, the soils and lake bed sediments contain high concentrations of soluble minerals. When the total mass of soluble minerals in soil and groundwater is compared to the mass of dissolved minerals that would be introduced by the freshwater used over the lifetime of the DCMs, the relative change in total minerals is insignificant.

Dissolved salts generally move across Owens Lake in highly concentrated solutions. The proposed project would move salt and water to meet the project objectives. During operation of the Shallow Flooding system, the movement of water and salt into and the evaporative transport of water out of the project area would remain similar to the pre-existing conditions.

Construction of Moat & Row areas may expose areas of shallow groundwater along the lake bed. This may require dewatering during the construction process. In addition, operation of Moat & Row areas may lead to long-term exposure of shallow ground water areas making that water available for wildlife and increased evaporation. The potential impacts to wildlife species associated with the elevated level of water quality constituents is described in detail in Section 3.2, *Biological Resources*, along with mitigation measures requiring ecological toxicity monitoring.

If the Managed Vegetation DCM is utilized in combination with the Moat & Row, it would include the use of fertilizers (potassium nitrate), de-scalent (1-Hydroxyethylidene diphosphonic Acid), and sodium hypochlorite in order to maintain the Managed Vegetation DCM, which would potentially impact surface water quality, therefore requiring mitigation measures that would reduce potential impacts to surface water quality related to the application of fertilizers to below the level of significance.

The Screening Level Ecological Risk Assessment (Appendix G, *Screening Level Ecological Risk Assessment*) concluded that there is some potential for exposure and low level of risk to wildlife from elevated levels of barium, boron, mercury, and zinc. However, overall, the Shallow Flooding DCMs have provided increased water quality over the previous existing conditions.[40]

Groundwater

Direct and Indirect Impacts

Impacts to groundwater would include any significant degradation of water quality within the water of Owens Lake or adjacent sediments, or major changes in groundwater elevations that could potentially impact local groundwater production wells or wetlands.

Water would be applied to the ground surface during the Shallow Flooding DCM. The use of the Moat & Row as a DCM does not involve the use of irrigation or flood water. The integration of the Managed Vegetation DCM with the Moat & Row DCM would include application of irrigation waters. In general, the application of water to the ground surface would potentially increase the level of shallow groundwater within the lake bed sediments if rate of application exceeds evaporation and plant transpiration rates. As previously noted, water application rates for both water-based DCMs will be minimized to conserve water and minimize groundwater and surface water impacts. The application of water to the ground surface would increase the level of shallow groundwater under the lake bed within the flooded areas. In areas of Moat & Row, existing shallow groundwater may be exposed , increasing the evaporation rate in those areas. The application of water and operation of drains for the Managed Vegetation DCM may cause lowering of pre-existing shallow groundwater levels in some areas and an overall rise in others. The response depends on the level of shallow groundwater prior to implementation of the proposed project.

In the areas where the Shallow Flooding is implemented, the shallow unconfined groundwater within the lake bed sediments may potentially rise to the surface. The design of the Shallow Flooding dust control measure includes the location of the water outlets in the uphill areas of the lake bed. The water will flow across the lake bed via gravity flow.

Areas where the Moat & Row DCM is implemented may see the shallow unconfined groundwater exposed to evaporation and to use by wildlife. This may increase the evaporation rates of shallow groundwater in these areas, which may lead to a slight reduction in the shallow groundwater in those areas.

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[40] Sapphos Environmental, Inc. July 2007. *Screening Ecological Risk Assessment Dust Control Measure Comparison, 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment SIP*. Prepared by: Kleinfelder, Windsor, CT.

The use of the Managed Vegetation DCM with the Moat & Row DCM would include the use of low salinity irrigation water, fertilizers (potassium nitrate), de-scalent (1-Hydroxyethylidene diphosphonic Acid), and sodium hypochlorite. Managed Vegetation includes the installation of subsurface drains to capture and recirculate excess water. This has the potential to modify the existing shallow groundwater levels, which will either rise or fall to the level of the drains depending on the original shallow groundwater level. The periodic irrigation of these areas would flush the salts from the near surface soils and reduce soil salinity, so that vegetation may be established. The drains would intercept and redirect the excess water out of the Managed Vegetation areas, toward the drainage capture ponds. The relative rise in elevation of the shallow groundwater table under the Managed Vegetation areas is expected to generally increase the hydraulic gradient, and increase the amount of head and flow away from these areas. Again, the net result would be movement of the shallow groundwater away from the Managed Vegetation areas.

The overall water quality of the groundwater within the lake bed sediments is not expected to change significantly as a result of the Shallow Flooding. The primary source of the irrigation water will be the Los Angeles Aqueduct, which is lower in salinity than the pre-existing shallow groundwater underlying the lake bed. The irrigation flow rate on the Shallow Flooded areas of the lake bed would generally be offset by the evaporation of free water on the surface and plant transpiration, and the excess flood water would be recirculated through the system.

The proposed project includes the use of fertilizers (potassium nitrate), de-scalent (1-Hydroxyethylidene diphosphonic Acid), and sodium hypochlorite to support Managed Vegetation, which would potentially impact groundwater quality. Existing monitoring and BMPs would be implemented as specified in project approvals obtained from the responsible agencies and included as mitigation in this document to ensure groundwater quality is not impacted by the proposed project.

The Owens River delta is topographically elevated relative to the lake bed and brine pool. Under existing conditions, low-salinity water flows across the surface of the Owens River delta and infiltrates into the delta surface. Due to the hydraulic separation between the delta and the lake bed, any potential rise in the shallow groundwater elevation in the area of the lake bed is not expected to significantly increase the groundwater elevation under the Owens River delta. Shallow groundwater beneath river channels in the Owens River delta is freshened by infiltrating surface water. Shallow groundwater gradients away from the delta would be maintained, so that this condition would not be significantly altered. No DCMs are proposed in the area of the delta.

Springs and seeps occur along the perimeter of lake bed at an elevation between 3,560 and 3,600 feet. The source of water for these is generally derived from the deeper confined aquifer systems and adjacent alluvial fans. The seeps and springs are hydraulically independent from the near-surface lake bed sediments where flooding or irrigation is proposed. Under the existing conditions of the lake bed, water that discharges from the seeps and springs infiltrates into the lake bed sediments and recharges the shallow groundwater beneath the lake bed. The water quality of the seeps and springs is not expected to be impacted as the hydraulic gradient of the source waters will be maintained.

There are currently production and supply wells in the communities that are located around Owens Lake. These include the wells in the communities of Keeler, Olancha-Cartago, and Swansea. The groundwater levels or water quality in the wells located near Owens Lake are not expected to change significantly as a result of the proposed DCMs because the aquifer systems that supply water to the wells are hydraulically distinct from the shallow sediments of Owens Lake.

The source of water for this proposed project, analyzed in this EIR, is from the Los Angeles Aqueduct The LADWP may seek to utilize other sources of water for dust control in the future such as groundwater from Inyo County. However, utilization of water for dust control from sources other than the Los Angeles Aqueduct would require separate environmental review and is not covered in this analysis due to the uncertainty of use and lack of information regarding the locations of groundwater wells, conveyance, and amount of groundwater use by the LADWP for DCMs.

Drainage

Direct and Indirect Impacts

Construction of the proposed project would require earthwork and minor grading to achieve finished grades. Grading is necessary to allow efficient distribution of water. Some minor grading may be necessary during operation of the system in order to maintain the efficiency of the water distribution and to manage salt deposits that may accumulate.

The areas of Shallow Flooding would be contained by new earthen berms on the sides and downhill portions of the proposed project approximately 3 to 5 feet in height and approximately 6 to 16 feet wide. The tops of the wider berm areas would be utilized as access roads. The berms would be constructed to resist erosion from any wind wave action and storm flows. Erosion control measures would include gradual side slopes and possibly the placement of rip rap on the interior berm faces. The containment berms would be constructed from compacted native soils and would have a gravel surface, as required, to accommodate access for maintenance vehicles.

The areas of proposed Shallow Flooding would potentially generate high volumes of storm runoff after a precipitation event due to existing saturation of the underlying soils. Many Shallow Flooding blocks would be equipped with high-capacity spillways. The spillways may be in the form of preconstructed culverts or low sections in the berm. Shallow Flooding areas can be expected to spill storm flow out on to the lake bed surface during significant storm events. In addition, drains would be installed in the areas of Managed Vegetation to capture and redirect excess water. Water released onto the lake bed from storm flows has a potential to create emissive areas.

The construction and operation of Moat & Row areas would include the addition of rows similar to large berms and moats similar to large channels. These channels would be approximately 20 feet wide and have the potential to channel stormwater flows and convey the increased storm water toward areas of lake bed, including the mineral lease or brine pool. Therefore, mitigation is required to reduce the potential for the Moat & Row to significantly impact drainage patterns and increase storm water flows.

Excess water that would be generated would have the potential to increase the attraction of insects into the area, including mosquitos and biting gnats. Section 3.2, *Biological Resources*, contains further analysis and mitigation measures to decrease impacts associated with the increase in insects into the area due to the excess water that would be generated.

The proposed DCMs will be implemented within the dry Owens Lake bed and will have no drainage impact on federal or state highways.

100-Year Flood Zone

Direct and Indirect Impacts

As discussed in the existing conditions, the proposed project is within a designated flood hazard area.[41] However, no residential uses are part of the proposed project. Those that could be exposed to flooding are limited to people working to maintain and operate the proposed project, and could promptly vacate the area should a flood hazard exist. Typically storm water control berms would reduce flow velocities and prevent damage to DCMs. However, the berms have failed in the past and therefore the adjacent Mineral Extraction operation of Trona from the Owens Lake bed, which is down gradient of the proposed project, may be in danger from increased flood potential. Therefore, an emergency management plan should be implemented for potential berm failures. This plan shall include the immediate notification of the down gradient trona mineral extraction operation on the lake to ensure the safety to personnel and equipment at the facility. The proposed project would not result in a significant adverse impact related to placing housing within a 100-year flood hazard area. However, the proposed project has a potential to cause a significant impact to exposing people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a failure of a lever or dam.

Seiche, Tsunamis, and Mudflows

Direct and Indirect Impacts

Implementation of the proposed project would not result in inundation by a seiche, tsunami, or mudflow. Seiches and tsunamis are the result of tectonic activity, such as an earthquake. A seiche is an oscillation of the surface of a landlocked body of water that can create a hazard to persons and structures on and in the vicinity of the water. A tsunami is an oceanic wave that can break inland creating a hazard up to several miles from the coast, depending on the severity of the wave. A mudflow is a moving mass of soil made fluid by a loss of shear strength, generally as a result of saturation from rain or melting snow.

Due to the low surface gradient of the proposed project area and the distance from the ocean and other bodies of water, there would be no direct or indirect impacts related to seiches or tsunamis. The low relief of the proposed project area does not contribute to the risk for earthquake-related ground failures that would result in mudflows; therefore, there would be no direct or indirect impacts.

Cumulative Impacts

The proposed project would not result in significant cumulative impacts to hydrology and water quality. A total of three related projects were identified in the vicinity of the proposed project in Section 2.9, *Related Projects*. The potential impacts of the proposed project can be evaluated within the context of the cumulative impacts of all ongoing and proposed development.

The proposed project, when considered with the 2003 SIP, would not create considerable cumulative impacts to hydrology and water quality because impacts to hydrology and water quality in both the 1998 SIP and the 2003 SIP reduce impacts to hydrology and water quality through the incorporation of mitigation measures.

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[41] Federal Emergency Management Agency. 1986. *Flood Insurance Rate Map, Inyo County, California*. Map Number 0600731275C and 0600731475C. Washington, DC.

The proposed project, when considered with the LORP, would not create a considerable cumulative impact to hydrology and water quality. The LORP's main objective is to mitigate impacts related to groundwater pumping by the LADWP. The proposed project has the potential to result in impacts to groundwater levels. However, the proposed project includes the incorporation of mitigation measures, which requires the monitoring of groundwater levels. Therefore, the LORP, when considered with the proposed project, would not create a significant cumulative impact to hydrology and water quality in relation to impacts on groundwater levels.

The proposed project, when considered with the U.S. Borax, Owens Lake Expansion Project/ Conditional Use Permit #02-13/Reclamation Plant #02-1, would not create a considerable cumulative impact to hydrology and water quality. The proposed project includes the incorporation of mitigation measures that require the incorporation of BMPs to avoid impacts related to degradation of water quality, as well as monitoring of surface and groundwater quality. Incorporation of the mitigation measures would reduce impacts related to water quality to below the level of significance.

Therefore, the hydrology and water quality impact of the proposed project would not be considerable when viewed in connection with the related hydrology and water quality effects of the past projects, other current projects, and reasonably foreseeable future projects listed in Section 2.9.

3.5.5 Mitigation Measures

Measure Hydrology-1, Acquire and Adhere to National Pollution Discharge Elimination System General Permit

To mitigate for direct, indirect, and cumulative surface water quality impacts caused by construction pollutants contacting storm water, products of erosion moving off site into receiving waters, and unauthorized non-storm water discharges, the City of Los Angeles Department of Water and Power shall obtain and adhere to the requirements of the National Pollution Discharge Elimination System General Permit for the 15.1 square miles of new work area specified in the 2008 State Implementation Plan. This includes the development and implementation of a Storm Water Pollution Prevention Plan, which specifies best management practices that shall prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving off site into receiving waters; the elimination or reduction of unauthorized non-storm water discharges; and inspections of best management practices. The Storm Water Pollution Prevention Plan shall also identify best management practices for controlling temporary construction dewatering discharges and may include temporary sediment control measures such as the addition of low-flow dispersal methods for minimizing erosion. The City of Los Angeles Department of Water and Power shall also be required to comply with the Guidelines for Erosion Control as listed in the Water Quality Control Plan for the Lahontan Region. The City of Los Angeles Department of Water and Power shall submit the final Storm Water Pollution Prevention Plan to the Great Basin Unified Air Pollution Control District and the California State Lands Commission after its approval by the Regional Water Quality Control Board for the Lahontan Region.

Measure Hydrology-2, Water Quality Monitoring and Reporting Program

The City of Los Angeles Department of Water and Power, prior to issuing any Notices to Proceed for construction of work in the areas specified in the 2008 State Implementation Plan, shall implement a Water Quality Monitoring and Reporting Program to ensure that there is no substantial degradation of water quality and to mitigate direct, indirect, and cumulative impacts to surface and groundwater quality and off-site groundwater levels. The Water Quality Monitoring and Reporting Program shall monitor operational water volumes and flows, and analyze the quality of project surface waters and groundwater. The monitoring program shall ensure that the project is operating within the quality limitations specified by the waste discharge requirements (Board Order No. R6V-2006-0036, WDID No. 6B14000903) adopted by the Regional Water Quality Control Board for Revised Waste Discharge Requirements for the Southern Zones Dust Control Project at Owens Lake.[42] The monitoring program shall be submitted to the Great Basin Unified Air Pollution Control District and the California State Lands Commission prior to the start of construction in the areas designated for dust control in the 2008 State Implementation Plan. All chemical analyses shall be performed by a laboratory with National Environmental Laboratory Accreditation Program certification.

Monitoring reports shall be completed and submitted to the Great Basin Unified Air Pollution Control District, the California State Lands Commission, and the Regional Water Quality Control Board within 60 days of the end of the monitoring period as described in Table 3.5.5-1, *Hydrology Monitoring and Reporting Schedule*. The reports shall include a summary of monitoring results and any corrective actions proposed or undertaken for any observed violations of water quality limitations or impacts to off-site groundwater levels. The water quality limitations are defined as a substantial (statistically significant based on a statistical analysis of current and baseline data) variation from the long-term baseline water data collected by the Great Basin Unified Air Pollution Control District for surface and groundwater quality and groundwater levels.[43] The Great Basin Unified Air Pollution Control District will continue to collect this baseline water data during project construction and operation. Periodic reductions in monitoring and reporting requirements, when justified by a documented review and evaluation of monitoring results, shall be implemented as authorized by the Regional Water Quality Control Board. Until monitoring results justify a reduction in monitoring requirements, monitoring shall be completed as follows:

- Flow rates and total volumes of flow to all dust control measure areas shall be monitored for each day and month for the first five years of work specified in the 2008 State Implementation Plan and thereafter as specified in Table 3.5.5-1.

- Surface water monitoring of Shallow Flood, Moat & Row, Managed Vegetation areas and groundwater monitoring of perimeter project observation wells shall be completed as described in Table 3.5.5-1 for total dissolved solids (TDS), chloride, chlorine, dissolved oxygen (DO), pH, electrical conductivity (EC), ammonia, aluminum, arsenic, barium, boron, cadmium, calcium, iron, lead, magnesium, manganese, nitrate, nitrite, potassium, selenium, sodium, carbonate, bicarbonate, phosphate, sulfate, vanadium, total alkalinity, total organic carbon (TOC), copper, chromium, zinc, bromide, Treflan (or Trifluralin), and sulfur.

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[42] California Regional Water Quality Control Board, Lahontan Region. 28 September 2006. Letter to Richard Harasick, City of Los Angeles Department of Water and Power, Los Angeles, CA. Subject: Revised Waste Discharge Requirements for the City of Los Angeles Department of Water and Power and the California State Lands Commission; Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Inyo County..

[43] Great Basin Unified Air Pollution Control District. 2000 (Revised 2003). *Archive of Groundwater and Hydrology Data, Owens Lake*. Bishop, CA.

TABLE 3.5.5-1
HYDROLOGY MONITORING AND REPORTING SCHEDULE

Description	Monitoring Schedule							
	2010	2011	2012	2013	2014	2016	2018	2023
Flow rates and total volumes of flow to all DCM areas	Daily (report monthly)	Daily (report monthly)	Daily (report monthly)	Daily (report monthly)	Daily (report monthly)	Daily (report monthly)	Daily (report monthly)	Daily (report monthly)
Surface water quality of Shallow Flood areas	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Annually (during DCM operation)	Annually (during DCM operation)	Annually (during DCM operation)
Surface water quality of Managed Vegetation areas	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Annually (during DCM operation)	Annually (during DCM operation)	Annually (during DCM operation)
Surface water quality of Moat and Row areas	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Annually (during DCM operation)	Annually (during DCM operation)	Annually (during DCM operation)
Groundwater monitoring of perimeter project observation wells	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Annually (during DCM operation)	Annually (during DCM operation)	Annually (during DCM operation)

KEY: DCM = dust control measures

Measure Hydrology-3, Berm Failure Prevention

The City of Los Angeles Department of Power and Water shall require soil berms to be constructed along the down-gradient and side boundaries of each Shallow Flooding irrigation block to prevent leakage and any increase in terms of rate, quantity, or quality of storm water flows to the brine pool area or mineral lease area. These berms will be keyed into the core of the lake bed and will be used to collect excess surface water along the downslope borders of each irrigation block. Design of flood protection berms is subject to approval by the California State Lands Commission, the Great Basin Unified Air Pollution Control District, and the Lahontan Regional Water Quality Control Board.

Measure Hydrology-4, Reduction of Flash Flood Potential

The City of Los Angeles Department of Power and Water shall require the use of sediment traps, road/berms with clay core, or parallel alignment of the moats and rows to the mineral lease for the Moat & Row dust control measure, to reduce the increased flash flood potential from the channelization of water and sediment toward the mineral lease. The Moat & Row design should ensure that there is no increase in terms of rate, quantity, or quality of storm water flows to the brine pool area or mineral lease area. Design of Moat & Row to avoid potential increase in flash flood impacts to the mineral lease is subject to approval by the California State Lands Commission, the Great Basin Unified Air Pollution Control District, and the Lahontan Regional Water Quality Control Board.

Measure Hydrology-5, Berm Failure Emergency Management Plan

The City of Los Angeles Department of Water and Power shall implement a emergency management plan for potential berm failures. This plan shall include the immediate notification of the down gradient trona mineral extraction operation on the lake to ensure the safety to personnel and equipment at the facility. In addition, the plan will include a notification of the California State Lands Commission, the Great Basin Unified Air Pollution Control District following the failure of a berm to ensure dust control efficiency. The emergency management plan shall be reviewed and approved by the California State Lands Commission and the trona mineral extraction operator prior to operation of the dust control measures, which may affect the mineral extraction operation.

3.5.6 Level of Significance after Mitigation

Implementation of mitigation measures Hydrology-1 through Hydrology-5 would be expected to reduce impacts to surface water quality and groundwater quality and levels to below the level of significance.