IV.5 FLOOD HAZARD, HYDROLOGY, AND DRAINAGE

IV.5.1 Approach to Impact Analysis

This chapter analyzes the potential for impacts to surface water resources. Existing conditions for surface water resources are described in Chapter III.5, Flood Hazard, Hydrology and Drainage. Analysis of impacts to surface water resources for each alternative in the Desert Renewable Energy Conservation Plan (DRECP or Plan) is based both on the description of Covered Activities on federal and nonfederal lands and the overall conservation strategy within the Plan Area. Covered Activities are actions associated with renewable energy development that would be permitted within Development Focus Areas (DFAs). Transmission facilities may also be developed outside the DFAs, but would be subject to permitting and management conditions set by the Plan. Construction and operation/maintenance would be permitted under the DRECP.

IV.5.1.1 General Methods

Construction and operation of renewable energy projects could exacerbate flooding and disrupt natural stream processes, increase erosion and downstream transportation of soils, and degrade or contaminate soil and water resources. There are extensive regulatory programs in place to prevent or minimize these impacts. The focus of this programmatic analysis is to identify the range of potential effects on flooding, hydrology and drainage and apply the appropriate regulatory programs and mitigation measures that would avoid, minimize, or mitigate adverse effects to the environment.

IV.5.1.1.1 Assumptions

Assumptions used in the analysis of impacts on flood, hydrology and drainage include the following:

- Renewable energy development within the Plan Area would not result in any new appropriation or diversion of surface water resources to meet water supply demands during construction, operation, maintenance, or decommissioning of projects. Water supply would primarily be made up from groundwater resources or from existing supplies of local water purveyors. For potential effects to groundwater resources, please see Chapter IV.6, Groundwater, Water Supply, and Water Quality.
- Potential effects to wild and scenic rivers are not evaluated since they are already protected under the Wild and Scenic River Act. Additionally, within the Plan Area, only a 26.3-mile section of the Amargosa River is so designated. The Bureau of Land Management (BLM) is currently preparing a Stream Management Plan for designated sections of the Amargosa River, which will further define the activities allowed

within the vicinity of the designated section and provide clear setback requirements for possible developments nearby. In addition and as part of this analysis, BLM has developed Conservation and Management Actions (CMAs) to avoid and minimize effects to various resources including the requirement that any renewable energy development would have to avoid and be set back from the boundaries of wild and scenic rivers within the Plan Area.

- Potential effects to springs and seeps are not evaluated because they would be protected under CMAs and, due to their limited areal footprint, can be readily identified and avoid development. Since springs are largely groundwater dependent, please refer to Chapter IV.6, Groundwater, Water Supply, and Water Quality, for potential effects of groundwater on springs.
- Potential for renewable energy development to violate any water quality standards or waste discharge requirements, or to cause substantial degradation to surface water quality, is not quantifiable under this programmatic DRECP. Project compliance with water quality standards is required under federal regulations (Clean Water Act [CWA] Sections 303, 401, 402, and 404) and the Resource Conservation and Recovery Act), state regulations (Porter-Cologne Water Quality Control Act, California Fish and Game Commission [CFGC] Sections 1600-1616, as amended, Sections 5650-5656), and applicable local standards and regulations. The evaluation of water quality standards compliance would be conducted on a project-specific basis and would consider both project design and local conditions (see Chapter IV.6, Groundwater, Water Supply, and Water Quality).
- The process for determining which surface water resources have the highest values primarily considers their biological resource benefits, which have been identified through the process of developing the Plan alternatives. The alternatives identify where both development and additional conservation areas could be located within the Plan Area to avoid or minimize effects to the highest-value resources, including surface water. This section quantifies potential effects to surface water resources for the No Action Alternative and the scenarios developed through the alternatives, which by design seek to avoid and minimize effects to valuable surface water resources.

Chapter IV.6, Groundwater, Water Supply, and Water Quality, also addresses water issues but focuses on groundwater.

IV.5.1.1.2 Methods for Quantifying Potential Effects

In this section, potential effects in each ecoregion subarea for each alternative are evaluated in light of two primary objectives: to reduce exposure to flooding, exacerbation

of flood effects and degradation of water quality, and reduce impacts to hydrologic surface water features and maintain natural surface water processes, groundwater processes, hydrogeomorphic processes, and hydrologic regimes. These potential effects, assuming full development of DFAs, have been quantified according to the following measures:

- **Potential to experience flood hazard.** This potential is evaluated based on floodplain maps prepared by the Federal Emergency Management Agency (FEMA)– in populated regions for floods that statistically have a 1% chance of occurring each year (i.e., 100-year flood events). Because it is sparsely populated, FEMA has not evaluated much of the Plan Area for potential flood hazards, which leads to inconclusive results in evaluating much of the Plan Area. Based on currently available data, the acreage within each subarea has been classified for flood hazard potential as either 0.2%, 1%, minimal chance of annual occurrence, or could not be assessed. This analysis focuses on the impact potential within the (mapped) 100-year floodplain.
- **Potential effects to surface water linear features and their contributing drainage networks.** The method used for the Plan Area was to quantify the length (in miles) of ephemeral streams and rivers, perennial and intermittent streams and rivers, and canals and ditches. When considering the potential effects to linear surface waters, it is best if each feature can be characterized along with streambeds and channel banks, as areas related both to one another and cumulatively within each ecoregion subarea. However, the data is not available, so the impact potential to linear surface water features has been quantified using stream lengths as a surrogate for the overall effects to linear surface water resources. This method can potentially underestimate the effects since the available data is limited to just the centerline rather than the areal extent of these features, including their lateral elements. A more detailed quantification of potential effects would be required at a project-specific level of environmental assessment. Linear water resources data evaluated for this Environmental Impact Report/Environmental Impact Statement (EIR/EIS) come from the National Hydrography Dataset (NHD), developed by the U.S. Geological Service (USGS). The NHD is a feature-based database that interconnects and uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system. NHD linear water resources data includes ephemeral streams and rivers, perennial and intermittent streams and rivers, and canals and ditches within the Plan Area (USGS 2010). Additional linear water resources may occur on individual project sites. While imperfect, this method does provide relative measures for the ecoregion subareas to identify and assess effects to linear surface water features.
- **Potential effects to surface water bodies.** This potential is evaluated using acres of water in water bodies including ephemeral lakes and playas, perennial lakes and

reservoirs, wetlands (the National Wetlands Inventory [NWI], as compiled by the U.S. Fish and Wildlife Service [USFWS]), and swamps and marshes. Areal water resources data evaluated in this EIR/EIS comes from NWI data developed by USFWS (USFWS 2014). This data set represents the extent and approximate location and type of wetlands and deepwater habitats in the conterminous United States. This data delineates the areal extent of wetlands and surface waters (Cowardin et al. 1979). Certain wetland habitats are excluded from the NWI mapping program because of the limitations of aerial imagery to detect wetlands. By policy, the USFWS also excludes certain types of "farmed wetlands" as either defined by the Food Security Act or that do not conform to the accepted definition (Cowardin et al. 1979).

While erosion is a potential effect from flooding, the erosion potential from both wind and water are evaluated in Chapter IV.4, Geology and Soils. Note that Chapter IV.6, Groundwater, Water Supply, and Water Quality, also addresses water issues but focuses on groundwater.

IV.5.1.2 CEQA Standards of Significance

Table IV.5-1 lists the impact statements evaluated in this chapter, the impact analysis tools, and the CEQA checklist, all evaluated in this chapter.

Table IV.5-1
CEQA Standards of Significance

Impact Statements	Impact Analysis Measures	CEQA Checklist
Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.	**Potential to experience flood hazard** as indicated by floodplain maps prepared by Federal Emergency Management Agency (FEMA) in populated regions for floods that statistically have either a 0.2% or 1% chance of occurring each year (that is, 500-year or 100-year flood events). Because it is sparsely populated, much of the Plan Area has not been evaluated by FEMA for potential flood hazards, which leads to inconclusive results.	• Would the alternative create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? • Would the alternative place within a 100-year flood hazard area structures that would impede or redirect flood flows? • Would the alternative 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?

Table IV.5-1
CEQA Standards of Significance

Impact Statements	Impact Analysis Measures	CEQA Checklist
Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.	Potential effects to surface water linear features and their drainage processes as indicated by length (in miles) of ephemeral streams/rivers, perennial and intermittent streams/rivers, and canals/ditches. Potential effects to surface water bodies–as indicated by area (in acres) of water bodies including ephemeral lakes/playas, perennial lakes/reservoirs, NWI wetlands (National Wetlands Inventory as compiled by USFWS), and swamps/marshes. Potential effects to springs—as indicated by the number of springs that could be affected.	• Would the alternative substantially alter the existing drainage network or structure of the site or area, including through the alteration of the course of a distributary network, stream or river?
Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality.	Compliance with Laws and Regulations	• Would the alternative violate any water quality standards or waste discharge requirements? • Would the alternative cause substantial degradation to surface water quality?
Not applicable	Not applicable	• Would the alternative cause, or be subject to, inundation by seiche, tsunami, or mudflow? • *(Neither seiche nor tsunami hazards would likely occur within the inland waters of the Plan Area. Mudflow is discussed in Chapter IV.5, Geology and Soils.)*
Not Applicable	Not Applicable	• Would the alternative 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? • *(There is no housing associated with renewable energy development, and thus this potential impact is not applicable for this assessment.)*

IV.5.2 Typical Impacts Common to All Action Alternatives

The following discussion of typical impacts common to all action alternatives refers to the Covered Activities described in Volume II, Table II.3-13 of this document. It describes activities during pre-construction site characterization, construction and decommissioning, and operations and maintenance.

IV.5.2.1 Impacts of Renewable Energy and Transmission Development

The potential for exposure to flooding, or to the exacerbation of conditions for flooding, or to cause impacts to hydrologic surface water features and the alteration of drainage patterns, is generally a function of how widespread land disturbance may be from renewable energy and transmission development. The broader and more intensive the land disturbance, the greater the likelihood of affecting surface water (See Figure III.5-1, Linear and Areal Surface Water Resources and Watersheds in the Plan Area). Distinctions in the level of disturbance and potential impacts among types of renewable energy and transmission developments are discussed here.

In general, transmission development may have the least impact because the footprint locations of switchyards and substations, and tower and pole locations of transmission and generation tie lines, can usually be more site-selective because they require less area and can therefore avoid most surface water features. Footings for transmission and generation tie line towers or poles do not cause a significant change in existing ground conditions when considering drainage. New access roads would potentially cause more widespread ground disturbance, but could be limited over surface water features.

Wind energy is most like transmission because the turbine pads are small and their locations can avoid many surface water resources. Wind turbines located within a floodplain could have minimal effects if the area of the turbine pads is small and their spacing allows flood flows to pass largely unimpeded.

Geothermal development also generally causes less ground disturbance when compared with solar because the power plant, switchyard, and associated steam wells and pipelines require significantly less area. Similar to transmission, geothermal development can be more site-selective to avoid surface water resources because it has a much smaller footprint than solar.

Solar energy development–including thermal trough, thermal power tower and photovoltaic (PV)–creates the greatest land disturbance because it requires significantly more area (typically on the scale of one or more square miles compared with less than 100 acres for most geothermal development). The extent of ground disturbance generally varies as thermal trough and PV typically require site grading, which removes all

vegetation, disturbs biological soil crust, and causes the greatest disturbance to surface water resources and drainage patterns. Disturbance to vegetation and surface soils changes the infiltration and runoff characteristics leading to a greater potential for erosion, sedimentation, exacerbation of flooding, and degradation of water quality. Thermal power tower technology can have less land disturbing impact compared with thermal trough and PV by largely maintaining existing ground contours within the mirror field and cutting vegetation near ground level rather than entirely removing it (thereby maintaining existing surface soil characteristics). However, many varieties of vegetation will not survive or remain as vigorous as they were before the ground disturbance, and although surface soils are not displaced and removed by grading, their infiltration and runoff characteristics can be significantly altered. While not all solar technologies and projects will require the same acreage per MW of power produced, the DRECP assumes 7 acres/MW for all solar technologies.

IV.5.2.1.1 Impacts of Site Characterization

Site characterization activities that could affect surface water resources may include off-road travel and geologic borings to investigate soil conditions. Disturbance to soil and vegetation from off-road travel can cause soil compaction, disturbance to biological soil crusts, and loss of vegetation that could change infiltration and runoff characteristics. The changes in runoff characteristics could lead to greater runoff from precipitation and changes in natural ground conditions from erosion. Off-road travel could also include crossing ephemeral streams, which could impact the bed and bank structure of the stream and alter the course of a stream or river, or change its flow rates and frequencies. These stream impacts could then affect morphological and ecological processes, vegetation, and animal species. Conducting geologic borings can cause similar impacts from access of related equipment and cause soil and water contamination if hydraulic drilling equipment leaks, or if drilling fluids are not properly contained and treated.

IV.5.2.1.2 Impacts of Construction and Decommissioning

IV.5.2.1.2.1 Flood Hazards and Effects on Streams and Rivers

Land disturbance activities described in the Covered Activities in Volume II, including clearing, grading, excavation, road construction, vegetation removal, fencing, drainage and flood control structures during development, could potentially disrupt drainage patterns, particularly of ephemeral stream channels. Considering the large areas of most renewable energy developments, it is likely that ephemeral and intermittent streams will flow through proposed project areas and that their drainage paths and patterns will be altered by the development. Project facilities, roads, temporary laydown areas, and the surrounding environment can all be subject to flooding during project construction and decommissioning. Flooding may cause not only damages to these facilities, but also

environmental damage on and off site, including erosion, sedimentation, and contamination of soil and water by transporting project-related hazardous materials and wastes. Disturbance to streams can also alter and diminish riparian habitat and the wildlife that depends upon it, as addressed in the Chapter IV.7, Biological Resources.

Disturbance to episodic streams could disrupt numerous ecosystem services including (1) watershed and landscape hydrologic connections; (2) water supply protection and water-quality filtering; (3) wildlife habitat movement and migration corridors; (4) sediment transport, storage and deposition; (5) groundwater recharge and discharge; (6) vegetation community support; and (7) nutrient cycling and movement. These streams also form critical interactions with adjacent drier upland areas to support critical life stages and contribute to overall regional biodiversity. These systems provide primary habitat, predator protection, movement corridors, migration stop-over sites, breeding and nesting sites, shade, and food sources and water in temporary or permanent pools for many species (Southern California Coastal Water Research Project [SCCWRP] 2011).

Ground disturbances within drainage areas can cause one or more of the following long-term effects:

- Alter existing drainage patterns through grading or channelization, resulting in concentrated stormwater flow patterns that increase the potential for erosion, sediment transport, and flooding effects, compared with natural diffused or distributary stormwater flow patterns.
- Substantially increase the rate or amount of surface runoff through ground disturbances (e.g., paving) that make the ground less pervious, which could result in flooding, substantial erosion, and sediment transport, both on or off site.
- Alter the course of a stream or river or change its flow rates and frequencies, causing changes to morphological and ecological processes that affect vegetation and animal species as subsurface water availability changes.
- Diminish the surface crusts found on relatively undisturbed soil surface areas of playas, increasing their vulnerability to wind erosion.
- Create or contribute to runoff that would either exceed the capacity of drainage systems or increase sources of polluted runoff.
- Place structures within a flood hazard area that would impede or redirect flood flows, or could be damaged by high flows, causing debris scatter or conveyance of hazardous materials or wastes.

IV.5.2.1.2.2 Effects on Springs

Springs can help sustain habitat and wildlife, and considering the lack of continuously flowing surface water features in the Plan Area, they provide considerable environmental value, albeit normally limited to their immediate locations. Disturbance of springs would be a long-term impact to discharge, distribution, and other ecological values they provide. If a spring area is disturbed or enclosed within the fenced area of a renewable energy or transmission facility, wildlife would not be able to access it.

IV.5.2.1.2.3 Effects on the Water Quality and Beneficial Uses of Plan Area Waters

Effects on the water quality and beneficial uses of Plan Area waters can occur during the construction and decommissioning phases of renewable energy projects. During construction, hazardous materials, particularly oil-based and liquid chemical products, can spill and cause contamination to soils, surface water bodies, and groundwater. Groundwater encountered during excavation can become turbid and degrade surface water quality if not properly managed. Water used for hydrostatic testing and flushing pipelines can contain metals and other hazardous substances, so can affect surface and groundwater quality if not properly treated before discharge. Storage of hazardous materials and wastes during construction and decommissioning can be disturbed from stormwater and flooding if not properly contained, or if project-related stormwater drainage facilities are not properly designed. These project-related activities can cause degradation and long-term adverse effects to water quality.

IV.5.2.1.3 Impacts of Operations and Maintenance

Project facilities, roads, and the surrounding environment can be subject to flooding during operations and maintenance. Considering the large area of most renewable energy developments, it is likely that ephemeral streams will flow through proposed project areas, and that drainage paths and processes will be altered. This can cause developed drainage systems to exceed their design capacities, which in turn may damage both the facilities and the environment, both on and off site (e.g., erosion, sedimentation, and contamination of soil and water by transport of project-related hazardous materials and wastes). Disturbance to streams can also alter and diminish riparian habitat (See Chapter IV.07, Biological Resources). If a spring area is enclosed within a project's fenced area, wildlife would also be unable to access it.

Storage of hazardous materials and wastes during operations and maintenance can be disturbed by stormwater and flooding if not properly contained, or if stormwater drainage facilities are not properly designed. Heat transfer fluids from some solar thermal-electric generation technologies (e.g., parabolic trough) can also potentially contaminate soils,

surface water, and groundwater if there is a rupture develop in heat transfer piping systems. These project-related activities can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater.

IV.5.2.2 Impacts of the Reserve Design

In order to meet the Plan's biological goals and objectives (defined in Volume I, Section I.3.3), a biological reserve design was developed for each alternative. Reserve lands include existing conservation (Legislatively and Legally Protected Areas [LLPAs]), Land Use Plan Amendment (LUPA) Conservation Designations, and Conservation Planning Areas.Conservation Planning Areas on private lands are not mandatory, so would occur only with willing sellers. Setting aside lands where disturbance would be minimized is a beneficial effect for surface water resources because of the reduced ground disturbance and resulting runoff in the vicinity of linear and areal surface water resources. Exacerbation of flood effects and degradation of water quality would not occur because there would not be any alteration to the drainage area and natural hydrologic processes within the 100-year floodplain. To the extent projects could be avoided within drainage areas, it would minimize the potential for contamination to soil and water from project-related hazardous materials and wastes.

For surface water resources, CMAs and reserve designs are different for each alternative, but also have similarities. For each alternative, there are the following differences: (1) the areal density of surface water features (including wetlands, the bed and banks of streams, and lakebeds of reservoirs and playas compared to the overall area of land); (2) the location and areal extent of lands selected for DFAs, relative to the location of surface water resources; and (3) the location and areal extent of conservation lands relative to the locations of surface water resources. These distinctions are considered in more detail in Section IV.5.3, Impact Analysis by Alternative.

IV.5.2.3 Impacts of BLM Land Use Plan Decisions

IV.5.2.3.1 Impacts of Renewable Energy Development and Transmission on BLM Lands

The typical impacts from the various renewable energy and transmission technologies on BLM lands would be the same as those described for Plan-wide impacts. However, the specific locations in which energy and transmission development will be allowed will be driven by LUPA decisions, which may encourage or restrict development in some areas.

IV.5.2.3.2 Impacts of BLM Land Designations and Management Actions

Because the BLM LUPA land designations would be managed to protect ecological, historic, cultural, scenic scientific, and recreation resources and values, they would also confer general protection for surface water resources**.** While other land uses are allowed within these areas, other uses must be compatible with the resources and values that the land designation is intended to protect.

Setting aside lands for no disturbance is a beneficial effect for surface water resources because road crossings and ground disturbance would be avoided in the vicinity of linear and areal surface water resources. Exacerbation of flood effects and degradation of water quality would not occur because there would not be any alteration to the drainage area and natural hydrologic processes within the 100-year floodplain. To the extent developments are avoided within drainage areas, it would also minimize potential for contamination to soil and water from project-related hazardous materials and wastes.

Details on allowable uses and management within National Conservation Lands appear in the proposed LUPA description in Volume II. Details on the goals, objectives, allowable uses, and management actions for each Area of Critical Environmental Concern (ACEC) and Special Recreation Management Area (SRMA) are in the LUPA worksheets in Appendix H.

IV.5.2.4 Impacts of Natural Community Conservation Plan and General Conservation Plan

The Natural Community Conservation Plan (NCCP) would be administered by the California Department of Fish and Wildlife (CDFW), and would be applicable to the entire Plan Area. The General Conservation Plan (GCP) would be administered by the U.S. Fish and Wildlife Service (USFWS) and would be applicable to nonfederal lands, a subset of the entire Plan Area.

IV.5.2.4.1 Natural Community Conservation Plan

The impacts of renewable energy development permitted under the NCCP would be the same as those defined for the Plan-wide impacts, including the typical impacts described in Section IV.5.2 and for each alternative.

IV.5.2.4.2 General Conservation Plan

The types of impacts resulting from renewable energy development permitted under the GCP would be the same as those defined for the Plan-wide impacts, including the typical impacts described in Section IV.5.2. However, the locations where these impacts would occur would vary by alternative. Any differences in these impacts that result from the locational differences are described for each alternative.

IV.5.3 Impact Analysis by Alternative

The following sections present impact analysis for the No Action Alternative, the Preferred Alternative, and Alternatives 1 through 4. The process for determining which surface water resources have the highest value primarily considers their biological resource benefits, which have been identified through the process of developing alternatives. The alternatives determine where development and additional conservation areas could occur to avoid or minimize effects to the highest value resources, including surface water. This section focuses on quantifying potential effects to surface water resources for the No Action Alternative and the scenarios developed through the defined alternatives, which by design seek to avoid and minimize effects to valuable surface water resources.

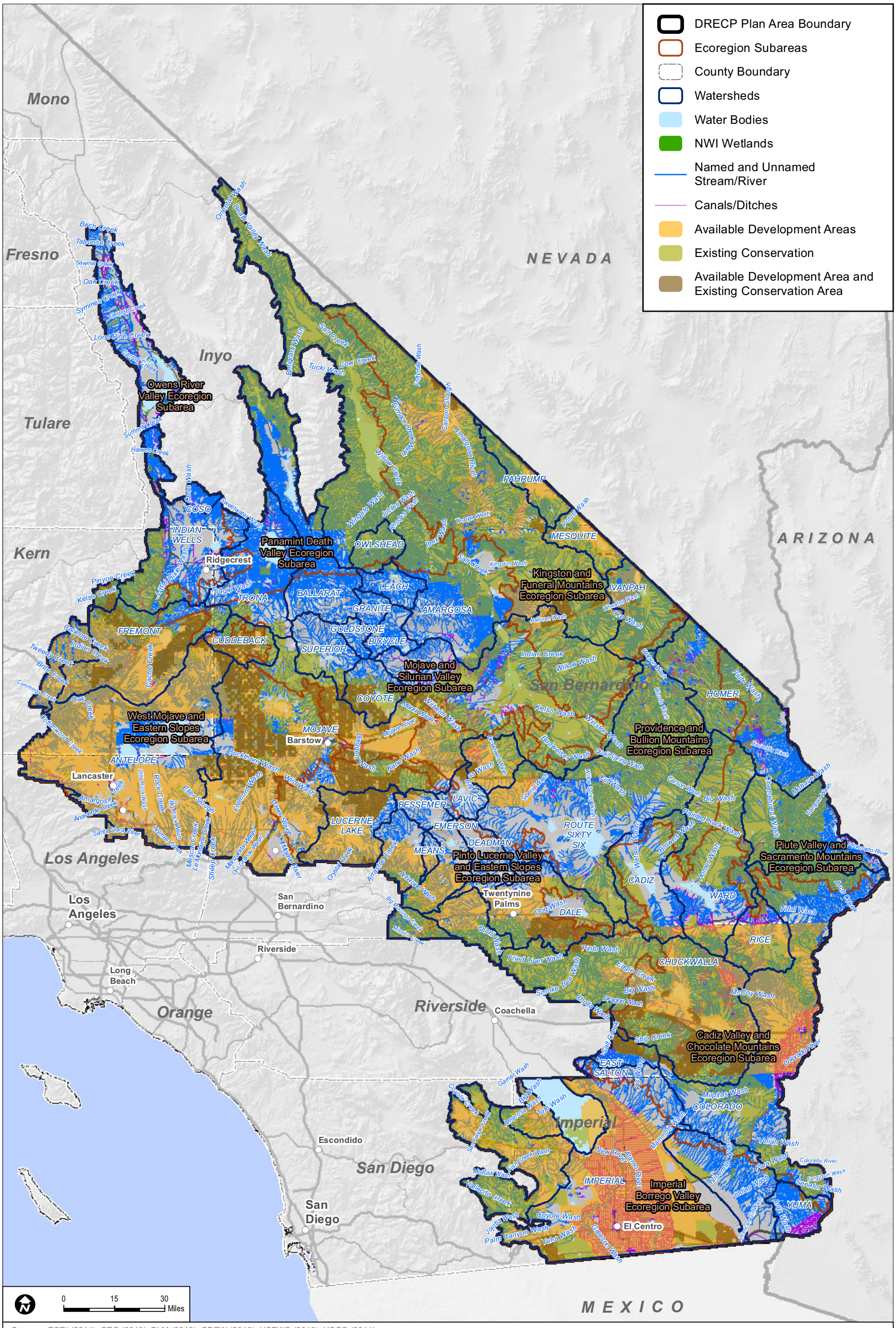
IV.5.3.1 No Action Alternative

In the No Action Alternative, no DFAs would be created. Instead, the existing geographic distribution of renewable energy development would continue. Conservation lands would remain as currently designated.

Figure IV.5-1 shows the expected geographic distribution of renewable energy development in the Plan Area and where conservation areas exist in relation to surface water resources for the No Action Alternative. Major surface water resources that could be developed under the No Action Alternative include the Amargosa, Mojave, and Colorado rivers.

Climate Change and Surface Water Effects. Climate change in the Plan Area was evaluated by the Conservation Biology Institute (CBI) and is presented in a report (Climate Change, Bachelet 2013) and in Appendix P. The CBI report provides background information for climate change and describes long-term adaptive management strategies. The CBI report provides information regarding:

- The existing climate setting for the Mojave and Sonoran deserts.
- The development of climate models, including uncertainty and scale issues.
- Projections for climate change in the Plan Area, including temperature and precipitation patterns and their effects on snowpack, hydrology, vegetation, and fuels and fire risk.



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USGS (2011)

FIGURE IV.5-1

Linear and Areal Surface Water Resources and Watersheds in the Plan Area - No Action Alternative

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The CBI report summarizes several of the projected large-scale environmental effects of climate change that will likely affect natural resources in the Plan Area, including changes in snowpack, hydrology, vegetation, and fuels and fire. Snowpack is projected to decrease under both the drier and wetter scenarios of the PCM (Parallel Climate Model) and GFDL (Geophysical Fluid Dynamics Laboratory) scenarios, although the PCM projects slightly higher snowpacks at higher elevations of the Sierra Nevada range through the twenty-first century (See Figure 14 in Appendix P).

Snowpack levels and the timing of precipitation and groundwater levels will alter major river flows, with a modest decrease in Colorado River flows and alterations in the hydrology of the Amargosa and Mojave rivers (although the CBI report does not elaborate on the specific types of those alterations). The Mojave River receives runoff from the San Bernardino Mountains, and the Amargosa River is bordered by several high mountain ranges that accumulate winter snowpack (See Figure 14 in Appendix P). Under both the PCM and GFDL models there will be substantial reductions in snowpack in both the San Bernardino and San Gabriel mountain ranges by 2100, as well as in the mountains ranges bordering the Amargosa River.

The Amargosa River region is sparsely populated and land uses along the river include rural communities, mining, and agriculture. The Amargosa River currently has surface flows, which extend about 17 miles along the river in the Shoshone, Tecopa, and Amargosa Valley areas and support well-developed cottonwood-willow riparian habitat that provides valuable wildlife habitat for a variety of species.

The Mojave River runs approximately 100 miles from the northern slope of the San Bernardino Mountains at Summit Valley near Cajon Pass, north through Victorville, to the northeast through Barstow, and then east through the Mojave Valley and Camp Cady to a closed basin sink near Baker. The Mojave River surface water flows are mostly ephemeral and occur during the winter and spring as a result of storm runoff. Recharge of the water basin along the Mojave River is primarily (up to 80%) from stormflow infiltration from the mountains in January through March, but the water table is being overdrafted by urban use, which is affecting the hydrology of the system and riparian communities along the River. With a reduction in the snowpack and increased human demands, it is expected that the Mojave River will be stressed by future climate change.

Hydrologic effects under drier climate changes also include reduced soil moisture and less groundwater recharge. Both the PCM and GFDL models project climate water deficits, which is the difference between actual evapotranspiration (AET) and potential evapotranspiration (PET), or PET-AET, or where evaporative demand is greater than available water (See Figure 6 in Appendix P). The CBI report suggests that, with these

changes, riparian corridors will become "islands of refuge" for species at risk from extreme heat and evaporative demand.

IV.5.3.1.1 Impacts Within the Entire Plan Area in No Action Alternative

IV.5.3.1.1.1 Impacts and Mitigation for Renewable Energy and Transmission Development in No Action Alternative

For the No Action Alternative, the locations for development may not avoid disturbance to the most sensitive surface water resources having the highest value for hydrologic function including maintaining natural surface water processes, groundwater processes, hydrogeomorphic processes, and hydrologic regimes. The impacts that have been defined are the types identified by, and based on the experience of, the lead agencies for approved solar, wind, and geothermal renewable energy, and transmission projects.

The No Action Alternative would allow renewable energy and transmission development anywhere within existing unrestricted lands in the Plan Area. The following impacts from ground disturbance and development within drainage areas can cause one or more of the following long-term effects common to the No Action Alternative and all other alternatives.

Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.

The extent to which drainage patterns can be altered and the risk of flooding on or off site increased is a combination of one or more of the following effects from development within a floodplain:

- Alter the existing drainage pattern of the site or area through grading or channelization, resulting in concentrated stormwater flow patterns that increase the potential for erosion, sediment transport, and flooding effects compared with the natural diffused or distributary stormwater flow patterns.
- Substantially increase the rate or amount of surface runoff by ground disturbance and treatments that make the ground less pervious (e.g., paving) in a manner that could result in flooding or substantial erosion and sediment transport on or off site.
- Diminish the physical and biological crusts on relatively undisturbed soil surface areas of playas, increasing their vulnerability to erosion.
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or contribute to substantial additional sources of polluted runoff.

Any ground disturbance in the vicinity of a surface water feature, particularly those associated with construction and decommissioning, can lead to long-term adverse impacts to surface water resources. Significant land disturbance can occur during the construction and removal of facilities. As discussed in Section IV.5.2, Typical Impacts Common to All Action Alternatives, development with the greatest to the least land disturbance is typically solar, geothermal, wind energy, and transmission.

As shown in Table IV.5-2, development within the No Action Alternative could occupy about 10,500 acres of lands within the Plan Area's mapped 100-year floodplain. This represents about 1.2% of the total mapped 100-year floodplain area. Solar energy represents about two-thirds of this small percentage of potential development, mostly in the Cadiz Valley and Chocolate Mountains and Imperial Borrego Valley ecoregion subareas. This would suggest that almost 99% of the development would not be in the 100-year floodplain. However, it is important to recognize that overall, 66% of the Plan Area has not been assessed for flood potential, suggesting that development within the Plan Area's 100-year floodplain could occupy more than 1.2% of the total area.

The No Action Alternative would not have protections under CMAs that apply to the action alternatives, so therefore does not require that areas not previously assessed by the Federal Emergency Management Agency (FEMA) undergo hydrologic study to determine the 100-year floodplain in proximity to the project, and to avoid development within the floodplain if possible.

Table IV.5-2
Development that Could Occur Within Plan Area Mapped 100 Year Floodplains (acres) – No Action Alternative

	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain Acreage that could be Developed	6,000	1,000	300	2,000	10,000
Total 100-Year Floodplain Acreage in Plan Area	884,000	884,000	884,000	884,000	884,000
Percent of 100-Year Floodplain that could be Developed	0.73%	0.15%	0.03%	0.28%	1.2%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.

Land disturbance activities during project development, including clearing, grading, excavation, road construction, vegetation removal, fencing, drainage and flood control structures, have the potential to disrupt drainage patterns, particularly of ephemeral stream channels. Considering the large area of most renewable energy developments, it is likely that ephemeral and intermittent streams will flow through proposed project areas, and that their drainage paths and patterns will be altered. Land disturbance can also alter the course of a stream or river, or change its flow rates and frequencies, causing variations to morphological and ecological processes that affect vegetation and animal species.

While Table R2.5-2 and Table R2.5-3 (in Appendix R2) suggest that the potential development impacts to linear and areal surface water resources would be minimal on an overall basis (representing potential impacts to 0.7% of linear and 0.3% of areal surface water resources), it is important to recognize the data limitations. Impacts to linear surface water features can potentially be underestimated since the available data is limited to consideration of only centerline lengths rather than the areal extent of these features as defined by their streambeds and channel banks.

Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality.

During all phases of plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, if not properly handled and contained, can spill and cause contamination to soils, surface water bodies, and groundwater. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly established within containment areas, and can cause degradation and long-term adverse effects to both water quality and the beneficial uses of surface waters and groundwater.

Although there are no quantifiable metrics for Impact FH-3, there are distinctions in the level of potential exposure for contaminants to enter surface waters by technology. Thermal trough technology, for example, which uses a heat transfer fluid conveyed throughout the solar field, likely has the highest exposure for spills and contamination. Although this technology uses a variety of safeguards to monitor and detect such a release and limit a release should a line rupture, it is not fail safe. Thermal power tower and geothermal energy would normally limit exposure to storage of hazardous materials and wastes around the power block, which has containment systems. PV solar, wind energy, and transmission have the least exposure because there is no need for large quantities of hazardous materials to be used and stored on site (other than for the associated oil-filled

electric switchgear and transformers common to all renewable energy and transmission developments). The handling, transportation, storage, and disposal of hazardous materials and wastes are regulated by a wide range of laws and regulations which would avoid or limit the exposure for accidental spills and releases.

Laws and Regulations

Existing laws and regulations would reduce the impacts of renewable energy development projects in the absence of the DRECP. Relevant regulations are presented in the Regulatory Setting in Volume III. Note that because this EIR/EIS addresses amendments to BLM's land use plans, these plans are addressed separately and are not included in this section. The requirements of relevant regulations would reduce impacts through the following mechanisms:

- The Clean Water Act (CWA) establishes water quality standards, discharge prohibitions and waste discharge limits that would help prevent degradation of surface and groundwater quality related to discharges to surface waters and wetlands, point source discharges (including stormwater), and dredge and fill activities in surface waters and wetlands.
- The Resource Conservation and Recovery Act (RCRA) would help protect surface water resources from contamination by regulating the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA is administered in California by the Department of Toxic Substances Control and California's Regional Water Quality Control Boards (RWQCBs).
- Federal Executive Order 11990 – Protection of Wetlands (as applicable to federal lands) and State Executive Order W-59-93 would require projects to avoid or minimize effects to wetlands.
- Executive Order 11988 – Floodplain Management would require developments on federal land to avoid or minimize effects within the mapped 100-year floodplain.
- The Porter–Cologne Water Quality Control Act would protect the water quality and beneficial uses of waters of the state (both surface and groundwater) under the authority of the State Water Resources Control Board (SWRCB or State Water Board) and nine RWQCBs to establish water quality standards and discharge prohibitions, issue waste discharge requirements, and implement provisions of the federal CWA.
- California Fish and Game Code, Sections 1600-1616, as amended, would help avoid or minimize effects to surface water resources from projects that could substantially divert or obstruct the natural flow or change or use any material from the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris where it may pass into any river, stream, or lake, or use materials from a streambed.

- California Fish and Game Code, Sections 5650-5656, as amended, prohibits the deposit of any substance or material that is deleterious to fish, plant life, mammals, or bird life. County General Plans and Development Codes present standards for grading and erosion control, managing stormwater, disposing of liquid waste and extracting groundwater. If a proposed site is on federal land where county regulations are not directly applicable to the project, the federal land manager has the option to confer with the county to determine and implement specific county General Plan and Development Codes as appropriate.

The Solar Programmatic EIS (PEIS)includes numerous Design Features (Appendix W) that would reduce the impacts of solar energy development, including measures to minimize erosion and runoff. Following is a summary of relevant measures.

- **WR1-1.** The project developer shall control project site drainage, erosion, and sedimentation related to stormwater runoff. The project developer shall identify site surface water runoff patterns and develop measures that prevent adverse impacts associated with project-related soil deposition and erosion throughout and downslope of the project site and project-related construction areas. This shall be implemented within a Stormwater Pollution Prevention Plan and incorporated into the POD, as appropriate. Numerous specifics are presented to ensure that effects are minimized, focusing on (a) Assessing stormwater runoff concerns, and (b) Methods to minimize stormwater runoff concerns.
- **WR1-2.** Project developers shall conduct a hydrologic study (or studies) that demonstrate a clear understanding of the local surface water and groundwater hydrology. Specifics require assessment of surface water and groundwater hydrology.
- **WR1-3.** Project developers shall coordinate with BLM and other Federal, state, and local agencies early in the planning process in order to identify water use for the solar energy project, and to secure a reliable and legally available water supply to meet project water needs. Specific requirements include (a) Assessing water use, and (b) Methods for minimizing water use.
- **WR1-4.** Project developers shall avoid and/or minimize impacts on existing surface water features, including streams, lakes, wetlands, floodplains, intermittent or ephemeral streams, and playas (any unavoidable impacts would be minimized or mitigated) and in nearby regions resulting from the development.
- **WR2-1.** Project developers shall avoid, minimize, and mitigate impacts on groundwater and surface water resources in accordance with laws and policies. Specific methods are defined to minimize impacts on surface water and groundwater resources.

- **WR3-1.** Compliance with the terms and conditions for water resource mitigation shall be monitored by the project developer. The developer shall consult with BLM through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by BLM. Specifics require how the developer shall maintain the water resource design elements during operations and maintenance of the project.
- **WR4-1.** Reclamation of the project site shall begin immediately after decommissioning to reduce the likelihood of water resource impacts from project activities. Developers shall coordinate with BLM in advance of interim/final reclamation to have BLM or other designated resource specialists on site during reclamation to work on implementing water resource requirements and BMPs. Specific methods are presented for minimizing water resource impacts associated with reclamation and decommissioning activities.

Mitigation

The No Project Alternative would not include the CMAs that are applicable to the action alternatives. Mitigation measures typically implemented to protect surface water resources include those defined here.

- **Drainage Erosion and Sedimentation Control Plan.** Lead agency stipulations typically require developers to address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, and identify all monitoring and maintenance activities. Areas of clearing and grading are to be defined. Treatments for exposed soils are to be defined, including dust palliatives. Best Management Practices (lead agency BMPs) typically include measures designed to prevent wind and water erosion, including application of chemical dust palliatives after rough grading to limit water use. BMPs also include measures to control dust and stabilize construction access roads and entrances.
- **Waste Discharge Requirements.** These requirements relate to discharges, or potential discharges, of waste that could affect the quality of waters of the U.S. or the state, and are typically developed in consultation with staff of the State Water Resources Control Board and the applicable California Regional Water Quality Control Board (Water Boards).
- **Stormwater Diversion.** For projects that include stormwater diversion channels for routing stormwater through or around a proposed renewable energy development, measures are generally implemented to assure that channels are maintained throughout the life of the project. Requirements may define sediment removal activities, vegetation management, bank protection and grade control, routine maintenance, and procedures for protection of downstream properties.

IV.5.3.1.1.2 Impacts from Reserve Design in the No Action Alternative

The No Action Alternative has no reserve design, but without approval of an action alternative, there would be continued protection of existing LLPAs like wilderness areas. In addition, under the No Action Alternative, renewable energy projects would continue to be evaluated and approved with project-specific mitigation requirements.

As indicated in Table IV.5-3 for the No Action Alternative, existing Plan Area conservation within the mapped 100-year floodplain could account for 200,497 acres, representing about 22.7% of the total mapped Plan Area 100-year floodplain acreage of 883,656 acres.

Table IV.5-3
Existing Plan Area Mapped 100-Year Floodplain That Could Be Conserved (acres) – No Action Alternative

	Existing Conservation	BLM LUPA Conservation	Total
Sum of 100-Year Floodplain Acreage that could be Conserved in Plan Area	180,000	21,000	200,000
Total 100-Year Floodplain Acreage In Plan Area	884,000	884,000	884,000
Percent of 100-Year Floodplain that could be Conserved	20.4%	2.3%	22.7%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-5 and Table R2.5-6 (Appendix R2) for the No Action Alternative, conservation of linear and areal surface water resources on an overall basis within the DFA could amount to 44.5% of the 80,000 miles of linear features and 43% of the 670,000 acres of areal surface water resources.

IV.5.3.1.2 Impacts on BLM Lands of Existing BLM Land Use Plans in No Action Alternative

The analysis in this section applies only to BLM LUPA lands within the Plan Area. Existing BLM land use plans within the Plan Area allow for renewable energy development in certain land designations including Solar Energy Zones (SEZs) and Solar PEIS Variance Lands. As indicated in Table IV.5-4 for the No Action Alternative, existing BLM land designations and management for floodplains would allow development on 12.8% of the total mapped 100-year floodplain within the DFA.

Table IV.5-4
Development that Could Occur Within BLM LUPA Lands
Affecting Mapped 100-Year Floodplains (acres) – No Action Alternative

	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain Acreage on BLM Lands that could be Developed	1,000	70	20	100	1,000
Total 100-Year Floodplain on BLM Lands	6,000	1,000	300	2,000	10,000
Percent of 100-Year Floodplain that could be Developed on BLM Lands	17.5%	5.7%	7.4%	5.0%	12.8%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-8 and Table R2.5-9 (Appendix R2), potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA of BLM LUPA lands, representing potential impacts to 0.8% of linear and 0.2% of areal surface water resources.

Existing land designations in the No Action Alternative that would conserve floodplain from development on BLM LUPA lands include ACECs. As indicated in Table IV.5-5 for the No Action Alternative, existing BLM land designations and management for floodplains would conserve 18.1% in relation to the total mapped floodplain within BLM-managed lands in the Plan Area.

Table IV.5-5
Existing Mapped 100-Year Floodplain Conserved on BLM LUPA Lands (acres) –
No Action Alternative

	Existing ACEC	Total
Sum of 100-Year Floodplain that could be Conserved on BLM Lands	24,000	24,000
Total 100-Year Floodplain on BLM Lands	133,000	133,000
Percent of 100-Year Floodplain that could be Conserved on BLM Lands	18.0%	18.0%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-11 and Table R2.5-12, conservation of linear and areal surface water resources on BLM LUPA lands would amount to 16.9% of the 80,000 miles of linear features and 10.1% of the 182,000 acres of areal surface water resources.

IV.5.3.1.3 Impacts of Natural Community Conservation Plan in No Action Alternative

The NCCP would apply to all lands within the Plan Area. In the absence of Plan implementation, the NCCP would not be approved and no incidental take permits would be issued under the NCCP. Projects would continue to be considered by the appropriate lead agency on an individual basis. The impacts that would occur in the absence of the NCCP would be the same as those described in Section IV.5.3.1.1.1 (Plan-wide analysis).

IV.5.3.1.4 Impacts of General Conservation Plan in No Action Alternative

As described in Appendix M, the GCP would apply to nonfederal lands in the Plan Area. In the absence of Plan implementation, the GCP would not be approved and no incidental take permits would be issued under the GCP. Projects would continue to be considered by the appropriate lead agency on an individual basis. The impacts that would occur in the absence of the GCP would be the same as those described in Section IV.5.3.1.1.1 (Plan-wide analysis), but would be specific to nonfederal lands.

IV.5.3.1.5 Impacts Outside the Plan Area in No Action Alternative

Outside the Plan Area, additional transmission lines would be needed to deliver the additional renewable energy to load centers (areas of high demand). It is assumed that new transmission lines outside the Plan Area would use existing transmission corridors between the Plan Area and existing substations in the more populated coastal areas of the state. The out of Plan areas through which new transmission lines might be constructed are San Diego, Los Angeles, North Palm Springs–Riverside, and Central Valley. These areas are described in Chapter III.5, Section III.5.10, Flood Hazard, Hydrology, and Drainage Areas.

IV.5.3.1.5.1 Impacts of Transmission Outside the Plan Area

Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.

Transmission lines may not substantially alter drainage or increase the risk of flooding since transmission towers have small footprints and their footings introduce minimal impervious surface. Transmission tower footing will be located outside surface water features or follow appropriate laws and regulatory processes (Fish and Game Code, Sections 1600-1616, as amended) to avoid and minimize impacts to drainage patterns.

Access roads would be either existing paved or unpaved roads and would not alter drainages appreciably. Runoff at disturbed sites would be controlled by implementation of erosion control plans and site restoration, as required by the RWQCB with jurisdiction. Runoff would not be diverted to avoid flooding on adjacent property.

Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.

Because of their small footprints and wide spacing, transmission towers are not expected to alter hydrologic process or affect surface water features. Tower footings introduce little to no barriers to flow, and the area around towers is typically restored to pre-construction conditions. Towers are generally not sited in watercourses. If it is necessary to site towers in wide playas, they are protected from erosion and minimally affect flows. Access roads may locally divert overland flows during storm events to prevent erosion, but this would be a localized event and would not disrupt or alter overall hydrologic processes.

Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality.

The primary potential contaminant used during transmission line construction would be fuel. Typically, fuel trucks deliver fuel to work sites and refuel equipment directly; fuel is not stored on site. Accidental spills can occur, but fuel vendors are required to have appropriate spill containment available so spills would be cleaned up immediately. Refueling is also typically required to be at least 50 feet from the nearest watercourse.

IV.5.3.1.5.2 Impacts of Existing BLM Land Use Plans Outside the Plan Area

Under the No Action Alternative, the existing BLM CDCA land use plan would continue to be implemented on CDCA lands. Under the No Action Alternative, renewable energy projects would still be developed through BLM's existing policies. Impacts on surface water resources would be of the types described in Section IV.5.2.1, with similar impact reduction measures being included on a case-by-case basis.

The existing land designations, such as existing protected areas, ACECs, and National Scenic and Historic Trails, would continue to be managed to protect their associated values and resources.

IV.5.3.1.6 CEQA Significance Determination: No Action Alternative

FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. Land disturbance activities associated with development of renewable energy technologies and transmission lines in the Plan Area,

including clearing, grading, excavation, road construction, vegetation removal, fencing, drainage and flood control structures, have the potential to disrupt drainage patterns, particularly of ephemeral stream channels. These activities can also increase the risk of flooding by changing the magnitude and timing of runoff and its path to flow over land. Adoption of the typical mitigation measures described for the No Action Alternative, along with applicable regulations, would generally ensure that impacts to surface water resources would be less than significant.

FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities. Adoption of the typical mitigation measures described for the No Action Alternative, along with applicable regulations, would generally ensure that impacts to surface water resources would be less than significant.

FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of a project's life, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, if not properly handled and contained, can spill and cause contamination to soils, surface water bodies, and groundwater. Stored hazardous materials and wastes can be disturbed from stormwater and flooding if not properly established within containment areas, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. Adoption of the typical mitigation measures described for the No Action Alternative, along with applicable regulations, would generally ensure that impacts to surface water resources would be less than significant.

IV.5.3.2 Preferred Alternative

For the Preferred Alternative, geographically dispersed DFAs would be created on public and private lands, providing a range of siting flexibility for renewable energy development. Additional conservation lands would be designated by BLM LUPA and Conservation Planning Area designations.

Figure IV.5-2 shows the geographic distribution of where renewable energy facilities would be located in DFAs, relative to surface water resources for the Preferred Alternative. Major surface water resources that could experience development under the Preferred Alternative include the Mojave and Colorado rivers.

IV.5.3.2.1 Plan-wide Impacts of Implementing the DRECP: Preferred Alternative

IV.5.3.2.1.1 Plan-wide Impacts and Mitigation Measures from Renewable Energy and Transmission Development

Impact Assessment

The types of impacts that would occur for the Preferred Alternative would be similar to impacts for the No Action Alternative. Please see Section IV.5.3.1.1.1 for a more detailed description of impacts common to all alternatives. The following assessment is limited to alternative-specific measures.

Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.

The following measure of potential activity within the 100-year floodplain indicates that potential adverse effects from development can lead to substantially altering drainage patterns and increasing the risk of flooding.

As indicated in Table IV.5-6 for the Preferred Alternative, development within the DFA would occupy about 15,000 acres of lands currently within the 100-year floodplain. This represents about 1.7% of the total mapped 100-year floodplain area of the DFA. Solar energy represents about two thirds of this small percentage of potential development that could occur within the mapped 100-year floodplain, mostly in the Cadiz Valley and Chocolate Mountains, and West Mojave and Eastern Slopes ecoregion subareas. This would suggest that over 98% of the development within the DFA would avoid the 100-year floodplain. However, it is important to recognize that overall, 66% of the Plan Area has not been assessed for flood potential, suggesting that development within the 100-year floodplain could occupy more than 1.7% of the total area of the DFA. The CMAs would require areas that have not been previously assessed by FEMA to undergo hydrologic study to determine the 100-year floodplain in proximity to the project, and to avoid development within the floodplain if possible.

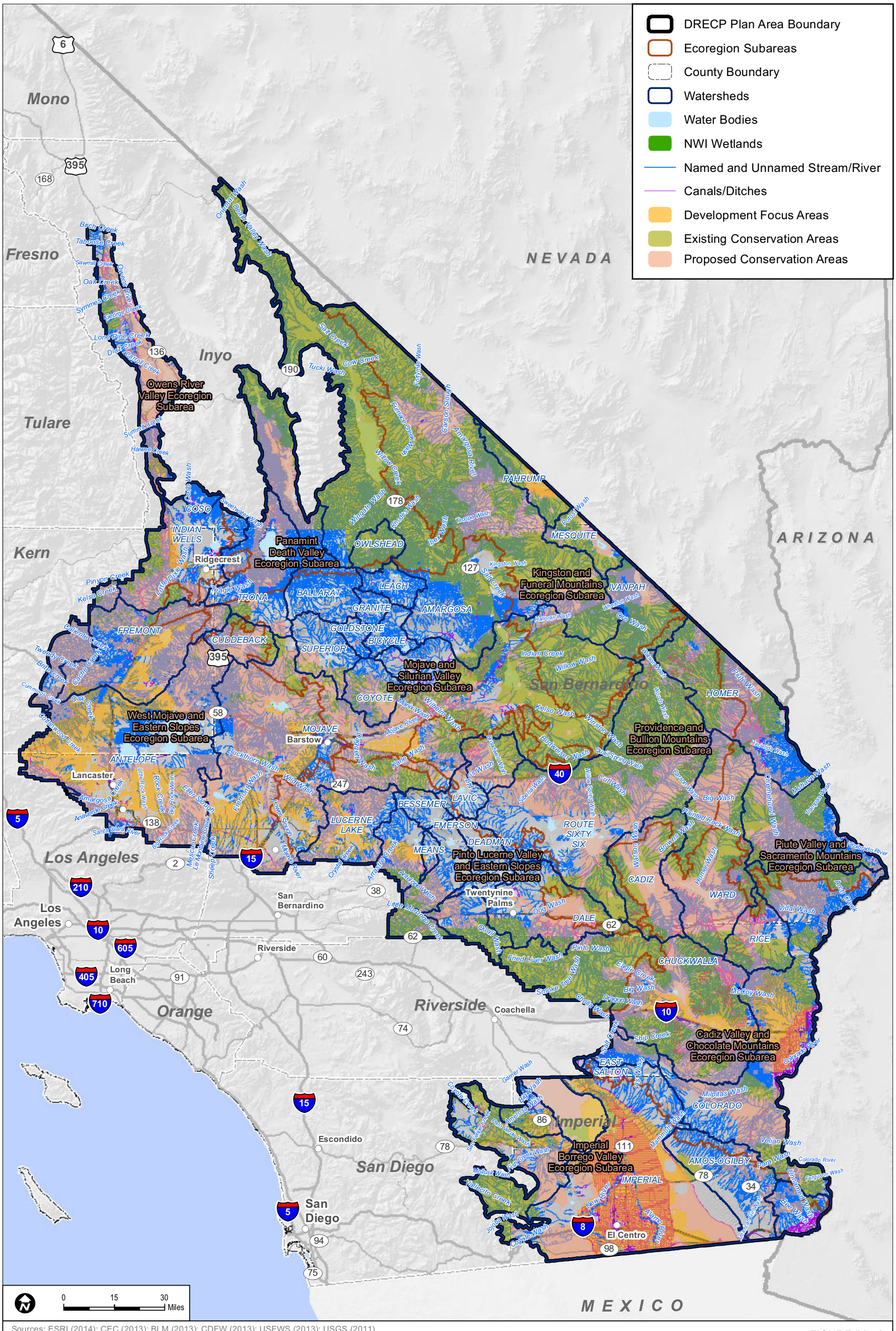
Table IV.5-6
Development that Could Occur Within Plan Area Mapped 100-Year Floodplains (acres) – Preferred Alternative

DRECP DFA Assessment	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain Acreage that could be Developed in Plan Area	11,000	600	2,000	2,000	15,000
Total 100-Year Floodplain Acreage in Plan Area	884,000	884,000	884,000	884,000	884,000
Percent of 100-Year Floodplain that could be Developed in Plan Area	1.2%	0.1%	0.2%	0.2%	1.7%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.

The following measures of potential activity within surface water features indicate the potential adverse effects from development within or near these surface water resources. While Table R2.5-14 and Table R2.5-15 in Appendix R2 suggest the potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA, representing potential impacts to 0.7% of linear and 1.2% of areal surface water resources, it is important to recognize the data limitations. Impacts to linear surface water features could potentially be underestimated since the available data is limited to considering only the centerline lengths rather than the areal extent of these features, as defined by their streambeds and channel banks and additional surface water features that have not been previously mapped.



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USGS (2011)

FIGURE IV.5-2

Linear and Areal Surface Water Resources and Watersheds in the Plan Area - Preferred Alternative

Draft DRECP and EIR/EIS

August 2014

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Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality.

Section IV.5.3.1.1.1, No Action Alternative, presents a detailed description of Impact FH-3, which is common to all alternatives.

Impacts in Study Area Lands

Study Area Lands refer to three categories of lands shown on alternative maps: Future Assessment Areas (FAAs), Special Analysis Areas (SAAs) and DRECP Variance Lands.

Future Assessment Areas. Lands within FAAs are neither reserve lands nor DFAs; they are simply areas that are deferred for future assessment. The future assessment will determine their suitability for renewable energy development or for ecological conservation. If renewable energy development occurs on FAA lands, a Land Use Plan Amendment would not be required. FAAs for each alternative are included and located as shown in Table IV.1-2 and Figure II.3-1 in Volume II. The FAAs represent areas where renewable energy development or inclusion to the reserve design could be implemented through an amendment to the DRECP but additional assessment would be needed.

Because most of the FAAs are presented as "undesignated areas" in the action alternatives, there would be no difference between the FAAs in the Preferred Alternative except that renewable development in an FAA would not require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the FAAs would not impact surface water resources because adequate CMAs and mitigation would apply to any development areas.

Special Analysis Areas. There are two areas defined as SAAs, representing areas subject to special ongoing analysis. These areas (located in the Silurian Valley and just west of Highway 395 in Kern County) have high value for renewable energy development, and also high value for ecological and cultural conservation, and recreation. SAA lands are expected to be designated in the Final EIR/EIS as either DFAs or included in the Reserve Design/Conservation Designation.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on variance lands would nt require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would not impact surface water resources.

Impact Reduction Strategies and Mitigation

The implementation of the Plan would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components. Also, the implementation of existing laws, orders, regulations and standards would reduce the impacts of project development on a project by project basis. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for the Preferred Alternative (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alternative. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands.

Similar among all action alternatives are CMAs that would effectively reduce impacts to surface water resources even though the potential impact exposure varies as a function of the location of surface water in proximity to areas designated for development and conservation. The primary CMAs include:

- Precluding construction within, or alteration of, 100-year floodplains where possible, and permitting only when all required permits from other agencies are obtained. The 100-year floodplain would be determined by hydrologic modeling and analysis if not already determined by FEMA;
- Establishing exclusion areas with buffer areas in all wetlands, riparian areas (seeps, springs, perennial and intermittent streams), playas (dry lake beds), and Wild and Scenic River corridors, and limiting effects to less than 5% of the total resource within the project right-of-way, or those that can be adequately mitigated;
- Reducing ground disturbance to water resources by requiring to the maximum extent feasible that construction equipment and vehicles use existing roads and utility corridors, and avoid cross-country travel. Within the project boundaries, cross-country vehicle and equipment use would be prohibited outside of approved designated work areas;
- Reducing the impacts to water resources by implementing standard practices that would prevent water erosion and sediment transport, and would require proper

containment of hazardous materials and wastes. This would include preparing a site-specific drainage, erosion and sediment control plan for all phases of the project.

Plan-wide CMAs require that the siting and design of Covered Activities maintain the function of natural surface water processes, groundwater processes, hydrogeomorphic processes, and hydrologic regimes. Existing laws and regulations associated with wetlands and water features would also apply to Covered Activities. Additionally, the Riparian and Wetland Natural Communities and Covered Species CMAs will provide additional avoidance and minimization that will contribute to maintaining and promoting hydrologic function. While the CMAs were developed for BLM lands, this analysis assumes that all CMAs would also be applied to nonfederal lands in the Plan Area.

A summary of the biological CMAs influencing conservation of water resources and their associated values for all alternatives in the Plan Area is presented here:

- CMA AM-PW-3 would establish setbacks to avoid and buffer certain water resources including riparian vegetation (seeps, springs, perennial and intermittent streams), wetlands, and agricultural canal and drain facilities. For the Mojave River, the setback would be the edge of the mapped riparian vegetation or the FEMA 100-year floodplain, whichever is greater.
- CMA AM-PW-9 would reduce the impacts to water resources by implementing standard practices that would prevent water erosion and sediment transport, and would require proper containment of hazardous materials and wastes. This would include preparing a site-specific drainage, erosion and sediment control plan for all phases of the project.
- CMA AM-PW-14 would reduce the impacts of ground disturbance to water resources by requiring to the maximum extent feasible that construction equipment and vehicles use existing roads and utility corridors, and avoid cross-country travel. Within the project boundaries, cross-country vehicle and equipment use would be prohibited outside of approved designated work areas.
- CMA-AM-LL2 would require that the siting and design of Covered Activities maintain the function of natural surface water processes, groundwater processes, hydrogeomorphic processes, and hydrologic regimes. Existing laws and regulations associated with wetlands and water features would also apply to Covered Activities.

A summary of the nonbiological CMAs influencing conservation of water resources and their associated values for various areas of land in the Plan Area, or as applicable to particular alternatives, are listed here:

- Impacts to surface water resources associated with renewable energy development on all BLM lands (and effectively all lands) in the Plan Area would be reduced by establishing exclusion areas with buffer areas in all wetlands, riparian areas (seeps,

springs, perennial and intermittent streams), playas (dry lake beds), and Wild and Scenic River corridors, and limit effects to less than 5% of the total resource within the project right-of-way, or those that can be adequately mitigated.

- Construction within, or alteration of, 100-year floodplains would be avoided where possible, and permitted only when all required permits from other agencies are obtained. The 100-year floodplain would be determined by hydrologic modeling and analysis if not already determined by FEMA.
- Development in the vicinity of Death Valley National Park, Joshua Tree National Park, or Mojave National Preserve would require all unavoidable impacts to surface waters be mitigated to ensure no net loss of function and value, that existing hydrology be maintained to the extent possible, and hydrologic alterations be avoided that could reduce water quality except if impacts are temporary or are minimal (less than 5% of the total mapped resources within the project right-of-way or can be adequately mitigated).

The CMAs for the Preferred Alternative related to Flood, Hydrology and Drainage Areas are the following:

- Preclude construction within, or alteration of, 100-year floodplains where possible, and permitting only when all required permits from other agencies are obtained. The 100-year floodplain would be determined by hydrologic modeling and analysis if not already determined by FEMA;
- Establish exclusion areas in all wetlands, riparian areas (seeps, springs, perennial and intermittent streams), playas (dry lake beds), and Wild and Scenic River corridors, and limit effects to less than 5% of the total resource within the project right-of-way, or those that can be adequately mitigated;
- Establish buffer zones, riparian setbacks, no-development areas, etc., identified as appropriate to a particular feature or resource, as will be determined on a site-specific basis, and will be consistent with the plan decision to protect these resources as appropriate. In general, placement of permanent facilities within buffers or protected zones will be discouraged, but may be permitted if water and riparian resource management objectives can be maintained, and if critical resources including Threatened & Endangered species are fully protected.
- Section 404 and 401 of the CWA and Fish and Game Code Section 1600 et seq. will be complied with for dry washes within the proposed ROW that have been or will likely be determined to be federal and/or state jurisdictional waters.
- Section 402 of the CWA and Fish and Game Code Section 5650 et seq. will be complied with for any activity that is determined to be a point source of pollution.

- Reduce ground disturbance to water resources by requiring to the maximum extent feasible that construction equipment and vehicles use existing roads and utility corridors, and avoid cross-country travel. Within the project boundaries, cross-country vehicle and equipment use would be prohibited outside of approved designated work areas;
- Reduce the impacts to water resources by implementing standard practices that would prevent water erosion and sediment transport, and would require proper containment of hazardous materials and wastes. This would include preparing a site-specific drainage, erosion and sediment control plan for all phases of the project.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.5.3.1.1.1.

Mitigation Measures

After implementation of the CMAs and existing laws and regulations, the following mitigation measures would allow participating agencies to require additional protection as appropriate during their subsequent review of specific projects. The following mitigation measures should be considered for each project.

Mitigation Measures for Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.

The CMAs, if applied to all lands in the Plan Area, provide a solid basis for protection of waters and water quality. Mitigation Measure FH-1a is required to supplement these measures.

FH-1a **Develop and Implement Erosion and Sedimentation Control Plan.** Prior to site mobilization, the developer shall develop a site-specific plan that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. The plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, and identify all monitoring and maintenance activities. The developer shall complete all engineering plans, reports, and documents necessary for the lead agency to assure the proposed grading, drainage improvements, and flood management activities comply with all requirements. The plan shall contain the following elements:

- **Vicinity Map:** A map shall be provided indicating the location of all project elements with depictions of all major geographic features to include watercourses, washes, distributary networks, irrigation and drainage canals, major utilities, and sensitive areas.
- **Site Delineation:** The site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, underground utilities, roads, and drainage facilities. Adjacent property owners shall be identified on the plan maps. All maps shall be presented at a legible scale.
- **Drainage:** The plan shall include the following elements:
    - **Topography –** Topography for off-site areas to define the existing upstream tributary areas to the site and downstream to provide enough definition to map the existing stormwater flow and flood hazard. Spot elevations shall be required where relatively flat conditions exist.
    - **Proposed Grade –** Proposed grade contours shall be shown at a scale appropriate for delineation of on-site ephemeral washes, drainage ditches, and tie-ins to the existing topography.
    - **Hydrology –** Existing and proposed hydrologic calculations for on-site areas and off-site areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and show all existing, interim, and proposed drainage infrastructure, and their intended direction of flow for a distance of at least 200' off site, and more if necessary if it can be reasonably expected that concentration of flow may cause off-site impacts such as channel incision erosion or exceedence of capacity.
    - **Hydraulics –**Provide hydraulic calculations to support the selection and sizing of the on-site drainage network, diversion facilities and BMPs.
- **Watercourses and Critical Areas:** The plan shall show the location of all on-site and nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the construction site. Maps shall identify high hazard flood prone areas.
- **Clearing and Grading:** The plan shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross-sections, cut and fill depths or other means. The loca-

tions of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The plan shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported, or a statement explaining that there would be no clearing or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.

- **Soil Wind and Water Erosion Control:** The plan shall address exposed soil treatments to be used during construction and operation of the proposed project for both road and nonroad surfaces including specifically identifying all chemical-based dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation. BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. All dust palliatives, soil binders, and weighting agents shall be approved by the lead agency prior to use. Dust palliatives shall avoid surface water features by a minimum of 100 feet.
- **Project Schedule:** The plan shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element construction, and final grading/stabilization). BMP implementation schedules shall be provided for each project element for each phase of construction.
- **Best Management Practices:** The plan shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading and stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.

Mitigation Measures for Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.

Land disturbance activities listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support

plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent, and ephemeral streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities.

While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a and Mitigation Measure FH-2a are also required. Mitigation Measure FH-2a would provide additional protection for constructed channels that would protect renewable energy projects and the surrounding environment in the desert.

FH-2a **Channel Maintenance Program.** The project developer shall develop and implement a Channel Maintenance Program (Program) that provides long-term guidance to implement stormwater channel maintenance projects and to comply with conditions of certification in a feasible and environmentally sensitive manner. The Program shall be reviewed by the lead agency. The channel maintenance work area shall be defined as the project engineered channels, typically extending to the top of bank, including access roads, and any related property that the project owns or for which it holds an easement for access and maintenance. The Program shall include all channel maintenance as needed to protect the project facilities and downstream property. Channel maintenance activities shall include the following:

1. **Sediment Removal** – sediment must be removed if it: (1) reduces the effective flood capacity to less than the design discharge, (2) prevents appurtenant hydraulic structures from functioning as intended, or (3) becomes a permanent, nonerodible barrier to instream flows.
2. **Vegetation Management** –manage vegetation in and adjacent to the channels to maintain hydraulic capacity. Vegetation management shall include control of all invasive or non-native vegetation.
3. **Bank Protection and Grade Control Repairs** – Bank protection and grade control structure repairs involve any action by the project developer to repair eroding banks, incising toes, or scoured channel beds, as well as to prevent erosion. The project developer must implement repairs when the problem: (1) causes or could cause significant damage to the project, related property, or structural elements of the channels; (2) affects public safety; (3) negatively affects groundwater recharge; or (4) negatively affects mitigation for vegetation, habitat, or species of concern.
4. **Routine Channel Maintenance** –trash removal and associated debris removal to maintain channel design capacity; repair and installation of fences, gates and signs; grading and other repairs to restore the original contour of access roads and, if applicable, levees.

Mitigation Measures for Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, if not properly handled and contained, can spill and cause contamination to soils, surface water bodies, and groundwater. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly established within containment areas, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. The existing regulations, along with CMAs, provide adequate avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.2.1.2 Impacts of the Reserve Design

Setting aside lands for no disturbance is a beneficial effect for surface water resources because road crossings and ground disturbance would be avoided in the vicinity of linear and areal surface water resources. Exacerbation of flood effects and degradation of water quality would not occur because there would not be any alteration to the drainage area and natural hydrologic processes within the 100-year floodplain. To the extent developments are avoided within drainage areas, they would also avoid potential for contamination to soil and water from project-related hazardous materials and wastes.

As indicated in Table IV.5-7, the reserve design would about double the area of mapped 100-year floodplain excluded from development, an increase from 20.4% to 37.2% as a percentage of the total mapped 100-year floodplain within the DFA associated with the Preferred Alternative. The increase in conservation of floodplain area would be 10.4% attributable from BLM's LUPA and 6.5% from the Conservation Planning Area[1].

Table IV.5-7
Existing and Additional Mapped 100-Year Floodplain Conserved from Reserve Design (acres) – Preferred Alternative

DRECP Reserve	Existing Conservation	BLM LUPA Conservation	Conservation Planning Area	Total
Sum of 100-Year Floodplain Acreage that could be Conserved in Plan Area	180,000	**92,000**	**57,000**	329,000
Total 100-Year Floodplain Acreage in Plan Area	883,000	883,000	883,000	883,000

[1] Note that Conservation Planning Areas identified on private lands are not mandatory and would only be implemented if there are willing sellers.

Table IV.5-7
Existing and Additional Mapped 100-Year Floodplain Conserved from Reserve Design (acres) – Preferred Alternative

DRECP Reserve	Existing Conservation	BLM LUPA Conservation	Conservation Planning Area	Total
Percent of 100-Year Floodplain that could be Conserved	20.4%	10.4%	6.5%	37.2%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-17 and Table R2.5-18, the reserve design would almost double the linear surface water features excluded from development for a total of 60.7% conserved among the 80,000 miles linear features, and would double the areal surface water features excluded from development for a total of 35.8% conserved among the 670,000 acres of areal surface water features.

IV.5.3.2.2 Impacts of DRECP Land Use Plan Amendment on BLM Land: Preferred Alternative

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA, and the impacts of the amended land use plans themselves.

IV.5.3.2.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

As indicated in Table IV.5-8, the mapped 100-year floodplain within the DFA designated by BLM's LUPA that could be subject to development would be 15.6% of the total mapped 100-year floodplain within the DFA associated with the Preferred Alternative.

Table IV.5-8
Development that Could Occur Within the DFA of BLM LUPA Lands Affecting Mapped 100-Year Floodplains (acres) – Preferred Alternative

DRECP DFA	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-year floodplain acreage that could be developed on BLM lands	2,000	80	100	90	2,000
Total 100-year floodplain acreage on BLM lands	11,000	600	2,000	2,000	15,000

Table IV.5-8
Development that Could Occur Within the DFA of BLM LUPA Lands Affecting Mapped 100-Year Floodplains (acres) – Preferred Alternative

DRECP DFA	Solar	Wind	Geothermal	Transmission	Total
Percent of 100-year floodplain that could be developed on BLM lands	18.4%	14.7%	8.0%	5.2%	15.6%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-20 and Table R2.5-21, potential development impacts to mapped linear and areal surface water resources would be minimal on an overall basis within the DFA of BLM LUPA lands, representing potential impacts to 0.3% of linear and 1.7% of areal surface water resources.

IV.5.3.2.2.2 Impacts of Changes to BLM Land Designations

Existing land designations in the Preferred Alternative that would conserve floodplains from development on BLM LUPA lands include ACECs, which would conserve 5.3%. As indicated in Table IV.5-9 for the Preferred Alternative, existing and proposed BLM land designations and management for floodplains would collectively conserve 83.5% in relation to the total mapped floodplain within BLM-managed lands in the Plan Area.

Table IV.5-9
Mapped 100-Year Floodplain Conserved on Existing and Proposed BLM LUPA Lands (acres) – Preferred Alternative

BLM Reserve	NLCS	ACEC	Wildlife	Wilderness Characteristics	Trail	Total
Sum of 100-Year Floodplain that could be Conserved on BLM Lands	71,000	7,000	40	13,000	20,000	111,000
Total 100-Year Floodplain on BLM Lands	133,000	133,000	133,000	133,000	133,000	133,000
Percent of 100-Year Floodplain that could be Conserved on BLM Lands	53.25%	5.27%	0.03%	9.94%	15.07%	83.5%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-23 and Table R2.5-24, conservation of mapped linear and areal surface water resources on BLM LUPA lands would amount to 78.2% of the 36,000 miles of linear features and 54.4% of the 182,000 acres of areal surface water resources.

IV.5.3.2.3 Impacts of Natural Community Conservation Plan: Preferred Alternative

The analysis of Covered Activities under the NCCP is equivalent to the Plan-wide analysis of the interagency alternatives. Reserve design features and other conservation actions under the NCCP alternatives represent more detailed categories of the reserve design under the interagency Plan-wide alternatives. These NCCP differences in reserve design features do not affect nonbiological resources analyzed in this document, and the analysis of reserve design and CMAs under the NCCP is therefore equivalent to the Plan-wide analysis of the interagency alternatives, as described in Section IV.5.

IV.5.3.2.4 Impacts of General Conservation Plan

The impacts of the GCP for the Preferred Alternative would be similar to those defined in Section IV.5.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. Areas of development occurring within the 100-year floodplain for both the GCP and Plan Area would occur mostly in the Cadiz Valley and Chocolate Mountains and West Mojave and Eastern Slopes ecoregion subareas. As indicated in Table R2.5-25, the potential extent of development within the 100-year floodplain compared with the total floodplain area would be higher for the GCP when compared with the Plan-wide DFA areas (at 3.1% of the 114,000 acres of GCP floodplain and 0.7% of the 883,000 acres of Plan-wide floodplain, respectively). As indicated in Table IV.5-26, the potential extent of GCP development affecting linear surface water features would be 2.2% of the 18,000 total miles of linear features, compared with 0.7% of the 80,000 miles Plan-wide. As indicated in Table IV.5-27, the potential extent of GCP development affecting areal surface water features would be 1.3% of the 227,000 total acres of areal features compared with 1.2% of the 670,000 acres Plan-wide.

As indicated in Table IV.5-28, conservation within the mapped 100-year floodplain compared with the total floodplain area would be less, proportionately, than for the GCP compared with the Plan-wide reserve areas (at 11.6% of the 524,000 acres of GCP floodplain and 37.2% of the 883,000 acres of DRECP floodplain, respectively). As indicated in Table IV.5-29, conservation associated with GCP protecting linear surface water features would be 14.4% of the 18,000 total miles of linear features, compared with 60.7% of the 80,000 miles Plan-wide. As indicated in Table IV.5-30, conservation associated with the GCP conservation land protecting areal surface water features would be 12.1% of the 227,000 total acres of areal features compared with 35.8% of the 670,000 acres Plan-wide.

IV.5.3.2.5 Impacts Outside the Plan Area

IV.5.3.2.5.1 Impacts of Transmission Outside the Plan Area

The impacts of transmission outside the Plan Area on flooding, hydrology, and drainage would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.5.3.1.5, Impacts Outside the Plan Area in No Action Alternative.

IV.5.3.2.5.2 Impacts of BLM LUPA Decisions Outside the Plan Area

To the extent that BLM's LUPA conserves lands and limits renewable energy and transmission development, it would be beneficial for surface water resources. The extent to which surface water resources are affected or protected from development is expected to be generally similar both outside and within the Plan Area.

IV.5.3.2.6 CEQA Significance Determination for the Preferred Alternative

CEQA significance for the Preferred Alternative for each impact follows.

FH-1: Plan components could substantially alter existing drainage processes and increase the risk of flooding on or off site. Land disturbance activities associated with development of renewable energy technologies and transmission lines in the Plan Area, including clearing, grading, excavation, road construction, vegetation removal, fencing, drainage and flood control structures, have the potential to disrupt drainage patterns, particularly of ephemeral stream channels. These activities can also increase the risk of flooding by changing the magnitude and timing of runoff and its path to flow over land. While the CMAs provide substantial avoidance and protection measures to surface water resources, mitigation measure FH-1a is also required. With adoption of Mitigation Measure FH-1a, Impact FH-1 would be less than significant to surface water resources.

FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities. While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measures FH-1a and FH-2a are required to provide additional protection to water resources. With adoption of these mitigation measures, Impact FH-2 would be less than significant to surface water resources.

FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, if not properly handled and contained, can spill and cause contamination to soils, surface water bodies, and groundwater. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly established within containment areas, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. Existing regulations, in combination with CMAs, provide substantial avoidance and protection measures to surface water resources, and would reduce Impact FH-3 to less than significant levels.

IV.5.3.2.7 Comparison of the Preferred Alternative with No Action Alternative

This section summarizes the comparison of the Preferred Alternative with the No Action Alternative. While there is data that provide us some basis for comparison, it is important to recognize that the No Action Alternative lacks guiding principles for locating facilities and may not result in the consistent and comprehensive application of mitigation measures as in the Preferred Alternative. Thus, the magnitude of detrimental environmental effects can potentially be greater than for the No Action Alternative, regardless of the results of the available metrics used to compare the alternatives.

IV.5.3.2.7.1 Preferred Alternative Compared with No Action Alternative for Plan-wide DRECP

Comparison of the Preferred and No Action Alternatives with respect to potential for Plan-wide development impacts to surface water resources is summarized as follows:

- The Preferred Alternative could allow development of up to 1.7% of the total mapped 100-year floodplain compared to 1.2% for the No Action Alternative.
- The Preferred Alternative could allow development of up to 0.7% of linear surface water features compared to 0.7% for the No Action Alternative.
- The Preferred Alternative could allow development of up to 1.2% of areal surface water features compared to 0.3% for the No Action Alternative.

Comparison of the Preferred and No Action Alternatives with respect to Plan-wide conservation of surface water resources is summarized as follows:

- The Preferred Alternative would conserve 37.2% of the total mapped 100-year floodplain compared to 22.7% for the No Action Alternative.
- The Preferred Alternative would conserve 60.7% of linear surface water features compared to 44.5% for the No Action Alternative.
- The Preferred Alternative would conserve 35.8% of areal surface water features compared to 43.0% for the No Action Alternative.

IV.5.3.2.7.2 Preferred Alternative Compared with No Action Alternative for the BLM Land Use Plan Amendment

Comparison of the Preferred and No Action Alternatives with respect to potential BLM LUPA development impacts to surface water resources is summarized as follows:

- The Preferred Alternative could allow development of up to 15.6% of the total mapped 100-year floodplain compared to 12.8% for the No Action Alternative.
- The Preferred Alternative could allow development of up to 0.3% of linear surface water features compared to 0.8% for the No Action Alternative.
- The Preferred Alternative could allow development of up to 1.7% of areal surface water features compared to 0.2% for the No Action Alternative.

Comparison of the Preferred and No Action Alternatives with respect to BLM LUPA conservation of surface water resources is summarized as follows:

- The Preferred Alternative would conserve 83.5% of the total mapped 100-year floodplain compared to 18.0% for the No Action Alternative.
- The Preferred Alternative would conserve 78.2% of linear surface water features compared to 16.9% for the No Action Alternative.
- The Preferred Alternative would conserve 54.4% of areal surface water features compared to 10.1% for the No Action Alternative.

IV.5.3.2.7.3 Preferred Alternative Compared with No Action Alternative for NCCP

The impacts of the NCCP for the Preferred Alternative are the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis. As a result, the comparison of the Preferred Alternative with the No Action Alternative for the NCCP is the same as described for Plan-wide DRECP.

IV.5.3.2.7.4 Preferred Alternative Compared with No Action Alternative for the GCP

The GCP is not applicable to the No Action Alternative, and thus there is no basis for comparison to the Preferred Alternative.

IV.5.3.3 Alternative 1

For Alternative 1, geographically confined DFAs would focus on private lands with emphasis on solar and geothermal energy development. Additional conservation lands would be designated by BLM LUPA and Conservation Planning Area designations.

Figure IV.5-3 shows the geographic distribution of both projects and conservation areas, in relation to surface water resources for Alternative 1. Major surface water resources that could experience development in their vicinity under Alternative 1 include the Mojave and Colorado rivers.

IV.5.3.3.1 Plan-wide Impacts of Implementing the DRECP: Alternative 1

IV.5.3.3.1.1 Plan-wide Impacts and Mitigation Measures from Renewable Energy and Transmission Development

Impact Assessment

The types of impacts that would occur for Alternative 1 would be similar to impacts for the No Action Alternative. Please see Section IV.5.3.1.1.1 for a more detailed description of impacts common to all alternatives.

Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.

The following measure of potential activity within the 100-year floodplain indicates the potential adverse effects from development that can lead to substantially altering drainage patterns and increasing the risk of flooding.

As indicated in Table IV.5-10 for Alternative 1, development within the DFAs could occupy about 17,398 acres of lands currently assessed as being within the 100-year floodplain. This represents about 2% of the total mapped 100-year floodplain area of the Plan Area. Solar energy represents about three quarters of this small percentage of potential development that could occur within the mapped 100-year floodplain, mostly in the Imperial Borrego Valley, Pinto Lucerne Valley and Eastern Slopes, and West Mojave and Eastern Slopes ecoregion subareas. As assessed currently, this would suggest that about 98% of the development within the DFA would avoid the 100-year floodplain. However, it is important to recognize that overall, 66% of the Plan Area has not been assessed for flood potential, suggesting that development within the 100-year floodplain could occupy more than 2% of the total area of the DFA. The CMAs would require areas that have not been previously assessed by FEMA to undergo hydrologic study to determine the 100-year floodplain in proximity to the project, and to avoid development within the floodplain if possible.

Table IV.5-10
Development that Could Occur Within Plan Area - Mapped 100-Year Floodplains (acres) – Alternative 1

	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain Acreage that could be Developed in Plan Area	13,000	80	3,000	2,000	17,000
Total 100-Year Floodplain Acreage in Plan Area	883,000	883,000	883,000	883,000	883,000
Percent of 100-Year Floodplain that could be Developed in Plan Area	1.5%	0.01%	0.3%	0.2%	2.0%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.

The following measures of potential activity within surface water features indicate the potential adverse effects from development within or near these surface water resources. While Table R2.5-32 and Table R2.5-33 in Appendix R2 suggest that potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA (representing potential impacts to 0.7% of linear and 1.4% of areal surface water resources), it is important to recognize the data limitations. There is the potential to underestimate impacts to linear surface water features since the available data is limited to considering only the centerline lengths rather than the areal extent of these features as defined by their streambeds and channel banks.

Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality.

Please see Section IV.5.3.1.1.1 for the No Action Alternative for a more detailed description of Impact FH-3.

Impacts in Study Area Lands

Future Assessment Areas. There are no FAAs in Alternative 1.

Special Analysis Areas. Designating the SAAs as conservation would have no impact to surface water resources. Impacts would be the same as those explained for the Plan-wide reserve design in Section IV.5.3.2.1.2, Impacts of the Reserve Design.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on variance lands would nt require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would not impact surface water resources.

Impact Reduction Strategies and Mitigation

The implementation of the Plan would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components.

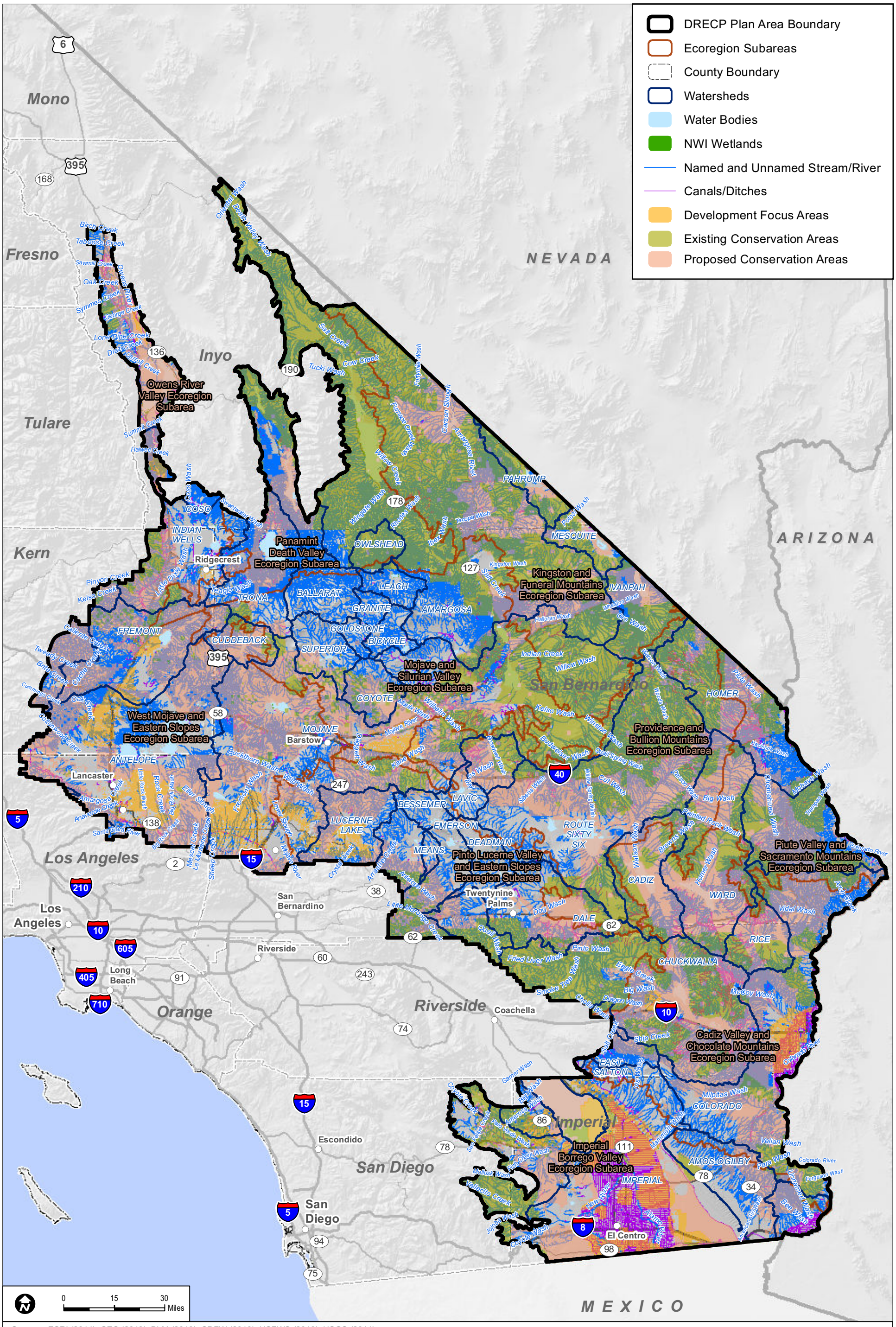
Also, the implementation of existing laws, orders, regulations and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for Alternative 1 (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs, as defined for the Preferred Alternative in Section IV.5.3.1.1. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.5.3.1.1.1.



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USGS (2011)

FIGURE IV.5-3

Linear and Areal Surface Water Resources and Watersheds in the Plan Area - Alternative 1

Draft DRECP and EIR/EIS

August 2014

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Mitigation Measures

After implementation of the CMAs and existing laws and regulations, the following mitigation measures would allow participating agencies to require additional protections as appropriate during subsequent review of specific projects. The following mitigation measures should be considered for each project.

Mitigation Measures for Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. The CMAs provide a solid basis for protection of waters and water quality. Mitigation Measure FH-1a (as described for the Preferred Alternative) is required to supplement these measures.

Mitigation Measures for Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities. While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measures FH-1a and FH-2a (see Preferred Alternative) are required. Mitigation Measures FH-2a would provide additional protection related to constructed channels that would protect renewable energy projects and the surrounding environment in the desert.

Mitigation Measures for Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, if not properly handled and contained, can spill and cause contamination to soils, surface water bodies, and groundwater. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly established within containment areas, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. The existing regulations, along with CMAs, provide adequate avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.3.1.2 Impacts from Reserve Design

Setting aside lands for no disturbance is a beneficial effect for surface water resources because road crossings and ground disturbance would be avoided within, and in the vicinity of, linear and areal surface water resources. Exacerbation of flood effects and degradation

of water quality would not occur because there would not be any alteration to the drainage area and natural hydrologic processes within the 100-year floodplain. To the extent development is avoided within drainage areas, it would also avoid potential for contamination to soil and water from project-related hazardous materials and wastes.

As indicated in Table IV.5-11, the reserve design would almost double the area of mapped 100-year floodplain excluded from development, an increase from 20.4% to 37.0% as a percentage of the total mapped 100-year floodplain within the DFA associated with Alternative 1. The increase in conservation of floodplain area above existing would be 9.7% as attributable from BLM's Land Use Plan Amendment (LUPA), and 6.9% from the Conservation Planning Area.

Table IV.5-11
Existing and Additional Mapped 100-Year Floodplain Conserved from Reserve Design (acres) – Alternative 1

	Existing Conservation	BLM LUPA Conservation	Conservation Planning Area	Total
Sum of 100-Year Floodplain Acreage that could be Conserved in Plan Area	180,000	86,000	61,000	327,000
Total 100-Year Floodplain Acreage in Plan Area	883,000	883,000	883,000	883,000
Percent of 100-Year Floodplain that could be Conserved in Plan Area	20.4%	9.7%	6.9%	37.0%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-35 and Table R2.5-36, the reserve design would almost double the linear surface water features excluded from development for a total of 60% conserved among the 80,000 miles linear features, and would almost double the areal surface water features excluded from development for a total of 38% conserved among the 670,000 acres of areal surface water features.

IV.5.3.3.2 Impacts of DRECP Land Use Plan Amendment on BLM Land: Alternative 1

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA, and the impacts of the amended land use plans themselves.

IV.5.3.3.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

As indicated in Table IV.5-12, the mapped 100-year floodplain within the DFA designated by BLM's LUPA as subject to development would be 2.9% of the total mapped 100-year floodplain within the DFA associated with Alternative 1.

Table IV.5-12
Mapped 100-Year Floodplain Within the BLM LUPA Area that Could be Developed (acres) – Alternative 1

	Solar	Wind	Geothermal	Transmission	Total
100-Year Floodplain Acreage that could be Developed on BLM Lands	300	0	40	100	500
Total 100-Year floodplain Acreage on BLM Lands	13,000	80	3,000	2,000	17,000
Percent of 100-Year Floodplain A that Could be Developed on BLM Lands	2.7%	0.00%	1.6%	7.1%	2.9%

Note: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-38 and Table R2.5-30, potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA of BLM LUPA lands, representing potential impacts to 0.3% of linear and 0.1% of areal surface water resources.

IV.5.3.3.2.2 Impacts of Changes to BLM Land Designations

Existing land designations in Alternative 1 that would conserve floodplains from development on BLM LUPA lands include ACECs, amounting to 33.7% conservation. As indicated in Table IV.5-13, existing and proposed BLM land designations and management for floodplains would collectively conserve 65.1% in relation to the total floodplain within BLM managed lands in the Plan Area.

Table IV.5-13
Existing and Proposed Mapped 100-Year Floodplain Conserved on BLM LUPA Lands (acres) – Alternative 1

	NLCS	ACEC	Wildlife Area	Wilderness	Trails	Total
Sum of100-Year Floodplain Acreage that could be Conserved on BLM Lands	21,204	44,646	5,005	13,174	2,293	86,322
Total 100-Year Floodplain Acreage on BLM Lands	132,595	132,595	132,595	132,595	132,595	132,595
Percent of 100-Year Floodplain that could be Conserved	16.0%	33.7%	3.8%	9.9%	1.7%	65.1%

Note: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-41 and Table R2.5-42, conservation of linear and areal surface water resources on BLM LUPA lands would amount to 64% of the 36,000 miles of linear features and 58% of the 182,000 acres of areal surface water resources.

IV.5.3.3.3 Impacts of Natural Community Conservation Plan: Preferred Alternative

The impacts of the NCCP for Alternative 1 would be the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis.

IV.5.3.3.4 Impacts of General Conservation Plan

The impacts of the GCP for Alternative 1 would be similar to those defined in Section IV.5.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. Areas of development occurring within the mapped 100-year floodplain for both the GCP and Plan Area would occur mostly in the Imperial Borrego Valley, Pinto Lucerne Valley and Eastern Slopes, and West Mojave and Eastern Slopes ecoregion subareas. As indicated in Table R2.5-43, the potential extent of development within the mapped 100-year floodplain compared with the total floodplain area would be approximately comparable for both the GCP and DRECP DFAs at 1.2% of the 524,000 acres of GCP floodplain and 2.0% of the 883,000 acres of Plan-wide floodplain.

As indicated in Table R2.5-44, the potential extent of GCP development affecting linear surface water features would be 2.7% of the 18,000 total miles of linear features compared with 0.25% of the 36,000 miles Plan-wide. As indicated in Table R2.5-45, the potential extent of GCP development affecting areal surface water features would be 2.5% of the 227,000 total acres of areal features compared with 0.05% of the 182,000 acres Plan-wide.

As indicated in Table R2.5-46, conservation within the mapped 100-year floodplain compared to the total mapped 100-year floodplain area would be less proportionately for the GCP compared with the DRECP Reserve areas at 12.4% of the 524,000 acres of GCP floodplain and 37% of the 883,000 acres of DRECP floodplain, respectively. As indicated in Table R2.5-47, conservation associated with the GCP reserve protecting linear surface water features would be15% of the 18,000 total miles of linear features compared with 60% of the 80,000 miles Plan-wide. As indicated in Table R2.5-48, conservation associated with the GCP reserve protecting areal surface water features would be 12.24% of the 227,000 total acres of areal features compared to 38% of the 670,000 acres Plan-wide.

IV.5.3.3.5 Impacts Outside the Plan Area

IV.5.3.3.5.1 Impacts of Transmission Outside the Plan Area

The impacts of transmission outside the Plan Area on flooding, hydrology, and drainage would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.5.3.1.5, Impacts Outside the Plan Area in No Action Alternative.

IV.5.3.3.5.2 Impacts of BLM LUPA Decisions Outside the Plan Area

To the extent various BLM land designations and management actions resulting from BLM's LUPA would result in conservation of lands and limit renewable energy and transmission development, they would be beneficial for surface water resources. The extent of surface water resources affected by development, as well as those protected from development as Conservation Designations, is expected to be generally similar both outside and within the Plan Area and within the Plan Area.

IV.5.3.3.6 CEQA Significance Determination for Alternative 1

CEQA significance for Alternative 1 for each impact is as follows.

FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. Land disturbance activities associated with development of renewable energy technologies and transmission lines in the Plan Area, including clearing, grading, excavation, road construction, vegetation removal, fencing, drainage and flood control structures, have the potential to disrupt drainage patterns, particularly of ephemeral stream channels. These activities can also increase the risk of flooding by changing the magnitude and timing of runoff and its path to flow over land. While the CMAs provide substantial avoidance and protection measures to surface water

resources, Mitigation Measure FH-1a is also required. With adoption of this mitigation measure, Impact FH-1 would be less than significant to surface water resources.

FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities, as listed under Impact FH-1, also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. These resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities.

While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measures FH-1a and FH-2a are required to provide additional protection to water resources. With adoption of these mitigation measures, Impact FH-2 would be less than significant to surface water resources.

FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, can spill and cause contamination to soils, surface water bodies, and groundwater if not properly handled. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly contained, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. Existing regulations, in combination with CMAs, provide substantial avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.3.7 Comparison of Alternative 1 with Preferred Alternative

This section summarizes the comparison of Alternative 1 with the Preferred Alternative.

Alternative 1 Compared with Preferred Alternative for Plan-wide DRECP

Comparison of Alternative 1 and the Preferred Alternative with respect to potential for Plan-wide development impacts to surface water resources is summarized as follows:

- Alternative 1 could allow development of up to 2.0% of the total mapped 100-year floodplain compared to 1.7% for the Preferred Alternative.
- Alternative 1 could allow development of up to 0.7%% of linear surface water features compared to 0.7% for the Preferred Alternative.
- Alternative 1 could allow development of up to 1.4% of areal surface water features compared to 1.2% for the Preferred Alternative.

Comparison of Alternative 1 to the Preferred Alternative with respect to Plan-wide conservation of surface water resources is summarized as follows:

- Alternative 1 would conserve 37.0% of the total mapped 100-year floodplain compared to 37.2% for the Preferred Alternative.
- Alternative 1 would conserve 60.2% of linear surface water features compared to 60.7% for the Preferred Alternative.
- Alternative 1 would conserve 38.3% of areal surface water features compared to 35.8% for the Preferred Alternative.

Alternative 1 Compared with Preferred Alternative for the BLM Land Use Plan Amendment

Comparison of Alternative 1 and the Preferred Alternative with respect to potential for BLM LUPA development impacts to surface water resources is summarized as follows:

- Alternative 1 could allow development of up to 2.9% of the total mapped 100-year floodplain compared to 15.6% for the Preferred Alternative.
- Alternative 1 could allow development of up to 0.3% of linear surface water features compared to 0.3% for the Preferred Alternative.
- Alternative 1 could allow development of up to 0.1% of areal surface water features compared to 1.7% for the Preferred Alternative.

Comparison of Alternative 1 and the Preferred Alternative with respect to BLM LUPA conservation of surface water resources is summarized as follows:

- Alternative 1 would conserve 65.1% of the total mapped 100-year floodplain compared to 83.5% for the Preferred Alternative.
- Alternative 1 would conserve 64.4% of linear surface water features compared to 78.2% for the Preferred Alternative.
- Alternative 1 would conserve 58.2% of areal surface water features compared to 54.4% for the Preferred Alternative.

Alternative 1 Compared with Preferred Alternative for NCCP

The impacts of the NCCP for Alternative 1 are the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis. As a result, the comparison of Alternative 1 with the Preferred Alternative for the NCCP is the same as described for Plan-wide DRECP.

Alternative 1 Compared with Preferred Alternative for the GCP

Comparison of Alternative 1 and the Preferred Alternative with respect to potential for GCP development impacts to surface water resources is summarized as follows:

- Alternative 1 could allow development of up to 2.5% of the total mapped 100-year floodplain compared to 3.1% for the Preferred Alternative.
- Alternative 1 could allow development of up to 2.7% of linear surface water features compared to 2.2% for the Preferred Alternative.
- Alternative 1 could allow development of up to 2.5% of areal surface water features compared to 1.3% for the Preferred Alternative.

Comparison of Alternative 1 and the Preferred Alternative with respect to GCP conservation of surface water resources is summarized as follows:

- Alternative 1 would conserve 16.2% of the total mapped 100-year floodplain compared to 14.2% for the Preferred Alternative.
- Alternative 1 would conserve 20.9% of linear surface water features compared to 19.6% for the Preferred Alternative.
- Alternative 1 would conserve 10.4% of areal surface water features compared to 10.2% for the Preferred Alternative.

IV.5.3.4 Alternative 2

For Alternative 2, geographically dispersed and maximized DFAs would focus on public and private lands with expanded wind energy development opportunities. Additional conservation lands would be designated by BLM LUPA and Conservation Planning Area designations.

Figure IV.5-4 shows the geographic distribution of renewable energy development and conservation areas in relation to surface water resources for Alternative 2. Major surface water resources that could experience development in their vicinity under Alternative 2 include the Mojave and Colorado rivers.

IV.5.3.4.1 Plan-wide Impacts of Implementing the DRECP: Alternative 2

IV.5.3.4.1.1 Plan-wide Impacts and Mitigation Measures from Renewable Energy and Transmission Development

Impact Assessment

The types of impacts that would occur for Alternative 2 would be similar to impacts for the No Action Alternative. Please see Section IV.5.3.1.1.1 for a more detailed description of impacts common to all alternatives.

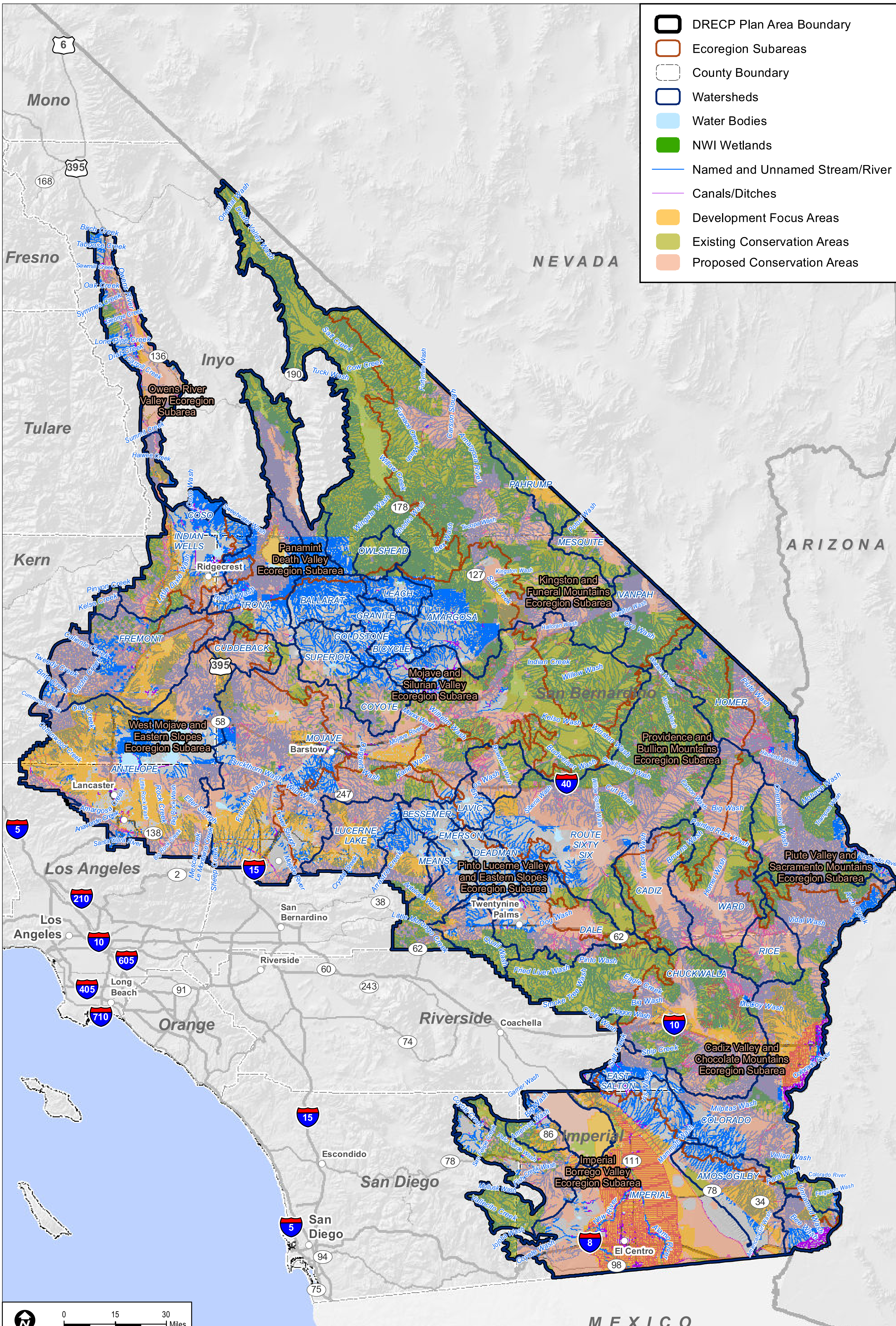

FIGURE IV.5-4

Linear and Areal Surface Water Resources and Watersheds in the Plan Area - Alternative 2

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Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.

The following measure of potential activity within the mapped 100-year floodplain indicates the potential adverse effects from development that can lead to substantially altering drainage patterns and increasing the risk of flooding.

As indicated in Table IV.5-14, development within the DFA could occupy about 12,752 acres of lands currently assessed as being within the mapped 100-year floodplain. This represents about less than 2% (1.44%) of the total area of the DFA. Solar energy represents about two thirds of this small percentage of potential development that could occur within the mapped 100-year floodplain, and dispersed throughout the Plan Area. As assessed currently, this would suggest that over 98% of the development within the DFA would avoid the 100-year floodplain. However, it is important to recognize that overall, 66% of the Plan Area has not been assessed for flood potential, suggesting that development within the 100-year floodplain could occupy more than 2% of the total area of the DFA. The CMAs would require areas that have not been previously assessed by FEMA to undergo hydrologic study to determine the 100-year floodplain in proximity to the project, and to avoid development within the floodplain if possible.

Table IV.5-14
Development that Could Occur Within Mapped 100-Year DFA Floodplains (acres) – Alternative 2

DFA Assessment	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain Acreage that could be Developed	8,186	671	1,566	2,330	12,752
Total 100-Year Floodplain Acreage in Plan Area	883,397	883,397	883,397	883,397	883,397
Percent of 100-Year Floodplain that could be Developed	0.9%	0.1%	0.2%	0.3%	1.4%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.

The following measures of potential activity within surface water features indicate the potential adverse effects from development within or near these surface water resources. While Table R2.5-50 and Table R2.5-51 in Appendix R2 suggest that potential development

impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA, representing potential impacts to 0.7% of linear and 1.0% of areal surface water resources, it is important to recognize the data limitations. There is the potential to underestimate impacts to linear surface water features since the available data is limited to considering only the centerline lengths rather than the areal extent of these features as defined by their streambeds and channel banks.

Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality.

Please see Section IV.5.3.1.1.1 for the No Action Alternative for a more detailed description of Impact FH-3 since it is common to all alternatives.

Impacts in Study Area Lands

Future Assessment Areas. Lands within FAAs are neither reserve lands nor DFAs; they are simply areas that are deferred for future assessment. The future assessment will determine their suitability for renewable energy development or for ecological conservation. If renewable energy development occurs on FAA lands, a Land Use Plan Amendment would not be required. FAAs for each alternative are included and located as shown in Table IV.1-2 and Figure II.3-1 in Volume II. The FAAs represent areas where renewable energy development or inclusion to the reserve design could be implemented through an amendment to the DRECP but additional assessment would be needed.

Because most of the FAAs are presented as "undesignated areas" in the action alternatives, there would be no difference between the FAAs in the Preferred Alternative except that renewable development in an FAA would not require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the FAAs would not impact surface water resources because adequate CMAs and mitigation would apply to any development areas.

Special Analysis Areas. Designating the SAAs as development would result in impacts similar to those identified for the DFAs for the Plan-wide impacts.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on variance lands would nt require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would not impact surface water resources.

Impact Reduction Strategies and Mitigation

The implementation of the Plan would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components. Also, the implementation of existing laws, orders, regulations and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for Alternative 2 (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alternative. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands. The CMAs for Alternative 2 are similar to those for the Preferred Alternative. Please see Section IV.5.3.2.1.1.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.5.3.1.1.1.

Mitigation Measures

After implementation of the CMAs listed and existing laws and regulations, the following mitigation measures would allow participating agencies to require additional protection as appropriate during their subsequent review of specific projects. The following mitigation measures should be considered for each project.

Mitigation Measures for Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. The CMAs provide a solid basis for protection of waters and water quality. Mitigation Measure FH-1a (as described for the Preferred Alternative) is required to supplement these measures.

Mitigation Measures for Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance

activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities. While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a and Mitigation Measure FH-2a (see Preferred Alternative) are required. Mitigation Measure FH-2a would provide additional protection related to constructed channels that would protect renewable energy projects in the desert.

Mitigation Measures for Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of Plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, if not properly handled and contained, can spill and cause contamination to soils, surface water bodies, and groundwater. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly contained, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. The existing regulations, along with CMAs, provide adequate avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.4.1.2 Impacts from Reserve Design

Setting aside lands for no disturbance is a beneficial effect for surface water resources because road crossings and ground disturbance would be avoided in the vicinity of linear and areal surface water resources. Exacerbation of flood effects and degradation of water quality would not occur because there would not be any alteration to the drainage area and natural hydrologic processes within the 100-year floodplain. To the extent developments are avoided within drainage areas, it would also avoid potential for contamination to soil and water from project-related hazardous materials and wastes.

As indicated in Table IV.5-15, the reserve design would more than double the area of mapped 100-year floodplain excluded from development, an increase from 20.4% to 36.9% as a percentage of the total mapped 100-year floodplain within the DFA associated with Alternative 2. The increase in conservation of floodplain area above existing would be 9.9% as attributable from BLM's LUPA and 7.0% from the Conservation Planning Area.

Table IV.5-15
Existing and Additional Mapped 100-Year Floodplain Conserved from Reserve Design (acres) – Alternative 2

	Existing Conservation	BLM LUPA Conservation	Conservation Planning Area	Total
Sum of 100-Year Floodplain Acreage that could be Conserved in Plan Area	180,000	88,000	61,000	326,000
Total 100-Year Floodplain Acreage in Plan Area	883,000	883,000	883,000	883,000
Percent of 100-Year Floodplain Acreage that could be Conserved in Plan Area	20.36%	9.9%	7.0%	36.9%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-53 and Table R2.5-54, the reserve design would about double the linear surface water features excluded from development for a total of 61.9% conserved among the 80,000 miles linear features, and would more than double the areal surface water features excluded from development for a total of 41.6% conserved among the 70,000 acres of areal surface water features.

IV.5.3.4.2 Impacts of DRECP Land Use Plan Amendment on BLM Land: Alternative 2

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA, and the impacts of the amended land use plans themselves.

IV.5.3.4.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

As indicated in Table IV.5-16, the 100-year floodplain within the DFA designated by BLM's LUPA that could be subject to development would be 16.2% of the total mapped 100-year floodplain within the DFA associated with Alternative 2.

Table IV.5-16
Mapped 100-Year Floodplain Within the BLM LUPA DFA Area that Could be Developed – Alternative 2

BLM DFA	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain that could be Developed on BLM Lands	1,691	129	120	122	2,062
Total 100-Year Floodplain on BLM Lands	8,186	671	1,566	2,330	12,752
Percent of 100-Year Floodplain that could be Developed on BLM Lands	20.7%	19.3%	7.7%	5.2%	16.2%

Note: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-56 and Table R2.5-57, potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA of BLM LUPA lands, representing potential impacts to 0.5% of linear and 1.6% of areal surface water resources.

IV.5.3.4.2.2 Impacts of Changes to BLM Land Designations

Existing land designations in Alternative 2 that would conserve floodplains from development on BLM LUPA lands include ACECs, amounting to 2.7% conservation. As indicated in Table IV.5-17, existing and proposed BLM land designations and management for floodplains would collectively conserve 93.6% in relation to the total mapped floodplain within BLM-managed lands in the Plan Area.

Table IV.5-17
Existing and Proposed Mapped 100-Year Floodplain Conserved on BLM LUPA Lands (acres) – Alternative 2

BLM Reserve	NLCS	ACEC	Wildlife Area	Wilderness Characteristics	Trails	Total
Sum of 100-Year Floodplain that could be Conserved on BLM Lands	74,000	4,000	0	13,000	33,000	124,000
Total 100-Year Floodplain on BLM Lands	133,000	133,000	133,000	133,000	133,000	133,000
Percent of 100-Year Floodplain that could be Conserved on BLM Lands	55.9%	2.7%	0.0%	9.9%	25.1%	93.6%

Note: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were

rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table IV.5-59 and Table IV.5-60, conservation of linear and areal surface water resources on BLM LUPA lands would amount to 93.1% of the 36,310 miles of linear features and 71.8% of the 181,917 acres of areal surface water resources.

IV.5.3.4.3 Impacts of Natural Community Conservation Plan: Alternative 2

The impacts of the NCCP for Alternative 2 would be the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis.

IV.5.3.4.4 Impacts of General Conservation Plan

The impacts of the GCP for Alternative 2 would be similar to those defined in Section IV.5.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. Areas of development occurring within the mapped 100-year floodplain for both the GCP and Plan Area would be generally dispersed within the Plan Area. As indicated in Table R2.5-61, the potential extent of development within the floodplain compared to the total floodplain area would be approximately comparable for both the GCP and Plan-wide areas at 1.7% of the 524,000 acres of GCP floodplain and 1.4% of the 883,000 acres of Plan-wide floodplain. As indicated in Table R2.5-62, the potential extent of GCP development affecting linear surface water features would be 1.9% of the 18,000 total miles of linear features compared with 0.7% of the 80,000 miles Plan-wide. As indicated in Table R2.5-63, the potential extent of GCP development affecting areal surface water features would be 1.1% of the 226,923 total acres of areal features compared with 1.0% of the 670,000 acres Plan-wide.

As indicated in Table R2.5-64, conservation within the mapped 100-year floodplain compared to the total mapped 100-year floodplain area would be less proportionately for the GCP when compared with the DRECP Reserve areas at 12% of the 524,000 acres of GCP floodplain and 37% of the 883,000 acres of DRECP floodplain, respectively. As indicated in Table R2.5-65, conservation associated with the GCP reserve protecting linear surface water features would be 15.9% of the 18,000 total miles of linear features compared with 62% of the 80,000 miles Plan-wide. As indicated in Table R2.5-66, conservation associated with the GCP reserve protecting areal surface water features would be 13.0% of the 227,000 total acres of areal features compared to 42% of the 670,000 acres Plan-wide.

IV.5.3.4.5 Impacts Outside the Plan Area

IV.5.3.4.5.1 Impacts of Transmission Outside the Plan Area

The impacts of transmission outside the Plan Area on flooding, hydrology, and drainage would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.5.3.1.5, Impacts Outside the Plan Area in No Action Alternative.

IV.5.3.4.5.2 Impacts of BLM LUPA Decisions Outside the Plan Area

To the extent various BLM land designations and management actions in BLM's LUPA result in conservation of lands and limit renewable energy and transmission development, they would be beneficial for surface water resources. The extent of surface water resources affected by development, as well as protected from development as a result of conservation designations, is expected to be generally similar both outside and inside the Plan Area.

IV.5.3.4.6 CEQA Significance Determination for Alternative 2

CEQA significance for Alternative 2 for each impact follows.

FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. Land disturbance activities associated with development of renewable energy technologies and transmission lines in the Plan Area, including clearing, grading, excavation, road construction, vegetation removal, fencing, drainage and flood control structures, have the potential to disrupt drainage patterns, particularly of ephemeral stream channels. These activities can also increase the risk of flooding by changing the magnitude and timing of runoff and its path of flow over land. While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a is also required. With adoption of this mitigation measure, Impact FH-1 would be less than significant to surface water resources.

FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities.

While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measures FH-1a and FH-2a are required to provide additional

protection to water resources. With adoption of these mitigation measures, Impact FH-2 would be less than significant to surface water resources.

FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of Plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, can spill and cause contamination to soils, surface water bodies, and groundwater if not properly handled and contained. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly established within containment areas, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. Existing regulations, in combination with CMAs, provide substantial avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.4.7 Comparison of Alternative 2 with Preferred Alternative

This section summarizes the comparison of Alternative 2 with the Preferred Alternative.

Alternative 2 Compared with Preferred Alternative for Plan-wide DRECP

Comparison of Alternative 2 and the Preferred Alternative with respect to potential for Plan-wide development impacts to surface water resources is summarized as follows:

- Alternative 2 could allow development of up to 1.4% of the total mapped 100-year floodplain compared to 1.7% for the Preferred Alternative.
- Alternative 2 could allow development of up to 0.7% of linear surface water features compared to 0.7% for the Preferred Alternative.
- Alternative 2 could allow development of up to 1.0% of areal surface water features compared to 1.2% for the Preferred Alternative.

Comparison of Alternative 2 to the Preferred Alternative with respect to Plan-wide conservation of surface water resources is summarized as follows:

- Alternative 2 would conserve 36.9% of the total mapped 100-year floodplain compared to 37.2% for the Preferred Alternative.
- Alternative 2 would conserve 61.9% of linear surface water features compared to 60.7% for the Preferred Alternative.
- Alternative 2 would conserve 41.6% of areal surface water features compared to 35.8% for the Preferred Alternative.

Alternative 2 Compared with Preferred Alternative for the BLM Land Use Plan Amendment

Comparison of Alternative 2 and the Preferred Alternative with respect to potential for BLM LUPA development impacts to surface water resources is summarized as follows:

- Alternative 2 could allow development of up to 16.2% of the total mapped 100-year floodplain compared to 15.6% for the Preferred Alternative.
- Alternative 2 could allow development of up to 0.50% of linear surface water features compared to 0.3% for the Preferred Alternative.
- Alternative 2 could allow development of up to 1.6% of areal surface water features compared to 1.7% for the Preferred Alternative.

Comparison of Alternative 2 and the Preferred Alternative with respect to BLM LUPA conservation of surface water resources is summarized as follows:

- Alternative 2 would conserve 93.6% of the total mapped 100-year floodplain compared to 83.5% for the Preferred Alternative.
- Alternative 2 would conserve 93.1% of linear surface water features compared to 78.2% for the Preferred Alternative.
- Alternative 2 would conserve71.8% of areal surface water features compared to 54.4% for the Preferred Alternative.

Alternative 2 Compared with Preferred Alternative for NCCP

The impacts of the NCCP for Alternative 2 are the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis. As a result, the comparison of Alternative 2 with the Preferred Alternative for the NCCP is the same as described for Plan-wide DRECP.

Alternative 2 Compared with Preferred Alternative for the GCP

Comparison of Alternative 2 and the Preferred Alternative with respect to potential for GCP development impacts to surface water resources is summarized as follows:

- Alternative 2 could allow development of up to 1.74% of the total mapped 100-year floodplain compared to 3.1% for the Preferred Alternative.
- Alternative 2 could allow development of up to 1.9% of linear surface water features compared to 2.2% for the Preferred Alternative.
- Alternative 2 could allow development of up to 1.1% of areal surface water features compared to 1.3% for the Preferred Alternative.

Comparison of Alternative 2 and the Preferred Alternative with respect to GCP conservation of surface water resources is summarized as follows:

- Alternative 2 would conserve 14.8% of the total mapped 100-year floodplain compared to 14.2% for the Preferred Alternative.
- Alternative 2 would conserve 20.1% of linear surface water features compared to 19.6% for the Preferred Alternative.
- Alternative 2 would conserve 11.4% of areal surface water features compared to 10.2% for the Preferred Alternative.

IV.5.3.5 Alternative 3

For Alternative 3, geographically dispersed DFAs would be established on public and private lands with emphasis on solar and geothermal energy development. Additional conservation lands would be designated by BLM LUPA and Conservation Planning Area designations.

Figure IV.5-5 shows the geographic distribution of renewable energy development and conservation areas in relation to surface water resources for Alternative 3. Major surface water resources that could experience development under Alternative 3 include the Mojave and Colorado rivers.

IV.5.3.5.1 Plan-wide Impacts of Implementing the DRECP: Alternative 3

IV.5.3.5.1.1 Plan-wide Impacts and Mitigation Measures from Renewable Energy and Transmission Development

Impact Assessment

The types of impacts that would occur for Alternative 3 would be similar to impacts for the No Action Alternative. Please see Section IV.5.3.1.1.1 for a more detailed description of impacts common to all alternatives.

Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.

The following measure of potential activity within the mapped 100-year floodplain indicates the potential adverse effects from development that can lead to substantially altering drainage patterns and increasing the risk of flooding.

As indicated in Table IV.5-18, development within the DFA would occupy about 17,533 acres of lands currently assessed as being within the mapped 100-year floodplain. This represents about 2% of the total mapped 100-year floodplain area of the DFA. Solar energy

represents about three quarters of this small percentage of potential development that could occur within the mapped 100-year floodplain, mostly in the Imperial Borrego Valley, and West Mojave and Eastern Slopes ecoregion subareas. As assessed currently, this would suggest that over 98% of the development within the DFA would avoid the 100-year floodplain. However, it is important to recognize that overall, 66% of the Plan Area has not been assessed for flood potential, suggesting that development within the 100-year floodplain could occupy more than 2% of the total area of the DFA. The CMAs would require areas that have not been previously assessed by FEMA to undergo hydrologic study to determine the 100-year floodplain in proximity to the project, and to avoid development within the floodplain if possible.

Table IV.5-18
Development that Could Occur Within Mapped 100-Year DFA Floodplains (acres) – Alternative 3

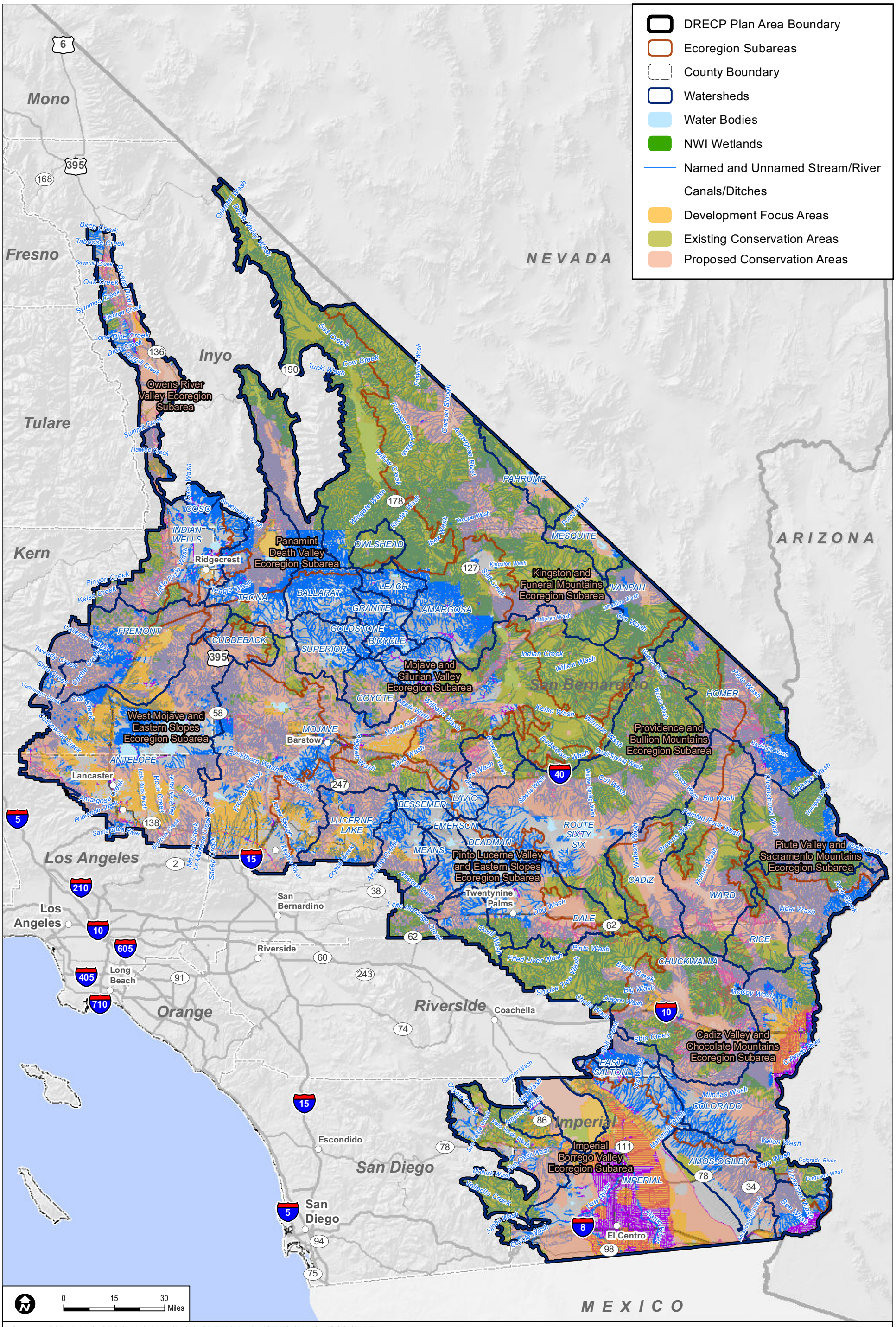
DFA Assessment	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain Acreage that could be Developed in Plan Area	13,000	300	2,000	2,000	18,000
Total of 100-Year Floodplain Acreage in Plan Area	883,000	883,000	883,000	883,000	883,000
Percent of 100-Year Floodplain that could be Developed in Plan Area	1.5%	0.0%	0.3%	0.2%	2.0%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.

The following measures of potential activity within surface water features indicate the potential adverse effects from development within or near these surface water resources.

While Table R2.5-68 and Table R2.5-69 (in Appendix R2) suggest that potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA, representing potential impacts to 0.7% of linear and 1.7% of areal surface water resources, it is important to recognize the data limitations. There is the potential to underestimate impacts to linear surface water features since the available data is limited to considering only the centerline lengths rather than the areal extent of these features, as defined by their streambeds and channel banks.



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USGS (2011)

FIGURE IV.5-5

Linear and Areal Surface Water Resources and Watersheds in the Plan Area - Alternative 3

Draft DRECP and EIR/EIS

August 2014

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Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality.

Please see Section IV.5.3.1.1.1 for the No Action Alternative for a more detailed description of Impact FH-3 since it is common to all alternatives.

Impacts in Study Area Lands

Future Assessment Areas. Lands within FAAs are neither reserve lands nor DFAs; they are simply areas that are deferred for future assessment. The future assessment will determine their suitability for renewable energy development or for ecological conservation. If renewable energy development occurs on FAA lands, a Land Use Plan Amendment would not be required. FAAs for each alternative are included and located as shown in Table IV.1-2 and Figure II.3-1 in Volume II. The FAAs represent areas where renewable energy development or inclusion to the reserve design could be implemented through an amendment to the DRECP but additional assessment would be needed.

Because most of the FAAs are presented as "undesignated areas" in the action alternatives, there would be no difference between the FAAs in the Preferred Alternative except that renewable development in an FAA would not require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the FAAs would not impact surface water resources because adequate CMAs and mitigation would apply to any development areas.

Special Analysis Areas. Designating the SAAs as development would result in impacts similar to those identified for the DFAs for the Plan-wide Impacts.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on variance lands would nt require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would not impact surface water resources.

Impact Reduction Strategies and Mitigation

The implementation of the Plan would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components.

Also, the implementation of existing laws, orders, regulations and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for Alternative 3 (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alternative. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands. The CMAs for Alternative 3 are similar to those for the Preferred Alternative. Please see Section IV.5.3.2.1.1.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.5.3.1.1.1.

Mitigation Measures

After implementation of the CMAs listed and existing laws and regulations, the following mitigation measures would allow participating agencies to require additional protection as appropriate during their subsequent review of specific projects. The following mitigation measures should be considered for each project.

Mitigation Measures for Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. The CMAs provide a solid basis for protection of waters and water quality. Mitigation Measure FH-1a (as described for the Preferred Alternative) is required to supplement these measures.

Mitigation Measures for Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities. While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a and Mitigation Measure

FH-2a (see Preferred Alternative) are required. Mitigation Measure FH-2a would provide additional protection related to constructed channels that would protect renewable energy projects in the desert.

Mitigation Measures for Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products can spill and cause contamination to soils, surface water bodies, and groundwater if not properly handled and contained. Stored hazardous materials and wastes can be disturbed from stormwater and flooding if not properly contained, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. The existing regulations, along with CMAs, provide adequate avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.5.1.2 Impacts from Reserve Design

Setting aside lands for no disturbance is a beneficial effect for surface water resources because road crossings and ground disturbance would be avoided in the vicinity of linear and areal surface water resources. Exacerbation of flood effects and degradation of water quality would not occur because there would not be any alteration to the drainage area and natural hydrologic processes within the 100-year floodplain. To the extent developments are avoided within drainage areas, it would also avoid potential for contamination to soil and water from project-related hazardous materials and wastes.

As indicated in Table IV.5-19, the reserve design would almost double the area of mapped 100-year floodplain excluded from development, an increase from 20.4% to 37.1% as a percentage of the total mapped 100-year floodplain within the DFA associated with Alternative 3. The increase in conservation of floodplain area above existing would be 10% as attributable from BLM's LUPA and 6.7% from the Conservation Planning Area.

Table IV.5-19
Existing and Additional Mapped 100-Year Floodplain Conserved from Reserve Design (acres) – Alternative 3

	Existing Conservation	BLM LUPA	Conservation Planning	Total
Sum of 100-Year Floodplain Acreage that could be Conserved in Plan Area	180,000	**89,000**	**60,000**	328,000
Total 100-Year Floodplain Acreage in Plan Area	883,000	883,000	883,000	883,000

Table IV.5-19
Existing and Additional Mapped 100-Year Floodplain Conserved from Reserve Design (acres) – Alternative 3

	Existing Conservation	BLM LUPA	Conservation Planning	Total
Percent of 100-Year Floodplain Conserved in Plan Area	20.4%	10.0%	6.7%	37.1%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-71 and Table R2.5-72, the reserve design would almost double the linear surface water features excluded from development for a total of 61.2% conserved among the 80,000 miles of linear features, and would almost double the areal surface water features excluded from development for a total of 38.5% conserved among the 670,000 acres of areal surface water features.

IV.5.3.5.2 Impacts of DRECP Land Use Plan Amendment on BLM Land: Alternative 3

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA, and the impacts of the amended land use plans themselves.

IV.5.3.5.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

As indicated in Table IV.5-20, the mapped 100-year floodplain within the DFA designated by BLM's LUPA that could be subject to development would be 12.2% of the total mapped 100-year floodplain within the DFA associated with Alternative 3.

Table IV.5-20
Mapped 100-Year Floodplain Within the BLM LUPA DFA Area that could be Developed (acres) – Alternative 3

BLM DFA	Solar	Wind	Geothermal	Transmission	Total
100-Year Floodplain Acreage that could be Developed on BLM Lands	2,000	60	100	100	2,000
Total 100-Year Floodplain Acreage on BLM Lands	13,000	300	2,000	2,000	18,000

Table IV.5-20
Mapped 100-Year Floodplain Within the BLM LUPA DFA Area that could be Developed (acres) – Alternative 3

BLM DFA	Solar	Wind	Geothermal	Transmission	Total
Percent of 100-Year Floodplain that could be Developed on BLM Lands	13.9%	18.0%	5.4%	7.4%	12.2%

Note: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-74 and Table R2.5-75, potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA of BLM LUPA lands, representing potential impacts to 0.3% of linear and 2.1% of areal surface water resources.

IV.5.3.5.2.2 Impacts of Changes to BLM Land Designations

Existing land designations in Alternative 3 that would conserve floodplains from development on BLM LUPA lands include ACECs, amounting to 4.9% conservation. As indicated in Table IV.5-21 for Alternative 3, existing and proposed BLM land designations and management for floodplains would collectively conserve 83.2% in relation to the total floodplain within BLM-managed lands in the Plan Area.

Table IV.5-21
Mapped 100-Year Floodplain Conserved on Existing and Proposed BLM LUPA Lands (acres) – Alternative 3

	NLCS	ACEC	Wildlife Area	Wilderness Characteristics	Trail	Total
Sum of 100-Year Floodplain Acreage that could be Conserved on BLM Lands	71,000	7,000	40	13,000	20,000	110,000
Total 100-Year Floodplain Acreage on BLM Lands	133,000	133,000	133,000	133,000	133,000	133,000
Percent of 100-Year Floodplain that could be Conserved on BLM Lands	53.3%	4.9%	0.03%	9.94%	15.07%	83.2%

Note: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the

subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-77 and Table R2.5-78, conservation of linear and areal surface water resources on BLM LUPA lands would amount to 78,9% of the 36,310 miles of linear features and 63.9% of the 181,917 acres of areal surface water resources.

IV.5.3.5.3 Impacts of Natural Community Conservation Plan: Alternative 3

The impacts of the NCCP for Alternative 3 would be the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis.

IV.5.3.5.4 Impacts of General Conservation Plan: Alternative 3

The impacts of the GCP for Alternative 3 would be similar to those defined in Section IV.5.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. Areas of development occurring within the mapped 100-year floodplain for both the GCP and Plan Area would be mostly in the Imperial Borrego Valley and West Mojave and Eastern Slopes ecoregion subareas. As indicated in Table R2.5-79, the potential extent of development within the floodplain compared with the total floodplain area would be approximately comparable for both the GCP and DFA areas at 2.4% of the 524,000 acres of GCP floodplain and 2.0% of the 883,000 acres of Plan-wide floodplain. As indicated in Table R2.5-80, the potential extent of GCP development affecting linear surface water features would be 2.3% of the 18,000 total miles of linear features compared with 0.7% of the 80,000 miles Plan-wide. As indicated in Table R2.5-81, the potential extent of GCP development affecting areal surface water features would be 2.0% of the 227,000 total acres of areal features compared to 1.7% of the 670,000 acres Plan-wide.

As indicated in Table R25-82, conservation within the mapped 100-year floodplain compared to the total floodplain area would be less proportionately for the GCP when compared to the DRECP Reserve areas at 12.1% of the 524,000 acres of GCP floodplain and 37.1% of the 883,000 acres of DRECP floodplain, respectively. As indicated in Table R2.5-83, conservation associated with the GCP reserve protecting linear surface water features would be 14.8% of the 18,000 total miles of linear features compared to 61.2% of the 80,000 miles Plan-wide. As indicated in Table R2.5-84, conservation associated with the GCP reserve protecting areal surface water features would be 12.0% of the 227,000 total acres of areal features compared with 38.5% of the 670,000 acres Plan-wide.

IV.5.3.5.5 Impacts Outside the Plan Area

IV.5.3.5.5.1 Impacts of Transmission Outside the Plan Area

The impacts of transmission outside the Plan Area on flooding, hydrology, and drainage would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.5.3.1.5, Impacts Outside the Plan Area in No Action Alternative.

IV.5.3.5.5.2 Impacts of BLM LUPA Decisions Outside the Plan Area

To the extent that various BLM land designations and management actions from BLM's LUPA result in conservation of lands and limit renewable energy and transmission development, it would be beneficial for surface water resources. The extent of surface water resources affected by development, as well as protected from development as a result of conservation designations, is expected to be generally similar both outside and inside the Plan Area.

IV.5.3.5.6 CEQA Significance Determination for Alternative 3

CEQA significance for Alternative 3 for each impact follows.

FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. Land disturbance activities associated with development of renewable energy technologies and transmission lines in the Plan Area, including clearing, grading, excavation, road construction, vegetation removal, fencing, drainage and flood control structures, have the potential to disrupt drainage patterns, particularly of ephemeral stream channels. These activities can also increase the risk of flooding by changing the magnitude and timing of runoff and its path to flow over land. While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a is also required. With adoption of this mitigation measure, Impact FH-1 would be less than significant to surface water resources.

FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities. While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a and Mitigation Measure FH-2a are required to provide additional protection to water resources. With adoption of these mitigation measures, Impact FH-2 would be less than significant to surface water resources.

FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, can spill and cause contamination to soils, surface water bodies, and groundwater if not properly handled and contained. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly contained, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and ground-water. Existing regulations, in combination with CMAs, provide substantial avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.5.7 Comparison of Alternative 3 with Preferred Alternative

This section summarizes the comparison of Alternative 3 with the Preferred Alternative.

Alternative 3 Compared with Preferred Alternative for Plan-wide DRECP

Comparison of Alternative 3 and the Preferred Alternative with respect to potential for Plan-wide development impacts to surface water resources is summarized as follows:

- Alternative 3 could allow development of up to 2.0% of the total mapped 100-year floodplain compared to 1.7% for the Preferred Alternative.
- Alternative 3 could allow development of up to 0.7% of linear surface water features compared to 0.7% for the Preferred Alternative.
- Alternative 3 could allow development of up to 1.7% of areal surface water features compared to 1.2% for the Preferred Alternative.

Comparison of Alternative 3 to the Preferred Alternative with respect to Plan-wide conservation of surface water resources is summarized as follows:

- Alternative 3 would conserve 37.1% of the total mapped 100-year floodplain compared to 37.2% for the Preferred Alternative.
- Alternative 3 would conserve 61.2% of linear surface water features compared to 60.7 for the Preferred Alternative.
- Alternative 3 would conserve 38.5% of areal surface water features compared to 35.8% for the Preferred Alternative.

Alternative 3 Compared with Preferred Alternative for the BLM Land Use Plan Amendment

Comparison of Alternative 1 and the Preferred Alternative with respect to potential for BLM LUPA development impacts to surface water resources is summarized as follows:

- Alternative 3 could allow development of up to 12.2% of the total mapped 100-year floodplain compared to 15.6% for the Preferred Alternative.
- Alternative 3 could allow development of up to 0.3% of linear surface water features compared to 0.3% for the Preferred Alternative.
- Alternative 3 could allow development of up to 2.1% of areal surface water features compared to 1.7% for the Preferred Alternative.

Comparison of Alternative 3 and the Preferred Alternative with respect to BLM LUPA conservation of surface water resources is summarized as follows:

- Alternative 3 would conserve 83.2% of the total mapped 100-year floodplain compared to 83.5% for the Preferred Alternative.
- Alternative 3 would conserve 78.9% of linear surface water features compared to 78.2% for the Preferred Alternative.
- Alternative 3 would conserve 63.9% of areal surface water features compared to 54.4% for the Preferred Alternative.

Alternative 3 Compared with Preferred Alternative for NCCP

The impacts of the NCCP for Alternative 3 are the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis. As a result, the comparison of Alternative 3 with the Preferred Alternative for the NCCP is the same as described for Plan-wide DRECP.

Alternative 3 Compared with Preferred Alternative for the GCP

Comparison of Alternative 3 and the Preferred Alternative with respect to potential for GCP development impacts to surface water resources is summarized as follows:

- Alternative 3 could allow development of up to 2.4% of the total mapped 100-year floodplain compared to 3.1% for the Preferred Alternative.
- Alternative 3 could allow development of up to 2.3% of linear surface water features compared to 2.2% for the Preferred Alternative.
- Alternative 3 could allow development of up to 2.0% of areal surface water features compared to 1.3% for the Preferred Alternative.

Comparison of Alternative 3 and the Preferred Alternative with respect to GCP conservation of surface water resources is summarized as follows:

- Alternative 3 would conserve 16.1% of the total mapped 100-year floodplain compared to 14.2% for the Preferred Alternative.
- Alternative 3 would conserve 20.4% of linear surface water features compared to 19.6% for the Preferred Alternative.
- Alternative 3 would conserve 10.1% of areal surface water features compared to 10.2% for the Preferred Alternative.

IV.5.3.6 Alternative 4

For Alternative 4, geographically dispersed DFAs would be designated on public and private lands with a mix of solar, wind and geothermal energy development. Additional conservation lands would be designated by BLM LUPA and Conservation Planning Area designations.

Figure IV.5-6 shows the geographic distribution of renewable energy development and conservation areas in relation to surface water resources for Alternative 4. Major surface water resources that could experience development in their vicinity under Alternative 4 include the Mojave and Colorado rivers.

IV.5.3.6.1 Plan-wide Impacts of Implementing the DRECP: Alternative 4

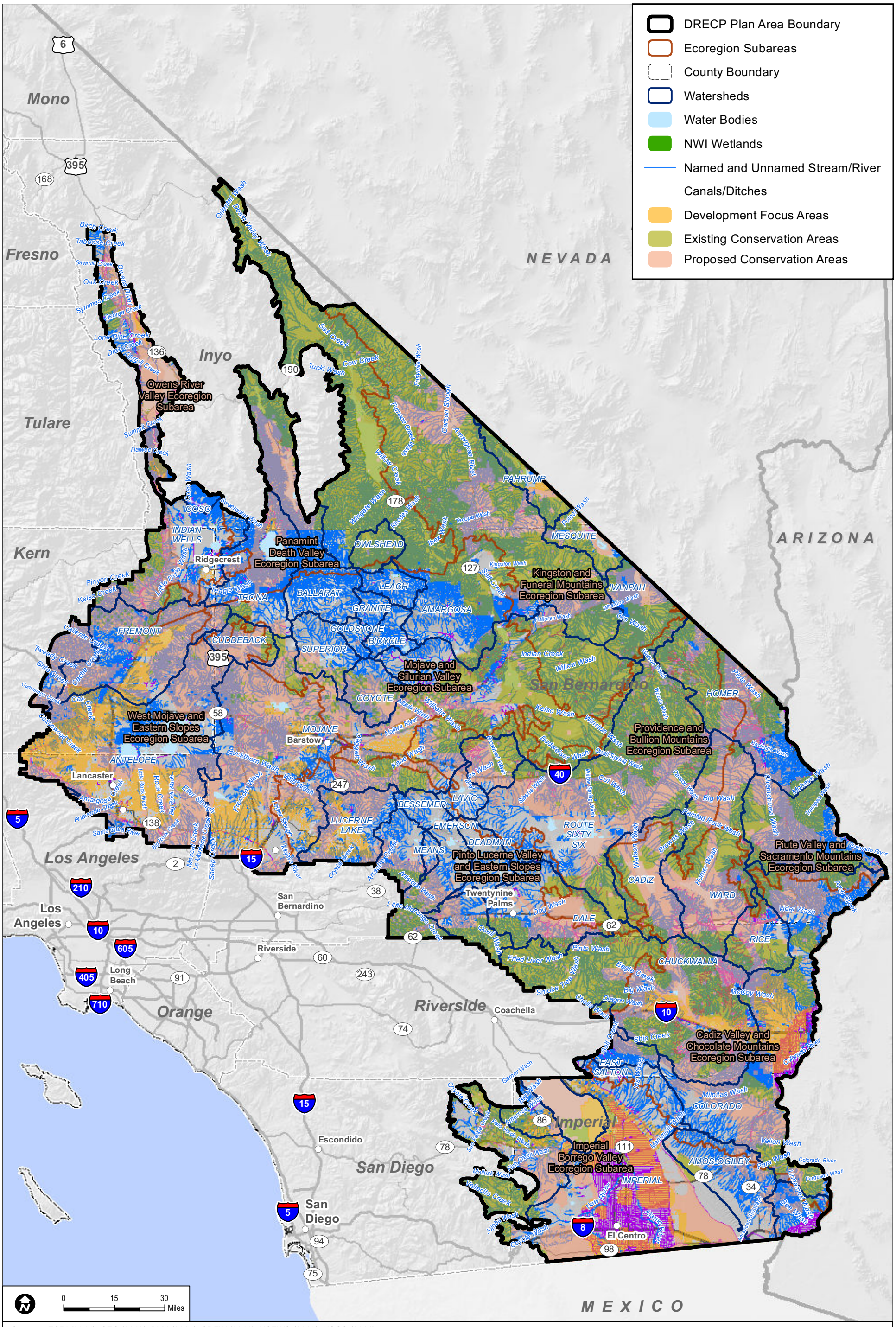
IV.5.3.6.1.1 Plan-wide Impacts and Mitigation Measures from Renewable Energy and Transmission Development

Impact Assessment

The types of impacts that would occur for Alternative 4 would be similar to impacts for the No Action Alternative. Please see Section IV.5.3.1.1.1 for a more detailed description of impacts common to all alternatives. The following assessment is limited to alternative-specific measures.

Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site.

The following measure of potential activity within the mapped 100-year floodplain indicates the potential adverse effects from development that can lead to substantially altering drainage patterns and increasing the risk of flooding.



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USGS (2011)

FIGURE IV.5-6

Linear and Areal Surface Water Resources and Watersheds in the Plan Area - Alternative 4

Draft DRECP and EIR/EIS

August 2014

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As indicated in Table IV.5-22 development within the DFA would occupy about 17,237 acres of lands currently assessed as being within the mapped 100-year floodplain. This represents about 2% of the total area of the DFA. Solar energy represents almost three quarters of this small percentage of potential development that could occur within the mapped 100-year floodplain, mostly in the Cadiz Valley and Chocolate Mountains, with less in Imperial Borrego Valley, and West Mojave and Eastern Slopes ecoregion subareas. This would suggest that about 98% of the development within the DFA would avoid the 100-year floodplain. However, it is important to recognize that overall, 66% of the Plan Area has not been assessed for flood potential, suggesting that development within the 100-year floodplain could occupy more than 2% of the total area of the DFA. The CMAs would require areas that have not been previously assessed by FEMA to undergo hydrologic study to determine the 100-year floodplain in proximity to the project, and to avoid development within the floodplain if possible.

Table IV.5-22
Development that Could Occur Within Mapped 100-Year Plan Area Floodplains (acres) – Alternative 4

	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain Acreage that could be Developed in Plan Area	12,000	500	3,000	2,000	17,000
Total 100-Year Floodplain Acreage in Plan Area	883,000	883,000	883,000	883,000	883,000
Percent of 100-Year Floodplain that could be Developed in Plan Area	1.4%	0.1%	0.3%	0.2%	2.0%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features.

The following measures of potential activity within surface water features indicate the potential adverse effects from development within or near these surface water resources.

While Table R2.5-86 and Table R2.5-87 in Appendix R2 suggest the potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA, representing potential impacts to 0.7% of linear and 1.4% of areal surface water resources, it is important to recognize the data limitations. There is the potential to

underestimate impacts to linear surface water features since the available data is limited to considering only the centerline lengths rather than the areal extent of these features as defined by their streambeds and channel banks.

Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality.

Please see Section IV.5.3.1.1.1 for the No Action Alternative for a more detailed description of Impact FH-3 since it is common to all alternatives.

Impacts in Study Area Lands

Future Assessment Areas. There are no FAAs in Alternative 4.

Special Analysis Areas. Designating the SAAs as development would result in impacts similar to those identified for the DFAs for the Plan-wide Impacts.

DRECP Variance Lands. DRECP Variance Lands represent the BLM Solar PEIS Variance Lands as screened for the DRECP and EIR/EIS based on BLM screening criteria. Covered Activities could be permitted for NCCP purposes only through an NCCP plan amendment. However, development of renewable energy on variance lands would not require a BLM Land Use Plan Amendment so the environmental review process would be somewhat simpler than if the location were left undesignated. Development of the DRECP Variance Lands would not impact surface water resources.

Impact Reduction Strategies and Mitigation

The implementation of the Plan would result in conservation of some desert lands as well as the development of renewable energy generation and transmission facilities on other lands. There are several ways in which the impacts of the renewable energy development covered by the Plan would be lessened. First, the Plan incorporates CMAs for each alternative, including specific biological reserve design components and LUPA components. Also, the implementation of existing laws, orders, regulations and standards would reduce the impacts of project development. If significant impacts would still result after implementation of CMAs and compliance with applicable laws and regulations, then specific mitigation measures are recommended in this section.

Conservation and Management Actions

The conservation strategy for Alternative 4 (presented in Volume II, Section II.3.1.1) defines specific actions that would reduce the impacts of this alternative. The conservation strategy includes definition of the reserve design and specific CMAs for the Preferred Alter-

native. While the CMAs were developed for BLM lands only, this analysis assumes that all CMAs would be applied also to nonfederal lands. The CMAs for Alternative 4 are similar to those for the Preferred Alternative. Please see Section IV.5.3.2.1.1.

Laws and Regulations

Similar to the No Action Alternative, existing laws and regulations will reduce certain impacts of Plan implementation. Relevant regulations are presented in the Regulatory Setting in Volume III. The requirements of relevant laws and regulations are summarized for the No Action Alternative in Section IV.5.3.1.1.1.

Mitigation Measures

After implementation of the CMAs and existing laws and regulations, the following mitigation measures would allow participating agencies to require additional protection as appropriate during their subsequent review of specific projects. The following mitigation measures should be considered for each project.

Mitigation Measures for Impact FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. The CMAs provide a solid basis for protection of waters and water quality. Mitigation Measure FH-1a (as described for the Preferred Alternative) is required to supplement these measures.

Mitigation Measures for Impact FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil) and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities.

While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a and Mitigation Measure FH-2a (see Preferred Alternative) are required. Mitigation Measures FH-2a would provide additional protection related to constructed channels that would protect renewable energy projects in the desert.

Mitigation Measures for Impact FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of Plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products that can spill and cause contamination to soils, surface water bodies, and groundwater if not properly handled and contained. Stored

hazardous materials and wastes can be disturbed via stormwater and flooding if not properly established within containment areas, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. The existing regulations, along with CMAs, provide adequate avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.6.1.2 Impacts from Reserve Design

Setting aside lands for no disturbance is a beneficial effect for surface water resources because road crossings and ground disturbance would be avoided in the vicinity of linear and areal surface water resources. Exacerbation of flood effects and degradation of water quality would not occur because there would not be any alteration to the drainage area and natural hydrologic processes within the 100-year floodplain. To the extent that developments are avoided within drainage areas, it would also avoid potential for contamination to soil and water from project-related hazardous materials and wastes.

As indicated in Table IV.5-23, the reserve design would almost double the area of mapped 100-year floodplain excluded from development, an increase from 20.4% to 36.0% as a percentage of the total mapped 100-year floodplain within the DFA associated with Alternative 4. The increase in conservation of floodplain area would be 9.1% as attributable from BLM's LUPA and 6.6% from the Conservation Planning Area.

Table IV.5-23
Existing and Additional Mapped 100-Year Floodplain Conserved from Reserve Design (acres) – Alternative 4

	Existing Conservation	BLM LUPA Conservation	Conservation Planning	Total
Sum of 100-Year Floodplain Acreage that could be Conserved in Plan Area	180,000	80,000	58,000	318,000
Total 100-Year Floodplain Acreage In Plan Area	883,000	883,000	883,000	883,000
Percent of 100-Year Floodplain Acreage Conserved in Plan Area	20.4%	9.1%	6.6%	36.0%

Note: Full data tables are available in Appendix R2.
The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-89 and Table R2.5-90, the reserve design would about double the linear surface water features excluded from development for a total of 58.2%

conserved among the 80,000 miles of linear features, and would about double the areal surface water features excluded from development for a total of 37.0% conserved among the 670,000 acres of areal surface water features.

IV.5.3.6.2 Impacts of DRECP Land Use Plan Amendment on BLM Land: Alternative 4

This section addresses two components of effects of the BLM LUPA: the streamlined development of renewable energy and transmission on BLM land under the LUPA, and the impacts of the amended land use plans themselves.

IV.5.3.6.2.1 Impacts from Renewable Energy and Transmission Development on BLM Land

As indicated in Table IV.5-24, the mapped 100-year floodplain within the DFA designated by BLM's LUPA that could be subject to development would be 0.2% of the total mapped 100-year floodplain within the DFA associated with Alternative 4.

Table IV.5-24
Mapped 100-Year Floodplain Within the BLM LUPA DFA Area that could be Developed (acres) – Alternative 4

	Solar	Wind	Geothermal	Transmission	Total
Sum of 100-Year Floodplain Acreage that could be Developed on BLM Lands	1,000	80	100	100	1,000
Total 100-Year Floodplain Acreage on BLM Lands	883,000	883,000	883,000	883,000	883,000
Percent of 100-Year Floodplain that could be Developed on BLM Lands	0.1%	0.01%	0.01%	0.01%	0.2%

Note: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table IV.5-92 and Table IV.5-93, potential development impacts to linear and areal surface water resources would be minimal on an overall basis within the DFA of BLM LUPA lands, representing potential impacts to 0.3% of linear and 1.4% of areal surface water resources.

IV.5.3.6.2.2 Impacts of Changes to BLM Land Designations

Existing land designations in Alternative 4 that would conserve floodplains from development on BLM LUPA lands include ACECs, amounting to 6.0% conservation. As indicated in Table IV.5-25 for Alternative 4, existing and proposed BLM land designations and management for floodplains would collectively conserve 65.1% of the 100-year floodplain in relation to the total floodplain within BLM-managed lands in the Plan Area.

Table IV.5-25
Mapped 100-Year Floodplain Conserved on Existing and Proposed BLM LUPA Lands (acres) – Alternative 4

	NLCS	ACEC	Wildlife Allocation	Wilderness Characteristics	Trail Mgmt	Total
Sum of 100-Year Floodplain Acreage that could be Conserved on BLM Lands	58,000	8,000	70	13,000	7,000	89,000
Total 100-Year Floodplain Acreage on BLM Lands	133,000	133,000	133,000	133,000	133,000	133,000
Percent of 100-Year Floodplain that could be Conserved on BLM Lands	44.0%	6.0%	0.1%	9.9%	5.2%	65.1%

Note: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

As indicated in Table R2.5-94 and Table R2.5-96, conservation of linear and areal surface water resources on BLM LUPA lands would amount to 65.8% of the 36,000 miles of linear features and 61.7% of the 182,000 acres of areal surface water resources.

IV.5.3.6.3 Impacts of Natural Community Conservation Plan: Alternative 4

The impacts of the NCCP for Alternative 4 would be the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis.

IV.5.3.6.4 Impacts of General Conservation Plan

The impacts of the GCP for Alternative 4 would be similar to those defined in Section IV.5.3.2.1 for the Plan-wide analysis, but they would occur on nonfederal lands only. Areas of development occurring within the mapped 100-year floodplain for both the GCP and Plan Area would primarily occur within the Cadiz Valley and Chocolate Mountains, with less in the Imperial Borrego Valley and West Mojave and Eastern Slopes ecoregion subareas. As indicated in Table R2.5-97, the extent of development within the mapped 100-year floodplain area would be approximately comparable for both the GCP and DFA areas at 2.5% of the 524,000 acres of GCP floodplain and 2.0% of the 883,000 acres of Plan-wide floodplain. As indicated in Table R2.5-98, the potential extent of GCP development affecting linear surface water features would be 2.2% of the 18,074 total miles of linear features compared to 0.7% of the 80,000 miles Plan-wide. As indicated in Table R2.5-99, the potential extent of GCP development affecting areal surface water features would be 1.8% of the 227,000 total acres of areal features compared to 1.4% of the 670,000 acres Plan-wide.

As indicated in Table R2.5-100, conservation within the mapped 100-year floodplain compared to the total floodplain area would be higher proportionately for the GCP compared to the DRECP Reserve areas at 42.6% of the 524,000 acres of GCP floodplain and 36.0% of the 883,000 acres of DRECP floodplain, respectively. As indicated in Table R2.5-101, conservation associated with the GCP reserve protecting linear surface water features would be15.0% of the 18,000 total miles of linear features, compared with 58.2% of the 80,000 miles Plan-wide. As indicated in Table R2.5-102, conservation associated with the GCP reserve protecting areal surface water features would be 12.1% of the 227,000 total acres of areal features compared with 37% of the 670,000 acres Plan-wide.

IV.5.3.6.5 Impacts Outside the Plan Area

IV.5.3.6.5.1 Impacts of Transmission Outside the Plan Area

The impacts of transmission outside the Plan Area on flooding, hydrology, and drainage would be the same under all alternatives. These impacts are as described for the No Action Alternative in Section IV.5.3.1.5, Impacts Outside the Plan Area in No Action Alternative.

IV.5.3.6.5.2 Impacts of BLM LUPA Decisions Outside the Plan Area

To the extent various BLM land designations and management actions from BLM's LUPA result in conservation of lands and limit renewable energy and transmission development, it would be beneficial for surface water resources. The extent of surface water resources affected by development, as well as those protected from development by conservation designations, is expected to be generally similar both outside and inside the Plan Area.

IV.5.3.6.6 CEQA Significance Determination for the Alternative 4

CEQA significance for Alternative 4 for each impact follows.

FH-1: Plan components could substantially alter existing drainage patterns and increase the risk of flooding on or off site. Land disturbance activities associated with development of renewable energy technologies and transmission lines in the Plan Area, including clearing, grading, excavation, road construction, vegetation removal, fencing, drainage and flood control structures, have the potential to disrupt drainage patterns, particularly of ephemeral stream channels. These activities can also increase the risk of flooding by changing the magnitude and timing of runoff and its path of flow over land. While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a is also required. With adoption of this mitigation measure, Impact FH-1 would be less than significant to surface water resources.

FH-2: Plan components could alter hydrologic processes and water-dependent resources of surface water features. Land disturbance activities as listed under Impact FH-1 also have the potential to alter the structure (streambed and channel banks), composition (vegetation, rocks and soil), and function (morphological and ecological processes, and hydrologic regimes that support plant and animal species) of surface water resources. The resources include seeps, springs, perennial and intermittent streams, wetlands, playas (dry lake beds), and agricultural canal and drain facilities.

While the CMAs provide substantial avoidance and protection measures to surface water resources, Mitigation Measure FH-1a and Mitigation Measure FH-2a are required to provide additional protection to water resources. With adoption of these mitigation measures, Impact FH-2 would be less than significant to surface water resources.

FH-3: Plan components could result in accidental releases of contaminants resulting in degradation of water quality. During all phases of plan activities, hazardous materials used and hazardous wastes generated, particularly oil-based and liquid chemical products, can spill and cause contamination to soils, surface water bodies, and groundwater if not properly handled and contained. Stored hazardous materials and wastes can be disturbed via stormwater and flooding if not properly contained, and can cause degradation and long-term adverse effects to water quality and the beneficial uses of surface waters and groundwater. Existing regulations, in combination with CMAs, provide substantial avoidance and protection measures to surface water resources, and no additional mitigation is required.

IV.5.3.6.7 Comparison of Alternative 4 with Preferred Alternative

This section summarizes the comparison of Alternative 4 with the Preferred Alternative.

IV.5.3.6.7.1 Alternative 4 Compared with Preferred Alternative for Plan-wide DRECP

Comparison of Alternative 4 and the Preferred Alternative with respect to potential for Plan-wide development impacts to surface water resources is summarized as follows:

- Alternative 4 could allow development of up to 2.0% of the total mapped 100-year floodplain compared to 1.7% for the Preferred Alternative.
- Alternative 4 could allow development of up to 0.7% of linear surface water features compared to 0.7% for the Preferred Alternative.
- Alternative 4 could allow development of up to 1.4% of areal surface water features compared to 1.2% for the Preferred Alternative.

Comparison of Alternative 4 to the Preferred Alternative with respect to Plan-wide conservation of surface water resources is summarized as follows:

- Alternative 4 would conserve 36.0% of the total mapped 100-year floodplain compared to 37.2% for the Preferred Alternative.
- Alternative 4 would conserve 58.2% of linear surface water features compared to 60.7% for the Preferred Alternative.
- Alternative 4 would conserve 37.0% of areal surface water features compared to 35.8% for the Preferred Alternative.

IV.5.3.6.7.2 Alternative 4 Compared with Preferred Alternative for the BLM Land Use Plan Amendment

Comparison of Alternative 4 and the Preferred Alternative with respect to potential for BLM LUPA development impacts to surface water resources is summarized as follows:

- Alternative 4 could allow development of up to 0.2% of the total mapped 100-year floodplain compared to 15.6% for the Preferred Alternative.
- Alternative 4 could allow development of up to 0.3% of linear surface water features compared to 0.3% for the Preferred Alternative.
- Alternative 4 could allow development of up to 1.4% of areal surface water features compared to 1.7% for the Preferred Alternative.

Comparison of Alternative 4 and the Preferred Alternative with respect to BLM LUPA conservation of surface water resources is summarized as follows:

- Alternative 4 would conserve 65.1% of the total mapped 100-year floodplain compared to 83.5% for the Preferred Alternative.

- Alternative 4 would conserve 65.8% of linear surface water features compared to 78.2% for the Preferred Alternative.
- Alternative 4 would conserve 61.7% of areal surface water features compared to 54.4% for the Preferred Alternative.

IV.5.3.6.7.3 Alternative 4 Compared with Preferred Alternative for NCCP

The impacts of the NCCP for Alternative 4 are the same as those defined in Section IV.5.3.2.1 for the Plan-wide analysis. As a result, the comparison of Alternative 4 with the Preferred Alternative for the NCCP is the same as described for Plan-wide DRECP.

IV.5.3.6.7.4 Alternative 4 Compared with Preferred Alternative for the GCP

Comparison of Alternative 4 and the Preferred Alternative with respect to potential for GCP development impacts to surface water resources is summarized as follows:

- Alternative 4 could allow development of up to 2.5% of the total mapped 100-year floodplain compared to 3.1% for the Preferred Alternative.
- Alternative 4 could allow development of up to 2.2% of linear surface water features compared to 2.2% for the Preferred Alternative.
- Alternative 4 could allow development of up to 1.8% of areal surface water features compared to 1.3% for the Preferred Alternative.

Comparison of Alternative 4 and the Preferred Alternative with respect to GCP conservation of surface water resources is summarized as follows:

- Alternative 4 would conserve 15.1% of the total mapped 100-year floodplain compared to 14.2% for the Preferred Alternative.
- Alternative 4 would conserve 20.6% of linear surface water features compared to 19.6% for the Preferred Alternative.
- Alternative 4 would conserve 10.3% of areal surface water features compared to 10.2% for the Preferred Alternative.