Hydrological Evaluation

Wister Solar Development Project

June 8, 2020

Prepared for:

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Prepared by ______________________________________

(signature)

Stanley Smith

Reviewed & Approved by ____________________________

(signature)

Kevin Kohan

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Abbreviations

°F	Degrees Fahrenheit
AAC	All American Canal
AFY	Acre-feet per year
amsl	Above mean sea level
ANL	Argonne National Laboratory
bmsl	Below mean sea level
DWR	California Department of Water Resources
IIRWMP	Imperial Integrated Regional Water Management Plan
LLNL	Lawrence Livermore National Laboratory
POD	Point of Diversion
Project	Wister Solar Development Project
Proposed Well	Wister Solar Development Project Proposed Water Distribution Well
Stantec	Stantec Consulting Services
TDS	Total dissolved solids

1.0 INTRODUCTION

ORNI 21, LLC (Ormat) is proposing to construct and operate the Wister Solar Development Project (Project) near the unincorporated community of Wister in Imperial County, California (**Figure 1**). The Project is located on a privately owned land parcel within the northwest quarter or Township (T) 10 South (S), Range (R) 14 East (E) Section 27, San Bernardino Meridian. The Project consists of 100 acres of solar installation with a production capacity of 20 megawatt (net), associated infrastructure, and a water distribution well. Commercial operations are anticipated to begin in 2021.

The proposed water distribution well (Proposed Well) would supply water for Project construction, operation and maintenance, and decommissioning. Water requirements are summarized in **Table 1**. Water needs for operation and maintenance include panel washing, backup dust suppression, and fire tank water.

This report describes the hydrology and water related aspects of the Project area and surrounding area. This report includes details of physiography, geologic setting, climate, land use, surface water features, groundwater features, and a hydrologic conceptualization. The extent of this report is generally limited to a two-mile radius around the proposed water distribution well. Where data were limited within a two-mile radius of the Project, information from beyond this radius was included.

Table 1 Estimated Project Water Needs

Phase	Water Usage Rate	Duration	Total Water Requirement (acre-feet)
1: Dirt Work	40,909 gallons per workday	1 month	2.76
2: Construction	16,136 gallons per workday	2-7 months	6.54
3: Reclamation	13,636 gallons per workday	1 month	0.92
Construction Total	**-**	**9 months**	**10.22**
Operation & Maintenance Total	**1.37 acre-feet/year**	**25-30 years**	**34.25-41.10**
Decommission Total	**-**	**1 month**	**5.0**
Project Total		**~26-31 years**	**49.47-56.32**

Assuming 22 construction days per month; Pre-construction water needs assumed to be negligible.

2.0 SITE DESCRIPTION

2.1 PHYSIOGRAPHY

The Project is located in the Basin and Range physiographic province, which includes inland portions of California, the majority of Nevada, and portions or Arizona, New Mexico, Oregon, Utah, Idaho, and Mexico. The Basin and Range is divided into several sub basins, which includes the Salton Trough, which contains the Project. The Salton Trough includes the Imperial Valley in the south and the Coachella Valley in the north. The Project is near the northeastern margin of the Imperial Valley, approximately 5 miles east of the Salton Sea, a saline lake located in Imperial Valley. Imperial Valley is bounded by the Coyote and Jacumba Mountains to the west, the Chocolate and Orocopia Mountains to the northeast, the Sand Hills and Cargo Muchacho Mountains to the southeast, and the United States of America and Mexico border to the south. Furthermore, the elevated margins of Imperial Valley are named West Mesa and East Mesa. The elevation of the Imperial Valley is mostly below sea level and the Project is at approximately 15 feet bmsl. The Chocolate Mountains, which are the closest mountains to the Project, have a maximum elevation of 2,877 feet amsl.

2.2 GEOLOGIC SETTING

The Salton Trough is a tectonically active pull-apart basin. The extensional tectonics results in crustal thinning and sinking. Fault systems near the Project include the San Andreas Fault Zone and Imperial Fault Zone, which are linked by the Brawley Seismic Zone. The trough has filled with sediments due to its topographically low setting and continued sinking. The overall vertical relief of the trough formation is estimated to exceed 14,000 feet, which has been caused by faulting, folding, and warping (Loeltz et al., 1975). The geology and geomorphology of the Imperial Valley was influenced by prehistoric Lake Cahuilla, including lacustrine sediments and paleo-shorelines. The adjacent Chocolate Mountains include outcrops Tertiary and older igneous and metamorphic rocks. The piedmont slope of the Chocolate Mountains, located northeast of the Project, includes poorly sorted alluvial and fluvial deposits with sparse vegetation (Loeltz et al., 1975).

2.3 CLIMATE

The Project area has a hot desert climate. Climate data was available from two nearby weather stations: Niland (0.9 miles west-northwest of the Project; NCEI 2020a) and Brawley (22 miles south of the Project; NCEI 2020b). Both sites report climate normals (1981 to 2010) with Niland reporting precipitation and Brawley reporting precipitation and temperature. Monthly average temperatures are between 54.9 to 91.6°F with minimum temperatures occurring in December and maximum temperatures occurring in August. Average annual precipitation at Niland was 2.88 inches and at Brawley was 2.78 inches. The majority of precipitation occurs from December through March.

Precipitation in the adjacent Chocolate Mountains are estimated at 4–6 inches/year (PRISM, 2020).

Table 2 Climate Normals near the Project

Period	Brawley[1]		Niland[2]
	Average Temperature (°F)	Precipitation (inches/year)	Precipitation (inches/year)
January	55.8	0.48	0.47
February	59.1	0.53	0.44
March	64.3	0.33	0.45
April	69.9	0.05	0.07
May	77.4	0.02	0.01
June	85.0	0.00[3]	0.03
July	91.3	0.08	0.23
August	91.6	0.21	0.21
September	86.2	0.16	0.22
October	75.2	0.25	0.18
November	63.2	0.19	0.17
December	54.9	0.48	0.40
Annual	72.9	2.78	2.88

1) Brawley, CA US; GHCND: USC00041048; 32.9544°, -115.5581°; 100 ft bmsl; NCEI, 2020a

2) Niland, CA US; GHCND: USC00046197; 33.2775°, -115.5239°; 60 ft bmsl; NCEI, 2020b

3) non-zero value that rounds to zero

2.4 LAND AND WATER USE

Land use within 2 miles of the Proposed Well is available from the 2003 Land Use GAP dataset. A summary of land use is provided in **Table 3**. The land area in 2002 was 75.6% natural ecosystem, including Sonora Mojave, North American Warn Desert, and Inter-Mountain Basins Shale Badlands. Cultivated croplands, pasture/hay and developed areas accounted for 24% of the area and the remaining 0.5% was open water. Approximately 9.6% of land within this area is within the Chocolate Mountain Aerial Gunnery Range, which is under the jurisdiction of the United States Navy and United States Marine Corps. Comparing land use classification to recent aerial imagery indicates some in land use due to the expansion of agriculture and solar energy operations, with other land use changes possible. Cultivated croplands include areas under irrigation, likely derived from laterals from the East Highline Canal.

Site Description

Table 3 Land Use Within Two Miles of the Proposed Well

Ecosystem	Description	Percent of Area
Sonora Mojave	Creosote Bush White Bursage Desert Scrub	29.9%
	Mixed Salt Desert Scrub	13.3%
North American Warm Desert	Riparian Woodland and Shrubland	11.4%
	Wash	10.8%
	Bedrock Cliff and Outcrop	7.4%
	Pavement	1.0%
	Playa	0.4%
	Volcanic Rockland	0.1%
	Active and Stabilized Dune	0.0%*
Cultivated Cropland	-	13.5%
Pasture/Hay	-	8.5%
Developed	Low Intensity	1.5%
	Medium Intensity	0.0%*
	Open Space	0.5%
Inter-Mountain Basins Shale Badland	-	1.2%
Open Water	Fresh	0.5%

*non-zero value that rounds to zero

3.0 HYDROLOGICAL SYSTEM

The hydrologic system in the vicinity of the Project includes the East Salton Sea groundwater basin (**Figure 2** and further details in Section 3.3), which is influenced by the surface water system, which includes intermittent creeks and canal systems with associated distribution and storage systems (see Section 3.2). Surface water features and wells are shown in **Figure 3**.

3.1 PRECIPITATION AND EVAPOTRANSPIRATION

Precipitation near the Project is recorded at approximately 2.8 to 2.9 inches/year. Modeled precipitation is higher in the Chocolate Mountains at approximately 4 to 6 inches/year. Potential evapotranspiration (PET) is between 80 and 100 inches/year within 2 miles of the Proposed Well (Esri, 2015). In the Chocolate Mountains, PET is higher at 100 to 110 inches/year. High PET rates combined with low precipitation rates limits the potential for groundwater recharge. However, recharge is possible during high precipitation storm events when PET is low.

3.2 SURFACE WATER SYSTEM

Surface water features within 2 miles of the Proposed Well include natural drainages and manmade features including canals, laterals, drains and ponds/reservoirs (**Figure 3**). Natural drainages include Iris Wash and unnamed minor drainages, which convey runoff from the Chocolate Mountains to the Imperial Valley. These drainages ultimately flow towards the Salton Sea, which is the low point of the basin. All-natural drainages are classified as intermittent (USFWS, 2020). All natural drainages are classified as intermittent (USFWS, 2020).

Canals include the Coachella Canal and the East Highline Canal (**Figure 3**). Both canals deliver water from the All American Canal (AAC), located approximately 40 miles south of the Project. The Coachella Canal is located approximately 1.3 miles from the Proposed Well. The Coachella Canal was initially unlined in the Imperial Valley, which lead to water losses into the alluvial sediments. In the late 1970s, the first 49 miles of the Coachella Canal was replaced with a concrete lined channel. This end of this segment is located approximately 3.6 miles east southeast of the Proposed Well. In the mid-2000s, the remaining 36.5 miles of the Coachella Canal (including the section near the Project; see **Figure 3**) was replaced with a concrete lined channel, reducing seepage losses into alluvial sediments.

The East Highline Canal is located approximately 0.5 miles from the Proposed Well. Furthermore, the East Highline Canal crosses the southwest corner of the Project (**Figure 1**). The East Highline Canal is unlined and likely results in seepage to alluvial sediments. The water distribution system in the Imperial Valley, near the Project, include laterals and ponds for distribution and storage, respectively, and drains to convey unused water from distribution system, farmland, and discharging groundwater to the Salton Sea (IIRWMP, 2012). The East Highline Canal is downgradient from the Project though a seepage mound in the shallow aquifer may be present upgradient of the canal, as identified along unlined sections of the AAC and Coachella Canal (Loeltz et al., 1975).

3.3 GROUNDWATER SYSTEM

The Project is located in the East Salton Sea Basin (basin 7-033) (**Figure 2**). The basin occupies the northeastern margin of the Imperial Valley, including the East Mesa, and alluvial surficial deposits of the Chocolate Mountains. The basin covers 279,824 acres. Adjacent basins include Chocolate Valley to the north, Arroyo Seco Valley to the east, Amos Valley to the southeast, and Imperial Valley to the south. No groundwater basin is defined in the footprint of the Salton Sea.

3.3.1 Aquifer Extent and Properties

Aquifers in the East Salton Sea Basin include alluvial aquifers, which are present as valley fill with maximum thicknesses of at least 400 feet (Willets et al., 1954). Water bearing units include unconsolidated Quaternary alluvium and semi-consolidated Tertiary to Quaternary alluvium. The groundwater storage capacity was estimated at 360,000 acre-feet (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 bgs. The shallow groundwater system was not specifically characterized during drilling and testing. However, 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 (**Figure 3**). Lithological details are provided in **Table 4**. 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).

Table 4 Lithological Log of 12S/16E-9A (9 Miles Southwest of the Proposed Well)

Lithology	Thickness (feet)	Depth Interval (feet)
Sand, silty, very fine, and brown clay	10	0-10
Sand, very coarse to fine, and very fine gravel	102	10-112
Clay, light-brown, and very fine silty sand	5	112-117
Sand, fine to medium, and silt	14	117-131
Clay, silty, yellow-brown	5	131-136
Sand, coarse to very coarse	15	136-151
Sand, very coarse to coarse, and very fine and larger gravel	45	151-196
Sand, fine to very coarse, and yellow-brown clay	19	196-215
Clay, yellow-brown, and fine sand	17	215-232
Sand, very fine to very coarse, and thin layers of gravel	48	232-280
Clay, yellow-brown; some light-gray clay	20	280-300
Clay, light-gray, and yellow-brown clay	40	300-340
Sand, medium to very coarse, and gravel	3	340-343
Clay, light-gray	13	343-356
Sand, fine to medium, and light-gray clay	15	356-371
Clay, silty, light-gray	13	371-384
Sand, very fine to medium, and thin layers of gray clay	33	384-417
Sand, fine to very coarse, and very fine to fine gravel	10	417-427
Sand, very fine to medium, and thin layers of gray clay	59	427-486
Clay, light-gray, and fine sand	6	486-492
Sand, silty, very fine to medium	24	492-516
Clay, light-gray	31	516-547
Sand, very fine to medium	15	547-562
Sand, very fine to medium, and light-gray clay	18	562-580
Clay, light-gray and yellow-brown	60	580-640
Sand, fine to very coarse, and light-gray clay	42	640-682
Clay, light-gray, and layers of fine to very coarse sand	30	682-712
Sandstone, very fine to medium, and fine to coarse sand	53	712-765
Clay, light-gray, and very fine to medium sandstone	17	765-782
Clay, light-gray; some yellow brown	38	782-820
Clay, gray and brown, and fine to very coarse sand	46	820-866
Sand, silty, fine to medium	61	866-927
Sand, silty, fine, and light-gray clay, in alternating layers	73	927-1,000

Source: Loeltz et al., 1975

3.3.2 Well Inventory

Only one well was identified within two miles of the Proposed Well. The well is located at 10S/14E-20N, approximately 2.0 miles west of the Proposed Well (**Figure 3**). Few details are available for this well and there are no records of construction details. However, water quality samples were collected in 1961 (see Section 3.3.8).

3.3.3 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).

3.3.4 Discharge and Extraction

Discharge from the East Salton Sea Basin includes springs, discharge into irrigation drains, and extractions from wells. Spring discharge, and water losses from associated vegetation, is likely limited based on the occurrence of few springs (see **Figure 3**). Irrigation drains in the Imperial Valley (including the western margin of the East Salton Sea Basin) primarily return excess irrigation water to the Salton but also function to remove discharging groundwater. Water well extraction rates were last estimated in 1952 at 6 acre-feet/year (DWR, 1975). Due to the lack of development in this basin, current extraction rates may be similar. However, this statement is speculative due to a lack of recent information (DWR, 2003).

3.3.5 Seeps and Springs

No identified springs or seepage are present within two miles of the Proposed Well. The closest identified spring is an unnamed spring located approximately 6.5 miles southeast of the Proposed Well (**Figure 3**) (USGS, 2020).

3.3.6 Underflow

Underflow seepage likely conveys water from the East Salton Sea Basin, downgradient into the Imperial Valley. The quantity of water flow between basins would require details of hydraulic gradients and transmissivities of adjoining aquifers and the impact of transmissive or impeding zones such as faults. Groundwater flow between other surrounding basins in unknown as hydraulic head and hydraulic gradient information is sparse.

3.3.7 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 bmsl. 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.

3.3.8 Groundwater Quality

Groundwater quality in the East Salton Sea Basin 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.

The next closest well to the Proposed Well with available water quality data is an inactive USGS monitoring well (11S/14E-2A) located approximately 2.8 miles to the southeast (USGS, 2020). The well is located in a Basin and Range basin-fill aquifer. The total depth was 825 feet bgs, however, the depth of the screened interval is unknown. Water quality was measured in the late 1960s and early 1970s. The latest water quality sample that includes all major ions (calcium, magnesium, sodium, potassium, bicarbonate, sulfate and chloride) was collected in 1969. This sample had sodium-chloride type water and a TDS concentration of 1,760 mg/L. Furthermore, temperatures were elevated above ambient temperatures at 44.4°C.

3.3.9 Transmissivity and Well Yield

Well yield information for the East Salton Sea Basin is limited. The only identified value is 25 gpm at well 11S/15E-23M, located approximately 9 miles southeast of the Proposed Well (**Figure 3**) (Loeltz et al., 1975). Hydraulic properties in East Mesa were summarized in the mid-1990s (Montgomery Watson, 1995). The range of hydraulic conductivities was 32 to 1,337 feet/day, which included wells several miles southeast of the Project.

3.4 WATER RIGHTS AND POINTS OF DIVERSION

No points of diversion (POD) are identified within two miles of the Proposed Well, (California Water Boards, 2020). However, this two-mile radius includes seven laterals from the East Highline Canal, which may have associated water rights and points of diversion. The closest identified POD is 5.7 miles southwest of the Proposed Well (California Water Boards, 2020). This POD is owned by the Metropolitan Water District of Southern California and is located along the N Lateral, which originates from the East Highline Canal. More distal PODs are associated with laterals and the Alamo River.

4.0 HYDROLOGIC EVALUATION SUMMARY

The Wister Solar Development Project is located within the East Salton Sea Basin, which includes the Chocolate Mountains and the northeastern margin of the Imperial Valley (**Figure 2**). The groundwater storage capacity of the East Salton Sea Basin was estimated at 360,000 acre-feet. Groundwater usage in the East Salton Sea Basin is limited due to generally poor water quality and limited inhabitants. Extraction rates for the East Salton Sea Basin were last estimated in 1952 at 6 acre-feet/year, which is 3% of the estimated recharge rate of 200 acre-feet/year (DWR, 1975). Limited development in the East Salton Sea Basin suggests that current extraction rates are similar. However, a lack of recent data limits the ability update this estimate. Furthermore, surface water from the Colorado River is conveyed into the Imperial Valley through a network of canals, laterals, and reservoirs, which has further reduced the need to develop groundwater resources.

Groundwater in the East Salton Sea Basin is present in alluvial aquifers at depths up to several hundred feet, and with generally high transmissivities (Montgomery Watson, 1995). At the Project, groundwater may also be present in an alluvial aquifer 40-50 feet bgs. Historically, groundwater recharge was significant in the vicinity of the earthen lined Coachella Canal. The replacement of the canal with a concrete lined channel has greatly reduced recharge to the adjacent alluvial aquifers. Near the Project, the Coachella Canal was concrete lined in the late 2000s. The East Highline Canal remains earthen-lined, which likely leads to recharge into the shallow alluvial aquifers near the Project. Recharge from precipitation is generally limited due to low precipitation rates and high evaporation potential. Recharge rates may be higher in the Chocolate Mountains due to higher precipitation rates at higher elevations (4-6 inches/year; PRISM, 2020). Recharge events are likely limited to larger storm events, which may generate runoff and seepage along ephemeral channels. Recharge rates from precipitation were estimated at 0.019 inches/year (Tompson et al., 2008).

The water needs for the Project are estimated at 10.22 acre-feet for construction in the first year, 1.37 acre-feet/year for the subsequent 25 to 30 years of operation, and 5 acre-feet for decommissioning at the end of operations (**Table 1**). Overall, the proposed extraction for the Project are significantly lower than recharge rates in an area where groundwater usage is limited.

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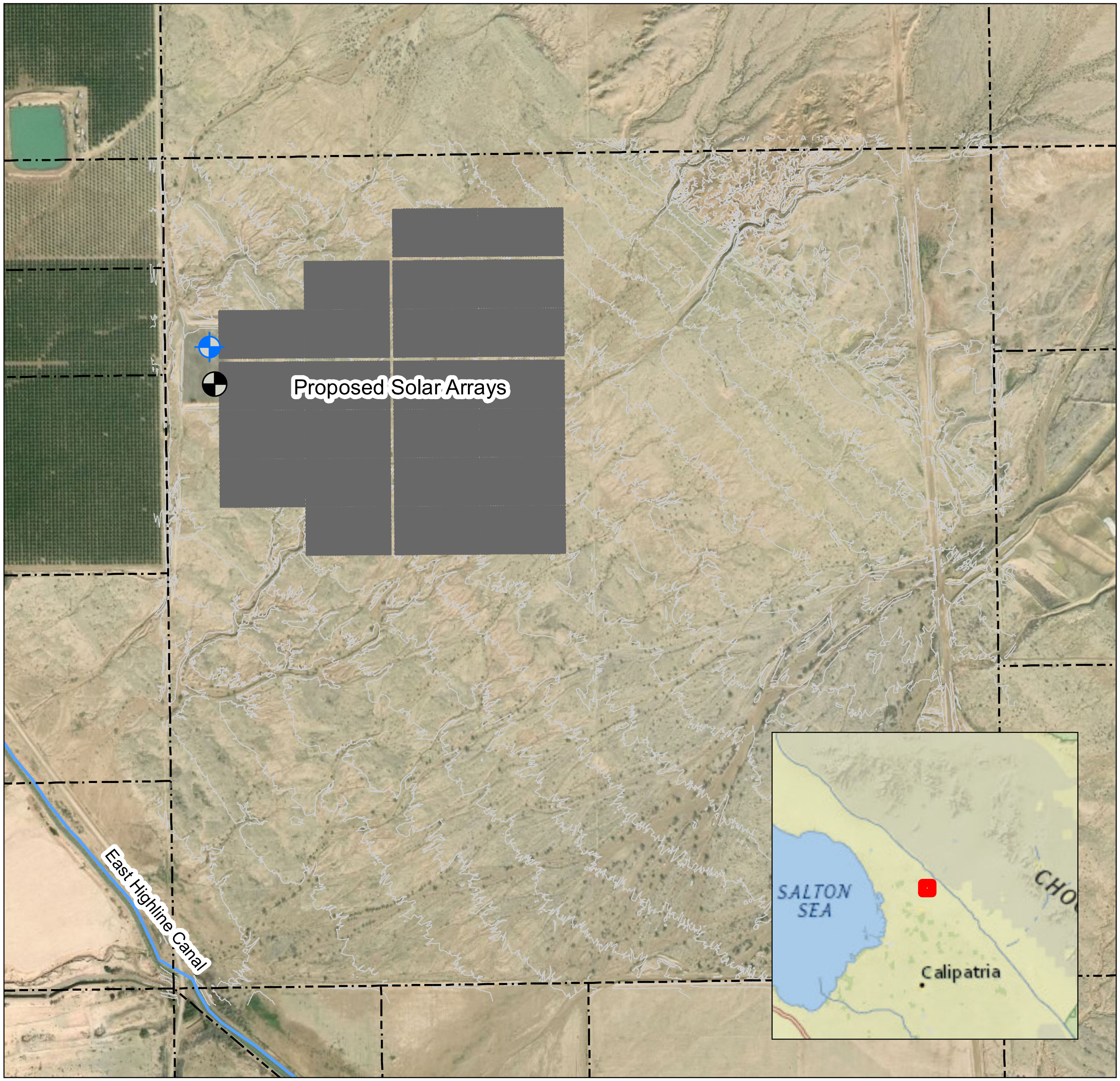
FIGURES



Stantec

Legend

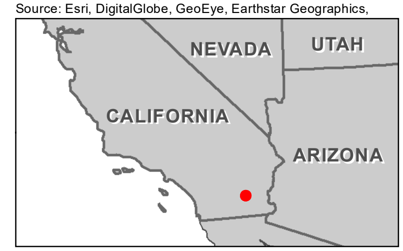
- Proposed Water Distrubution Well
- Geothermal Test Well 12-27
- Property Line
- Contour-major
- Project Location

N

0 150 300 metres

(At original document size of 8.5x11)
1:11,713

Notes
1. Coordinate System: NAD 1983 UTM Zone 11N
2. Data Sources:
3. Background: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics,



Project Location
T10S, R14E, S27
Imperial County, CA

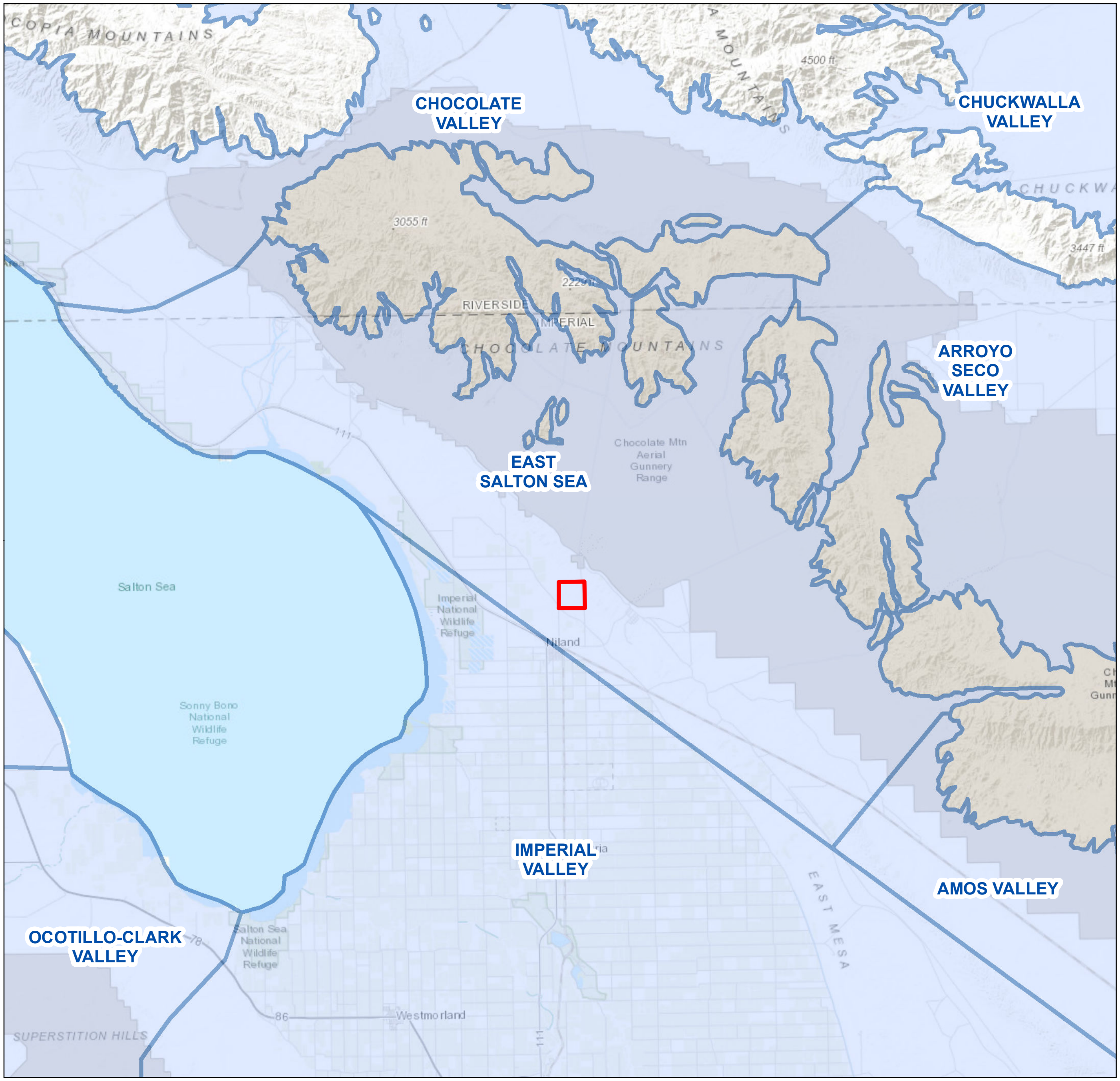
Prepared by LR on 2020-05-29
TR by SS on 2020-05-29
IR Review by KK on 2020-05-29

Client/Project
185804209 REVA
ORNI 21, LLC
Wister Solar Development Project
Hydrologic Evaluation

Figure No.
1

Title
Project Location and Overview

\\US1342-F01\workgroup\1858\active\185804156\03_data\GIS\mxd\Fig1_Location_8x11L.mxd Revised: 2020-06-08 By: stasmith



Stantec

Legend

Project Location

Groundwater Basin

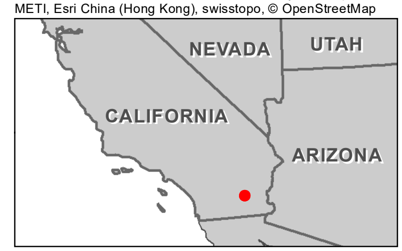
N

0 4,700 9,400 metres

(At original document size of 8.5x11)
1:372,507

Notes

1. Coordinate System: NAD 1983 UTM Zone 11N
2. Data Sources:
3. Background: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap



Project Location
T10S, R14E, S27
Imperial County, CA

Prepared by LR on 2020-05-29
TR by SS on 2020-05-29
IR Review by KK on 2020-05-29

Client/Project
185804209 REVA
ORNI 21, LLC
Wister Solar Development Project
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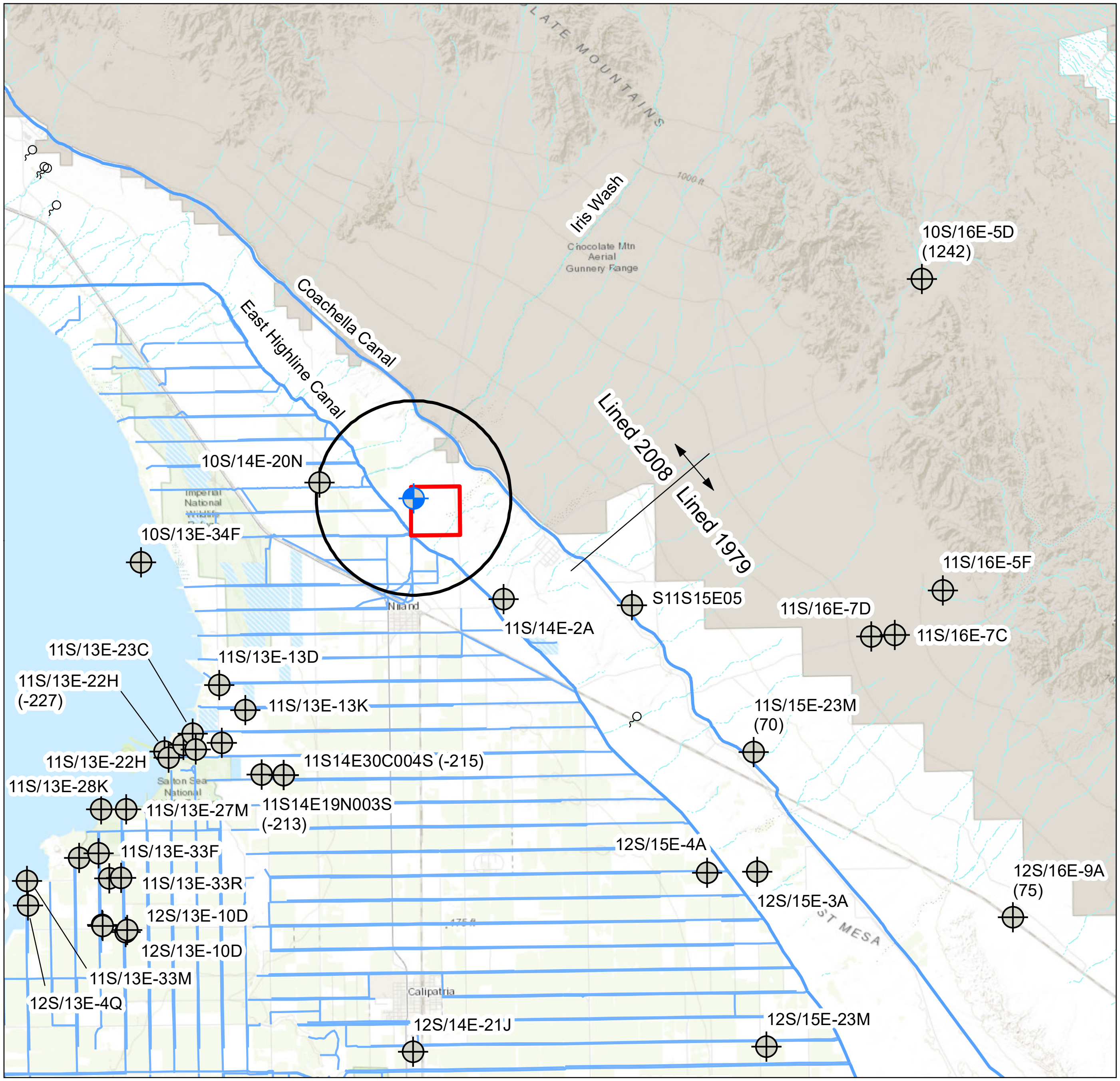
Figure No.
2

Title
Groundwater Basins

\\US1342-F01\workgroup\1858\active\185804156\03_data\GIS\mxd\Fig2_GW_Basins_8x11L.mxd Revised: 2020-06-08 By: stasmith



Stantec

Legend

- Proposed Water Distribution Well
- Existing or Historical Well (Water Level Elevation ft amsl)
- Spring
- Canal
- Lateral
- Intermittent Creek
- Proposed Well 2-Mile Buffer
- Project Location

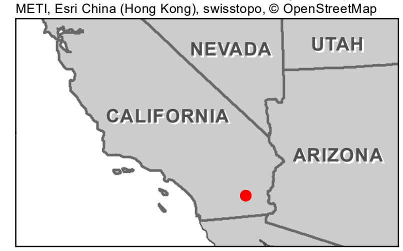
N

0 2,500 5,000 metres

(At original document size of 8.5x11)
1:200,000

Notes

1. Coordinate System: NAD 1983 UTM Zone 11N
2. Data Sources:
3. Background: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap



Project Location
T10S, R14E, S27
Imperial County, CA

Prepared by LR on 2020-05-29
TR by SS on 2020-05-29
IR Review by KK on 2020-05-29

Client/Project
185804209 REVA
ORNI 21, LLC
Wister Solar Development Project
Hydrologic Evaluation

Figure No.
3

Title
Well and Water Resources Inventory

\\US1342-F01\workgroup\1858\active\185804156\03_data\GIS\mxd\Fig3_Water_Resources_8x11L_20200601.mxd Revised: 2020-06-08 By: stasmith