

4.9 HYDROLOGY/WATER QUALITY

This section provides a description of existing water resources within the study area and pertinent local, State, and Federal plans and policies regarding the protection, management, and use of water resources (Section 4.9.1, Environmental Setting). Potential hydrological and water quality effects of the project-related facilities, as described in Chapter 3.0, are considered in Section 4.9.2 and, if necessary, mitigation is proposed based on the anticipated level of significance. Section 4.9.3 concludes by describing significant residential impacts following the application of mitigation, if any.

4.9.1 Environmental Setting

The study area lies within the Imperial Valley Planning Area of the Colorado River Basin (Regional Water Quality Control Board (RWQCB) 2005). As shown in Figure 4.9-1, the study area is situated within the extreme southern portion of the Imperial Valley Planning Area, approximately 30 miles south of the Salton Sea, and is located within the Brawley Hydrologic Area (Calwater 2010). The Imperial Valley is characterized as a closed basin and, therefore, all runoff generated within the Brawley Hydrologic Area discharges into the Salton Sea.

The study area is characterized by a typical desert climate with dry, warm winters, and hot, dry summers. Most of the rainfall occurs in conjunction with monsoonal conditions between May and September, with an average annual rainfall of less than 3 inches for the study area. The 10-year, 24-hour estimated precipitation amount for the study area is 1.8 inches; while the 100-year, 24-hour estimated precipitation is 3 inches (Western Regional Climate Center 2004).

4.9.1.1 Regulatory Setting

This section identifies and summarizes federal, state, and local laws, policies, and regulations that are applicable to the projects.

Federal

Federal plans, policies, and regulations that are applicable to the projects are presented below under the following headings.

Clean Water Act

The U.S. Environmental Protection Agency (EPA) is the lead Federal agency responsible for managing water quality. The Clean Water Act (CWA) of 1972 is the primary Federal law that governs and authorizes the EPA and the states to implement activities to control water quality. The various elements of the CWA that address water quality and are applicable to the projects are discussed below. Wetland protection elements administered by the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA, including permits for the discharge of dredged and/or fill material into waters of the United States, are discussed in Chapter 4.4, Biological Resources.

Under Federal law, EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations. Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of two elements: (1) designated beneficial uses of the water body in question; and (2) criteria that protect the designated uses. Section 304(a) requires EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. EPA is the Federal agency with primary authority for implementing regulations adopted under the CWA. EPA has delegated the State of California the authority to implement and oversee most of the programs authorized or adopted for CWA compliance through the Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act), described below.

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the U.S. must obtain a water quality certification from the State Water Resources Control Board (SWRCB) in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate.

CWA Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit program to control point source discharges from industrial, municipal, and other facilities if their discharges go directly to surface waters. The 1987 amendments to the CWA created a new section of the CWA devoted to regulating storm water or nonpoint source discharges (Section 402[p]). The EPA has granted California primacy in administering and enforcing the provisions of the CWA and the NPDES program through the State Water Resources Control Board (SWRCB). The SWRCB is responsible for issuing both general and individual permits for discharges from certain activities. At the local and regional levels, general and individual permits are administered by RWQCBs.

CWA Section 303(d) Impaired Waters List

CWA Section 303(d) requires states to develop lists of water bodies that will not attain water quality standards after implementation of minimum required levels of treatment by point-source dischargers. Section 303(d) requires states to develop a total maximum daily load (TMDL) for each of the listed pollutants and water bodies. A TMDL is the amount of loading that the water body can receive and still be in compliance with applicable water quality objectives and applied beneficial uses. TMDLs can also act as a planning framework for reducing loadings of a specific pollutant from various sources to achieve compliance with water quality objectives. TMDLs prepared by the state must include an allocation of allowable loadings to point and nonpoint sources, with consideration of background loadings and a margin of safety. The TMDL must also include an analysis that shows links between loading reductions and the attainment of water quality objectives.

The impaired water bodies listed on the 303(d) list for the Brawley Hydrologic Area include the Imperial Valley Drains (managed by the Imperial Irrigation District), New River, and the Salton Sea. The Imperial Valley Drains are responsible for draining the study area. Further discussion of specific pollutant listings is provided in Section 4.9.1.2.

Antidegradation Policy

The Federal Antidegradation Policy, established in 1968, is designed to protect existing uses, water quality, and national water resources. The Federal policy directs states to adopt a statewide policy that includes the following primary provisions:

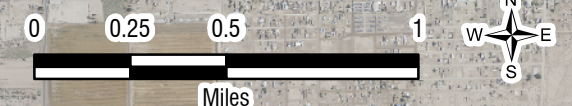
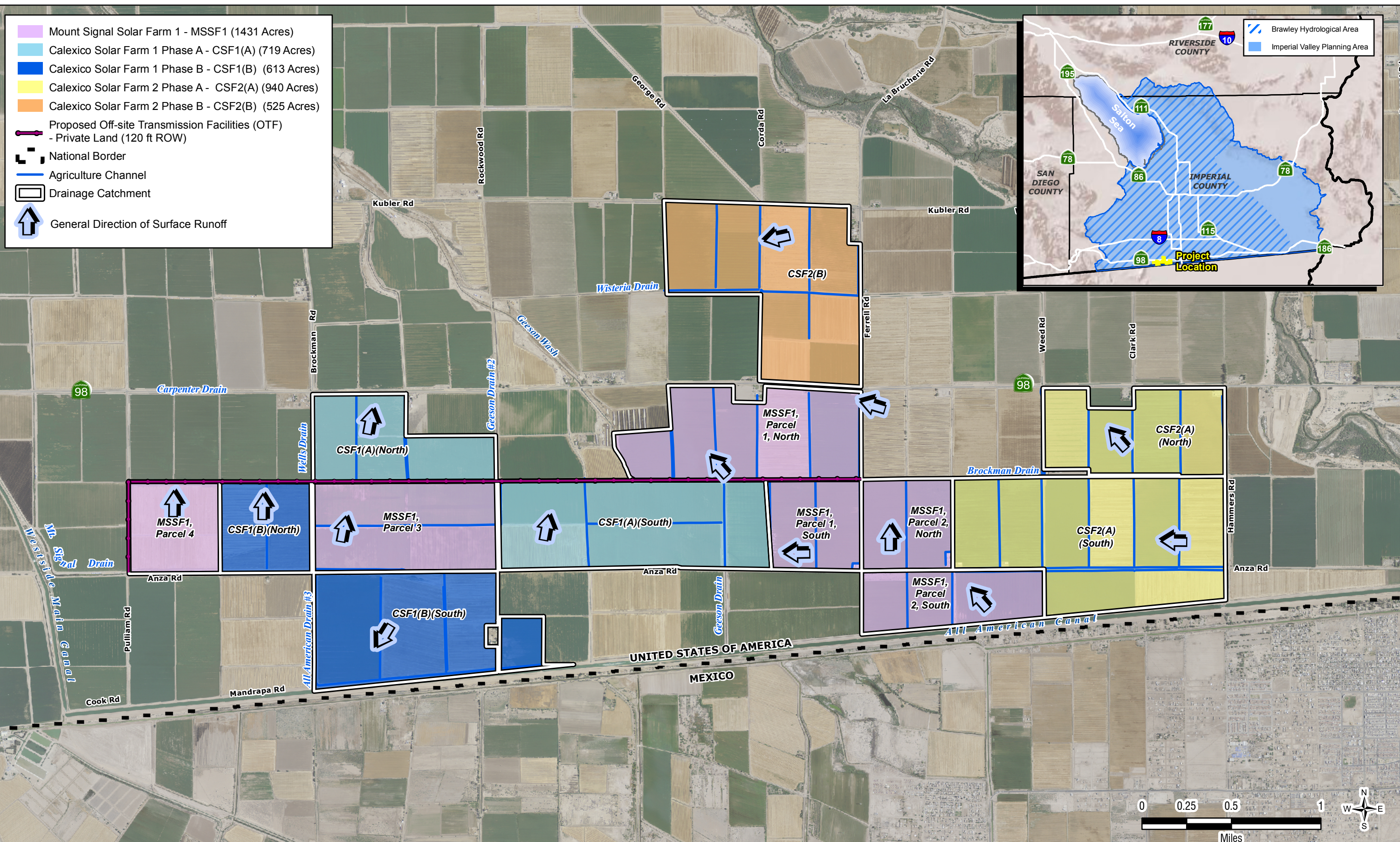
- Existing in-stream uses and the water quality necessary to protect those uses shall be maintained and protected.
- Where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development.
- Where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

The Federal Anti-Degradation Policy is applicable to the proposed on-site wastewater system and is implemented by the RWQCB and County's Public Health Department.

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations that limit

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Regional Hydrology and Localized Drainage
Figure 4.9-1

development in floodplains. FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection covered by the FIRMs is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 (0.01) annual exceedance probability [AEP] (i.e., the 100-year flood event). The study area is included on southern portions of FIRMs 06025C2050C and 06025C2075C (FEMA 2008). According to these FIRMs, the entire study area is contained within Zone X and outside the limits of the 100-year flood zone (FEMA 2008).

State

Numerous state laws and regulations apply to use, conservation, and protection of water resources. Each of these applicable laws and regulations are outlined and briefly described below.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, also known as the California Water Code, is California's statutory authority for the protection of water quality. Under this act, the state must adopt water quality policies, plans, and objectives that protect the state's waters. The act sets forth the obligations of the SWRCB and RWQCBs pertaining to the adoption of Water Quality Control Plans and establishment of water quality objectives. Unlike the federal CWA, which regulates only surface water, the Porter-Cologne Act regulates both surface water and groundwater.

Water Quality Control Plan for the Colorado River Basin

The Water Quality Control Plan for the Colorado River Basin (or Basin Plan) prepared by the Colorado River Basin RWQCB (Region 7) identifies beneficial uses of surface waters within the Colorado River Basin region, establishes quantitative and qualitative water quality objectives for protection of beneficial uses, and establishes policies to guide the implementation of these water quality objectives (RWQCB 2005). According to the Basin Plan (RWQCB 2005), the beneficial uses established for the Imperial Valley Drains, which include Mt. Signal Drain, Brockman Drain, Carpenter Drain, Greeson Drain, and Wisteria Drain, New River, and the Salton Sea include: industrial service supply; freshwater replenishment; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; preservation of rare, threatened, or endangered species; and aquaculture.

California Toxics Rule

Under the California Toxics Rule (CTR), the USEPA has proposed water quality criteria for priority toxic pollutants for inland surface waters, enclosed bays, and estuaries. These federally promulgated criteria create water quality standards for California waters. The CTR satisfies CWA requirements and protects public health and the environment. The USEPA and the SWRCB have the authority to enforce these standards, which are incorporated into the NPDES permits that regulate the current discharges in the study area.

NPDES General Industrial and Construction Permits

The NPDES General Industrial Permit requirements apply to the discharge of stormwater associated with industrial sites. The permit requires implementation of management measures that will achieve the performance standard of the best available technology economically achievable and best conventional pollutant control technology. Under the statute, operators of new facilities must implement industrial BMPs in the projects' SWPPP and perform monitoring of stormwater discharges and unauthorized non-stormwater discharges. Construction activities are regulated under the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit) which covers stormwater runoff requirements for projects where the total amount of ground disturbance during construction exceeds one acre. Coverage under a General Construction Permit requires the preparation of a Stormwater Pollution Prevention Plan (SWPPP) and submittal of a Notice of Intent (NOI)

to comply with the General Construction Permit. The SWPPP includes a description of BMPs to minimize the discharge of pollutants from the site during construction. Typical BMPs include temporary soil stabilization measures (e.g., mulching and seeding), storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or stormwater, and using filtering mechanisms at drop inlets to prevent contaminants from entering storm drains. Typical post-construction management practices include street sweeping and cleaning stormwater drain inlet structures. The NOI includes site-specific information and the certification of compliance with the terms of the General Construction Permit.

Local

Similar to the Federal and State levels, there are several applicable local plans and regulations that apply to use, conservation, and protection of water resources. Each of these applicable plans and regulations are outlined and briefly described below.

County of Imperial General Plan

Due to the economic, biological, and agricultural significance water plays in the Imperial County, the Water Element and the Conservation and Open Space Element of the General Plan contain policies and programs, created to ensure water resources are preserved and protected. Table 4.9-1 identifies General Plan policies and programs for water quality and flood hazards that are relevant to the projects and summarizes the projects’ consistency with the General Plan. While this EIR analyzes the projects’ consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Imperial County Board of Supervisors ultimately determines consistency with the General Plan.

TABLE 4.9-1. PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN WATER RESOURCES POLICIES

General Plan Policies	Consistency with General Plan	Analysis
Conservation and Open Space Element		
1) Structural development normally shall be prohibited in the designated floodways. Only structures which comply with specific development standards should be permitted in the floodplain.	Consistent	The projects do not contain a residential component nor would it place housing within a 100-year flood hazard area.
Water Element		
1) The County of Imperial shall make every reasonable effort to limit or preclude the contamination or degradation of all groundwater and surface water resources in the County.	Consistent	Mitigation measures contained in Section 4.9.2.3 will require that the project applicant prepare a site-specific drainage plan and water quality management plan to minimize adverse effects to local water resources. Further, Sections 4.6 and 4.8 include additional mitigation requirements for the projects’ septic waste treatment and disposal system and the management of hazardous materials and waste during the construction and operation of the projects. These mitigation requirements will be made conditions approval in conjunction with the County’s approval of the Conditional Use Permit(s) (CUPs) for the projects.
2) All development proposals brought before the County of Imperial shall be reviewed for potential adverse effects on water quality and quantity, and shall be required to implement appropriate mitigation measures for any significant impacts.	Consistent	See response for Water Element Policy 1) above.

County of Imperial Land Use Ordinance, Title 9

The County's Ordinance Code provides specific direction for the protection of water resources. Applicable ordinance requirements are contained in Division 10, Building, Sewer and Grading Regulations, and summarized below.

Chapter 4 - Uniform Plumbing Code. The Uniform Plumbing Code, 1997 Edition, including the appendices, as adopted by the International Association of Plumbing and Mechanical Officials, is incorporated by reference. Section 91004.01, Modification of the Uniform Plumbing Code, of the Ordinance Code includes additional requirements in terms of minimum spacing requirements and minimum septic tank sizing.

Chapter 10 - Grading Regulations. Section 91010.02 of the Ordinance Code outlines conditions required for issuance of a Grading Permit. These specific conditions include:

1. If the proposed grading, excavation or earthwork construction is of irrigatable land, that said grading will not cause said land to be unfit for agricultural use;
2. The depth of the grading, excavation or earthwork construction will not preclude the use of drain tiles in irrigated lands;
3. The grading, excavation or earthwork construction will not extend below the water table of the immediate area; and
4. Where the transition between the grading plane and adjacent ground has a slope less than the ratio of one and one-half feet on the horizontal plane to one-foot on the vertical plane, the plans and specifications will provide for adequate safety precautions.

Imperial Irrigation District

The Imperial Irrigation district (IID) is an irrigation district organized under the California Irrigation District Law, codified in Section 20500 et seq. of the California Water Code. Critical functions of IID include diversion and delivery of Colorado River water to the Imperial Valley, operation and maintenance of the drainage canals and facilities, including those in the study area, and generation and distribution of electricity. Several policy documents govern IID operations and are summarized below:

- The Law of the River and historical Colorado River decisions, agreements and contracts;
- The Quantification Settlement Agreement and Transfer Agreements;
- The Definite Plan, now referred to as the Systems Conservation Plan, which defines the rigorous agricultural water conservation practices being implemented by growers and IID to meet the Quantification Settlement Agreement (QSA) commitments;
- The Equitable Distribution Plan, which defines how IID will prevent overruns and stay within the cap on the Colorado River water rights;
- Existing IID standards and guidelines for evaluation of new development and define IID's role as a responsible agency and wholesaler of water; and
- Integrated Water Resources Management Plan, Draft IID Plan, September 2009.

In relation to the projects, IID maintains regulation over the drainage of water into their drains, including the design requirements of stormwater retention basins. IID requires that retention basins be sized to handle an entire rainfall event in case the IID system is at capacity. Additionally, IID requires that outlets to IID facilities be no larger than 12 inches in diameter and must contain a backflow prevention device (IID 2009).

Imperial County Engineering Guidelines Manual

Based on guidance contained in the County's Engineering Guidelines Manual, the following drainage requirements would be applicable to the projects.

III A. GENERAL REQUIREMENTS

1. All drainage design and requirements are recommended to be in accordance with the Imperial Irrigation District (IID) "Draft" Hydrology Manual or other recognized source with approval by the County Engineer and based on full development of upstream tributary basins. Another source is the Caltrans I-D-F curves for the Imperial Valley.
2. Public drainage facilities shall be designed to carry the ten-year six-hour storm underground, the 25-year storm between the top of curbs provided two 12-foot minimum width dry lanes exist and the 100-year frequency storm between the right-of-way lines with at least one 12-foot minimum dry lane open to traffic. All culverts shall be designed to accommodate the flow from a 100-year frequency storm.
3. Permanent drainage facilities and right of way, including access, shall be provided from development to point of satisfactory disposal.
4. Retention volume on retention or detention basins should have a total volume capacity for a three-inch minimum precipitation covering the entire site with no C reduction factors. Volume can be considered by a combination of basin size and volume considered within parking and/or landscaping areas. There is no guarantee that a detention basin outletting to an IID facility or other storm drain system will not back up should the facility be full and unable to accept the project runoff. This provides the safety factor from flooding by ensuring each development can handle a minimum 3-inch precipitation over the project sites.
5. Retention basins should empty within 72 hours and no sooner than 24 hours in order to provide mosquito abatement. Draining, evaporation or infiltration, or any combination thereof can accomplish this. If this is not possible then the owner should be made aware of a potential need to address mosquito abatement to the satisfaction of the Environmental Health Services (EHS) Department. Additionally, if it is not possible to empty the basin within 72 hours, the basin should be designed for 5 inches, not 3 inches as mentioned in Item #4 above. This would allow for a saturation condition of the soil due to a 5" storm track. EHS must review and approve all retention basin designs prior to County Public Works approval. Nuisance water must not be allowed to accumulate in retention basins. EHS may require a nuisance water abatement plan if this occurs.
6. The minimum finish floor elevation shall be 12 inches above top of fronting street curb unless property is below street level and/or 6 inches above the 100-year frequency storm event or storm track. A local engineering practice is to use a 5-inch precipitation event as a storm track in the absence of detailed flood information. The 100-year frequency storm would be required for detention calculations.
7. Finish pad elevations should be indicated on the plans, which are at or above the 100-year frequency flood elevation identified by the engineer for the parcel. Finish floor elevations should be set at least 6 inches above the 100-year flood elevation.
8. The developer shall submit a drainage study and specifications for improvements of all drainage easements, culverts, drainage structures, and drainage channels to the Department of Public Works for approval. Unless specifically waived herein, required plans and specifications shall provide a drainage system capable of handling and disposing of all surface waters originating within the subdivision and all surface waters that may flow onto the subdivision from adjacent lands. Said drainage system shall include any easements and structures required by the Department of Public Works or the affected Utility Agency to properly handle the drainage on-site and off-site. The report should detail any vegetation and trash/debris removal, as well as address any standing water.

9. Hydrology and hydraulic calculations for determining the storm system design shall be provided to the satisfaction of the Director, Department of Public Works. When appropriate, water surface profiles and adequate field survey cross-section data may also be required.
10. An airtight or screened oil/water separator or equivalent is required prior to permitting on-site lot drainage from entering any street right of way or public storm drain system for all industrial/commercial or multi residential uses. A maximum 6-inch drain lateral can be used to tie into existing adjacent street curb inlets with some exceptions. Approval from the Director of Public Works is required.
11. The County is implementing a storm water quality program as required by the State Water Resources Control Board, which may modify or add to the requirements and guidelines presented elsewhere in this document. This can include ongoing monitoring of water quality of storm drain runoff, implementation of Best Management Practices (BMPs) to reduce storm water quality impacts downstream or along adjacent properties. Attention is directed to the need to reduce any potential of vectors, mosquitoes or standing water.
12. A Drainage Report is required for all developments in the County. It shall include a project description, project setting including discussions of existing and proposed conditions, any drainage issues related to the site, summary of the findings or conclusions, off-site hydrology, on-site hydrology, hydraulic calculations and a hydrology map.

4.9.1.2 Existing Conditions

The study area is located within the Brawley Hydrologic Area, which is part of the Imperial Hydrologic Unit; an enclosed basin. Natural surface water features located in the watershed include the Geeson Wash, New River, and the Salton Sea to the north. The natural hydrology within the study area is highly altered by a network of engineered drains constructed by the Imperial Irrigation District. Within the immediate study area, these drain facilities discharge into the Geeson Wash, which flows north into New River and ultimately the Salton Sea. The total watershed area within the Brawley Hydrologic Area is approximately 1,362,885 acres.

Localized Drainage Conditions

Mt. Signal Solar Farm 1 (MSSF1). The land area comprising the MSSF1 site location generally consists of agricultural cropland or fallow land with level topography. In general, the existing topography has been graded to facilitate agricultural cultivations within the study area. Based on information provided by the project applicant, grades across the study area are generally flat ranging from 0.2 percent to 0.4 percent. Due to the discontinuous nature of the MSSF1 site, different portions of the MSSF1 drain into different drain features owned and operated by IID. However, all flows generated within the study area ultimately drain into Geeson Wash to the north.

The IID drainage system largely consists of earthen open channels paralleling irrigation canals on the downstream side of the fields (IID 2009). The drains collect excess surface flows from the agricultural fields (tailwater), subsurface flows from a system of tile drains underlying the fields (tilewater), and operational spill from the canals and laterals. The entire system was designed strictly to drain excess irrigation water; consequently, the system has no more than incidental capacity to intercept and convey storm runoff from the surrounding desert, mountains, or the urban areas in the Imperial Valley (IID 2009). In addition, some site locations include an on-site drainage system comprised of perforated tile drains that may also convey flows to the IID drain system.

As depicted in Figure 4.9-1, Parcel 1 of MSSF1 is bisected by the Brockman Drain. Runoff from land areas to the south of the Brockman Drain flow directly into the Brockman Drain and are controlled via an inlet structure owned and maintained by IID. This watershed area is referred to as drainage catchment MSSF1, Parcel 1 (south) (see Figure 4.9-1 and Table 4.9-2). Areas to the north of the Brockman Drain runoff directly into the Geeson Wash via the Geeson Drain, which too is controlled via a drain inlet

structure. This watershed area is referred to as drainage catchment MSSF1, Parcel 1 (North) (see Figure 4.9-1 and Table 4.9-2).

A similar situation occurs for runoff generated from MSSF1, Parcel 2, which is bisected by Anza Road. Runoff generated to the south of Anza Road on MSSF1, Parcel 2, travels west to the Geeson Drain and then flows north into the Geeson Wash. This watershed area is referred to as drainage catchment MSSF1, Parcel 2 (South) (see Figure 4.9-1 and Table 4.9-2). To the north of Anza Road, runoff from MSSF1, Parcel 2, drains into the Brockman Drain. This watershed area is referred to as drainage catchment MSSF1, Parcel 2 (North)(see Figure 4.9-1 and Table 4.9-2).

Runoff generated from land surfaces within MSSF1, Parcel 3 are expected to flow north and enter either the Geeson Drain #2 or Wells Drain, before discharging into the Geeson Wash. This watershed area is referred to as drainage catchment MSSF1, Parcel 3 (see Figure 4.9-1 and Table 4.9-2). MSSF1, Parcel 4, located further east also drains to the north and is believed to drain into the Carpenter Drain, which travels west and discharges into the Mount Signal Drain before emptying into the Geeson Wash. This watershed area is referred to as drainage catchment MSSF1, Parcel 4 (see Figure 4.9-1 and Table 4.9-2).

TABLE 4.9-2 PRELIMINARY DRAINAGE CATCHMENTS WITHIN THE STUDY AREA

Drainage Catchment	Total Drainage Area (Acres)	IID Drain Accepting Runoff ¹
MSSF1, Parcel 1 (North)	393	Geeson Drain
MSSF1, Parcel 1 (South)	167	Brockman Drain
MSSF1, Parcel 2 (North)	167	Brockman Drain
MSSF1, Parcel 2 (South)	206	Geeson Drain
MSSF1, Parcel 3	332	Wells Drain or Geeson Drain #2
MSSF1, Parcel 4	167	Carpenter Drain, Mount Signal Drain
CSF1(A)(North)	245	Woodbine Drain
CSF1(A)(South)	474	Geeson Drain
CSF1(B)(North)	166	Carpenter Drain, Mount Signal Drain
CSF1(B)(South)	446	All American Drain #3
CSF2(A)(North)	293	Wisteria Drain
CSF2(A)(South)	646	Brockman Drain
CSF2(B)	524	Wisteria Drain

Source: USGS 1976 and 1978; HDR 2011.

Note: ¹ Preliminary discharge to IID drain locations requires verification through a site specific drainage study.

Calexico Solar Farm 1, Phase A (CSF1(A)). Drainage characteristics within the CSF1(A) site location are very similar to that described for MSSF1. CSF1(A) is bisected by the Geeson Drain #2, which acts as a drainage divide within CSF1(B). Areas within CSF1(A) to the east of the Geeson Drain #2, flow north, northeast and discharge into the Geeson Drain. This watershed area is referred to as drainage catchment CSF1(A)(South) (see Figure 4.9-1 and Table 4.9-2). Areas within CSF1(A) to the west of the Geeson Drain #3 empty into either Woodbine Drain or Geeson Drain #3. This watershed area is referred to as drainage catchment CSF1(A)(North)(see Figure 4.9-1 and Table 4.9-2).

Calexico Solar Farm 1, Phase B (CSF1(B)). Drainage characteristics within the CSF1(B) site location are similar to that described for MSSF1. CSF1(B) is bisected by Anza Road, which acts as a drainage divide within CSF1(B). Flows to the south of Anza Road within CSF1(B) discharge into the All American Drain #3, which in turn travels south and then west to the Mount Signal Drain. Once in the Mount Signal Drain, flows travel back to the north to the Geeson Wash. This watershed area is referred to as drainage catchment CSF1(B)(North) (see Figure 4.9-1 and Table 4.9-2). To the north of Anza Road, runoff from CSF1(B) flows to the north and enters the Carpenter Drain, which flows to the west and empties into the

Mount Signal Drain. This watershed area is referred to as drainage catchment CSF1(B)(South) (see Figure 4.9-1 and Table 4.9-2).

Calexico Solar Farm 2, Phase A (CSF2(A)). Drainage characteristics within the CSF2(A) site location are similar to that described for MSSF1. CSF2(A) is bisected by the Brockman Drain, which acts as a drainage divide within CSF2(A). Drainage runoff from areas within CSF2(A) to the south of the Brockman Drain enters the Brockman Drain and travels west towards the Geeson Wash. This watershed area is referred to as drainage catchment CSF2(A)(South)(see Figure 4.9-1 and Table 4.9-2). In contrast, areas within CSF2(A) to the north of the Brockman Drain flow into the Wisteria Drain and travel west, northwest. This watershed area is referred to as drainage catchment CSF2(A)(North) (see Figure 4.9-1 and Table 4.9-2).

Calexico Solar Farm 2, Phase B (CSF2(B)). Drainage characteristics within the CSF2(B) site location are similar to that described for MSSF1. CSF2(B) is bisected by the Wisteria Drain, which flows west to the Geeson Wash. Based on the level topography within CSF2(B), all runoff generated on-site is expected to empty into the Wisteria Drain, which continues west and discharges into the Geeson Wash. This watershed area is referred to as drainage catchment CSF2(B) (see Figure 4.9-1 and Table 4.9-2).

Off-site Transmission Facilities (OTF) - Private Lands. Drainage conditions within the OTF corridor that are located within private lands are similar to those described for MSSF1. This corridor traverses through the study area and crosses or borders the following watershed areas as described above: MSSF1, Parcel 1 (North); MSSF1, Parcel 1 (South); MSSF1, Parcel 2 (North), MSSF1, Parcel 2 (South), MSSF1, Parcel 3; MSSF1, Parcel 4; CSF1(A)(South); CSF1(A)(North); CSF1(B)(North); and SF2(A)(South).

OTF – BLM Lands. Drainage from the OTF corridor within BLM Lands also drains into the Salton Sea similar to that described for the study area for the projects. However, unlike areas to the east of the West Main Canal, the OTF on BLM lands is more characteristic of a desert landscape and a more natural drainage pattern absent of any artificial drainage facilities.

Flooding

As described in Section 3.1.1.1, the study area and OTF corridors are included within the southern portions of FIRMs 06025C2050C and 06025C2075C. According to these FIRMs, the entire study area is contained within Zone X and outside the limits of the 100-year flood zone (FEMA 2008). Zone X delineates areas within the limits of the 500-year flood. Flood protection for the study area is provided by a levee feature that borders the eastern edge of CSF2(A) and delineates the limits of the 100-year flood zone for New River.

Surface Water Quality

Land use and water resources are unequivocally linked. A variety of natural and human factors can affect the quality and use of streams, lakes, and rivers. Surface waters may be impacted from a variety of point and non-point discharges. Examples of point sources may include wastewater treatment plants, industrial discharges, or any other type of discharge from a specific location (commonly a large-diameter pipe) into a stream or water body. In contrast, non-point source pollutant sources are generally more diffuse in nature and connected to a cumulative contribution of multiple smaller sources. There is no comprehensive water quality monitoring station in the study area, and water quality data are limited.

Common non-point source contaminants within the study area may include, but are not limited to: sediment, nutrients (phosphorous and nitrogen), trace metals (e.g., lead, zinc, copper, nickel, iron, cadmium, and mercury), oil and grease, bacteria (e.g., coliform), viruses, pesticides and herbicides, organic matter, and solid debris/litter. Vehicles account for most of the heavy metals, fuel and fuel additives (e.g., benzene), motor oil, lubricants, coolants, rubber, battery acid, and other substances.

Nutrients result from excessive fertilizing of agricultural areas, while pesticides and herbicides are widely used in agricultural fields and roadway shoulders for keeping right-of-way areas clear of vegetation and pests. Additionally, the use of on-site septic systems for wastewater disposal can degrade shallow groundwater by contributing nitrate. All these substances are entrained by runoff during wet weather and discharged into local drain facilities operated by IID and eventually into the Salton Sea.

Based on the 305(b)/303(d) Integrated Report prepared by the Colorado River Basin Regional Water Quality Control Board (RWQCB), the following water features within the Brawley Hydrologic Area include the Imperial Valley Drains, New River, and the Salton Sea. Specific impairments listed for each of these water bodies (or Category 5) are identified below (SWRCB 2010):

- Imperial Valley Drains: Impaired for chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, endosulfan, polychlorinated biphenyls (PCBs), sedimentation/siltation; toxaphene, and selenium;
- New River: Impaired for chlordane, chlorpyrifos, copper, DDT, diazinon, dieldrin, Hexachlorobenzene/ HCB, mercury, nutrients, organic enrichment/low dissolved oxygen, PCBs, pathogens, sediment, selenium, toxicity, toxaphene, trash, and zinc;
- Salton Sea: Impaired for arsenic, chlorpyrifos, DDT, enterococcus, nutrients, salinity, and selenium.

In relation to the Imperial Valley Drains, the listings for DDT, dieldrin, and, endosulfan only apply to drains that are not responsible for draining the immediate study area (SWRCB 2010).

Groundwater Hydrology

The study area and OTF corridors overlies the southern end of the Imperial Valley Groundwater Basin (DWR Basin Number: 7-30), which covers approximately 1,870 square miles (DWR 2003). The physical groundwater basin extends across the border into Baja California where it underlies a contiguous part of the Mexicali Valley (DWR 2003). However, the southern boundary of the Imperial Valley Groundwater Basin is defined politically as the U.S./Mexico border. The basin has two major aquifers, separated at depth by a semi-permeable aquitard¹ that averages 60 feet thick and reaches a maximum thickness of 280 feet (DWR 2003). The average thickness of the upper aquifer is 200 feet with a maximum thickness of 450 feet. As much as 80 feet of fine-grained, low permeability prehistoric lake deposits have accumulated on the valley floor, which result in locally confined aquifer conditions (DWR 2003).

Groundwater recharge within the basin is primarily from irrigation return. Other recharge sources are deep percolation of rainfall and surface runoff, underflow into the basin, and seepage from unlined canals which traverse the valley (DWR 2003). Groundwater levels within a majority of the basin have remained stable from 1970 to 1990 because of relatively constant recharge and an extensive network of subsurface drains (DWR 2003).

4.9.2 Impacts and Mitigation Measures

This section presents the significance criteria used for considering project-related hydrology and water quality impacts, the methodology employed for the evaluation, and mitigation requirements, if necessary.

4.9.2.1 Thresholds of Significance

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. The projects under consideration would be determined to result in a significant hydrology/water quality impact if it would result in any of the following:

¹ An aquitard is a zone within the earth that restricts the flow of groundwater from one aquifer to another.

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade groundwater water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would decline to a level which would not support existing land uses or planned uses for which permits have been granted);
- Alter the existing surface hydrology;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion, siltation, or flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Place within a 100-year (0.01 AEP) flood hazard area structures that would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Result in inundation by seiche, tsunami, or mudflow.

4.9.2.2 Methodology

This analysis considers the potential for the projects to impact local and regional surface hydrology and water quality based on the components described in Chapter 2. The impact analysis focuses on foreseeable changes to existing hydrologic and water quality conditions in the context of the significance criteria listed above. The impact analysis provides a discussion for each of the major project components in the context of proposed construction activities and post-construction operations. In the absence of a formal drainage plan, potential hydromodification impacts resulting from new impervious surfaces associated the projects were assessed by using the Rational Method ($Q=CiA$) to calculate pre- and post-construction runoff. Rainfall intensities for the 100-year rainfall intensity were derived from the Western Regional Climate Center (WRCC 1977). Appendix I contains the assumptions applied, which are intended to be conservative and not for design purposes.

4.9.2.3 Impact Analysis

<p>IMPACT 4.9-1</p>	<p>Violation of Water Quality Standards During Construction. Construction of the projects could generate discharges to surface water resources that could potentially violate water quality standards or waste discharge requirements.</p>
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MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, OTF-BLM Lands

Construction of the project facilities would involve excavation, soil stockpiling, grading, and the installation of solar arrays, access roads, and electrical distribution, transmission, and substation facilities. There are multiple construction related activities that could have potential direct or indirect impacts on the water quality of local surface water features and shallow groundwater resources including sedimentation, erosion, handling hazardous materials, dewatering, if required, and canal and drain crossings by the electrical distribution lines of access roads. Further drain crossings, if required, could result in the disturbance of the drainage bed or bank, which could also weaken the bank’s structure and increase its susceptibility to erosion. Disturbing the geomorphic characteristics and stability of the channel bed and banks may initiate chronic erosion in natural and engineered channels thereby resulting in increased

turbidity. A similar circumstance could occur upon decommissioning of the projects prior to site restoration. In both cases, such impacts could be exacerbated if surface vegetation is not reestablished and stabilized prior to the next high-flow or precipitation event and could result in **significant** direct impacts within the immediate vicinity of construction and indirect impacts to water quality further downstream.

Hazardous materials associated with construction would be limited to substances associated with mechanized equipment, such as gasoline and diesel fuels, engine oil, and hydraulic fluids. If precautions are not taken to contain contaminants, accidental spills of these substances during construction could produce contaminated stormwater runoff (nonpoint source pollution), a major contributor to the degradation of water quality in surface waters. Without proper containment and incident response measures in place, the operation of construction equipment could result in **significant** direct and indirect impacts to water quality.

Construction of the projects could, at times, also require dewatering of shallow, perched groundwater in the immediate vicinity of excavations and installation of underground features at a limited number of areas where groundwater depths are shallow. Groundwater withdrawn from the construction areas would be subsequently discharged to local drainage ditches or via land application. These discharges may contain sediments, dissolved solids, salts, and other water quality constituents found in the shallow groundwater, which could degrade the quality of receiving waters. Degradation of local receiving waters from the introduction of shallow groundwater during construction dewatering could result in a **significant** impact to receiving waters.

Prior to construction and grading activities, the project applicant is required to file an NOI with the SWRCB to comply with the General NPDES Construction Permit and prepare a SWPPP, which addresses the measures that would be included during project construction to minimize and control construction and post-construction runoff to the “maximum extent practicable.” In addition, NPDES permits require the implementation of BMP’s that achieve a level of pollution control to the maximum extent practical, which may not necessarily be completely protective of aquatic life or address water quality impairments for local waterways. This represents a **significant**, direct and indirect impact. For these reasons, the implementation of the prescribed mitigation would be required to ensure that the project SWPPPs and Grading Plan(s) include measures necessary to minimize water quality impacts as a result of project construction and post-construction runoff. In addition, given that site decommissioning would result in similar activities as identified for construction, these impacts could also occur in the future during site restoration activities.

Mitigation Measure(s)

The following mitigation measure is required for MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, and OTF-BLM Lands.

4.9-1a Acquire Appropriate Clean Water Act Regulatory Permits, Prepare SWPPP, and Implement BMPs Prior to Construction and Site Restoration. The project applicant or its contractor shall prepare a SWPPP specific to the projects and be responsible for securing coverage under SWRCB’s NPDES stormwater permit for general construction activity (Order 2009-0009-DWQ). The SWPPP shall identify specific actions and BMPs relating to the prevention of stormwater pollution from project-related construction sources by identifying a practical sequence for site restoration, BMP implementation, contingency measures, responsible parties, and agency contacts. The SWPPP shall reflect localized surface hydrological conditions and shall be reviewed and approved by the project applicant prior to commencement of work and shall be made conditions of the contract with the contractor selected to build and decommission the projects. The SWPPP(s) shall incorporate control measures in the following categories:

- Soil stabilization and erosion control practices (e.g., hydroseeding, erosion control blankets, mulching);
- Dewatering and/or flow diversion practices, if required (see Mitigation Measure 4.9-1b);
- Sediment control practices (temporary sediment basins, fiber rolls);
- Temporary and post-construction on- and off-site runoff controls;
- Special considerations and BMPs for water crossings, wetlands, and drainages;
- Monitoring protocols for discharge(s) and receiving waters, with emphasis placed on the following water quality objectives: dissolved oxygen, floating material, oil and grease, pH, and turbidity;
- Waste management, handling, and disposal control practices;
- Corrective action and spill contingency measures;
- Agency and responsible party contact information, and
- Training procedures that shall be used to ensure that workers are aware of permit requirements and proper installation methods for BMPs specified in the SWPPP.

The SWPPP shall be prepared by a qualified SWPPP practitioner with BMPs selected to achieve maximum pollutant removal and that represent the best available technology that is economically achievable. Emphasis for BMPs shall be placed on controlling discharges of oxygen-depleting substances, floating material, oil and grease, acidic or caustic substances or compounds, and turbidity. Given that Imperial Valley Drains would accept runoff from the study area and are listed as impaired for sediment, the SWPPP shall include BMPs sufficient for Risk Level 2 projects. Best Management Practices for soil stabilization and erosion control practices and sediment control practices will also be required. Performance and effectiveness of these BMPs shall be determined either by visual means where applicable (i.e., observation of above-normal sediment release), or by actual water sampling in cases where verification of contaminant reduction or elimination, (inadvertent petroleum release) is required to determine adequacy of the measure.

4.9-1b Properly Dispose of Construction Dewatering in Accordance with the Colorado River Basin Regional Water Quality Control Board. If required, all construction dewatering shall be discharged to an approved land disposal area or drainage facility in accordance with Colorado River Basin RWCQB requirements. The project applicant or its construction contractor shall provide the Colorado River Basin RWQCB with the location, type of discharge, and methods of treatment and monitoring for all groundwater dewatering discharges. Emphasis shall be placed on those discharges that would occur directly or in proximity to surface water bodies and drainage facilities.

Significance After Mitigation

With the implementation of the above mitigation measures, impacts to surface water quality as attributable to the projects would be reduced to a **less than significant** level through the inclusion of focused BMPs for the protection of surface water resources. Monitoring and contingency response measures would be included to verify compliance with water quality objectives for all surface waters crossed during construction. Particular emphasis would be placed on dissolved oxygen, floating material, oil and grease, and turbidity (or sediment) as these are generally the water quality constituents of most concern during construction-related activities.

<p>IMPACT 4.9-2</p>	<p>Violation of Water Quality Standards During Operation. Operation of the projects' O&M facilities, solar arrays, electrical substation and distribution facilities, and access roads could involve the use of materials or substances that could be entrained in surface runoff and discharged to surface waterways or groundwater.</p>
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MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, OTF-BLM Lands

Post-construction runoff from the constructed facilities would carry two main water quality impacts that could impact surface water drainages and drains within the study area and the Geeson Wash, which accepts drainage from the study area, and empties into the New River. The first is caused by an increase in the type and quantity of pollutants in storm water runoff. As runoff flows over developed surfaces, water can entrain a variety of potential pollutants including, but not limited to, oil and grease, pesticides, trace metals, and nutrients. These pollutants can become suspended in runoff and carried to receiving waters. These effects are commonly referred to as non-point source water quality impacts.

Long-term operation of the projects' solar facilities is expected to pose limited threat to surface water quality after the completion of construction. With the exception of the OTF of BLM Lands, the projects would be subject to the County's Grading Regulations as specified in Section 91010.02 of the Ordinance Code. However, the operation of the O&M, substation, and OTF facilities would involve the routine use of materials and chemicals that could still impact surface waters if handled or stored improperly. Additionally, the study area is located in unincorporated Imperial County and not subject to a Municipal Stormwater (MS4) Permit, which requires the implementation of post-construction stormwater BMPs to achieve pollutant removal to the maximum extent practicable. Additionally, the projects would not be subject to the current version of the NPDES General Industrial Permit. For these reasons, there is no regulatory mechanism in place that would address water quality concerns related to leaks and spills of chemicals stored and used at the project facilities and the retention of post-construction runoff to pre-construction conditions. Based on these considerations, the projects have the potential to result in both direct and indirect water quality impacts that could be **significant**.

Long term point discharges from the projects would be minimal, but could result in reductions in water quality where the water released is of lower quality than ambient conditions. These discharges would be infrequent, but could include landscape irrigation, uncontaminated pumped ground water, and discharges of potable water during water tank cleaning [as defined in 40 CFR 35.2005(21)]. In this context, long-term water quality impacts from point sources would be **less than significant**.

The second potential impact from post-construction runoff is a potential increase in the quantity of water delivered to adjacent or nearby water bodies during storms. Increased impervious surfaces can interrupt the natural cycle of gradual percolation of water through vegetation and soil. Instead, water is collected from surfaces such as asphalt, concrete, and other compacted surfaces and routed to drainage systems where large volumes of runoff are discharged to the nearest receiving water. This process is referred to as hydromodification and can contribute to stream bank scouring and downstream flooding, which can result in loss of aquatic life and damage to property. Drainage runoff from the project above-ground facilities would enter one of numerous drain features owned and operated by IID (see Table 4.9-2). For these reasons, the projects could result in on- and off-site discharges that could indirectly impact downstream surface waters by increasing drain scour and/or sedimentation. Therefore, this indirect impact is considered **significant**.

Mitigation Measure(s)

The following mitigation measure is required for MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, and OTF-BLM Lands.

4.9-2 Incorporate Post-Construction Runoff BMPs into Project Drainage Plan and Maximize Opportunities for Low Impact Development. The project Drainage Plan shall adhere to County and IID guidelines to treat, control, and manage the on- and off-site discharge of stormwater to existing drainage systems. Low Impact Development opportunities, including but not limited to infiltration trenches or bioswales, will be investigated and integrated into the Drainage Plan to the maximum extent practical. The Drainage Plan shall provide both short- and long-term drainage solutions to ensure the proper sequencing of drainage facilities and treatment of runoff generated from project impervious surfaces prior to off-site discharge.

The project applicant shall ensure the provision of sufficient outlet protection through the use of energy dissipaters, vegetated rip-rap, soil protection, and/or other appropriate BMPs to slow runoff velocities and prevent erosion at discharge locations for the O&M facilities, access roads, electrical distribution and substation facilities, and solar array locations. A long-term maintenance plan shall be developed and implemented to support the functionality of drainage control devices. The facility layout(s) shall also include sufficient container storage and on-site containment and pollution-control devices for drainage facilities to avoid the off-site release of water quality pollutants, including, but not limited to oil and grease, fertilizers, treatment chemicals, and sediment.

Significance After Mitigation

With the implementation of Mitigation Measure 4.9-2, potential water quality impacts resulting from post-construction discharges during project operations would be reduced to a less than significant level. With the proposed mitigation, any stormwater runoff generated from the project facility sites would be subject to on-site treatment and retention and, therefore, would not pose a significant threat to local surface water features or shallow groundwater resources. Potable water discharges generated during operations would be of limited quantity and sufficient quality that they would pose a **less than significant** threat to the environment.

<p>IMPACT 4.9-3</p>	<p>Impacts to Groundwater Recharge, Supply, and Adjacent Wells. The projects would not involve the use of groundwater, which could otherwise carry the potential for interference with current groundwater recharge, possible depletion of groundwater supplies, or interference with adjacent wells.</p>
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MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, OTF-BLM Lands

As described in Chapter 3.0, the projects would utilize existing water service contracts with IID and would not involve the use of groundwater and no construction of new well facilities is proposed. For this reason, the projects would not carry the potential to create drawdown effects that could otherwise adversely affect adjacent wells. Although groundwater dewatering may be necessary during construction, these activities would only result in temporarily reductions in groundwater levels within and directly adjacent to construction areas. Any localized lowering of the groundwater table would recover quickly following pumping and would not cause a net deficit in aquifer volume or a lowering of the groundwater table in the Imperial Valley Groundwater Basin. As a result, **no significant** impacts to groundwater levels are expected.

Mitigation Measure(s)

No mitigation measures are required.

IMPACT 4.9-4	Alternation of Drainage Patterns and Off-site Flooding. The projects could result in the alteration of existing drainage patterns thereby increasing the rate or amount of surface runoff in a manner that could result in on or off-site flooding and downstream erosion and sedimentation.
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MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, OTF-BLM Lands

The project solar array grids, O&M facilities, access roads, substations, and transmission tower foundations would involve the placement of impervious surfaces, which would alter the infiltration characteristics of the ground surface on the facility sites and carry the potential to result in increases in peak runoff flows. Although individually the facility sites are relatively small, when combined, the net increase in peak runoff could contribute to on-site flooding or flooding at downstream locations. These direct and indirect impacts could be **significant**.

The projects are located in the extreme southern portion of the Brawley Hydrology Area and drained by numerous drain facilities owned and operated by IID. These drain features all contribute flows to Geeson Wash to the north of the study area (see Figure 4.9-1). In contrast, the transmissions towers constructed for the OTF on BLM lands would be constructed within the BLM's "N" Corridor, which drain into the surrounding natural desert landscape. However, these discharges all ultimately contribute flow to New River watershed. Without the retention and dissipation of post-construction runoff, these facilities could collectively contribute to hydro-modification within their respective drainage catchments and scour in receiving waters. Additionally, post-construction drainage flows could result in localized, off-site discharges that may exceed the capacity of existing IID drainage inlet structures or otherwise affect existing improvements. These direct and indirect impacts could be **significant**.

To calculate projected changes in runoff within the study area for the projects, the Rational Method was used to quantify pre- and post-construction runoff flows from each of the drainage catchments illustrated in Figure 4.9-1. Based on conditions observed on site, existing site conditions were assumed to have 20 percent or less impervious surface cover. Under the projects conditions, the impervious surface cover was increased to 50 percent to provide a worst-case estimate of peak runoff. Table 4.9-3 provides the pre- and post-construction runoff volumes for each drainage catchment along with the net change in runoff following the projects.

TABLE 4.9-3 PRELIMINARY DRAINAGE CATCHMENTS WITHIN THE PROJECT STUDY AREA

Drainage Catchment ¹	Existing Conditions (100-Year)(cfs)	Proposed Conditions (100-Year)(cfs) ²	Projects' Net Change in Runoff (100-Year)(cfs)
MSSF1, Parcel 1 (North)	448	577	+129
MSSF1, Parcel 1 (South)	190	253	+62
MSSF1, Parcel 2 (North)	190	244	+54
MSSF1, Parcel 2 (South)	235	302	+67
MSSF1, Parcel 3	378	486	+108
MSSF1, Parcel 4	190	253	+62
CSF1(A)(North)	279	368	+89
CSF1(A)(South)	540	694	+154
CSF1(B)(North)	189	251	+62
CSF1(B)(South)	508	654	+146
CSF2(A)(North)	334	437	+103
CSF2(A)(South)	736	947	+211
CSF2(B)	597	777	+179

Source: Caltrans Highway Manual 2006; HDR 2011.

Notes: ¹ OTF-Private is considered within MSSF1, Parcel 1 North; MSSF1, Parcel 2 North; CSF1(A) North; and CSF2(A) North.

² Not intended for design purposes.

The results reveal the estimated rate of stormwater runoff (in cfs) produced within each drainage catchment for a 100-year, 24-hour storm event. Rates of runoff are the absolute maximum that would occur during a 24-hour storm and, therefore, provide a conservative estimate for determining the net change in post-construction runoff. Additionally, because the project applicant is considering a few different technology options for the solar array fixtures (e.g., tracking or fixed-tilt), this analysis assumes the use of fixed-tilt systems because their land coverage is greater when compared to tracking mount systems. As provided in Table 4.9-3, the projects would collectively increase peak runoff discharges from each of the watershed areas contained within the study area. Appendix I provides the calculations and assumptions used to derive these values.

The net increase in peak runoff as a result of the projects would likely be partially attenuated by several of the containment areas, landscaped areas, paved walkways, and crushed rock roadways included as part of the projects' conceptual design and, therefore, it is reasonable to conclude that the above values likely over-estimate post-construction drainage flows. Additionally, given that much of the study area is rural, the projects' total area in relation to the total watershed area is minor and unlikely to contribute substantially to hydromodification. However, based on the results, it is reasonable to conclude that the project facilities would result in a net increase in drainage discharge. This increase in peak flows, could contribute to additional downstream flooding, impact existing drainage infrastructure, including IID and County roadway drain inlet structures, and/or increase bank scour in receiving waters. These potential drainage impacts are considered **significant**.

Mitigation Measure(s)

The following mitigation measure is required for MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, and OTF-BLM Lands.

4.9-4 Prepare Drainage Plan(s) for Structural Facilities. The project applicant shall prepare a site specific Drainage Plan for all facilities constructed in conjunction with the projects that meets County Department of Public Works and IID requirements, where applicable. The Drainage Plan shall incorporate measures to maintain off-site runoff during peak conditions to pre-construction discharge levels. Design specifications for the detention, retention, and/or infiltration facilities shall provide sufficient temporary storage capacity to accommodate the 100-year, 24-hour storm event to pre-project conditions. Retention facilities shall empty within 72 hours and no sooner than 24 hours in order to provide mosquito abatement.

Significance After Mitigation

With the implementation of the above mitigation measure, impacts to on and off-site drainage patterns would be mitigated to a **less than significant** level through the preparation of a formal drainage plan, thereby minimizing the potential for on-site or downstream flooding.

<p>IMPACT 4.9-5</p>	<p>Placement of Housing within a 100-Year Floodplain. The projects would not 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.</p>
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MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, OTF-BLM Lands

The projects would not involve the construction of residential housing and, therefore, would not place housing within a 100-year flood hazard area as mapped on the most recent FIRMs for the study area. There are no flood protection facilities including dam impoundments upstream of the study area. Although levees provide flood protection from the New River for the project study area, no residential structures would be constructed that could otherwise be subject to hazards from a levee failure. Additionally, the

project proposes no modifications or crossings at levee structures that border CSF2(A), which could otherwise indirectly impact existing residents. Therefore, **no impact** is identified for this issue area.

Mitigation Measure(s)

No mitigation measures are required.

IMPACT 4.9-6	Impede or Redirect Flood Flows. The projects would not require the placement of structures within a 100-year flood hazard area, which would impede or redirect flood flows.
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MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, OTF-BLM Lands

The projects' facilities would not be constructed within a delineated 100-year flood hazard area or floodway. As a result, the construction and operation of the projects would not place structures within a 100-year flood hazard area as mapped on the most recent federal Flood Insurance Rate Map. Following construction, any structures that are required to cross IID drainage facilities would be required to be strung over the drain feature or submerged a minimum of five feet below the ground surface and set back from local waterways. Additionally, construction of these facilities, particularly at water crossings, would likely occur during the late summer months and would be of limited duration and, therefore, would be unlikely to expose workers to significant risk of injury or death as a result of flooding. Based on these considerations, the resulting impact is considered **less than significant**.

Mitigation Measure(s)

No mitigation measures are required.

IMPACT 4.9-7	Inundation from Flooding or Mudflows. The projects would not expose people or structures to a significant risk of loss, injury or death involving inundation by flooding, including flooding as a result of the failure of a levee or dam, seiche, or tsunami or inundation by mudflows.
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MSSF, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, OTF-BLM Lands

In recognition of the study area's inland location, the threat of tsunamis or seiche originating from the Salton Sea is considered negligible. As described in Chapter 4.6, Geology and Soils, the topography within the vicinity of study area is generally level and, therefore, the hazard of mudflows of adversely affecting the project facilities is very low. For this reason, **no significant impact** would occur.

Mitigation Measure(s)

No mitigation measures are required.

4.9.3 Residual Impacts

With implementation of the mitigation measures listed above, implementation of the projects would not result in any residual significant impacts related to increased risk of flooding from stormwater runoff, from water quality effects from long-term urban runoff, or from short-term alteration of drainages and associated surface water quality and sedimentation. With the implementation of the required mitigation measures during construction and decommissioning of the projects, water quality impacts would be minimized to a less than significant level. Based on these circumstances, the projects would not result in any residential significant and unmitigable adverse impacts to surface water hydrology and water quality.