

## **4.6 HYDROLOGY AND WATER QUALITY**

### **4.6.1 Introduction and Background**

The Coachella Valley can be characterized as an extremely hot and dry subtropical desert bounded by slopes of the San Jacinto, Santa Rosa, San Bernardino and Little San Bernardino Mountains. Mean annual rainfall is very low from the desert floor into the foothills, and in some years no measurable rainfall has been reported within the Plan Area. Most of the rainfall occurs during the cooler months of November through March, but occasional high-intensity thunderstorms and tropical storms occur in late summer and early fall.

Floods that impact the Plan Area can be attributed to three different types of storm events: general winter storms, combining high-intensity rainfall and rapid melting of the mountain snowpack; tropical storms out of the southern Pacific Ocean; and summer thunderstorms. Summer storms pose a greater threat of flooding to the valley than winter storms because of their high intensity and short duration of rainfall. Major historic and benchmark storm events have generated 6.45 inches of rain in a period of 6 hours.

The Coachella Valley Water District (CVWD) and County Flood Control are responsible for the management of regional drainage within the Plan Area, including rivers, major streams and their tributaries, and areas of significant sheet flooding. Both Districts are empowered with broad management functions, including development review and conditioning, flood control planning, construction operation and maintenance of drainage improvements for regional flood control facilities, as well as watershed and watercourse protection related to those facilities. Portions of the Plan Area that are subject to flooding from 100-year storms have been mapped by the Federal Emergency Management Agency (FEMA); most of the Plan Area has not been mapped by FEMA.

The generation of sediment for fluvial transport occurs primarily in the headwaters areas of drainage basins. Within the western and northwestern portions of the Plan Area, important sediment generation occurs within the San Jacinto, San Bernardino and Little San Bernardino Mountains. In the central portions of the valley, important sediment generation occurs within the Little San Bernardino Mountains and the Indio Hills. During periods of storm runoff, sediments in headwaters areas are suspended in storm flows, carried downslope in channels and deposited and stored on terraces and alluvial fans. Major fluvial deposition areas include the Whitewater River flood plain, the Mission Creek and Morongo Wash flood plains, Long Canyon flood plain, Sky Valley and the area between the Indio Hills and US Interstate-10.

As discussed in Section 3.7 of this Final Recirculated EIR/Supplemental Final EIS, the major groundwater subbasins serving the Coachella Valley are in a state of overdraft, where the rate of groundwater extraction exceeds both natural and artificial recharge. In the northwestern portion of the Plan Area, CVWD owns, operates and manages the Whitewater Recharge Basins located between State Highway 111 and US Interstate-10, located in the vicinity of the Whitewater Floodplain Conservation Area. These basins recharge the Upper Thermal Subbasin of the Whitewater River Basin. Recharge water originates from mountain runoff conveyed by the San Gorgonio and Whitewater Rivers, from smaller local drainages and from a turnout on the Colorado River Aqueduct owned and operated by Metropolitan water District (MWD). Groundwater recharge facilities were recently constructed along Mission Creek, north of Pierson Boulevard and east of State Highway 62. These facilities, briefly described above and under the jurisdiction of the Desert Water Agency, encompass approximately 150 acres and would be able to recharge up to 25,000 acre-ft per year. These basins are located in the vicinity of the Upper Mission Creek/Big Morongo Canyon Conservation Area.

CVWD has informed CVAG that the WRP-7 percolation ponds (East Indio Hills) have already been constructed and are not for groundwater recharge. These ponds are for effluent disposal to provide adequate storage for periods when the demand for recycled water is low. CVWD has no plans to build recharge basins near the Indio Quarry sand and gravel mine. Two larger recharge facilities are currently being planned along the east front of the Santa Rosa Mountains in the Lower Thermal Subbasin, adjacent to the Santa Rosa and San Jacinto Mountains Conservation Area. These include the Dike No. 4 Recharge Facilities project and the Martinez Canyon Recharge Facilities. These three planned facilities have been identified in the MSHCP as covered projects/activities.

Natural and artificial groundwater recharge is largely managed by County Flood Control, DWA and CVWD. As public "districts" under state law, CVWD, DWA, RCFCWCD and others act as their own Lead Agency and have control over the approval, construction, operation and maintenance of these facilities.

Section 3.7 of this EIR/EIS provides additional background on hydrology and water quality issues.

#### **4.6.2 Thresholds of Significance/Criteria for Determining Significance for CEQA Analysis**

The Plan and the Alternatives would have a significant effect on hydrology and water quality if they:

- a. Violate any water quality standards or waste discharge requirements.
- b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.
- d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- e. 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.
- f. Otherwise substantially degrade water quality.
- g. Place housing within a 100-year flood hazard as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- h. Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- i. 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.
- j. Contribute to inundation by seiche, tsunami, mud or debris flow.
- k. Conflict with requirements of federal agencies required to take action to reduce risk of flood loss, restore the natural and beneficial values of floodplains, and minimize impacts of flooding on human safety, health and welfare (Executive Order 11988).

### **4.6.3 Hydrology- and Water-Quality-Related Project Impacts**

The MSHCP has been developed in close coordination and consultation with County Flood Control and CVWD. Coordination and consultation has also occurred with the US Army Corps of Engineers on both a project-specific and regional basis. Drainage plans for the major drainages deemed important to the viability of the Plan have also been reviewed, analyzed and

documented by the US Geological Survey.<sup>1</sup> The following assesses the potential conflicts or impacts of the Plan on hydrology and water quality.

### Proposed Action/Preferred Alternative

An essential goal of the Plan is the preservation of existing hydraulic systems, which facilitate the transport of sand and other sediments onto alluvial fans and floodplains that lie within the high-wind corridor of the western Coachella Valley. These major drainages include the San Gorgonio River, Whitewater River and associated tributaries, Mission Creek and Morongo Washes, Long Canyon Wash and other drainages in the Little San Bernardino and Mountains and Indio Hills. These drainages are sand (soft) bottom and include broad floodplains where opportunity for percolation of storm flows is substantial. Many of these areas have been selected and developed for large-scale ground water recharge activities, including the CVWD Whitewater recharge basins and the Desert Water Agency Mission Creek recharge basins. The continued functioning of these drainages as characterized in the Plan would serve to assure, rather than interfere with ground water recharge. Large expanses of the San Gorgonio, Whitewater, Mission Creek and other washes protected by the Plan provide a significant permanent capacity for direct groundwater recharge from both natural and artificial sources.

This Proposed Action/Preferred Alternative provides Take Authorization for CVWD's planned groundwater recharge facilities and the continued operation of its existing groundwater recharge facilities within the Plan Area. DWA is not a Permittee and no Take Authorization is provided for its Mission Creek recharge facility; however, this facility is located outside the Conservation Areas and is not adversely impacted by the Plan.

The MSHCP requires that CVWD would conserve the lands within the Whitewater Floodplain Preserve in perpetuity and would cooperate with CVCC in the conservation of the other CVWD lands in the Conservation Areas. In the maintenance and operation of these facilities, CVWD utilizes light capacity diversion levees composed of "sugar sand" to direct low-flows into the recharge basins. During periods of larger storm flows, the sugar sand levees give way under the force of the heavier flows and allow sand and silt-laden flood waters to flow directly to the larger floodplain immediately east of the subject basins. This complementary design allows the CVWD to conduct essential groundwater recharge, while assuring that larger, bulked flows reach floodplain deposition areas where aeolian (wind) transport can take place. Under the Preferred Alternative, CVWD would also spread sediment periodically removed from the recharge basins

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<sup>1</sup> "Long-Term Sand Supply to Coachella Valley Fringe-Toed Lizard (*Uma inornata*) Habitat in the Northern Coachella Valley, California." Griffiths, P.G., Robert H. Webb, Nicholas Lancaster, et al. US Geological Survey. August 29, 2002.

in the aeolian transport zone for the Whitewater Floodplain Preserve. The Preferred Alternative is not expected to significantly interfere with artificial groundwater recharge facilities/activities.

The Proposed Action/Preferred Alternative provides Take Authorization for the operation and maintenance of levees and flood control channels within the Conservation Areas to ensure that Plan implementation does not expose people or structures to significant risk of loss, injury, or death from flooding, including flooding as a result of the failure of a levee or dam. Further, the Plan would not in itself permit housing within a 100-year flood hazard as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. Nor would the Plan itself permit structures which would impede or redirect flood flows within a 100-year flood hazard area, or create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

The Proposed Action/Preferred Alternative would not contribute to inundation by seiche, tsunami, mud or debris flow since it would not create any physical changes that would cause or contribute to such inundation. In contrast, the Plan would conserve many floodplain areas, thus reducing the potential for structures to be build in these areas.

## **Surface Waters**

As shown on Figure 4-5 in the Draft EIR/EIS and Figure 3-1 in the Draft MSHCP, persistent surface waters in the Plan Area are limited to those associated with the Salton Sea, the lower reaches of the Whitewater River, and the sources of the Whitewater River in Whitewater Canyon. Perennial flows are also associated with major drainages of the SRSJM, including Snow Creek, Palm Canyon, and others. Also identified are the fault-controlled oases located along the San Andreas Fault, which passes through the Plan Area. The Colorado River is another important water source in the Plan Area and is delivered to the southeastern Coachella Valley by the Coachella Branch of the All-American Canal to supply the lower valley agricultural irrigation system. The MWD Colorado River Aqueduct discharges Colorado River water into the upper Whitewater River as a source of groundwater recharge in the upper valley. The Salton Sea water quality is well documented and is not affected by the Proposed Plan.

The quantity and quality of surface waters in the Coachella Valley vary with the source. Four representative sources of surface water and their primary constituents are shown in the table below, Table 4-5. The Whitewater River (North) represents rain and snowmelt from the San Bernardino Mountains. Snow Creek represents rain and snowmelt from the San Jacinto Mountains. Typical quality of Colorado River water is also compared to this same water after use in agricultural irrigation.

**TABLE 4-5**  
**MSHCP Plan Area: Mineral Analysis of Representative Surface Waters**

Source	Whitewater River (North)	Snow Creek	Colorado River	Whitewater River (South)
Constituent	Epm <sup>1</sup> /ppm <sup>2</sup>	Epm/ppm	Epm/ppm	Epm/ppm
Ca	1.75/35	0.50/10	3.97/79	9.09/181
Mg	0.90/11	0/0	2.31/28	3.74/45
Na	0.62/14	0.47/11	4.78/110	32.58/749
K	0.108/4.2	0.04/1.6	0.11/4.3	0.39/15
Cl	0.1/4	0.0	6.01/213	15.96/566
<b>Total Dissolved Solids</b>	201 ppm	55 ppm	727 ppm	2,983 ppm

Notes: <sup>1</sup> epm = chemical equivalents per million; <sup>2</sup> ppm = parts per million by weight.

Source: DWR Bulletin No. 108: CV Investigation, California Department of Water Resources, July 1964.

Through Reserve assembly, the Plan would not substantially alter any existing drainage pattern, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site, nor in a manner that would substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site. For the same reason, the Plan would not degrade water quality; nor would it substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Again, for the same reason, the Plan would not violate any water quality standards or waste discharge requirements.

The Proposed Action/Preferred Alternative does not propose any significant change to existing or planned flood control projects or facilities, which could result in increasing or contributing to the danger of inundation by mud or debris flows. Existing regulation of Development on mapped floodplains (where permitted) is intended to reduce risk to lives or property to a level that is less than significant; the Plan would have no effect on these regulations or their enforcement. The federally sponsored and recently approved Thousand Palms (Whitewater River Basin) flood control project<sup>2</sup> provides 100-year flood protection for urban development in a 45 square mile Plan Area.

The Thousand Palms/Whitewater River Basin flood control project levee system is designed to allow and facilitate a cascading of fluvial discharges from several drainages onto the wind-swept portion of the valley floor, where it is transported into sensitive habitat for sand-adapted species

<sup>2</sup> "Whitewater River Basin Feasibility Report and Environmental Impact Statement," prepared by the U.S. Army Corps of Engineers, Los Angeles District. June 26, 2000. Planning area extended south from the Indio Hills, east of Rio del Sol, to existing and planned residential development subject to flooding and inundation.

covered in the Plan. No other federal projects are planned which could adversely affect the Plan's implementation or be affected by the Plan. The Preferred Alternative does not conflict with but rather complements requirements of federal agencies to act to reduce risk of flood loss and minimize impacts human safety, health and welfare, and to restore the natural and beneficial values of floodplains.

### Public Lands Alternative

This Alternative would not, in and of itself, interfere with natural or artificial groundwater recharge because no new lands are conserved.

Adoption of the Public Lands Alternative involves no new acquisition of lands and is not expected to conflict with federal flood control projects or actions necessary to reduce risk of flood loss, restore the natural and beneficial values of floodplains, or protect human life and property. Neither would the alternative potentially contribute to inundation from mud or debris flows, given that it does not alter existing or planned flood control nor affect existing or planned land use patterns. The Alternative would not degrade water quality, be responsible for any structures being sited in floodplains, or alter any drainage patterns. While this Alternative would not have any significant adverse impacts, it would also have fewer beneficial impacts than the Preferred Alternative.

This alternative could adversely affect existing and planned groundwater recharge facilities in the Plan Area. Portions of the existing Whitewater Recharge Basins area are federal lands and the lack of a broader Reserve System resulting from this alternative could jeopardize these facilities when permit renewal came up in 2015. Lands within or adjacent to portions of the planned CVWD Dike 4 and Martinez Canyon recharge basins projects are under federal ownership. The Public Lands Alternative could result in the need for individual permits for their development. In the absence of a comprehensive conservation plan as with the Preferred Alternative, securing individual permits for such projects would be substantially more difficult. These uncertainties and the biological resource conservation issues that would remain unresolved under this alternative mean that the potential for adverse impacts to existing and planned groundwater recharge facilities could be significant for CEQA analysis purposes.

### Core Habitat with Ecological Processes Alternative

The Core Habitat with Ecological Processes Alternative provides for less conservation than the Preferred Alternative, but the impacts to hydrology and water quality from implementation of this Alternative are essentially the same as those for the Preferred Alternative.

### Enhanced Conservation Alternative

This Alternative would result in a substantial increase in lands in Conservation Areas beyond that of any of the other Alternatives. Additional lands would be added to a variety of broadly distributed Conservation Areas. This Alternative would somewhat increase the amount of alluvial fan and floodplain that would be placed in conservation. The San Gorgonio and Whitewater River washes and floodplain acquisitions would be modestly increased. Additional portions of the floodplains of the Mission Creek and Big/Dry/Little Morongo Washes would also be acquired from willing sellers under this Alternative, with the stated purpose of limiting the extent of flood control improvements. The expansion of the Mission/Morongo floodplain would be for the stated purposes of enhancing the function of the floodplain as a wildlife movement corridor. The Alternative does not include lands in a Conservation Area at the mouth or along the length of the Long Canyon Wash.

The Enhanced Conservation Alternative does not interfere with either natural or artificial ground water recharge. This Alternative creates greater opportunities for conflicts with adopted local or regional flood control plans or projects. Specifically, the Desert Hot Springs Master Drainage Plan calls for both upstream and downstream improvement of Mission Creek and Morongo Wash stormwater channels, and significant reduction of the FEMA-mapped 100-year floodplain. The Enhanced Conservation Alternative would significantly alter or could preclude these improvements, which are important to the protection of existing and planned development in the vicinity of these drainages.

The Enhanced Conservation Alternative also appears to conflict directly with continued development of the Mid-Valley Stormwater Channel, which has been designed and is being implemented by CVWD and affected local jurisdictions. The Mid-Valley channel benefit area includes lands located south of US Interstate-10 and east of Date Palm Drive in Cathedral City, extending eastward along the northeast-facing slope of the Palm Springs Sand Ridge. Extending and beyond Cook Street in the City of Palm Desert.

The Enhanced Conservation Alternative proposes large portions of this area in a Conservation Area, although substantial portions of these lands have already developed and other developments have already been approved. Adoption of this Alternative would require the deferral, significant reduction or elimination of the Mid-Valley Stormwater Channel. Much of the development that has created the need for this facility has already occurred. It is uncertain how or to what extent this Alternative would ultimately impact this facility; however, the impacts to existing and future development could be significant for CEQA analysis purposes

The Enhanced Conservation Alternative also expands the Conservation Area and management for a substantially greater portion of the Coachella Valley Stormwater Channel, extending the conservation management length to the juncture of the subject channel and the Thousand Palms Channel in Indio. As with the upper segment of this channel (Whitewater River Channel), the subject channel is the primary flood control facility in this part of the Plan Area. The Coachella Valley Stormwater Channel is also essential to the safe and efficient operation of the valley's agriculture. Potential conflicts may arise between the desire to optimize riparian and other habitats supported by the channel, and its function and capacity as a regional flood control facility.

#### No Action/No Project Alternative

The No Action/No Project Alternative does not include Plan adoption and would therefore have no impact on hydrology and water quality or local, regional, state, or federal flood control plans. Many of the covered flood control projects and areas of operation and maintenance responsibilities listed as Covered Activities in the MSHCP are located at least partially within identified Conservation Areas; it can be assumed that most of these activities and projects may require individual Take permits. Over time, pressure on additional species could result in their becoming listed, further exacerbating the problems in facilitating Development by implementing planned flood control improvements.

In theory, all of the flood control projects/activities defined as Covered Activities could be implemented under the individual permit process. However, securing such permits can be expensive and time consuming, and as cumulative impacts became more apparent, Wildlife Agencies could conceivably refuse further project approvals until more comprehensive conservation efforts were once again attempted.

Listed and sensitive species have received state and federal protection and in the past have placed constraints on flood control projects, how they protect development, and on overall economic activity. In light of the highly specialized and, in some cases endemic and near-endemic nature of many of the MSHCP covered species, under the No Action/No Project Alternative conflicts are likely to increase as continuing habitat loss and fragmentation drives more of these species toward listing by state and federal agencies.

The No Action/No Project Alternative also precludes a coherent, integrated and coordinated conservation plan that could provide long-term protection of Listed and sensitive species and their habitats by taking into consideration and integrating flood control projects with conservation goals and objectives. In addition to the continued piecemeal means by which flood control projects/species protection conflicts are addressed, over time circumstances could worsen

and the extent and pattern of potentially induced urban development could ultimately preclude the possibility of structuring viable habitat conservation plans that can assure the long-term protection of these species.

There are time limits within which the Service is to respond to requests for Section 7 permits; however, there is no time limit on processing requests for Section 10(a) permits. In addition to the uncertainties of securing permits, the costs associated with obtaining permits on an individual basis can be very high; and there is no guarantee that the Service and CDFG would be able to grant Permits. In the absence of coordinated conservation for the Plan's Covered Species and the essential nature of improved and maintained flood control facilities in the Plan Area, some projects may not be permitted. For individual flood control projects, therefore, the individual permit process is expected to take a longer period of time, potentially delaying their implementation.

This Alternative would not directly affect or interfere with artificial groundwater recharge facilities/activities. However, the No Action Alternative also precludes a coherent, integrated and coordinated conservation plan that could provide long-term permitting for these essential facilities. The Whitewater recharge basin permit expires in 2015 and would require new formal consultations with federal and state wildlife officials in order for it to be extended. These facilities would also need to secure Take Authorization for this and other groundwater recharge projects by the Wildlife Agencies. In the absence of a comprehensive, conservation plan, urban development in the Plan Area would continue.

Fragmented conservation efforts may not be able to avoid subsequent plant and wildlife listings that could adversely affect the viability of these recharge projects, both existing and proposed. The continuation of the status quo could result in significant interference with artificial groundwater recharge facilities/activities.

### **Summary of Hydrology and Water Quality Impacts for All Alternatives**

Impacts associated with the various alternatives of the MSHCP are summarized in Table 4-6. The Proposed Action/Preferred Alternative, Public Lands Alternative, and the Core Habitat with Ecological Processes Alternative avoid significant impacts with respect to hydrology and water quality. The Enhanced Conservation Alternative results in large areas where planned flood protection would not or might not occur (Mission Creek/Morongo Washes). The No Action/No Project Alternative would result in a continuation of piecemeal review of flood control projects without the benefit of integrating flood control with species protection and habitat preservation.

**TABLE 4-6**  
**Hydrology and Water Quality Summary of Impact by Alternative**

<b>Alternative</b>	<b>Potential Adverse Impacts to Hydrology and Water Quality</b>
Proposed Action/Preferred Alternative	No
Public Lands Alternative	Potential indirect
Core Habitat with Ecological Processes Alternative	No
Enhance Conservation Alternative	No
No Project/No Action Alternative	Potential indirect

#### **4.6.4 Hydrology- and Water-Quality-Related Mitigation Measures**

Of the alternatives considered, only the Enhanced Conservation Alternative has the potential to have direct and potentially significant adverse impacts on local or regional flood control plans and facilities for CEQA analysis purposes. This alternative could also conflict with requirements of federal agencies required to take action to manage floodplains and provide protection. The Public Lands Alternative and the No Action/No project Alternative could have indirect significant impacts for CEQA analysis purposes if the lack of Take Authorization adversely impacted the ability of CVWD to construct new recharge facilities or to maintain existing facilities. No Feasible mitigation measures have been identified.

#### **4.6.5 Levels of Significance after Mitigation for CEQA Analysis**

Only the Enhanced Conservation Alternative has been identified as having a significant potential for adverse impacts for CEQA analysis purposes. No Feasible mitigation measures have been identified, so the potential impact of this Alternative would be significant. The Public Lands Alternative and the No Action/No project Alternative could have indirect significant impacts if the lack of Take Authorization adversely impacted the ability of CVWD to contract new recharge facilities or to maintain existing facilities.

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