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Water Supply Assessment

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2021

Water Supply Assessment – Glamis Specific Plan (GSP) Project

DRAFT – April 2021

PREPARED FOR IMPERIAL COUNTY PLANNING & DEVELOPMENT SERVICES

BY DUBOSE DESIGN GROUP, INC.

Glamis Specific Plan Project
Draft Water Supply Assessment

Draft September 2021

Prepared for Imperial County Planning and Development Services

Dubose Design Group.

ACRONYMS

AAC	All-American Canal
AF	Acre-Foot or Acre-Feet
AFY	Acre-Feet per Year
AMSL	above mean sea level
APN	Assessor's Parcel Number
BGS	Below Ground Surface
BLM	Bureau of Land Management
CDWR	California Department of Water Resources
CEQA	California Environmental Quality Act
CMAGR	Chocolate Mountain Aerial Gunnery Range
CUP	Conditional Use Permit
County	Imperial County
CWC	California Water Code
DDG	Dubose Design Group
GHG	Greenhouse Gas
GMP	Groundwater Management Plan
GPA	General Plan Amendment
GSPA	Glamis Specific Plan Areas
DU	Dwelling Unit
ICPDS	Imperial County Planning and Development Services
IID	Imperial Irrigation District
In	Inches
IRWMP	Integrated Regional Water Management Plan
ISDRA	Imperial Sand Dunes Recreational Area
K.G.R.A	Known Geothermal Resource Area
LNL	Livermore National Laboratory
MAF	Million Acre- Feet
MGD	Million Gallons per Day
MW	Megawatt
NADW	North Algodones Dunes Wilderness
PV	Photo Voltaic
PRC	Public Resource Code
R&D	Research and Development
RMZ	Recreation Management Zones
RV	Recreational Vehicle
RWQCB	Regional Water Quality Control Board
SB	Senate Bill

SR	State Route
TDS	Total Dissolved Solids
UPRR	Union Pacific Railroad
US	United States
USGS	United States Geological Survey
USBR	United States Bureau of Reclamation
WSA	Water Supply Assessment

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1. PURPOSE OF THE WATER SUPPLY ASSESSMENT & APPLICABILITY

This Water-Supply Assessment (WSA) was prepared for the Imperial County Planning and Development Services (ICPDS) and Polaris, Inc. (The "Applicant") by water supply experts at DuBose Design Group, Inc (DDG) for the proposed Glamis Specific Plan (GSP) Project ("The Project"). The proposed Project consists of four phases of land use development, encompassing many land use types which are either permitted by right or through the process of a Conditional Use Permit (CUP). This WSA is a requirement of California law, specifically Senate Bill (SB) 610 (referred to as SB 610). SB 610 is an Act that amended Section 21151.9 of the Public Resources Code (PRC), and Sections 10631, 10656, 10910, 10911, 10912, and 10915 of the California Water Code (CWC). For the purposes of CWC Section 10912, the following terms have the following meanings: (a) "Project" means any of the following: (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit (du) project.

SB-610 essentially requires a Lead Agency to determine that a project, as defined by CWC Section 10912, which is subject to the California Environmental Quality Act (CEQA) (1) has identified a public water system or groundwater basin that may supply the water the project needs, and (2) to request the project's applicant to prepare a specific WSA for the project.

2. DESCRIPTION OF THE PROPOSED PROJECT AREA

Imperial County (the County) is in southeast California and borders Arizona and Mexico. The County is in an arid region and a part of the Sonoran Desert. The GSP area (GSPA) is located approximately 27 miles east of Brawley at the intersection of State Route (SR) 78 (SR 78) and the Union Pacific Railroad (UPRR) in Imperial County, California. Geographically, the Project site is located within the lower Colorado River Sonoran Desert Region in the east central portion of the County. The Project site is owned by the Applicant. Figure 1, *Regional Location*, shows the location of the Project site in relation to Imperial County and surrounding areas. Figure 2, *Project Vicinity*, shows the relationship between the GSPA and surrounding vicinity with the Imperial Sand Dunes Recreation Area (ISDRA) located immediately to the southwest, the North Algodones Dunes Wilderness (NADW) immediately to the northwest, and the Chocolate Mountains and Chocolate Mountain Aerial Gunnery Range (CMAGR) located to the northeast.

The GSP consists of seven (7) parcels which include Assessor's Parcel Numbers (APNs) 039-310-017, 039- 310-022, 039-310-027, 039-310-023, 039-310-029, 039-310-026, and 039-310-030) totaling approximately 142 acres. The Project site is located in the northeast quarter of Section 33 and the northwest quarter of Section 34, Township 13 South, Range 18 East of the Glamis 7.5-minute quad. The Project site is further defined as located at Latitude 32°59'46.95" North and Longitude 115°04'21.77" (approximate geographic center of the Project site), see Figure 3, Aerial Imagery, for the Project site.

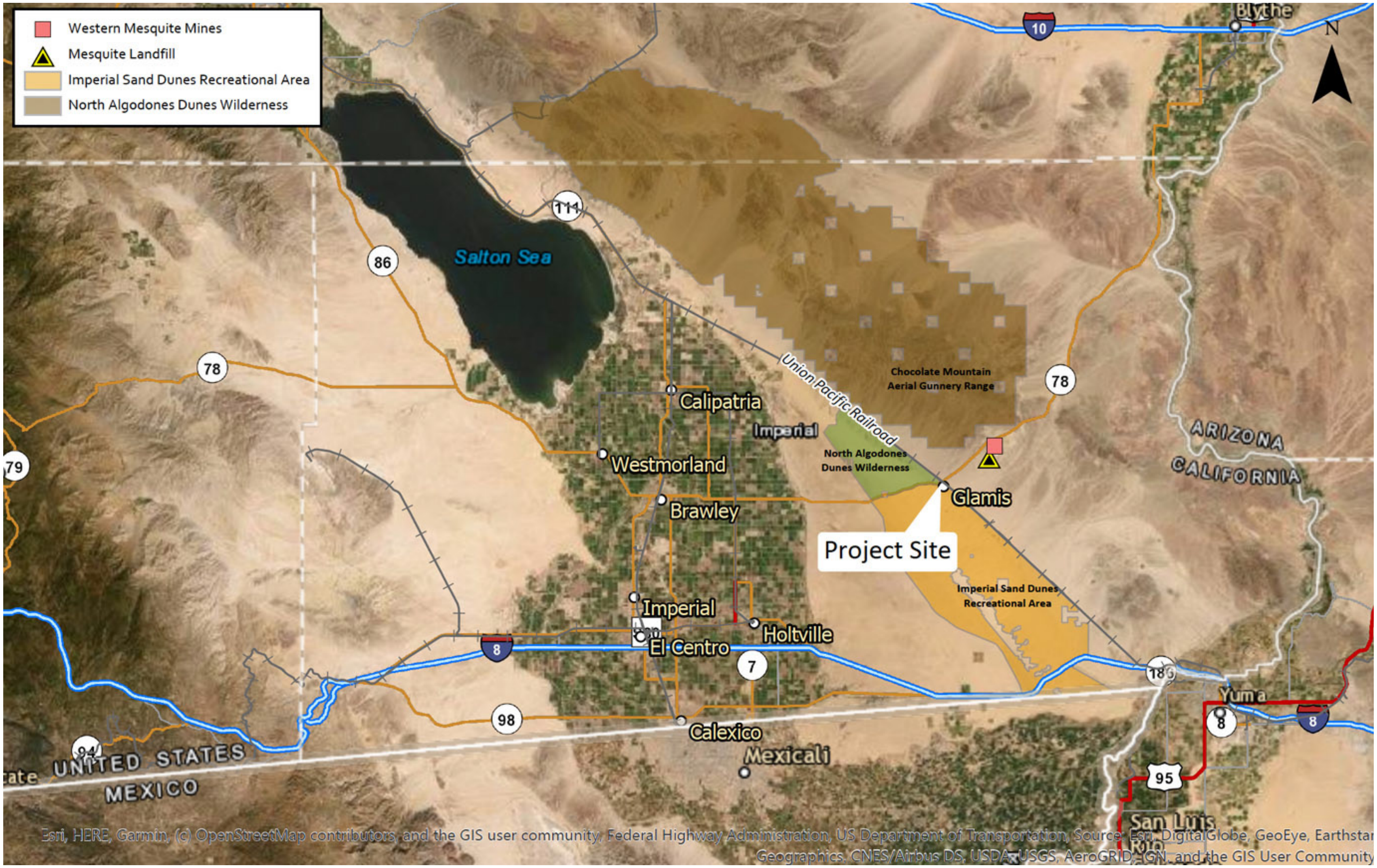

Figure 1: Regional Location

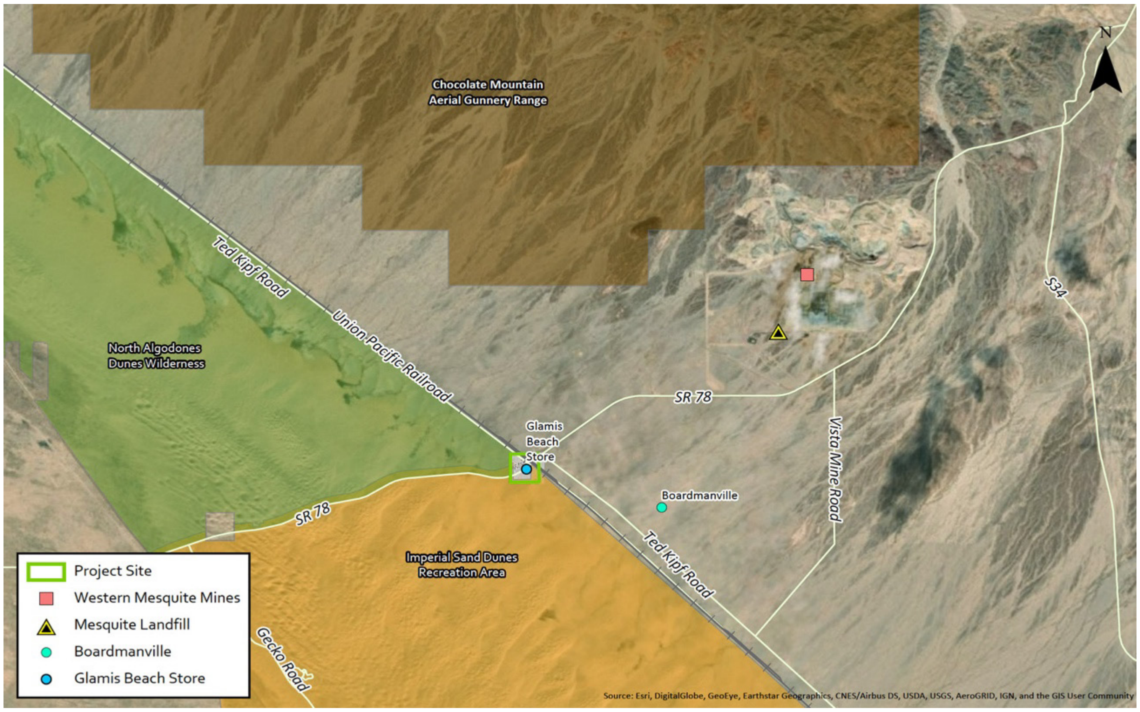

Figure 2: Project Location

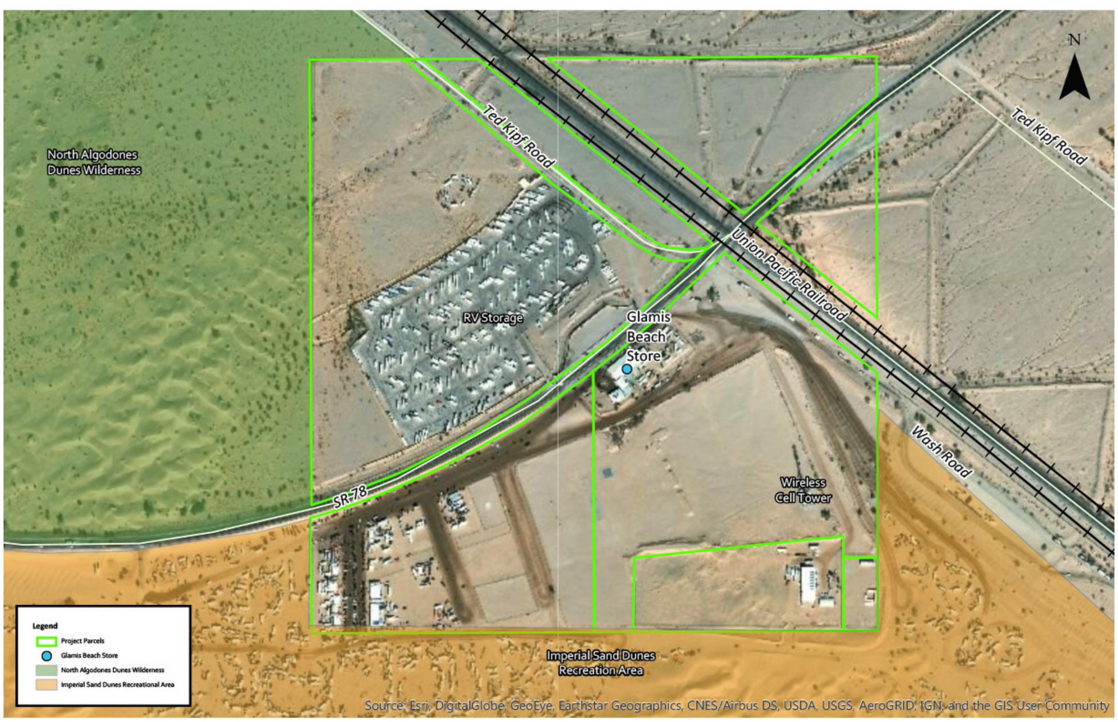

Figure 3: Aerial Photograph of Project Site

3. EXISTING CHARACTERISTICS

The Project site can be characterized as an area of open, sandy, disturbed desert land with all existing development occurring in close proximity (within approximately 0.25 mile) to the intersection of SR 78 and the UPRR. The Project site consists of several adjoining parcels. On one parcel (APN 039-310-029) there is a one- and a two-story metal building structure with water tanks, a wireless communications facility, a private residence/storage building, and an unmaintained storage shed and shipping containers which together comprise what is commonly referred to as the "Glamis Beach Store." Also, there is a separate seasonal off-highway vehicle (OHV) repair business (and two related Recreational Vehicle [RV] trailers) connected to the Glamis Beach Store. Immediately south of the APN 039-310-029 parcel, is the 8-acre parcel (APN 039-310-030), which includes a single-family residence, large RV storage garages, and other related equipment storage buildings while the southeast corner of the Project site is a 1-acre parcel (APN 039-310-017).

Opposite the Glamis Beach Store (to the north of SR 78 from Glamis Beach Store) is an existing RV storage area, and other vacant desert land. On the parcel on the southwest side of the Project site (APN 039-310-027) there are wood posts to form a sectioned-off parking/vendor area. On the northeast side of the GSPA, there are two triangular parcels (on the northeast side of the UPRR, APN 039-310-022 and APN 039-310-023), which are currently vacant.

The Project site is relatively flat with a southwest-to-northeast trending grade of less than one percent or an approximate difference in elevation of 23 feet above mean sea level (AMSL) between the southwest corner of the site (approximate elevation of 324 feet AMSL) and the northeast corner of the site (approximately 347 feet AMSL). Areas of wind-blown sand dunes with sporadic native vegetation are found situated and encroaching upon the southeast corner of the Project site.

4. SURROUNDING AREAS

The GSP contains the only private commercial land uses within the Project vicinity and is surrounded by open desert land that is managed by the Bureau of Land Management (BLM). Also, the CMAGR is located approximately 3 miles to the north of the GSPA. The GSPA is within and surrounded by the ISDRA and is bordered by the NADW to the northwest. Within all of the various BLM lands surrounding the GSPA, the BLM has designated Recreation Management Zones (RMZs) which dictate the allowable recreation activities within those areas and provide for BLM's management objectives within those areas. The ISDRA, NADW and RMZs are briefly discussed below.

4.1 Imperial Sand Dunes Recreation Area (ISDRA)

The ISDRA is the largest mass of sand dunes in the State of California, extending for more than 40 miles in length (from north to south), and averaging approximately 5 miles wide (from east to west). Dunes within the ISDRA can reach heights of 300 feet above the desert floor, providing OHV recreationists an ideal location for their activities. The ISDRA, which is managed by the BLM, includes a variety of camping areas, ranger stations, restrooms, and other facilities to support OHV recreationists who visit the area primarily between October and April. The BLM allows special events with a permit within the ISDRA.

4.2 North Algodones Dunes Wilderness (NADW)

The NADW covers more than 26,000 acres and is manages by the BLM as a part of the National Wilderness Preservation System. The NADW is closed to all vehicles and mechanized use. Camping is allowed throughout the area, however there is no water no facilities for visitors within the NADW.

4.3 BLM Recreation Management Zones (RMZs)

The BLM has designated RMZs on BLM lands located though the area surrounding the GSPA. The RMZs provide an activity-level planning framework for BLM's recreation management. The RMZs have been allocated throughout the planning area to represents permitted recreational niches (activities, experiences and benefits). The GSPA is bordered by three RMZs. An Open RMZ to the south, a Limited RMZ to the northeast, and the NADW RMZ to the northwest. The Open RMZ allows for unrestricted OHV recreation, camping, commercial vending, hiking and wildlife viewing. The Limited RMZ allows for limited use OHV recreation (travel limited to designated routes of travel or areas with seasonal restrictions under specific conditions), camping, environmental education, and tourism opportunities. The NADW RMZ prohibits any motorized recreation opportunities and allows for non-motorized recreation, such as camping, hiking, and educational opportunities.

4.4 Chocolate Mountain Aerial Gunnery Range

The CMAGR is a live-fire training range used for developing and training U.S. Marine Corps and Navy aviators/land combat forces (see Figure 2, Project Vicinity). The CMAGR consists of approximately 459,000 acres and is bounded on the west by the Salton Sea basin, and on the east by the Chuckwalla and Palo Verde mountains. It straddles the northern portion of the Chocolate Mountains east of the Salton Sea in Imperial and Riverside Counties, California, with restricted airspace in both California and Arizona. The northern border is separated from the Orocopia Mountains by Salt Creek and extends south to (near) SR 78 approximately 3 miles northeast of the GSPA. The CMAGR is under the jurisdiction of the U.S. Navy and Marine Corps and is closed to the public. The authorization for aircrews to deliver live ordnance on realistic targets is a central component of the overall value of the CMAGR. However, due to the significant distance between the GSP and the CMAGR, these ongoing military activities do not have any impacts to the GSPA.

The Holtville Rocket Target Range has two live bombing locations to the west and north of the GSPA, however both are approximately 10 and 8 miles away, respectively. Those live bombing/ target range areas that are used by the U.S. Navy and Marine Corps do not currently have any effect on the use of the GSPA, nor would any impact be expected in the future.

5. CLIMATE FACTORS

Imperial Valley is in the northern Sonoran Desert, which has a subtropical desert climate characterized by hot, dry summers and mild winters. Clear and sunny conditions typically prevail, and frost is rare. The region receives 85 to 90 percent of possible sunshine each year, the highest in the United States. Winter temperatures are mild rarely dropping below 32°F, but summer temperatures are very hot, with more than 100 days over 100°F each year. The remainder of the year has a relatively mild climate with temperatures averaging in the mid-70s. The 100-year average climate characteristics are provided in Table 5-1 below. Rainfall contributes around 50,000 acre-feet (AF) of effective agricultural water per inch of rain. Most rainfall occurs from November through March; however, summer storms can be significant in some years. Annual areawide rainfall is shown in Table 5-

2 below. The thirty-year, 1988-2017, average annual air temperature was 74.1°F, and average annual rainfall was 2.59 inches. This record shows that while average annual rainfall has fluctuated, the 10-year average temperatures have slightly increased over the 30-year averages.1 Furthermore, January can be noted as the month that has the most amount of rainfall in Imperial, CA which can be observed in Table 5-3 (below).

Table 5-1: Climate Characteristics, Imperial, CA 100-Year Record, 1918-2017

Climate Characteristic	Annual Value
Average Precipitation (100-year record, 1918-2017)	2.96 inches (In)
Minimum Temperature, Jan 1937	16 ºF
Maximum Temperature, July 1995 & June 2017	121 ºF
Average Minimum Temperature, 1918-2017	47.9 ºF
Average Maximum Temperature, 1918-2017	98.3 ºF
Average Temperature, 1918-2017	72.9 ºF

Source: IID Imperial Weather Station Record

Table 5-2: Monthly Mean Temperature (ºF) – Imperial, CA 10-Year, 30-Year & 100-Year (2008-2017, 1988-2017, 1918-2017)

	Jan			Feb			Mar			Apr		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	82	32	56	86	36	61	95	41	67	100	46	72
30-year	81	33	56	84	37	60	93	41	66	99	47	71
100-year	80	31	55	84	35	59	91	40	64	99	46	71
	May			Jun			Jul			Aug		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	107	53	78	115	61	87	114	69	92	114	67	91
30-year	106	54	79	113	60	86	114	68	92	113	69	92
100-year	105	52	78	113	59	86	114	68	92	113	68	91
	Sep			Oct			Nov			Dec		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	114	67	92	103	51	76	92	38	64	82	30	55
30-year	113	69	92	102	51	76	90	39	64	80	32	55
100-year	113	68	91	101	49	75	90	38	63	80	32	56

Source: IID Imperial Headquarters Station Record (Data provided by IID staff).

[1] IID WSA BOILERPLATE

Table 5-3: Monthly Mean Rainfall (In) – Imperial, CA 10-Year, 30-Year & 100-Year (2008-2017, 1988-2017, 1918-2017)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
10-year	0.54	0.30	0.13	0.04	0.08	0.01	0.26	0.31	0.16	0.13	0.14	0.44	2.53
30-year	0.50	0.44	0.26	0.07	0.06	0.00	0.15	0.22	0.22	0.16	0.18	0.34	2.59
100-year	0.40	0.39	0.25	0.10	0.03	0.00	0.12	0.34	0.37	0.26	0.20	0.50	2.96

Source: IID WIS: CIMIS stations polygon calculation (Data provided by IID staff).

6. POPULATION TRENDS

The Imperial County Housing Element states, "According to the 2010 US Census, the total population of Imperial County was 174,528 in 2010, an increase of 23 percent since 2000. The population of the unincorporated county increased 15 percent over the same period, from 32,865 to 37,778. Heber was the most populated townsite in the unincorporated county, with a population of 4,275 in 2010; however, Salton City saw the most growth from 2000 to 2010. The Salton City population increased from 944 residents to 3,763, an increase of 299 percent.2" Table 6-1 below identifies the population projections for the unincorporated county and Imperial County as a whole for 2020 and 2035."3.

The Southern California Association of Governments (SCAG) prepares a population forecast as part of its Regional Transportation Plan/Sustainable Growth Strategy. The population in the unincorporated areas of the county grew nearly 80 percent from 2010 to 2020 and another 26 percent from 2020 to 2035.

Table 6-1: Unincorporated Population Trend

Year	2000	2010	2020	2035
Population	32,865	37,778	67,900	73,400

Imperial County Housing Element, 2013

7. GLAMIS SPECIFIC PLAN AREA DESCRIPTION

7.1 Project Location

The approximately 142-acre GSP is located and contained within the County's designated Glamis Specific Plan Area (GSPA). The GSPA allows for the development and creation of a Specific Plan in in accordance with GSPA design criteria, objectives and policies as outlined in the County's General Plan. The existing zoning designation for the GSPA is Open Space/ Preservation (S-2) and a very small area that is General Commercial (C-2).

The general area of the Glamis Beach Store (within APN 039-310-029) is zoned as C-2, while the remainder of the Project site is zoned S-2. The Project site is surrounded by BLM land uses on all sides. The Applicant has prepared this proposed GSP, which includes a General Plan Amendment (GPA) and Zone Change for County approval. The GSP proposes the establishment of Commercial/Recreational (CR) designated zoning based upon different levels of allowable land use intensity. Also, the GSP proposes a Zone Change from S-2 (Open Space/

[2] http://www.icpds.com/CMS/Media/3_ImperialCountyHE_-FINAL_9-27-13.pdf, Retrieved June 2020

[3] http://www.icpds.com/CMS/Media/3_ImperialCountyHE_-FINAL_9-27-13.pdf, Retrieved June 2020

Preservation) to S-1 (Open Space/ Recreation) for the approximate 1 –acre parcel on the southeast side of the Project (APN 039-310-017). The phasing plan component of the GSP would phase the development so that more intense land uses are developed incrementally over time within the various proposed zones. The CR zoning designations are discussed in greater detail below. In conjunction with the Specific Plan a matching land use ordinance to implement the GSP is also provided.

7.2 Project Elements

Figure 7-1, *Glamis Specific Plan – Land Use Areas*, identifies proposed land uses that would be permitted within the CR zones. Three zoning categories as shown below are being implemented. The following CR Zones are described in their current setting.

7.2.1 CR-1 Zone

The CR-1 Zone is proposed as the least intensive CR zone of the GSP and allows for a limited range of land uses for use focused on private residences, guest housing, vehicle storage, accessory storage building, equipment storage, off-road vehicle maintenance, repair and development off road vehicle maintenance, repairs and development by owner, Research and Development (R&D) facility and vehicle wash areas for owners own use only, As shown in Table 7-1, a total of approximately twenty-two (22) land uses are permitted within this zone.

7.2.2 CR-2 Zone

The CR-2 Zone is proposed for moderate intensity CR Zone of the GSP and allows for a limited range of land uses focused on research and development, employee housing and utility infrastructure uses. As shown in Table 7-1, a total of thirty-four (34) land uses are permitted within this Zone. The permitted land uses of the CR-2 Zone are intended to restrict land uses that promote traffic trips and crossings of the UPRR.

7.2.3 CR-3 Zone

The CR-3 Zone allows for a maximum range of recreational, commercial, resort, retail, medical, entertainment and utility infrastructure land uses. There is a total of 66 land uses which are permitted within this Zone. The purpose of the CR-3 Zone is to provide the greatest flexibility of land use. This zoning, based on the 66 permitted uses listed from Table 7-1, is the highest in water use. Table 7-1 illustrates the list of uses allowed or permitted with a CUP. It is important to note those indicated in red, are deemed high water users. Thus, those users in red are land uses that although they may be permitted, by right, or with a CUP, will have to submit a Water Engineering Study at the time of development as well as a project independent WSA. In addition, they would be required to consult the East Mesa Planning Division at the Regional Water Quality Control Board.

Table 7-1: CR Zones Allowed/PermittedUses[1]

#	Allowed/Permitted Land Uses	CR-1	CR-2	CR-3
1	Accessory storage buildings	X	X	X
2	Adventure Center			X
3	Amusement Facilities			X
4	Bar(s)			X
5	Billboards		X	X

[1]https://www.icpds.com/assets/5-Zoning-Areas-Established-.pdf

Table 7-1: CR Zones Allowed/PermittedUses[1]

#	Allowed/Permitted Land Uses	CR-1	CR-2	CR-3
6	Bulk water sales (RV and general retail sale)			X
7	Caretakers quarter(s) maximum of 3	X	X	X
8	Communications Facilities (i.e., towers)	X	X	X
9	Condominium housing	X	X	X
10	Convention area			X
11	Desert Tours (off road experience)		X	X
12	Drive-in food facilities			X
13	Employee Housing	X	X	X
14	Entertainment Events	X		X
15	Equipment Storage	X	X	X
16	Film production / movie studio		X	X
17	Fireworks display area (as permitted by fire dept and other authorities)		X	X
18	Fuel Station (gas/diesel/propane, including convenience mart)	X	X	X
19	Guest Housing	X	X	X
20	Helipad (emergency/public)	X	X	X
21	Hotel/Motel Accommodations		X	X
22	Lighting or light shows (non-fireworks) as permitted		X	X
23	Medical Services Facility		X	X
24	Mobile food trucks			X
25	Movie theater			X
26	Obstacle Course / Technical driving area			X
27	Off road driving school / Public workshops			X
28	Off road vehicle maintenance, repair, development, research by owner (no sales/leasing)	X	X	X
29	Oil, gas, geothermal exploration		X	X
30	Park, Playground and Picnic area(s)	X		X
31	Power Generation (on site use i.e., diesel/propane)	X	X	X
32	Private Residences	X	X	X
33	Public Parking area(s)			X
34	Public Restrooms			X
35	Public showers			X
36	Racetrack			X
37	Rental Facilities (off road equipment/vehicles)			X
38	Research and Development Facilities	X	X	X
39	Restaurant(s)			X
40	Retail displays / entrance signage			X
41	RV Dump Station(s) provided it meets County requirements		X	X
42	RV Park	X	X	X
43	RV and off-road vehicle storage	X	X	X
44	RV repair facility		X	X
45	Shooting range		X	X

Table 7-1: CR Zones Allowed/Permitted Uses[1]

#	Allowed/Permitted Land Uses	CR-1	CR-2	CR-3
46	Solar generating facility including battery storage up to 30 MW for onsite and export	X	X	X
47	Sporting goods store(s)			X
48	Stores (retail general)			X
49	Stores (retail specialty)			X
50	Temporary sales facilities			X
51	Testing facilities (off road equipment)			X
52	Tourist information center			X
53	Training Facilities (off road vehicle use/safety)		X	X
54	Utility Buildings	X	X	X
55	Utility Substation	X	X	X
56	Vehicle parts sales			X
57	Vehicle Repair and Service			x
58	Vehicle Sale			x
59	Vehicle storage area	X	X	X
60	Vehicle wash down area	X	X	X
61	Vendor Sales Area(s) restricted by owner			X
62	Viewing Deck or Tower			X
63	Village area			X
64	Water and/or Wastewater treatment facilities	X	X	X
65	Wedding Chapel			X
66	Wind generating (for electrical power systems) including battery storage up to 30 MW for onsite and export		X	X

*Those uses indicated in red, are land uses that although they may be permitted by right, or with a Conditional Use Permit, will have to submit at the time of development a Water Engineering Study as well as submit on the project's behalf and project independent Water Supply Assessment, as well as consult the East Mesa Planning Division at the Regional Water Quality Control Board. .

7.2.4 Zone (Open Space/Recreation)

The S-1 Zone (Open Space/Recreation) applies only within Planning Area 8. Within this parcel, the GSP proposes a change of zone from the current S-2 Zone to S-1 Zone. As per Title 9, Division 5, Chapter 18, Section 90518.00 of the County's development code, the purpose of the S-1 zone is to designate areas that recognize the unique Open Space and Recreational character of Imperial County including the deserts, mountains and waterfront areas. Primarily, the S-1 Zone is characterized by low intensity human utilization and small-scale recreation related uses. Any new subdivision in the S-1 zone will require all necessary infrastructure, including potable water, sewer and roads to County Standards. The S-1 Zone allows the following uses permitted with a CUP (see Table 7-2 below). Those users in red are land uses that although they may be permitted, by right, or with a CUP, will have to submit a Water Engineering Study at the time of development as well as a project independent WSA. In addition, they would be required to consult the East Mesa Planning Division at the Regional Water Quality Control Board.

Table 7-2 : County of Imperial S-1 Open Space/Recreation Zone – Allowed/Permitted Uses

#	Allowed/Permitted Uses
1	Accessory Structure including cargo container (provided they have an approved building permit and are subordinate to a primary building/use)
2	Crop and tree farming
3	Directional signs of not to exceed six (6) square feet in area but not including commercial advertising
4	Duck clubs
5	Fish farms
6	Forest industries
7	Grazing
8	Gun clubs
9	Harvesting of any wild crop
10	Hotels and motels
11	Marinas, boat liveries and boat launching ramps
12	Mobile home/RV Park (provided 50% of the total use is for RV use)
13	Residence (one per legal parcel)
14	RV park
15	Solar energy extraction generation (provided that it is for on-site consumption only).
16	Home Occupation (per Division 4, Chapter 4; home occupation permit required).

*Those uses indicated in red, are land uses that although may be permitted by right will have to submit at the time of development a Water Engineering Study as well as submit on the project's behalf and project independent Water Supply Assessment, as well as consult the East Mesa Planning Division at the Regional Water Quality Control Board. .

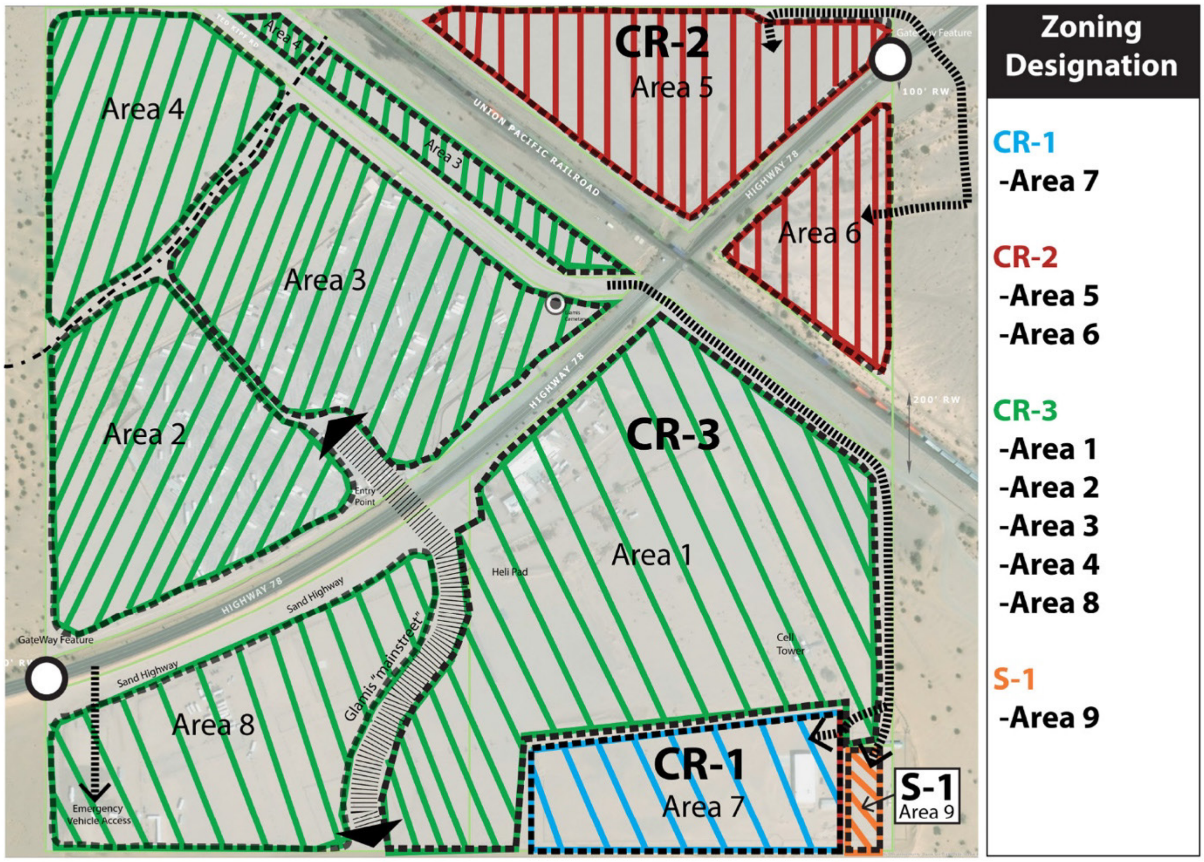

Figure 4 Land Use Preferred

7.2.4.1 Land Use Areas

As shown in Figure 4, Glamis Specific Plan – Land Use Areas, the GSP consist of nine (9) Land Use Areas. Figure 4 shows the CR (CR-1, CR-2, and CR 3) and S-1 zoning applicable within each Land Use Area. Land Use Area 1 is considered as the most developable area of the GSP due to the lack of safety concerns such as pedestrian and OHV crossings along SR 78 and the UPRR. Additionally, special events such as Camp RZR, have been historically hosted in this area that is adjacent to the Open RMZ to the south (within the IDSDRA) which provides for the greatest OHV accessibility of the entire Project site. As shown in the list below, the Land Use Areas correspond with the following Project APNs.

7.3 Phasing Plan

Development within the GSPA is intended to occur over a span of approximately 20 to 50 years and will depend on market conditions, availability of supporting infrastructure, and other factors. Four (4) phases of development are proposed. Within these phases additional phasing may occur and are described as follows which is shown in Figure 5, Glamis Specific Phasing Plan. The proposed zoning is determined based on the total acres involved with the site as seen on Table 7-3. Throughout the Project, the given areas will correspond with a particular APN as well as a certain phase. Table 7-4 provides the relationship among these three factors. It is important to note that according to the applicant, phasing will not be done in a sequential order as the project is built out over the proper water engineering and industry will need to be evaluated through independent studies. Before certain significant structural improvements are made to this area, required and necessary infrastructure improvements relevant to potable water, wastewater treatment and electrical service would be needed and developed in order to accommodate the projected demand from visitors. There may be some improvements made within this parcel that are not dependent on such services and therefore could be implemented ahead of such infrastructure.

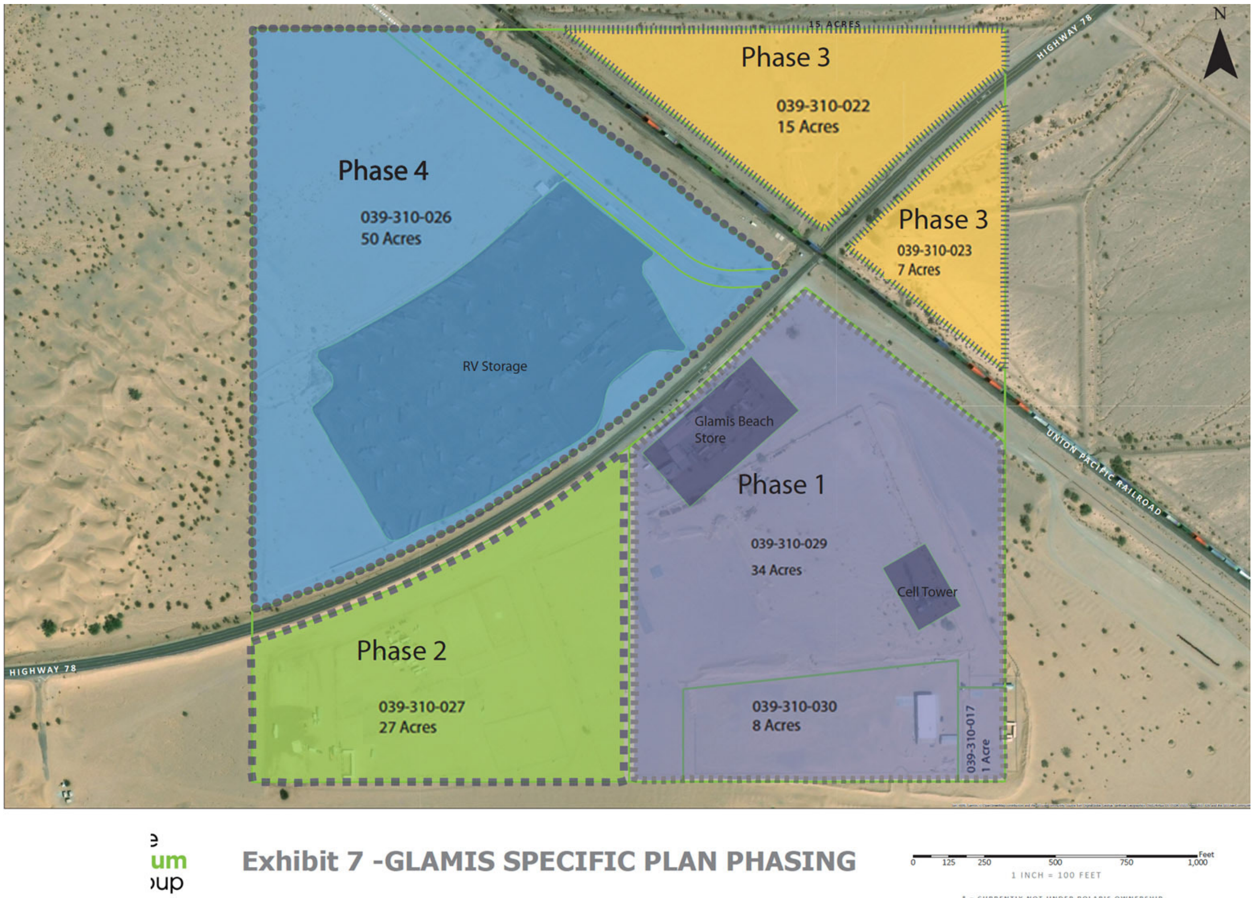

Figure 5 Glamis Specific Plan Phasing

Table 7-3:Phasing Plan in Relation to Zoning and Total Acreage

Phase	Total Acres	Proposed Zoning
Phase One	43 AC	CR-1 and CR-3
Phase Two	27 AC	CR-3
Phase Three	22 AC	CR-3
Phase Four	50 AC	CR-1 and CR-3

Table 7-4: Relationship Table Summary, GSP Land Area and APN and Corresponding Phases

Land Use Area	APN	Phase
Area 1	039-310-029 & 039-310-027	Phase One (390-310-029) Phase Two (390-310-027)
Area 2	390-310-026	Phase Four
Area 3	390-310-026	Phase Four
Area 4	039-310-026	Phase Three Phase Four
Area 5	390-310-026	Phase Three
Area 6	039-310-023	Phase One Phase Four
Area 7	039-310-030	Phase One*
Area 8	039-310-027	

* Small portion overlaps special events space.

8. OVERALL WATER DEMAND FOR PROJECT

Overall water demand is divided between construction and operations. Construction of Phase 1 would likely occur within the first three years. Development of all four phases is estimated to take place over a 20 to 50 year period. Construction water use is based on the square footage of the proposed facilities and the amount of water required for a 4-inch slab of concrete. Estimated construction water use is shown in Table 8-1.

Table 8-1: Construction Water Demand

Proposed Land Uses (PHASES) & Water Consumption					
Proposed Land Uses	Size (Square Feet [SF])	80 lb Bags of Cement Required[5]	Gallons of Water Required per Bag[4]	Total Water use (Gallons)	Total Water Use Acre Feet (AF)
Phase One					
R&D Facility	5,000 SF	2,778	5	13,890	0.04
Hotel / Motel	20 Rooms (8347 SF)[1]	4,638	5	23,190	0.07
Restaurant					
Restaurant	4,000 SF	2,223	5	11,115	0.03
Fast food	4,000 SF	2,223	5	11,115	0.03
Bar	4,000 SF	2,223	5	11,115	0.03
Retail Expansion	2,000 SF	1,112	5	5,560	0.02

Proposed Land Uses (PHASES) & Water Consumption					
Proposed Land Uses	Size (Square Feet [SF])	80 lb Bags of Cement Required[5]	Gallons of Water Required per Bag[4]	Total Water use (Gallons)	Total Water Use Acre Feet (AF)
Service Center	4 Bays (792 SF)[2]	440	5	5,560	0.02
RV Park	10 RV-sites (43,560 SF)	24,200	5	121,000	0.37
PV Solar Generation Facility	7 AC				19.32
			Total for Phase One	*165,465*	*19.93*
Phase Two					
EMS Facility	5,000 SF	2,778	5	13,890	0.04
Glamis Mainstreet Circulation Corridor	4,450 x72 = 13,4451 SF	74,695	5	373,475	1.14
			Total for Phase Two	*387,365*	*1.18*
Phase Three					
Multi-Family Residential / Staff Housing	14 DU (5,843 SF)[1]	32,464	5	162320	0.49
RV Park	20 sites (87,120 SF)	48,400	5	242000	0.74
			Total for Phase Three	*404,320*	*1.23*
Phase Four					
Guest Housing	14 DU (5,843 SF)[1]	32,464	5	162320	0.49
RV Storage	30 sites (1,306,800 SF)	72,600	5	363000	1.11
Special Event Space					
			Total for Phase Four	*525,320*	*1.6*

Overall operational water demand for the Project is shown in Table 8-2.

Table 8-2: Overall Proposed Water Consumption Usage per Land Use by Phase

Proposed Land Uses (PHASES) & Water Consumption					
Proposed Land Uses	Size	Gallons Per Day (GPD)	Total Gallons Per Days (211)	Total Acre Feet (AF)	Duration of Time (Days) October –April
Phase One					
R&D Facility	5,000 SF	44 (4 people)	9,284	0.02	211
Hotel / Motel	20 Rooms	72.6	306,372	0.94	211
Restaurant					211
Restaurant	4,000 SF	5,800	1,223,800	3.75	211
Fast food	4,000 SF	1,934	408,074	1.25	211
Bar	4,000 SF	3,000	633,000	1.94	211
Retail Expansion	2,000 SF	244	51,484	0.16	211
Service Center	4 Bays	1000	211,000	0.65	211
RV Park	10 Sites	27.5 (11 Person) 302.5	63827.5	0.19	211
Vendors [e]	30 Vendors	55 (Per Vendor)	348,150	1.06	211
PV Solar Generation Facility	7AC	-NA	NA	0.7 AF	365
Total for Phase One				**10.66**	
Phase Two					
EMS Facility	5000 SF	44 (4 people)	9284	0.02	211
Glamis Mainstreet Circulation Corridor	NA	NA	NA	NA	NA
Total for Phase Two	**NA**	**NA**	**NA**	**.02**	**NA**
Phase Three					
Multi-Family Residential / Staff Housing	14 DU	55 Gallons per[2] day per Unit	162,470	0.50	211
RV Park	20 sites	27.5 (22 persons) (605)	127,655	0.39	211
Total for Phase Three	-	-	**684,695**	**0.89**	**211**
Phase Four					

[2] https://www.sandiegocounty.gov/content/dam/sdc/pds/SGMA/Human-Right-To-Water-Presentation-Notes.pdf

Proposed Land Uses (PHASES) & Water Consumption					
Proposed Land Uses	Size	Gallons Per Day (GPD)	Total Gallons Per Days (211)	Total Acre Feet (AF)	Duration of Time (Days) October –April
Guest Housing	14 DU	55 Gallons per[3] day per Unit	162,470	0.50	211
RV Storage	NA				
Special Event Space	NA				
Total for Phase Four	**NA**	**NA**	**NA**	**0.50**	**NA**

8.1 Phase One

As shown in Figure 5, *Glamis Specific Phasing Plan*, development of Phase One will occur where the existing Glamis Beach Store, Restaurant and Bar, and OHV repair facility are located as contained within Land Use Area 1 (APN 039-310-029), Area 5 (039-310-026) and Area 6 (APN 039-301-023).

Before certain significant structural improvements are made to this area, required and necessary infrastructure improvements relevant to potable water, wastewater treatment and electrical service would be needed and developed to accommodate the projected demand from visitors. There may be some improvements made within these Land Use Areas that are not dependent on such services and therefore could be implemented ahead of such infrastructure.

Uses permitted within Phase One could include restaurant(s), bar(s), repair shop(s), a vendor row area and event area, and other uses (see Table 7-1).

Phase One would be contained within Land Use Areas 1 with the exception of possible development of a research and development (R&D) facility which would occur in Area 5 and an RV park in Area 6. Part of Land Use Area 7 (APN 039-310-030) could be developed during Phase One as it slightly overlaps onto current land used for Camp RZR.

The estimated water demand for construction for Phase 1 is expected to be approximately 19.93 AF over a three year period of construction (6.64 AF annually for three years) and 10.66 AF annually for operational use. During the first three years of Phase One the Applicant would be using 17.3 AF per year. Once construction is completed this amount would be reduced to 10.66 AF per year. It is important to note that the Applicant currently has an allocated amount of 1.5 AF through an existing CUP. The Applicant has requested an increase to 25 AF through the application of an additional CUP. The existing water treatment system has the capability to treat 22 AF of water per year.

In addition, the Applicant is proposing to host special events three to four times per year that could host up to 50,000 people. Water use for these individual events could range from 2 to 5 AF based on the

[3] https://www.sandiegocounty.gov/content/dam/sdc/pds/SGMA/Human-Right-To-Water-Presentation-Notes.pdf

calculations shown in Tables 8-3 and 8-4. Estimated water use for these special events could be as much as 20 AF if four, maximum capacity events, are held. Water use for these events would be brought in and the Applicant would be required to prove to the County they have the ability to source this water.

Table 8-3: Per Capita Health and Safety Water Quantity Calculation[3]

Facility	Non-Conserving		Conservation Fixtures	
Toilets	4 Flushes X 3.5 gpf	14.0	4 Flushes X 1.6 gpf	10.5
Showers	5 min X 3.0 gpm	15.0	5 min X 2.0 gpm	10.0
Washers	12.0 gpcd	4.0	10. gpcd	10.0
Kitchen	4 gpcd	4.0	4 gpcd	3
Other	4 gpcd	4	4 gpcd	4
Gallons per Person Per day		49.0		33.4

[3] http://www.cityofelcentro.org/userfiles/6-23-16%20FINAL%20El%20Centro%202015%20UWMP.pdf

Table 8-4: Water Consumption based on Event Population (Hypothetical Model)

Event	Population	Average Per Capita Health and Safety Water Calculations	Gallons per Event	Acre Feet
Event A	20,000 people	33 gpd	660,000 g	2 AF
Event B	30,000 people	33 gpd	990,000 g	3 AF
Event C	50,000 people	33 gpd	1,650,000 g	5 AF

8.1.1 Electrical Service Upgrades for Phase One

The third system of infrastructure improvement would be electrical service upgrades. The Project site currently relies on diesel generators for all of its electrical power demand needs. It may not be a feasible option for new development to be reliant upon diesel generators in the future since air quality and greenhouse gas (GHG) emissions regulations are likely to become more restrictive over time. With this in mind, three options are being evaluated to determine which available source of power supply would best fit as the preferred option for the GSP.

- The first option would to be for Imperial Irrigation District (IID) to construct and install a power line (transmission line and/or distribution line) to extend from the nearest substation (approximately 7.2 miles to the northeast). This could potentially occur during Phase One in Area 1.
- A second and potentially more viable option would be to develop a small commercial solar photovoltaic (PV) system, with a back-up battery storage component or another green power system. This could potentially occur during any phase although it is anticipated for purposes of this WSA to occur in Phase One in Areas 1, 4 or 5.
- A third option may be wind generation. Although winds in this area are sporadic, there is newer technology and future technology that may make wind or other green energy an option.

The timing for either of these three (3) powers supply/delivery options to be developed is unknown at this time. However, one of these three power supply/delivery options will need to be considered prior to initial development, since the use of diesel generators (existing condition) to support future development, would be prohibitively costly and complex in meeting air quality regulatory requirements.

8.1.2 Water Demand For Phase One

Per the State of California, the California Water Code states the following:

> *"California Water Code section 10912. For the purposes of this part, the following terms have the following meanings: (a) "Project" means any of the following: (1) A proposed residential development of more than 500 dwelling units. (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space. (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space. (4) A proposed hotel or motel, or both, having more than 500 rooms. (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area. (6) A mixed-use project that*

> *includes one or more of the projects specified in this subdivision. (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project. (b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections."*

Phase One encompasses many potential land use types and, if permitted as indicated on Table 7-1, any high demand land use will have to submit a Water Engineering Study as well as project independent WSA. In addition, they would have to consult the East Mesa Planning Division at the Regional Water Quality Control Board. The Applicant is currently using 1.5 AF per year with an additional CUP application pending of an additional allowance of 23.5 AF which would total 25 AF per year. This amount would be able to accommodate all the proposed land use categories.

8.2 Phase Two

Phase Two would most likely be within Area 1, immediately west of Phase One. Phase Two development would serve as an extension to development occurring within Phase One by incorporating land uses permitted under the CR Zone similar to those permitted in Phase One. Phase Two would involve development of an EMS Facility in APN 039-310-027 and would also incorporate the Glamis Mainstreet (as shown on Figure 4) to serve as a circulation corridor for OHV traffic to and from the dunes and to Phase Four (Areas 2, 3, 4, and 6) located directly north of SR 78 and east of the UPRR.

8.2.1 Water Demand for Phase Two

Similarly, as stated for Phase One, Per the State of California, the CWC states the following:

"California Water Code section 10912. For the purposes of this part, the following terms have the following meanings: (a) "Project" means any of the following: (1) A proposed residential development of more than 500 dwelling units. (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space. (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space. (4) A proposed hotel or motel, or both, having more than 500 rooms. (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area. (6) A mixed-use project that includes one or more of the projects specified in this subdivision. (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project. (b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections."

Phase Two is anticipated to occur after Phase One is complete. The amount of water required for construction of Phase Two would be 1.18 AF and operational water use would be 0.02 AF per year. Thus, operational water uses for Phase Two would represent only a minor increase in water demand from Phase One.

8.3 Phase Three

Phase Three, located on the northeast side of the UPRR and bisected by SR 78, would be located within Areas 4 and 5. No major public use facilities would be considered for development within these two APNs to discourage OHV traffic from crossing the UPPR to access these areas. Phase Three however, would serve for the development of uses relevant to employee housing, RV park, and possible PV Solar array system.

8.3.1 Water Demand for Phase Three

Per the State of California, the CWC states the following:

> *"California Water Code section 10912. For the purposes of this part, the following terms have the following meanings: (a) "Project" means any of the following: (1) A proposed residential development of more than 500 dwelling units. (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space. (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space. (4) A proposed hotel or motel, or both, having more than 500 rooms. (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area. (6) A mixed-use project that includes one or more of the projects specified in this subdivision. (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project. (b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections."*

The amount of water required for construction of Phase Three would be 1.23 AF and 0.89 AF per year of water would be required for operations. Thus, operational water uses for Phase Three would represent only a slight increase in operational water use from Phase One and Phase Two and additional water would not be required.

8.4 Phase Four

Per the State of California, the CWC states the following:

"California Water Code section 10912. For the purposes of this part, the following terms have the following meanings: (a) "Project" means any of the following: (1) A proposed residential development of more than 500 dwelling units. (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space. (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space. (4) A proposed hotel or motel, or both, having more than 500 rooms. (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area. (6) A mixed-use project that includes one or more of the projects specified in this subdivision. (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project. (b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections."

Phase Four, located on the north side of SR 78, would be located within Land Use Areas 2, 3 4 and 64. Phase Four would encompass development of guest housing in Area 4, additional RV storage in Area 6 and special event space in Areas 2 and 3. Most of the infrastructure improvements for this phase will be based on regulatory, safety and liability concerns, and consequently, will require specific infrastructure improvements to be in place prior to development.

8.4.1 Water Demand for Phase 4

Phase Four would require 1.6 AF of construction water and 0.5 AF per year of operational water use. Thus, operational water uses for Phase Four would only be a slight increase over Phases One, Two and Three and additional water would not be required.

9. PREPARATION OF SB 610 ASSESSMENTS – GROUNDWATER

9.1 Imperial Integrated Regional Water Management Plan (October 2012)

Imperial County has an Integrated Regional Water Management Plan (IRWMP) which was adopted in October of 2012. As stated in the IRWMP, "…The Imperial IRWMP area lies within the Salton Trough of southern California as shown on Figure 6. The Salton Trough is the dominant feature of the Colorado Desert geomorphic province of California. The trough is about 130 miles long and up to 70 miles wide and is generally considered the northwesterly landward extension of the Gulf of California (Loeltz et al., 1975). The term Salton Basin (Basin) applies to the broad region draining directly into the Salton Sea. The Imperial Valley lies in the central part of the Basin south of the Salton Sea. Most of the IID service area overlies the area defined as the Imperial Valle. The Salton Sea is a critical component of the Pacific Flyway migratory corridor as it is an essential overwintering site for thousands of migratory waterfowl. Its marsh areas provide significant habitat for the endangered Yuma clapper rail…4"

[4] https://www.iid.com/water/water-supply/water-plans/imperial-integrated-regional-water-management-plan, Retrieved , June 2020

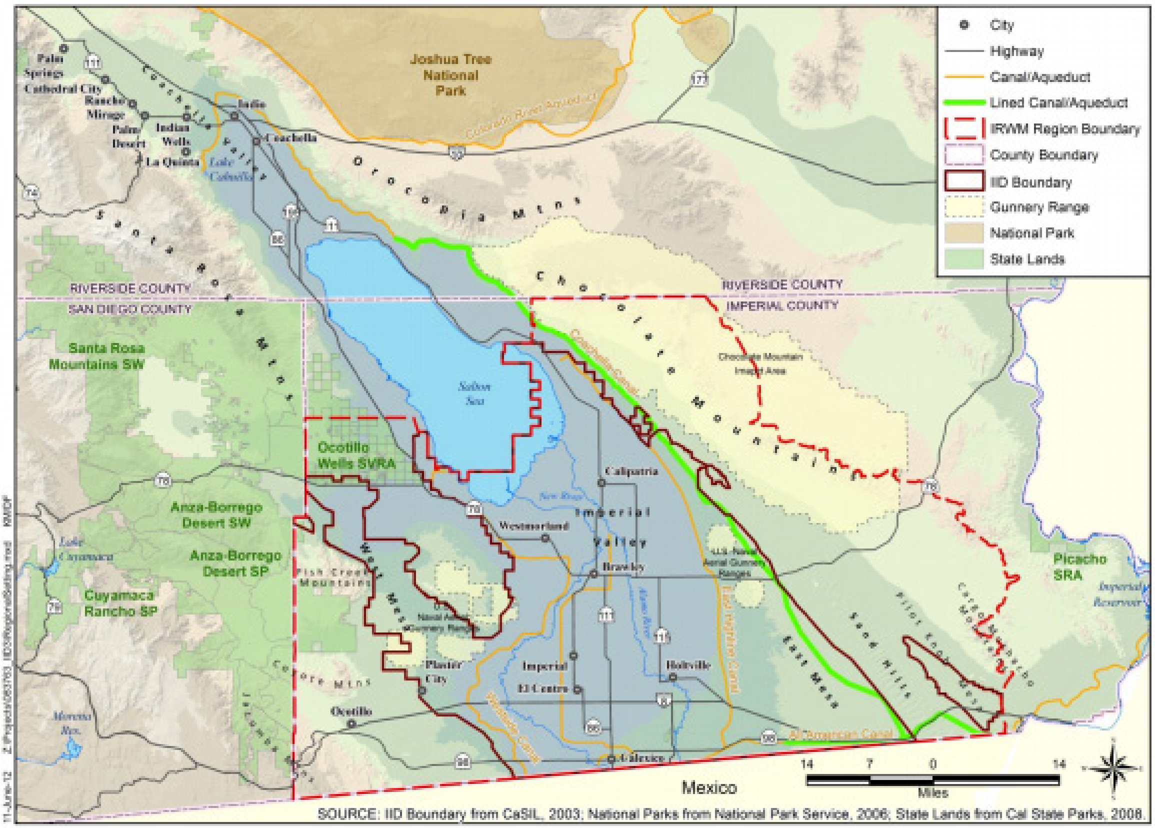

Figure 6: Imperial IRWMP Area

The IRWMP encompasses three principal physiographic and hydrologic areas: (1) the Imperial Valley which lies within the valley floor generally inside the boundaries of the Westside Main and East Highline Canals and north of Mexico; (2) the East Mesa which is generally east of the East Highline Canal; and (3) the West Mesa generally west of the Westside Main canal. The proposed Project is in the East Mesa, which is in the southeastern portion of the Salton Basin. The IRWMP describes this area as the broad area east of the East Highline Canal and east margin of pre-historic Lake Cahuilla, and west of the Sand Hills Fault. The East Mesa is also roughly bordered by the Coachella Canal on the east and the AAC on the south. The East Mesa is an alluvial surface that slopes gently west-southwest, covered with thin veneers of wind-blown sand. The East Mesa aquifer is chiefly unconfined, homogenous, and composed of coarse grained deposits of gravels, sands, silts, and silty clays that were deposited by the Colorado River. Faults in East Mesa (e.g., San Andreas Fault and Algodones Fault) act as partial barriers to the westward flow of groundwater from this area. The Calipatria Fault also crosses a small portion of the East Mesa along the southwest margin and also impedes the flow of groundwater out of East Mesa.

According to the IRWMP, the East Mesa has the greatest amount of available data on groundwater quality, and it includes a large number of groundwater wells. It also has a small number (12) of water supply wells, some of which are used for agricultural purposes. It has two aquifers: a shallow unconfined zone from 0 to 85 feet and a deeper semi-confined zone from 85 to 160 feet (Crandall, 1983). The aquifers were differentiated based on chemistry of their waters and the perforated interval of the particular well. Table 9-2 below provides the analysis and characterization of the water quality[5].

Table 9-1: East Mesa Water Quality from IRWMP

Table B-1. East Mesa Water Quality

	Zone A (85 to 160 Feet)		Zone B (0 to 85 Feet)	
Chemical Character	Sodium Chloride	15 wells	Sodium Chloride	13 wells
	Sodium Sulfate	3 wells	Sodium Sulfate	10 wells
	Sodium Bicarbonate	0 wells	Sodium Bicarbonate	6 wells
pH	Range: 7.4- 8.6	17 wells	Range: 4.3-11.2	17 wells
	Common 7.4- 8.6		Common 6.9- 9.0	
	4.3- 6.4	0 wells	4.3- 6.4	4 wells
	6.5- 7.5	1 well	6.5- 7.5	5 wells
	7.6- 8.6	16 wells	7.6- 8.6	11 wells
	8.7- 9.7	0 wells	8.7- 9.7	3 wells
	9.8-11.2	0 wells	9.8-11.2	4 wells
TDS (ppm)	Range 589-2860	17 wells	Range: 250-2620	27 wells
	Common: 750- 995	9 wells	Common: 434- 787	16 wells
	589	1 well	250	1 well
	1270	1 well	882-1413	7 wells
	1710-2860	6 wells	1750-2620	3 wells
	7112	1 well	7151	1 well
F (ppm)	Range: 0.2-1.4	10 wells	Range 0.1-1.6	22 wells
	1.9	1 well	3	1 well
B	0.26 and 0.46	2 wells	0.41	1 well

Source: Crandall, 1983

According to the IRWMP, hydraulic conductivity values for the shallow and deeper aquifers values varied from a low value of 0.5 foot per day in the central irrigated area of the to a high value of 80 feet per day in East Mesa, where sediments are highly transmissive sands and gravels. Therefore, the IRWMP concludes that on average, new wells in the East Mesa would be expected to have higher yields than those in the West Mesa[5].

The IRWMP states, "Data available in the IRWMP for wells in the East Mesa include well yields and specific capacities. Reported well yields varied from 80 to 3,000 gallons per minute (gpm), depending on depth and location. In general, yields in excess of 900 gpm were associated with depths of 200 feet or more. Specific capacity data reported for seven wells in the East Mesa, varied from 0.8 to 85 gallons per minute per square foot. The well with the highest specific capacity was located at the junction of the All American Canal (AAC) and Coachella Canal. Specific capacities were highest to the east and diminished to the west. Higher specific capacities were associated with wells deeper than 200 feet (Crandall, 1983). Consistent with the overall geologic model for the Imperial IRWMP area, the highest transmissivities are associated with the East and West Mesas

[5] https://www.iid.com/water/water-supply/water-plans/imperial-integrated-regional-water-management-plan, Retrieved, June 2020.

[5] https://www.iid.com/water/water-supply/water-plans/imperial-integrated-regional-water-management-plan

where aquifer formations are generally more homogenous and include a much higher proportion of coarse sands and gravels then the Imperial Valley floor, allowing groundwater to move at higher rates."[5]

The direction of groundwater movement in the East Mesa is controlled primarily by contours of groundwater level elevation; the rate of groundwater movement is proportional to the gradient or slope of the groundwater table. Groundwater levels and flow have changed with lining of the canals; therefore, two temporal sets of water level data are presented: one for 1960 representing conditions with recharge from the canals and one for 1993 after the southerly portions of the Coachella Canal was lined. Lining of portions of the AAC, generally about six miles east of the East Highline Canal to about five miles east of the Coachella Canal was not started until 2006 so neither set of maps reflect the reduction of seepage from the AAC. A portion of the AAC still contributes recharge to East Mesa. Additional details groundwater contour maps are also provided for both the East and West Mesas.

10. EAST MESA GROUNDWATER MANAGEMENT PLANNING AREA[5]

The Project is located in the East Mesa Groundwater Management Planning Area (Figure 7) which is a planned and coordinated locally to ensure a sustainable groundwater basin to meet future water supply needs. Planning elements are the tasks that go into developing an adopted Groundwater Management Plan (GMP) and forming a governance structure to represent and implement the plan over the Management Area. To reach this goal, many of the legal requirements now in effect have to be addressed in the planning stage to include their implementation when governance has been formed and active monitoring and reporting are taking place. This chapter introduces each of the planning elements that go into developing the GMP.

The Groundwater Management Planning Elements for the East Mesa Area include elements from three sources: SB 1938 mandatory components, Assembly Bill (AB) 3030 and SB 1938 voluntary components, and California Department of Water Resources (CDWR) Bulletin 118 suggested components. The seven mandatory components that are required to be compliant with SB 1938 will need to be addressed in the GMP. The GMP will also need to address the twelve (12) specific technical elements identified in the CWC, along with the seven recommended components identified in DWR Bulletin 118 (DWR 2003). This guidance document encourages a locally developed, stakeholder-driven GMP process that reflects current State law; coordinates existing groundwater management; and defines actions for developing projects and management programs to monitor the operation of the East Mesa Area and to improve the long-term sustainability of groundwater resources in the area and support the goals and objectives of the IRWMP. This guidance document also provides the required action items of an adopted GMP that, when implemented, will maintain or enhance groundwater levels and water quality, minimize inelastic land subsidence, and manage available surface and groundwater conjunctively to allow greater operational flexibility.

[5] https://www.iid.com/water/water-supply/water-plans/imperial-integrated-regional-water-management-plan

[5] https://www.iid.com/home/showpublisheddocument?id=9546

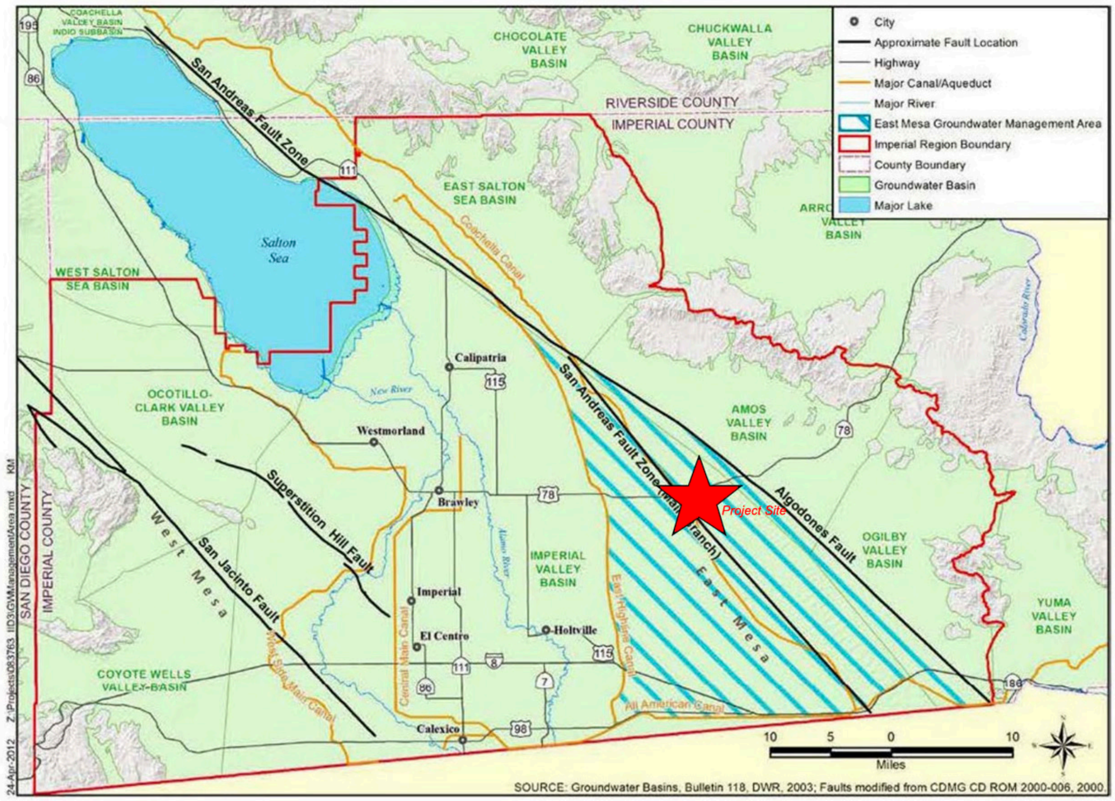

Figure 7 :East Mesa Groundwater Management Plan Area & Project Location[5]

10.1 Title 9, Division 21, Water Well Regulation [Division 21 Adopted November 24, 1998 (Amended October 31, 2006)]

Title 9, Division 21, Water Well Regulation, Division 21, Sec. 92102.00 Permit(S) Required

Title 29, Section 92102.00 states, in relevant part, that "No person shall (1) drill a new well, (2) activate a previously drilled but unused well, (unused shall mean a well or wells that have not been used for a 12 month) period by installing pumps, motors, pressure tanks, piping, or other equipment necessary or intended to make the well operational, (3) increase the pumping capacity of a well, or (4) change the use of a well, without first obtaining a CUP through the ICPDS. The pumping capacity shall mean the "permitted amount" or in the absence of a permit the annual acreage, over 3-year period." Therefore, the Applicant would need to obtain a CUP from the County for the onsite well.

Additionally, this Section of Title 29 states that "[Sec. 92102.00…] (B) Well Construction Permit. No person shall dig, bore, drill, deepen, enlarge, refurbish, or destroy a water well, cathodic protection well, observation well,

[5] Please see Appendix A for East Mesa Groundwater Management Elements

monitoring wells or any other excavation that intersects ground water without first obtaining a well construction permit through the Planning & Development Services Department…" The Applicant would also have to obtain a Well Construction Permit from the County.

Title 9, Division 21, Water Well Regulation, Division 21, Sec. 92102.05 Suspension and Revocation

A. Circumstances for such action: Enforcement agency may suspend or revoke any permit issued pursuant to this Ordinance, whenever it finds that the permittee has violated any of the provisions of this Ordinance or has misrepresented any material fact in his/her application or any supporting documents for such a permit. Prior to ordering any such suspension or revocation, the enforcement agency shall give permittee an opportunity for a hearing thereon, after reasonable notice. The hearing shall be before the enforcement agency, the director, or his designated representative.

B. Consequences: No person whose permit has been suspended or revoke shall continue to perform the work for which the permit was granted until, in case of suspension, such permit has been reinstated by the enforcement agency.

C. Additional Work: Upon suspending or revoking any permit, the enforcement agency may order permittee to perform any work reasonably necessary to protect the ground water from pollution or contamination, if any work already done by permittee has left a well in such a condition as to constitute a hazard to the quality of the ground water. No permittee or person who has obtained a permit issued pursuant to this Ordinance shall fail to comply with such order

TITLE 9, DIVISION 21, WATER WELL REGILATION, DIVISION 21, SEC. 92103.01 REPORTS

This Section of Title 9 requires the submission of a Completion Report: "The driller shall provide the enforcement agency a completion report within 30 days of the completion of any well construction, reconstruction, or destruction job.

A. Submittal of State "Report of Completion": A copy of the "Report of Completion" (Driller's well log) required by CWC, Section 13751, shall be submitted by the well driller to the enforcement agency within 30 days of construction or destruction of any well (except driven wells). This report shall document that the work was completed in accordance with all applicable standards and additional permit conditions. This section shall not be deemed to release any person from the requirement to file said report with the CDWR.

B. Confidentiality of Report: With the exception of the well driller's name, the date the well was drilled and the well yield, all information contained in this report shall remain "Confidential".

C. Other Agency's Requirements: Nothing in this Ordinance shall be deemed to excuse any person from compliance with the provisions of CWC, Section 13752, relating to notices and reports of completion or any other federal, state, or local reporting regulations.

TITLE 9, DIVISION 21, WATER WELL REGILATION, DIVISION 21, SEC. 92103.00 REGISTRATION OF WELL

This Section requires that any person who uses a new or existing well shall first register said well with the ICPDS. If a well is under an active conditional use permit, the well shall be deemed to be registered. Any well that is not under an Imperial County CUP shall be registered with the ICPDS and the State pursuant to CWC, Section 13750. An application to register any well shall be filed with the ICPDS and said application shall contain all information required upon said form.

TITLE 9, DIVISION 21, WATER WELL REGILATION, DIVISION 21, § 92103.02 WELL STANDARDS

Except as otherwise specified, the standards for the construction, repair, reconstruction, alteration, reactivation, operation, or abandonment of wells shall be as set forth in:

A. The CDWR Bulletin 74-81 entitled, "Water Well Standards, State of California", except as modified by subsequent supplements or revisions issued by the CDWR. Division 21 Adopted November 24, 1998 (Amended October 31, 2006)

B. The CDWR Bulletin 74-90 and any subsequent supplements or revisions issued by the CDWR.

C. The following factors, to the extent necessary to avoid conditions of overdraft, subsidence, well interference, water quality degradation, or other environmental degradation: 1. The type of use or uses served. 2. The number of users served. 3. Wasteful or inefficient use. 4. Water conservation activities. 5. Reasonable need of the extractor and other affected water users. 6. The quality of groundwater. 7. The affected groundwater basin or sub-basins. 8. Environmental impact as determined through the CEQA review. 9. Any other factors that the ICPDS reasonably believes it should consider in order to reach an equitable result within the entire County in accordance with the provisions of this Ordinance, and of California Law.

11. COLORADO RIVER BASIN REGION OF CALIFORNIA (BASIN PLAN) (2019)5

For water quality planning and protection purposes, the Project is within the Colorado River Basin Region of the California Regional Water Quality Control Board (RWQCB). The Water Quality Control Plan for the Colorado River Basin (Basin Plan) is the Board's master plan for water quality protection. The Basin Plan identifies the waters in the Region, their beneficial uses, and water quality objectives to protect those uses. The Basin Plan fulfills state and federal statutory requirements for water quality planning, thereby preserving and protecting ground and surface waters of the Colorado River Basin Region. The proposed Project is in the Imperial Valley Hydrologic Unit.

11.1 Beneficial Use Designations Of Aquifers

The groundwater Beneficial Use Designations for this Region are currently based on hydrologic units. The Basin Plan designates Municipal and Industrial supply as the beneficial uses of groundwater in the Imperial Valley Hydrologic Unit. However, first encountered groundwater beneath the Project's site is likely too saline (TDS > 5,000 mg/L) to support the Municipal Supply designation. Because of this, in the next three years, Regional

[5] https://www.waterboards.ca.gov/coloradoriver/water_issues/programs/basin_planning/docs/bp032014/r7_bp2019fullbp.pdf, Retrieved, June 2020

Water Board staff intends to review the appropriate groundwater data and propose changes to the Beneficial Use Designations so that they will correspond to individual groundwater aquifers within the various hydrologic units. Nevertheless, based on a recent hydrologic evaluation conducted by Stantec for the Project, deeper groundwater is expected to be available beneath the site in quantity and quality for the proposed Project5.

11.2 Historic Use In The Basin- Records

The closest historical records of related to groundwater pumping on record belongs to the Western Mesquite Mines, with ORDER R7-2014-0032, Waste Discharge Requirements and Monitoring and Reporting Program permit with the California RWQCB Colorado River Basin Region.

The newly approved Wister Solar Project will also be receiving water from this aquifer.

According to the IRWMP there is proof that farmers did use groundwater wells at one point to water crops, however there are no records on file at the County of Imperial of such permits. The majority of farmers rely on the IIDs water conveyance system for water deliveries.

The proposed well would be new and therefore has no other historical use. All water being pumped will from this proposed ground water well will be a net increase.

12. PROJECT WELL HYDRAULIC EVALUATION [5]

East Mesa is located in the southeastern portion of the Salton Basin and is described as the broad area east of the East Highline Canal and east margin of pre-historic Lake Cahuilla, and west of the Sand Hills Fault. The Sand Hills Fault (also named the Algodones Fault), an easterly splay of the San Andreas Fault system, is mapped as bordering the east side of the Sand Hills (Loeltz et. al., 1975). The East Mesa is also roughly bordered by the Coachella Canal on the east and the AAC on the south. The East Mesa is an alluvial surface that slopes gently west-southwest, covered with thin veneers of wind-blown sand. The East Mesa aquifer is chiefly unconfined, homogenous, and composed of coarse grained deposits of gravels, sands, silts, and silty clays that were deposited by the Colorado River. In East Mesa, the San Andreas Fault zone includes a main branch along the west margin of the Sand Hills, and an easterly splay identified as the Algodones Fault (Loeltz et. al., 1975). These faults act as partial barriers to the westward flow of groundwater from this area. The Calipatria Fault also crosses a small portion of the East Mesa along the southwest margin and also impedes the flow of groundwater out of East Mesa.[5]

12.1 Aquifer Extent and Properties

The groundwater storage capacity was estimated at 360,000 AF (DWR, 1975). High permeability units likely include coarse sands and gravels, where present. Aquifer extents are bounded by outcropping bedrock in the Chocolate Mountains and possibly low-permeability fault zones such as the San Andreas Fault Zone, the Banning Mission Fault, and other unnamed faults. Specific to East Mesa, aquifers in this area are generally unconfined, homogenous, and composed of sediments deposited by the Colorado River (IIWMP, 2012). A geothermal test well was previously drilled at the Project by Ormat (well 12-27) to a depth of 3401 feet below ground surface (bgs). The shallow groundwater system was not specifically characterized during drilling and testing. However,

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[5] Stantec: Hydrological Evaluation, Wister Solar Development Project. June 2020.
[5] STANTEC STUDY
[5] https://imperialirwmp.org/wp-content/uploads/2013/07/Appendix-B-Desalination-Groundwater-Development-20121016_Proof21.pdf

static temperature logs from the well may indicate the presence of an aquifer zone as shallow as 40 to 50 feet bgs. Other aquifer zones are likely present but were not identified due to the limitations of temperature logs. Geothermal properties of the test well were non-economical, and the well was abandoned. The nearest East Mesa well with a lithological log is 12S/16E-9A, which is located 9 miles to the southwest of the Proposed Well. In the 1000-foot log, 61% of the thickness is dominated by sand, 34% dominated by clay and approximately 1% dominated by sandstone. Sand and clay intervals also include silts and gravels. Coarse sands and gravels, likely having high hydraulic conductivities, are intermittently present throughout the logged sequence. The perforated interval of the well was placed at 150-1,000 feet and the static water level was recorded at 154.5 feet bgs, which is an elevation of 65.5 feet bgs. Other nearby wells with lithological logs were completed in the Imperial Valley and contain higher percentages of clay (Loeltz et al., 1975).

In the East Mesa, the source of water supply recharge to the groundwater aquifer was from canal seepage from the old unlined Coachella Canal and the AAC. However, recharge has essentially ceased when portions of unlined Coachella Canal were lined in 1979. Although portions of the AAC were lined between 2006 and 2010, the project did not complete lining of the canal completely through the East Mesa area, so some recharge from the canal to the mesa still continues. Due to the arid conditions, virtually no direct precipitation reaches the groundwater aquifer in the East Mesa (Crandall, 1983). Groundwater from the East Mesa is discharged at ground surface in springs and in the subsurface into Imperial Valley aquifers. Discharge of groundwater onto ground surface in springs occurs at areas of shallow groundwater along the AAC. In these areas, where wetlands have been created from canal seepage, discharged groundwater consumptive use is mainly attributable to evapotranspiration by phreatophytes and surface evaporation. Subsurface outflow in the East Mesa occurs toward the Imperial Valley, toward Mexico, and into a portion of the East Highline Canal.

The storage capacity of the Imperial Valley has been estimated at approximately 14 MAF of water (CDWR, 1975). Available aquifer storage within the East Mesa in between the East Highline Canal and the old unlined Coachella Canal is estimated to be one (1) MAF (USBR, 1988). The aquifer storage potential of the West Mesa has not been quantified; however, aquifer conditions in the area appear favorable for storage of water. However, it will be more difficult to supply the water to the West Mesa area as there are no canals along the topographical higher areas where permeable sediments are present.

The East Mesa area is the most favorable for an aquifer storage and recovery operation. The concept of storing and recovering Colorado River water during IID underruns in the East Mesa and has been the subject of investigation by both IID and the U.S. Bureau of Reclamation (USBR) since the mid-1980s. In 1989, a recharge study using a portion of the old unlined Coachella Canal just south of the Glamis Known Geothermal Resource Area and west of the San Andreas Fault, diverted an average of 80 cfs (17,000 AF) of water into the canal for 3.5 months proving the sediments are favorable for a recharge facility (USBR, 1992). The recharged water raised the water table by about 15 feet near the canal, but only raised the piezometric head in the semi-confined intermediate aquifer by about 3 feet. USBR postulated the piezometric head in the intermediate aquifer was raised due to the overburden of the recharged mound of water in the shallow aquifer applying great pressure to the intermediate aquifer. Most likely the confining layer separating the two aquifers is not a significant barrier to groundwater flow and that by pumping from the intermediate aquifer could induce recharged water to enter the intermediate aquifer where the aquifers have a higher transmissive capacity and potential for developing high yielding wells. Additional testing is needed. The upper and intermediate aquifers beneath East Mesa are highly permeable. Groundwater in storage beneath the East Mesa west of the San Andreas fault in just the upper aquifer is estimated to be about 1.5 million AF. The aquifers are generally full and may need to be pumped to create storage for recharged water. The aquifers are favorable for development of high capacity wells, and water is generally of good quality, with TDS ranging from 500 to 1,000 mg/L.

12.2 Recharge

Groundwater recharge in the East Mesa area was historically dominated by seepage from the Coachella Canal, prior to replacement with concrete lined channels in the late 1970s and mid-2000s. Prior to lining, seepage from the 36.5-mile section near the Project has been estimated at 26,000 acre-feet per year. Unlined sections of the AAC continue to recharge the East Mesa groundwater aquifer. However, the unlined section is approximately 45 miles from the Project. In the absence of canal seepage, recharge to the East Mesa aquifer from direct precipitation is estimated to be near zero (Leroy Crandall and Associates, 1983). Groundwater recharge in the Chocolate Mountains may include mountain front recharge and stream flow runoff (Tompson et al., 2008). The Lawrence Livermore National Laboratory (LLNL) groundwater model (Tompson et al., 2008) estimated that recharge from precipitation within the Imperial Valley and portions of surrounding ranges was 0.019 inches/year, which is less than 1% of precipitation. Furthermore, the LLNL model did not include additional recharge along the mountain fronts. The 2013 groundwater model, which was updated by Argonne National Laboratory (ANL; Greer et al., 2013) estimated recharge at 0.056 inches/year in Imperial Valley and 7.2 inches/year along the mountain-front area of the Chocolate Mountain. This estimate of mountain-front recharge may not be supported by the estimated precipitation rates for the Chocolate Mountains (4-6 inches/year; PRISM, 2020). In 2003, the DWR classified the East Salton Sea Basin groundwater budget type as 'C', which indicates that groundwater data is insufficient to estimate the groundwater budget or groundwater extraction (DWR, 2003).

12.3 Groundwater Levels

Groundwater levels in the vicinity of the Project have been influenced by the presence of the canal systems, including the Coachella Canal, East Highline Canal, and associated laterals and drains. Seepage from the unlined Coachella Canal created a groundwater mound in the shallow alluvial aquifer of East Mesa, with water levels rising over 70 feet in some areas (Loeltz et al., 1975). Groundwater level decline in the vicinity of the Coachella Canal has been monitored since the late 1970s when the first 49 miles of the earthen canal channel was replaced with a concrete channel. United States Geological Survey (USGS) well 11S/15E-23M, which is approximately 9 miles southeast of the Proposed Well (Figure 3), shows an asymptomatic groundwater level decline from 20.68 feet bgs in 1979 to approximately 50 feet bgs at present. The water level elevations as of March 2020 were approximately 70 feet AMSL. No groundwater levels have been reported along the Coachella Canal section that was lined in the late 2000s. However, a similar asymptotic decline could be expected. Groundwater levels in Imperial Valley have been historically measured at two multi-level wells located approximately 6.5 to 7.5 miles southwest of the Proposed Well (11S14E30C and 11S14E19N; Figure 3). Water levels at these locations were within 10 feet of the ground surface in 1989. The groundwater elevation at that time was approximately 215 feet AMSL. Groundwater levels in the irrigated areas have been controlled by the drain systems (IIRWMP, 2012). Current groundwater levels, although sparse, generally agree with historical groundwater elevation distributions. Groundwater elevations are higher in mountainous areas and East Mesa and decline towards Imperial Valley and the Salton Sea. This distribution of groundwater elevations suggests groundwater flow directions roughly coincide with topography. However, the flow of groundwater and distribution of groundwater levels is likely influenced by faults, which act as barriers, and changes in transmissivity.

12.4 Groundwater Quality

Groundwater quality in the East Mesa is generally reported as poor and not suitable for domestic, municipal, or agricultural purposes (DWR, 2004). Water types include sodium chloride and sodium sulfate. Total dissolved solids (TDS) concentrations are reported as 356 to 51,632 mg/L, whereas the National Secondary Drinking Water Regulations limit TDS to 500 mg/L. Groundwater quality is generally considered better in the vicinity of the unlined canals due to the recharge of lower TDS water. The closest well to the Proposed Well with available water quality data is located 2 miles to the west (Loeltz et al., 1975). A limited number of water quality constituents were measured in 1961, including pH (8.0), specific conductivity (19,200 µS/cm), bicarbonate (210 mg/L), chloride (6,050 mg/L), calcium-magnesium hardness (2,440 mg/L), and non-carbonate hardness 2,270 mg/L). The screened interval depth of this well is unknown.

13. PROJECT WATER DEMAND

The Applicants request for 25 total AFY would be able to accommodate all proposed land uses. Water from the aquifer can be supplied to the Project via the proposed well in accordance with County and State regulations. The Project is anticipated to use approximately 12.07 AF per year after all construction is complete. As stated previously, the Applicant would be required to submit revised and additional WSAs prior to development of any water intensive land use development. The applicant will have to upgrade their infrastructure at the time of development and infrastructure will have to be analyzed thoroughly through the independent WSA.

14. SUMMARY AND CONCLUSIONS

- The proposed Project has an estimated total water demand of 12.07 AF. Thus, the proposed Project demand is an increase of AFY from the historical 10-year average or percent (100 %) than the historic 10-year average.
- The Applicant will have to upgrade their water infrastructure in order to meet the water demands for land uses permitted by right in the CR-1, 2 and 3 Zones as well as the S-1 Zone of Open Space.
- Based on the amount of groundwater within the basin and the recharge rate of 200 acre-feet/year the project supply is able to meet the projected demand of the Project.
- Based on the Environmental Impact Report (EIR) prepared for this proposed Project pursuant to the CEQA, California Public Resources Code sections 21000, *et seq*., the Lead Agency hereby finds that the County of Imperial groundwater for the East Mesa projected water supply will be sufficient to satisfy the demands of this proposed Project for Phase One, however Phase Two and onward will have to in addition to existing and planned future uses, including agricultural and non-agricultural uses for a 30-year Water Supply Assessment period and for the year proposed Project life.
- Permitting: The applicant is subject to all Local, State and Federal Laws during construction and operations for the GSP.
- Approval of CUP – Groundwater Well. Pursuant to Title 9 Division 21: Water Well Regulations, §92102.00, the Applicant will be required to obtain a CUP for the proposed on-site groundwater well. As required by §92102.00, no person shall (1) drill a new well, (2) activate a previously drilled but unused well, (unused shall mean a well or wells that have not been used for a 12 month) period by installing pumps, motors, pressure tanks, piping, or other equipment necessary

or intended to make the well operational, (3) increase the pumping capacity of a well, or (4) change the use of a well, without first obtaining a CUP through the ICPDS.

- It is suggested that the applicant run water quality analysis for precautionary purposes.

15. WORK CITED

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