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CH2MHILL

September 9, 2009
File No.: 04.02.16.02
Project No. 357891

Mr. John Kessler, Project Manager
California Energy Commission
Systems Assessment and Facilities Siting Division
1516 9th Street, MS 15
Sacramento, CA 95814-5504

RE: Data Response, Set 1P
Ivanpah Solar Electric Generating System (07-AFC-5)

Dear Mr. Kessler:

On behalf of Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC (Applicant), please find attached one original and four hard copies, plus ten CD copies of Data Response, Set 1P.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

Enclosure
c: POS List
Project File

Ivanpah Solar Electric Generating System (ISEGS)

(07-AFC-5)

Data Response, Set 1P

(Response to Data Request: Soil and Water)

Submitted to the

California Energy Commission

Submitted by

Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners IV, LLC; and Solar Partners VIII, LLC

September 9, 2009

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Introduction

Attached are Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC (Applicant) responses to the California Energy Commission (CEC) Staff's data requests numbers 1 through 116 for the Ivanpah Solar Electric Generating System (Ivanpah SEGS) Project (07-AFC-5). The CEC Staff served these data requests on December 12, 2007, as part of the discovery process for Ivanpah SEGS. The responses are grouped by individual discipline or topic area. Attachments are keyed to the data response. Hence the first attachment to Data Response 64 would be called "Attachment DR64-1A." A revision to that attachment would be called "Attachment DR64-1B."

Additional tables, figures, or documents submitted in response to a data request (supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of a discipline-specific section and may not be sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

The Applicant looks forward to working cooperatively with the CEC and BLM staff as the Ivanpah SEGS Project proceeds through the siting process. We trust that these responses address the Staff's questions and remain available to have any additional dialogue the Staff may require.

Soils and Water Resources (64)

Background

A Federal Clean Water Act section 401 certification may be required. If there are potential impacts to surface waters (perennial and ephemeral) of the State and/or Waters of the United States, such as drainages, streams, washes, ponds, pools, and wetlands, this certification will be required from the RWQCB. These impacts need to be quantified and mitigated. Please refer to: http://www.waterboards.ca.gov/lahontan/401WQC/401WQC_Index.htm.

Data Request

64. Please discuss in detail whether a 401 certification is required. If required, please discuss compliance with the RWQCB requirements discussed on the following RWQCB webpage: http://www.waterboards.ca.gov/lahontan/401WQC/401instructions2app.pdf.

Response: On August 6, 2009 the Applicant filed Data Response, Set 1N including, among other items, Attachment DR64-1A, Evaluation of Project Impacts on Beneficial Uses of Waters of the State. This evaluation was based on Category 1, 2 or 3 washes in the jurisdictional delineation report. Comments received from Lahontan Region on Data Response Set 1N, indicated that the Beneficial Use Evaluation should have also included the data for the smaller Category 4 and 5 washes, since all ephemeral washes are considered to be Waters of the State. Hence, the Ivanpah Solar Electric Generating System (SEGS) Project Beneficial Use and Dredge/Fill Impacts Analysis for Waters of the State (Revision 1) is being submitted as Attachment DR64-1B.

TECHNICAL MEMORANDUM CH2MHILL

Ivanpah Solar Electric Generating System (SEGS) Project Beneficial Use and Dredge/Fill Impacts Analyses for Waters of the State (Revision 1)[1]

PREPARED FOR:	Steve De Young/BSE Tracie Wheaton/BSE
PREPARED BY:	Kathy Rose/CH2M HILL
COPIES:	John Carrier/CH2MHILL Jen Renz/CH2MHILL
DATE:	September 8, 2009
PROJECT NUMBER:	357891.TM.HR

Summary

Proposed construction, operations, and closure activities for the Ivanpah Solar Electric Generating System (SEGS) project were evaluated for their potential to adversely affect the designated beneficial uses (BUs) of Waters of the State, which are identified in the Water Quality Control Plan (Basin Plan) for the area within the Lahontan Regional Water Quality Control Board's (LRWQCB) jurisdiction The evaluation concludes that the project would have no permanent impacts to BUs, and that long-term and temporary impacts to BUs would be fully mitigated.

Introduction

The Ivanpah SEGS project will consist of three independent solar thermal electric generating facilities (or solar plants) that will be co-located approximately 1.6 miles west of the Ivanpah Dry Lake and 4.5 miles southwest of Primm, Nevada, in San Bernardino County, California (Figure 1, figures are located at the end of the memo). The project site will be located on federal property managed by the Bureau of Land Management (BLM). The three Ivanpah SEGS facilities will have a combined nominal rating of 400 megawatt (MW).

In total, Ivanpah SEGS will affect approximately 4,061.65 acres. Ivanpah 1 will require about 913.49 acres (1.43 square miles) and Ivanpah 2 will require about 920.72 acres (1.44 square miles), while Ivanpah 3 is larger and will require approximately 1,836.27 acres (2.9 square miles). Additionally, there will be a common area between Ivanpah 1 and 2 (approximately 377.50 acres) that will include the Southern California Edison (SCE) substation and shared facilities (administration/storage building, groundwater production wells, and portions of the linear facilities). Portions of this common area will be used during construction for

[1] This document incorporates: (1) comments received August 26, 2009 from Lahontan RWQCB staff on version dated August 5, 2009; and (2) dredge/fill impacts associated with Category 4 and 5 washes.

staging, laydown, and temporary construction offices. Additional land disturbance will be associated with the gas line tap station and its construction (1.26 acres), the gas line and its construction from the tap station to the edge of Ivanpah 3 (2.30 acres), the new dirt road to the mining claim (0.41 acres), and construction and paving of a portion of Colosseum Road from the Primm Valley Golf Club to the project (9.69 acres).

Construction activities will result in temporary, short-term disturbance to limited areas. These areas will be restored to pre-project conditions upon completion of construction. Long-term disturbance areas are affected during project operations and will be rehabilitated and restored upon decommissioning. Decommissioning activities themselves could cause temporary, short-term disturbance to the landscape, similar to those of project construction. These impacts will likewise be mitigated through site rehabilitation and revegetation. Permanent disturbance areas occur where project facilities/structures will remain in place following closure. Permanent, long-term, and temporary land disturbance associated with implementation of Ivanpah SEGS are quantified in Table 1, below.

TABLE 1
Areas of Permanent, Long-Term, and Temporary Land Disturbance

Components	Acres
Permanent Disturbance Area	
Ivanpah 1	0.00
Ivanpah 2	0.86
Ivanpah 3	8.53
Kern River Gas Transmission Line (KRGT)	0.00
CLA including improvements to Colosseum Road	36.86
TOTAL AREAS OF PERMANENT DISTURBANCE	46.25
Long-Term Disturbance Area	
Ivanpah 1	912.11
Ivanpah 2	790.43
Ivanpah 3	1,427.83
Kern River Gas Transmission Line (KRGT)	0.89
CLA including Improvements to Colosseum Road	53.18
TOTAL AREAS OF LONG-TERM DISTURBANCE	3,184.43
Temporary Disturbance Area	
Ivanpah 1	1.37
Ivanpah 2	129.43
Ivanpah 3	400.33
Kern River Gas Transmission Line (KRGT)	2.67
CLA Including improvements to Colosseum Road	297.17
TOTAL AREAS OF TEMPORARY DISTURBANCE	830.97

Note: Some totals have been revised from those submitted in the Closure, Revegetation and Rehabilitation Plan (CH2M HILL, 2009d)

The purpose of this technical memorandum is to identify and evaluate impacts to designated beneficial uses of Waters of the State, which could potentially be affected by construction, operations, and decommissioning of Ivanpah SEGS. Some Basin Plan designated BUs did not exist historically, do not exist currently, and will not exist in the foreseeable future; these BUs are noted but are not evaluated further in this memorandum. This evaluation will assist staff of the LRWQCB in providing project requirements to the California Energy Commission (CEC), which will be incorporated into the permit to be issued by CEC for the project.

Environmental Setting

The project site is located within the Ivanpah Valley, near the California-Nevada border (Figure 1). The valley covers about 560,000 acres, including 340,000 acres within California and 220,000 acres within Nevada. The California portion of the Ivanpah Valley is referred to as Ivanpah South (Durbin, 2007). The Ivanpah Valley is a closed basin and surface waters in the project area drain to and evaporate on Ivanpah Lake, a desert playa located 1.6 miles to the east of the project site. Waterways in or near the project site include numerous unnamed ephemeral washes on the middle part of the bajada at the base of the Clark Mountains to the west.

Numerous ephemeral washes dissect the project site and range in size from small (1 to 4 feet wide), weakly expressed erosional features to large, broad (over to 85 feet wide) drainages that occur throughout the Mojave Creosote Bush Scrub habitat. The active flow channels of the smaller washes are generally devoid of vegetation and typically have a sandy-gravel substrate, although some washes also contain cobble and scattered larger rocks. Most of the larger channels typically contain scattered vegetation including creosote bush and cheesebush, especially in braided channels that contain slightly elevated areas intermixed with the active flow channels. Mojave Wash Scrub is limited to the larger washes (typically over 15 feet) with sandy gravel substrate and well-defined banks. Vegetation associated with these features included catclaw (*Acacia greggii*), cheesebush, Mojave Desert California Buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), desert willow (*Chilopsis linearus*), black-banded rabbitbrush (*Chrysothamnus paniculatus*), bladder-sage (*Salazaria mexicana*), desert almond (*Prunus fasciculata*), Virgin River encelia (*Encelia virginensis*), Anderson's boxthorn (*Lycium andersonii*), Cooper's boxthorn (*Lycium cooperi*), sand-wash groundsel (*Senecio flaccidus* var. *monoensis*), wire lettuce (*Stephanomeria pauciflora*), and blue sage (*Salvia dorrii*) (For a complete description of plant communities present on the proposed Ivanpah SEGS site, see the Delineation of Waters of the United States report [CH2M HILL, 2008] and the Draft Biological Assessment [CH2M HILL, 2009a].) In addition, vegetation types observed during rare plant surveys of the Ivanpah Substation to Mountain Pass Substation area are described in the Biological Survey Report prepared by EPG (EPG 2008).

Ephemeral washes in the project area were assigned a size category of 1, 2, 3, 4 or 5 (CH2M HILL, 2008) based on wash width. Category 1 washes are large ephemeral drainages over 36 feet wide. Category 2 washes are relatively large ephemeral drainages over 20 feet wide and no more than 35 feet wide. Category 3 washes are over 10 feet wide and no more than 20 feet wide. Category 4 includes ephemeral washes over 4 feet wide and no more than 10 feet wide. Category 1, 2, 3 and 4 washes include single, large channels with well-defined

bed and banks, as well as broad, but weakly expressed, assemblages of braided erosional channels. Category 5 includes weakly expressed erosional/flow channels that generally lack defined cut banks and are no more than 4 feet wide. Ephemeral drainages within the project area are quantified below in Table 2, and representative photographs are provided in Exhibit DR641B-1. All wash categories are considered to be Waters of the State. There are no springs, seasonal or perennial creeks, or wetlands located on or near the project site.

Approximately 198.72 acres of ephemeral washes (i.e., Waters of the State) were identified and mapped in the project study area. Breakdown of areal extent for each category is provided in Table 2, and Figure 2 shows their distribution across the Ivanpah SEGS site.

TABLE 2
Summary of Waters of the State Identified in the Project Study Area (CH2M HILL, 2008)

Wash Category	Project Feature	Number of Washes[a]	Wash Length (feet)	Wash Acreage
Category 1 (36-85 feet)	Ivanpah 1	0	0	0.00
	Ivanpah 2	3	7,066	7.48
	Ivanpah 3	4	5,392	8.29
	Utility Corridor	1	1,100	1.01
	Colosseum Road	0	0	0.00
	Substation and Administrative Area	0	0	0.00
	Category 1 Total	**8**	**13,559**	**16.78**
Category 2 (21-35 feet)	Ivanpah 1	0	0	
	Ivanpah 2	4	5,847	3.90
	Ivanpah 3	7	6,399	3.96
	Utility Corridor	1	706	0.36
	Colosseum Road	0	0	0.00
	Substation and Administrative Area	0	0	0.00
	Category 2 Total	**12**	**12,953**	**8.22**
Category 3 (11-20 feet)	Ivanpah 1	10	19,850	7.06[b]
	Ivanpah 2	22	21,903	7.79[b]
	Ivanpah 3	32	46,069	16.39[b]
	Utility Corridor	8	8,497	3.02[b]
	Colosseum Road	9	6,018	2.14[b]
	Substation and Administrative Area	13	11,111	3.95[b]
	Category 3 Total	**94**	**113,446**	**40.37**

TABLE 2
Summary of Waters of the State Identified in the Project Study Area (CH2M HILL, 2008)

Wash Category	Project Feature	Number of Washes[a]	Wash Length (feet)	Wash Acreage
Category 4 (5-10 feet)	Ivanpah 1	95	103,016	17.74[b]
	Ivanpah 2	130	110,833	19.08[b]
	Ivanpah 3	171	169,855	29.24[b]
	Utility Corridor	16	8,624	1.48[b]
	Colosseum Road	11	3,589	0.62[b]
	Substation and Administrative Area	36	32,167	5.54[b]
	Category 4 Total	**459**	**428,083**	**73.71**
Category 5 (1-4 feet)	Ivanpah 1	397	245,095	14.07[b]
	Ivanpah 2	292	200,172	11.49[b]
	Ivanpah 3	449	399,574	22.93[b]
	Utility Corridor	29	24,459	1.40[b]
	Colosseum Road	36	4,442	0.25[b]
	Substation and Administrative Area	197	96,386	5.53[b]
	Category 5 Total	**1,400**	**970,129**	**55.68**
Waters of the State (Total of All Categories)		**1,973**	**1,538,170**	**198.72**

Note:

[a] Number of washes is based on number of segments in each category mapped in each of the project areas.
[b] Acreage calculated using Wash Length and the median width of the category range
No wetlands were observed within the entire project area.

Hydrology

Storm flows on the site result from two combined hydrologic processes: runoff from the mountain watersheds to the west and runoff generated on the alluvial fans themselves. The mountain watershed area draining to the site is approximately 13,900 acres, and is comprised of about 15 different subwatersheds ranging in size from 211 to 3,220 acres (West Yost Associates, 2009).

Development of the project would result in impervious surfaces limited to the areas occupied by power blocks, power tower, and related facilities. Once developed, the project would result in 38.2 acres of impervious surfaces, which would comprise only about 1 percent of the total project area. Solar field development will maintain unobstructed sheet flow, with water exiting the site in existing natural contours and flows. Relatively small rock filters and local diversion berms through the heliostat fields may be installed as required to discourage water from concentrating, and to maintain sheet flow (CH2M HILL, 2009b [specifically, Figure 9 of Appendix A]).

To protect the power block and tower areas from floods, a western diversion ditch will be constructed to channel storm runoff around each power block, power tower area and substation before discharging as sheet flow to the east of these structures (see Figure 18 of Appendix A to DESCP [CH2M HILL, 2009b]). Hydrologic and hydraulic modeling support the need for stormwater diversion channels to provide flood protection to structures. Models predict that post-project hydrology would not be substantially different than pre-project conditions for the 100-year storm event. Runoff volumes from the site are predicted to increase between 0 and 3.2 percent, and peak flows are predicted to increase no more than 11 percent. Offsite flow increases are limited to just a few locations down gradient from the southern portion of Ivanpah 2 and the Construction Logistics Area (see West Yost Associates, 2009).

Scour will develop around pylons located within stream channels. A conical depression will be eroded in the channel bed at the base of a pylon. The depression will be of about equal diameter and depth. The magnitude of the depth or diameter depends mostly on the bank-full streamflow velocity, which is the streamflow velocity when the streamflow depth equals the channel depth. However, based on research sponsored by the Federal Highway administration, the scour depth would be less than three times the pylon diameter, regardless of the streamflow velocity. For the 6-inch pylon diameter proposed for the Ivanpah SEGS project, the maximum scour depth would be 1.5 feet for high velocities, regardless of the streamflow velocity, but the maximum scour will be smaller for low velocities.

Scour at a pylon was calculated using an equation developed by the Federal Highway Administration for estimating scour at bridge piers. The scour about a circular pier tends to occur as a cone-shaped depression surrounding the pier. The equation for estimating the scour depth has the form:

$$\frac{y_s}{a} = \min\left[2K_1K_2K_3K_4\left(\frac{y}{a}\right)^{0.35} Fr^{0.43}, 3\right]$$

Where:

$$Fr = \frac{v}{\sqrt{gy}}$$

and where:

y_s is the scour depth [ft],
a is the pier diameter [ft],
K_1 is a correction factor for pier shape,
K_2 is a correction factor for angle of flow relative to pier,
K_3 is a correction factor for bed condition,
K_4 is a correction factor for bed armoring,
Fr is the Froude number for the channel flow,
v is the flow velocity [ft/s], and
y is the flow depth [ft].

Based on guidelines developed by the Federal Highway Administration, the correction factors are $K_1 = 1$, $K_2 = 1$, $K_3 = 1.1$, and $K_4 = 1$. The pylon diameter (a) is 0.5 ft. The Manning

equation was used to calculate the streamflow velocity for the bank-full channels. The roughness coefficient for the velocity calculation was n = 0.04 and the channel slope was S = 0.04.

The calculated scour volumes are listed in Table 3. The scour volume at a single pylon is listed in the table, which is the volume of the cone-shaped depression surrounding the pylon. Listed also is the channel area and the number of pylons that would be located within existing channels. The channel areas are listed for five channel categories, where the categories are based on the channel width. The channel areas represent the total channel areas within the Ivanpah SEGS subareas indicated in the table. The number of pylons within a channel area is based on an average radial pylon spacing of 25 feet between rows and a circumferential spacing of 18 feet along rows, which translates into 450 square feet per pylon. (Note, this methodology is much more conservative than that used for calculation of dredge and fill impacts in Table 5 [i.e., estimated numbers of pylons is much greater using this methodology and is likely overestimated]). As indicated in Table 3, the estimated total scour volume is 9,847 cubic feet (365 cubic yards), which is small compared to the size of the Ivanpah SEGS site. If that sediment volume were to be spread over the Ivanpah SEGS site, the thickness of the resulting soil cover would be 0.0007 inches.

TABLE 3
Estimated Scour Volume Around Pylons Located in Existing Channels

Wash Category	Wash Widths Per Category (ft)	Ivanpah SEGS Subarea	Avg. Wash Width (ft)	Cum. Wash Length (ft)	Cum. Wash Area (acres)	No. of Pylons	Scour Depth (ft)	Scour Volume Single Pylon (ft3)	Scour Volume All Pylons (ft3)
1	36-85	1		0					
		2	46.1	7,066	7.48	724	1.50	3.53	2,559
		3	67.0	5,392	8.29	802	1.50	3.53	2,835
		Total		12,458	15.77	1,526			5,393
2	21-35	1		0					
		2	29.1	5,847	3.90	377	1.50	3.53	1,332
		3	27.0	6,399	3.96	383	1.05	1.20	460
		Total		12,246	7.86	760			1,793
3	11-20	1	15.5	19,850	7.06	683	0.83	0.60	410
		2	15.5	21,903	7.79	754	0.83	0.60	453
		3	15.5	46,069	16.39	1,586	0.83	0.60	953
		Total		87,822	31.24	3,023			1,815
4	5-10	1	7.5	103,016	17.74	1,717	0.49	0.13	216
		2	7.5	110,833	19.08	1,846	0.49	0.13	232
		3	7.5	169,855	29.24	2,830	0.49	0.13	356
		Total		383,704	66.06	6,393			804

TABLE 3
Estimated Scour Volume Around Pylons Located in Existing Channels

Wash Category	Wash Widths Per Category (ft)	Ivanpah SEGS Subarea	Avg. Wash Width (ft)	Cum. Wash Length (ft)	Cum. Wash Area (acres)	No. of Pylons	Scour Depth (ft)	Scour Volume Single Pylon (ft3)	Scour Volume All Pylons (ft3)
5	1-4	1	2.5	245,095	14.07	1,361	0.20	0.01	12
		2	2.5	200,172	11.49	1,112	0.20	0.01	10
		3	2.5	399,574	22.93	2,219	0.20	0.01	20
		Total		844,841	48.49	4,692			42
		TOTAL		**1,341,071**	**169.42**	**16,394**			**9,847**

Designated Beneficial Uses

Section 303 of the federal Clean Water Act (CWA) defines water quality standards to include both the BUs of the waters involved and the water quality criteria applied to protect those uses. BUs and water quality objectives have been established for all waters of the State, including both surface and ground waters. Designated BUs for surface waters and ground waters in the project area are identified in the Basin Plan for the areas under jurisdiction of the LRWQCB.

BUs for minor surface waters, including wetlands, springs, streams, lakes, and ponds, are identified in the LRWQCB Basin Plan for the Ivanpah hydrologic unit. Additionally, the Basin Plan states that "Unless otherwise specified, beneficial uses also apply to all tributaries of surface waters identified in Table 2 (i.e., specific surface waters which are not listed have the same beneficial uses as the streams, lakes, wetlands, or reservoirs to which they are tributary)." Therefore, beneficial uses that are designated for Ivanpah Lake would potentially apply to its tributary ephemeral washes. Beneficial uses applicable to the ephemeral washes that would be potentially affected by the project, as well beneficial uses for Ivanpah Lake and groundwater, are identified and defined in Table 3, below.

TABLE 4
Existing and Potential Beneficial Uses of Waters of the State that are Relevant to the Project (LRWQCB Basin Plan)

Beneficial Use Abbreviation	Beneficial Use Definition	Minor Surface Waters	Ivanpah Lake	Ivanpah Valley Ground Water
MUN	**Municipal and Domestic Supply**. Beneficial uses of waters used for community, military, or individual water supply systems including, but not limited to, drinking water supply.	X	X	X

TABLE 4
Existing and Potential Beneficial Uses of Waters of the State that are Relevant to the Project (LRWQCB Basin Plan)

Beneficial Use Abbreviation	Beneficial Use Definition	Minor Surface Waters	Ivanpah Lake	Ivanpah Valley Ground Water
AGR	**Agricultural Supply**. Beneficial uses of waters used for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing.	X	X	X
GWR	**Ground Water Recharge**. Beneficial uses of waters used for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.	X	X	
REC-1	**Water Contact Recreation**. Beneficial uses of waters used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities,	X	X	
REC-2	**Noncontact Water Recreation**. Beneficial uses of waters used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.	X	X	
COMM	**Commercial and Sportfishing.** Beneficial uses of waters used for commercial or recreational collection of fish or other organisms including, but not limited to, uses involving organisms intended for human consumption.	X		
WARM	**Warm Freshwater Habitat**. Beneficial uses of waters that support warm water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.	X	X	
COLD	**Cold Freshwater Habitat**. Beneficial uses of waters that support cold water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.	X	X	
SAL	**Inland Saline Water Habitat**. Beneficial uses of waters that support inland saline water ecosystems including, but not limited to, preservation and enhancement of aquatic saline habitats, vegetation, fish, and wildlife, including invertebrates.		X	
WILD	**Wildlife Habitat**. Beneficial uses of waters that support wildlife habitats including, but not limited to, the preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl.	X	X	

TABLE 4
Existing and Potential Beneficial Uses of Waters of the State that are Relevant to the Project (LRWQCB Basin Plan)

Beneficial Use Abbreviation	Beneficial Use Definition	Minor Surface Waters	Ivanpah Lake	Ivanpah Valley Ground Water
WQE	**Water Quality Enhancement**. Beneficial uses of waters that support natural enhancement or improvement of water quality in or downstream of a water body including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, streambank stabilization, maintenance of channel integrity, and siltation control.		X	
FLD	**Flood Peak Attenuation/Flood Water Storage**. Beneficial uses of riparian wetlands in flood plain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.		X	
IND	**Industrial Service Supply**. Beneficial uses of waters used for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, geothermal energy production, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.			X
FRSH	**Freshwater Replenishment**. Beneficial uses of waters used for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).			X

Beneficial Use Analysis

This section evaluates impacts to beneficial uses of all potentially-impacted Waters of the State that could result from project construction, operations, and decommissioning activities (see Table 3 for identification of those waters and their respective designated beneficial uses). In general, the low impact development approach used in site design allows for construction of the project without substantial grading or filling of drainages; therefore, substantial disturbance to Waters of the State is not expected. For example, heliostat placement and road crossings would largely follow existing contours, and earth movement would only occur where necessary for vehicle maneuvering. Refer to the Closure, Revegetation and Rehabilitation Plan (CH2M HILL, 2009d) for the most up-to-date description of the low impact design (LID) design approach that has been adopted by BrightSource for the Ivanpah SEGS project.

Beneficial uses could potentially be impacted either directly, through dredging or placement of fill in Waters of the State, or indirectly through activities that occur outside of Waters of the State but that affect the beneficial uses of those waters (e.g., increased amount of surface runoff through creation of impervious surfaces, which could lead to increased scour within drainages).

Furthermore, potential impacts to beneficial uses could occur to surface waters that are located within the project area, to downstream receiving waters (i.e., Ivanpah Lake), or to underlying groundwater that will be used during project operations. Each of these waters is considered to be Waters of the State.

Direct Impacts to Waters of the State (Dredge and Fill)

Dredging and/or filling of Waters of the State would occur during the following project activities, and impacts are quantified in Table 4.

- Construction, maintenance and usage of roads and paths
- Rerouting of trails
- Stabilization of streambed and banks using baskets, riprap and contouring
- Construction of the substation and administration buildings
- Installation of natural gas pipeline and water/gas utility lines
- Installation of heliostats
- Installation of perimeter fencing
- Removal of structures and facilities at project closure
- Site rehabilitation and revegetation after construction and at project closure

Impacts are classified as being temporary, long-term, or permanent, depending upon impact duration. These are described below and are shown in Figures 3 through 6[2] for Ivanpah 1, 2, 3 and the CLA, respectively.

Temporary Dredge/Fill Impacts:

Temporary dredge/fill impacts would be associated with construction activities, and include activities that take place in the construction corridor for roads, trenching and installation of utilities and perimeter fencing, and incidental fill resulting from equipment and foot traffic through the washes. Construction staging and succulent storage will take place in the CLA; staging areas, parking, trailer placement, etc. will completely avoid category 1, 2 and 3 ephemeral washes. Because design details have not been finalized for the CLA, 25 percent of the total area occupied by Category 4 and 5 washes was assumed to have temporary fill impacts associated with construction. Temporary impacts will be minimized across the entire site by limiting traffic and other activities to the minimum area necessary to complete construction.

Incidental fill impacts could also occur through mowing of vegetation. Vegetation will be mowed in association with development of maintenance paths; and additional vegetation may be cut to accommodate heliostat placement and performance. Vegetation mowing around heliostats that are placed within Waters of the State would potentially result in incidental fill. However, because vegetation is primarily present only within upland "islands" within large, braided washes and active channels are largely devoid of vegetation, mowing will be very limited and cutting of vegetation will be able to be performed, at least to some extent, from maintenance paths. Therefore, mowing outside of the maintenance paths is considered to represent a very minor contribution to fill and is not quantified for purposes of estimating dredge and fill impacts for the project.

[2] Figures 3 through 6 are large oversize drawings. Five copies are being provided to the CEC. Electronic copies will be provided to others upon request

Temporary dredge/fill impacts associated with decommissioning include dredge/fill activities associated with removal of water and gas pipelines and perimeter fencing, removal of asphalt roads, and structures. The site Closure, Revegetation and Rehabilitation Plan (CH2M HILL 2009d) describes how impacts will be mitigated following periods of land disturbance (i.e., construction and decommissioning). It is assumed that natural processes will continue to result in shifting drainage patterns across the bajada, and temporary disturbances to smaller drainages will largely be self-mitigating.

Long-Term Fill Impacts:

Long-term dredge/fill impacts are those that are associated with the approximate 50-year period of operations for the Ivanpah SEGS project. Long-term impacts include operations usage of dirt roads and paths (e.g., heliostat washing), fill associated with structures (e.g., the administration building), fill associated with asphalt road crossings, and any other fill that will be removed at project closure. Long-term dredge/fill impacts will be minimized through implementation of low impact design (LID) of the project, and by siting project structures and other features to avoid drainages (especially larger, active washes) where possible. Decommissioning activities will include removal of all structures, heliostats, asphalt roads (except Colosseum Road), and fences. The site will be restored and revegetated in accordance with the Closure, Revegetation and Rehabilitation Plan (CH2M HILL, 2009d). Rehabilitation activities will include filling the stormwater diversion channels around each of the power blocks using soil material from the adjacent berms (the berms will be constructed from material excavated during construction of diversion channels), in order to reestablish pre-project surface topography (CH2M HILL, 2009d). At that time, drainage connections will be reestablished, if and where necessary. In some cases where construction entails filling drainages (e.g., construction of the administration building) decommissioning is not expected to necessitate reestablishing drainage pathways, because drainages should be effectively established following 50 years of operations. For the most part, natural processes are expected to continue to result in shifting drainage pathways across the bajada, and little stream restoration should be necessary since site hydrology will not be substantially altered during construction, operations or decommissioning.

Permanent Fill Impacts:

Permanent fill impacts are associated with project features that will remain in place following project completion. These features include Colosseum Road improvements, certain stream stabilization features, the substation with associated stormwater diversion channel and berm. Permanent direct (dredge/fill) impacts associated with the Ivanpah SEGS will impact less than 2 percent of the existing Waters of the State within the project study area.

Total dredge/fill impacts are relatively minor and will not affect the function of Waters of the State. Therefore, direct impacts occurring through dredge and fill activities are expected to have only a nominal impact on BUs.

TABLE 5
Dredge and Fill Impacts for Ivanpah SEGS

		Linear Impacts to Washes[7] (feet):	Impact Area[12] (acres)	Fill Volume (cubic yards)	Dredge Volume (cubic yards)
30-foot-wide asphalt roads (including 3-foot shoulder)[4]	Amount	11,639	---	---	---
	Temporary[1]		0.995	0	0
	Long-term[2]		0.5	806[13]	806
	Permanent[3]		1.346	2,172	2,172[15]
24-foot-wide asphalt roads[4]	Amount	4,433	---	---	---
	Temporary		0.13	0	0
	Long-term		0.31	500[14]	500
	Permanent		0.059	95[14]	95
15-foot-wide dirt roads	Amount	2,022	---	---	---
	Temporary		0	0	0
	Long-term		0.192	0	0
	Permanent		0	0	0
12-foot-wide dirt roads[5]	Amount	16,171	---	---	---
	Temporary		0.154	0	0
	Long-term		2.19	0	0
	Permanent		0.113	0	0
12-foot-wide rerouted trails	Amount	1,194	---	---	---
	Temporary		0	0	0
	Long-term		0.061	0	0
	Permanent		0.188	0	0
12-foot-wide gravel road	Amount	487	---	---	---
	Temporary		0	0	0
	Long-term		0	0	0
	Permanent		0.028	0	0
10-foot-wide heliostat maintenance paths	Amount	154,800	---	---	---
	Temporary		0	0	0
	Long-term		21.57	0	0
	Permanent		0	0	0
10-foot-wide heliostat arrays	Amount	158,285	---	---	---
	Temporary		21.8	0	0
	Long-term		0.031	0	0
	Permanent		0	0	0
Natural gas line corridor[6]	Amount	7,380	---	---	---
	Temporary		0.939	0	0

TABLE 5
Dredge and Fill Impacts for Ivanpah SEGS

		Linear Impacts to Washes[7] (feet):	Impact Area[12] (acres)	Fill Volume (cubic yards)	Dredge Volume (cubic yards)
	Long-term		0	0	0
	Permanent		0	0	0
Gas and water utility lines	Amount	1,126	---	---	---
	Temporary[8]		0.215	2,828	2,828[16]
	Long-term		0.19	0	0
	Permanent		0	0	0
Metering sets	Amount	80	---	---	---
	Temporary		0	0	0
	Long-term		0.005	0	0
	Permanent		0	0	0
Power blocks, diversion channels and berms	Amount	17,177	---	---	---
	Temporary		0	0	0
	Long-term		1.284	1,419	503
	Permanent		0.15	75	289
Gen-tie lines and towers[9]	Amount	0	---	---	---
	Temporary		0	0	0
	Long-term		0	0	0
	Permanent		0	0	0
Administration/Maintenance Building	Amount	3,618	---	---	---
	Temporary		0	0	0
	Long-term		0.444	666	0
	Permanent		0	0	0
Substation	Amount	4,670	---	---	---
	Temporary		0	0	0
	Long-term		0	0	0
	Permanent		0.572	845	0
Construction laydown, staging and stockpiling[10]	Amount		---	---	---
	Temporary		2.674	0	0
	Long-term		0	0	0
	Permanent		0	0	0
Perimeter fence installation[11]	Amount	0	---	---	---
	Temporary		76	0	0
	Long-term		0	0	0
	Permanent		0	0	0

TABLE 5
Dredge and Fill Impacts for Ivanpah SEGS

		Linear Impacts to Washes[7] (feet):	Impact Area[12] (acres)	Fill Volume (cubic yards)	Dredge Volume (cubic yards)
TOTAL DREDGE AND FILL IMPACTS	**Temporary**		**26.91**	**2,828**	**2,828**
	Long-term		**26.78**	**3,391**	**1,809**
	Permanent		**2.46**	**3,187**	**2,556**

NOTES:
[1] Temporary impacts are associated with construction activities, and these areas will be restored upon completion of construction.
[2] Long-term impacts continue for the duration of project operations, which is estimated at approximately 50 years. At project decommissioning, these areas will be rehabilitated and revegetated.
[3] Permanent impacts are associated with roads and structures that will remain following project closure.
[4] Temporary impact area includes a 7-foot construction corridor that extends on either side of the roadway footprint + shoulder.
[5] Temporary impact area includes 28-foot corridor for installation of water line from wells to main line; and 38-foot construction corridor for installation of gas line from tap point to top of Ivanpah 3.
[6] Temporary impact area includes 38-foot construction corridor associated installation of natural gas pipeline within 12-foot dirt road on east side of project area.
[7] Note that linear distances are likely overestimated since there is redundancy among values for temporary, long-term, and permanent impacts.
[8]Temporary impact area associated with installation of gas and water lines to Ivanpah 2 power block. Dredge/fill volumes include all gas and water pipeline installation.
[9] No gen-tie towers will be placed in washes.
[10]Assumes Category 1, 2 and 3 washes will be avoided; and 25% of area occupied by Category 4 and 5 washes will have temporary incidental fill impacts.
[11] Assumes fence installation requires a trench that is 1 foot deep and 6 inches wide. Assumes 7 crossings of Category 1 washes; 12 crossings of Category 2 washes; 60 crossings of Category 3 washes; 192 crossings of Category 4 washes; and 399 crossings of Category 5 washes.
[12] Stream widths used in estimation of impact area were assumed to be 60.5 feet for Category 1 washes; 28 feet for Category 2 washes; 15.5 feet for Category 3 washes; 7.5 feet for Category 4 washes; and 2.5 feet for Category 5 washes.
[13] Dredge/fill volume estimated for channel crossings on east side of Ivanpah 2. Assume 12 inches of existing streambed is removed and replaced with an equal volume of asphalt and aggregate road base. Roads will be removed at project closure, so impacts are considered to be long-term. (Volume = linear impact x median width of channel x 1 ft depth of dredge).
[14] Dredge/fill volume estimated for 1 stabilized channel crossing over Category 1 wash on Ivanpah 2 road to power block; several crossings of Category 3, 4 and 5 washes; permanent impacts are associated with Category 3 wash crossing on road to substation. Assume 12 inches of existing streambed is removed and replaced with an equal volume of asphalt and aggregate road base. Long-term and permanent impact = linear impact x median stream width x 1 foot dredge depth.
[15] Dredge/fill volume estimated for Colosseum Rd. improvement from golf course to Ivanpah 2. The road improvement will affect approximately 2,895 linear feet of Category 3 streambed, with a median width of 15.5 feet; 128 feet of Category 4 wash; and 470 feet of Category 5 washes. Approximately 12 inches of existing streambed would be removed and replaced with the same volume of aggregate base and asphalt. The 30-foot-wide asphalt road would have a 3-foot gravel shoulder on either side. Road will not be removed upon project closures, so impacts are permanent.
[16] Dredge/fill volume estimated for installation of natural gas pipeline and other water and gas utilities through Waters of State (all categories of ephemeral washes). Assumes trench that is 8 feet wide at top, 3 feet wide at bottom, and 3 feet deep. Excavated material would be replaced following installation of utilities, so impacts are temporary. Equivalent temporary dredge/fill volumes would be expected upon project closure when pipes are removed.

0 = Either no impact or fill is incidental.

Beneficial Use Analysis for Ivanpah Lake

Because larger washes tend to dissipate into smaller, more braided channels as they progress downslope, the majority of drainages, including those in the project area, terminate prior to reaching Ivanpah Lake. In proximity to Ivanpah Lake, defined erosional features diminish and broad surface flows predominate.

The project is not expected to result in a substantial change to the volume or velocity of flows that could potentially reach Ivanpah Lake. Peak flows are predicted to remain similar to pre-project conditions at downstream locations, and storm runoff volumes are likewise expected to remain very similar to pre-project conditions (see West Yost Associates, 2009). Therefore, the project is expected to have no impacts to the designated BUs of Ivanpah Lake.

Beneficial Use Analysis for Minor Surface Waters

This section discusses the project's potential impacts to the designated BUs of minor surface waters (Category 1, 2 , 3, 4 and 5 ephemeral washes) in the project area.

Municipal and Domestic Supply (MUN)

Project construction, operations, and closure activities would have no impact on this beneficial use. Conditions within surface drainages do not currently support MUN, since water is rarely present. Furthermore, surface flows historically have been insufficient to support MUN, and flows are unlikely to be sufficient to support MUN in the foreseeable future. Drainages are ephemeral and convey only short duration flows in response to major storm events. Volume and duration of flow would not be substantially altered by the project.

Water quality objectives that are aimed at protecting the designated MUN beneficial use could be violated if pollutants are discharged into Waters of the State. Project construction and operation activities could potentially lead to accelerated erosion and sediment transport, introduce pollutants through improper material handling, equipment maintenance and storage. By implementing best management practices (BMPs) that are identified in the construction and industrial Stormwater Pollution Prevention Plans (SWPPPs) and the Drainage, Erosion and Sediment Control Plan (DESCP), impacts to water quality will be avoided or minimized during construction and operations activities. The construction and operations SWPPPs and DESCP can be consulted for a thorough description of BMPs to be implemented and monitoring to be undertaken. If wastewater is treated on the site and re-used for landscape irrigation, WDRs would be obtained from the LRWQCB. Conformation to permit conditions would ensure that water quality is adequately protected and no impacts to beneficial uses would occur.

Agricultural Supply (AGR)

Land in the vicinity of the project is leased from BLM for grazing purposes, and water for cattle is obtained from springs located to the west of the project site. Ephemeral washes located downgradient from the water source for grazing cattle do not carry water except during large storm events, and Ivanpah SEGS would have a negligible effect on the amount, timing, or quality of surface flows in them. Therefore, no impacts to AGR beneficial use would occur.

Groundwater Recharge (GWR)

Ivanpah SEGS would not negatively impact GWR, because it would not create substantial impervious surfaces that would generate substantial increased volumes and velocities of stormwater runoff that would preclude recharge. Most recharge occurs in the area via streambed infiltration of water generated through runoff-producing precipitation in the mountains (Durbin, 2007). Infiltration rates associated with minor surface waters (Category 1, 2 and 3 ephemeral washes) within the project study area would not be substantially impacted by Ivanpah SEGS; therefore, GWR will not be impacted.

Water Contact Recreation (REC-1)

Minor surface waters within the project study area do not currently support, nor are they likely to support in the future, REC-1 because surface flows do not normally occur except during substantial storms. While REC-1 is normally a designated BU for all waters to meet the Clean Water Act (CWA) presumption of "fishable and swimmable," because this BU is not supported in minor surface waters in the project study area, it cannot be impacted by the project.

Nevertheless, the project would not contribute pathogenic organisms to minor surface waters that would preclude their current or future REC-1 use. If wastewater is treated onsite and used for landscape irrigation, any discharge to land would comply with WDRs that would be obtained from the LRWQCB.

Noncontact Water Recreation (REC-2)

Water quality considerations relevant to noncontact water recreation include, but are not limited to, activities such as hiking, camping, and aesthetic enjoyment. Recreation within the project boundary will be prevented for the 50-year operations period, and access will be restricted by fencing. To mitigate recreational impacts, however, existing trails will be rerouted around the project, and will reconnect with the trail system. Following the 50-year period of operations, fencing will be removed and the entire disturbed area will be restored. (See CH2M HILL, 2009d for the plan of restoration.) Therefore, there will be no permanent impacts to REC-2 BU, and temporal loss of REC-2 BU will be mitigated by rerouting the existing trail system around the project, allowing for continued recreational use of the area.

Commercial and Sportfishing (COMM)

Minor surface waters within the project study area do not support, nor are they likely to support in the future, commercial or sportfishing. Therefore, the project will not have an impact on COMM.

Warm Freshwater Habitat (WARM)

Minor surface waters within the project study area have never been known to support aquatic habitat or aquatic organisms. Therefore, the project is not expected to have an impact on WARM.

Cold Freshwater Habitat (COLD)

Minor surface waters (ephemeral washes) within the project study area do not support, nor are they anticipated to support in the future, cold freshwater habitat. Therefore, the project will have no impact on COLD.

Wildlife Habitat (WILD)

Ephemeral washes, although characterized by infrequent and short duration flows, create a mosaic of habitat areas due to changes in soil texture, distance, increased moisture and other factors that increase the diversity of vegetation across the landscape. In some areas, open sandy banks may provide suitable burrow sites for the desert tortoise and areas with increased soil moisture support diverse Mojave wash scrub habitats. Ephemeral washes may also provide suitable microsite habitat conditions for special-status plant species. Ephemeral channels provide important wildlife movement corridors in arid regions because they contain continuous chains of vegetation that wildlife can use for cover and food (USEPA, 2008); however, smaller ephemeral washes on the Ivanpah SEGS site would likely have limited wildlife corridor function, since they are very narrow and shallow with plant diversity and density not substantially different than surrounding uplands (see photographs in Exhibit DR641B-1).

Vegetation/Habitat

According to the USEPA (2008), vegetation in ephemeral stream channels is important for resource retention by protecting soils from wind and water erosion, slowing storm flow velocity, and moderating temperatures. Ephemeral stream vegetation also influences biogeochemical cycles by providing leaf litter along with food and cover for wildlife. Mojave Wash Scrub vegetation is associated with some of the larger ephemeral washes within the Ivanpah SEGS area. During construction, vegetation within the channels may be mowed to a height of about 1 foot (but root systems will remain intact) to accommodate construction of heliostats. In construction-related temporary impact areas, rehabilitation and revegetation efforts will occur soon after completion of construction activities as described in the Closure, Revegetation, and Rehabilitation Plan (CH2M HILL, 2009d).

Vegetation height and presence will be managed in washes during the project construction and operations. Upon decommissioning at project closure, all disturbed areas will be rehabilitated and revegetated. (See CH2M HILL, 2009d, for information pertaining to restoration/revegetation.) By allowing vegetation within the heliostat arrays to remain intact and potentially to regrow after project closure and by revegetating and restoring disturbed areas within minor surface waters, temporal loss of WILD would be partially mitigated. Because the entire site will be fenced to prevent desert tortoise from migrating into the area, ephemeral washes will not be available for wildlife use and will not function as wildlife corridors during project construction and operations. Fencing would effectively reduce the ecosystem connectivity function of washes, by putting a barrier to wildlife movement across a substantial portion of the watershed draining to Ivanpah Lake. On the other hand, this barrier is necessary to protect the desert tortoise and other wildlife that could be adversely affected by project activities, such as the nighttime washing of mirrors.

Threatened and Endangered Plant Species

No federally or state-listed plant species were observed during floristic surveys at the Ivanpah SEGS project site. Eight special status plants, however, were observed during 2007

and 2008 surveys, including small-flowered androstephium (*Androstephium breviflorum*), Mojave milkweed (*Asclepias nyctaginifolia*), desert pincushion (*Coryphantha chloranta*), Utah vine Milkweek (*Cynanchum utahense*), nine-awned pappus grass (*Enneapogon desvauxii*), Parish's club-cholla (*Crusonia* (=*Opuntia*) *parishii*), Utah mortonia (*Mortonia utahensis*) and Rusby's desert mallow (*Sphaeralcea rusbyi* var. *eremicola*). A list of plant species observed during surveys is provided in the 2008 Botanical Resources Report (Attachment BR3-1A, Supplemental Data Response, Set 1D) prepared by GANDA (2008).

Desert Tortoise

The project area is located in the southeastern portion of the Northern and Eastern Mojave (NEMO) Coordinated Management Plan (BLM, 2002). It is not within or adjacent to a BLM-designated Desert Wildlife Management Area (DWMA), area of critical environmental concern (ACEC) or Wildlife Habitat Management Area (WHMA). The Ivanpah SEGS project study area is not located within designated critical habitat for the desert tortoise but is located approximately 5 miles north of the Ivanpah critical habitat unit (which is just north of the I-15 and Route 164 interchange).The project study area is within suitable habitat for the desert tortoise; NEMO indicates that the non-lakebed portion of Ivanpah Valley is excellent quality tortoise habitat with some of the highest population densities in the East Mojave (CH2M HILL, 2009a).

Surveys conducted in 2007 and 2008 indicate that desert tortoise sign, including live tortoises, carcasses, and burrows, were observed within the project area (including Ivanpah 1, 2 and 3). The desert tortoise is listed as threatened species under the Federal Endangered Species Act (USFWS, 1990a) in response to loss and degradation of habitat caused by numerous human activities including urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The tortoise was state-listed in California as threatened in 1989, and is classified as State Protected and Threatened by the neighboring state of Nevada.

Prior to commencing construction activities, impacts to desert tortoise would be mitigated by constructing exclusionary fencing around the entire project boundary; surveying and relocating/translocating any desert tortoise that are present on the site. The project would indirectly impact WILD through the loss of burrowing, breeding, and foraging habitat for desert tortoise over the 50-year period of project operations. Furthermore, habitat quality would potentially be reduced if invasive plant species are introduced or soils become compacted as the result of the project. The draft Biological Assessment (CH2M HILL, 2009a) provides a thorough description of potential direct and indirect impacts to desert tortoise.

Upon project decommissioning, nearly all structures/facilities associated with the project would be removed and the entire disturbed area rehabilitated and revegetated. Restoration activities would include soil decompaction (where necessary for revegetation), relocation of cactus and succulents that were previously salvaged, and seeding with plant species that are native to the area. Rehabilitation and revegetation activities would partially mitigate impacts to WILD that occurred due to habitat degradation during project operations, although the draft Biological Assessment suggests that it may take many years for restored habitat to again be adequate to support desert tortoise. (See the Biological Assessment [CH2M HILL 2009a] and the Application for Incidental Take Permit [BrightSource, 2009] for additional measures that would be implemented during construction and operations to avoid and minimize adverse effects to the desert tortoise.) Removal of fencing and

restoration of the site upon project closure would allow desert tortoise to once again use the site as habitat following completion of restoration activities. However, the application for Incidental Take Permit (BrightSource, 2009) indicates that approximately 3,712 acres of habitat would be considered permanently lost.

An application for an Incidental Take Permit under Section 2081(b) of the California Endangered Species Act, was submitted to the California Department of Fish and Game (CDFG) in May, 2009; and an application for a Streambed Alteration Agreement was submitted to CDFG, in June 2009. A compensatory mitigation plan to address significant direct, indirect, and cumulative impacts to desert tortoise, loss of habitat for special-status plant and animal species, and impacts to Waters of the State is being developed in coordination with the US Fish and Wildlife Service, CDFG, BLM and CEC. Mitigation is expected to include appropriate levels of habitat acquisition and enhancement, as well as funding for other agency-sponsored actions that would benefit desert tortoise and Mojave Desert plant and animal communities in the Ivanpah Valley (BrightSource, 2009). In a letter dated July 23, 2009, BLM confirms an agreement with CDFG regarding mitigation measures for the project (USDOI, 2009). Implementation of the compensatory mitigation plan will likewise mitigate any direct, indirect or cumulative effects to WILD.

Beneficial Use Analysis for Groundwater

During operations, the project would use approximately 100 acre-ft/yr of groundwater pumped from two production wells that would be developed in the Construction Logistics Area. This water would be used primarily for heliostat washing and boiler feedwater. Pumping is expected to produce localized minor groundwater level declines over time, with a 2.1-foot decline at 0.5 mile from the well, 1.4-foot at one mile, and 0.8-foot at 2 miles (Durbin, 2007). A groundwater budget was developed by Timothy J. Durbin, Inc. (2007), which demonstrated that even with Ivanpah SEGS use of groundwater, annual precipitation recharge and water-use returns would exceed pumping withdrawals. The recharge rate was estimated to currently be about 4,000 acre-ft/year, and current water-use returns are about 800 acre-ft/year, for a total of 4,800 acre-ft/yr. Current pumping of groundwater was estimated at 2,300 acre-ft/year. With proposed pumping by Ivanpah SEGS, plus additional pumping that is expected from the Molycorp Mine, groundwater withdrawals are expected to increase to 2,800 acre-ft/year, which is still less than the rate of recharge and returns (Timothy J. Durbin, Inc., 2007).

Municipal and Domestic Supply (MUN)

The project would not adversely affect the quantity of groundwater available for municipal and domestic supply. Groundwater use by the project, alone or in combination with other projects in the Ivanpah Valley, would not cause annual groundwater withdrawals from the underlying aquifer to be greater than annual groundwater recharge and returns (Timothy J. Durbin, Inc., 2007).

The project would not adversely affect the quality of groundwater available for municipal and domestic supply. During project operations, concrete-lined ponds would be used should water need to be discharged due to a failure in the system. Use of these ponds would prevent pollutants from being discharged to land or to ephemeral washes where they could eventually contaminate underlying groundwater. These measures are identified in the

operations SWPPP for the project (CH2M HILL, 2009e), and include practices such as providing secondary containment for hazardous materials, providing appropriate waste management, etc.

Because the project would not adversely affect the quantity or quality of underlying groundwater, it would not have a negative impact on MUN.

Agricultural Supply (AGR)

The project would not adversely affect the quantity or quality of groundwater available for agricultural supply. (See discussion for MUN, above.)

Industrial Service Supply (IND)

Ivanpah SEGS would use groundwater for consumptive use, which is consistent with the IND designation in the LRWQCB Basin Plan.

Freshwater Replenishment (FRSH)

Ivanpah SEGS would not affect the use of groundwater for natural or artificial maintenance of surface water quantity or quality (e.g., salinity); therefore, the project would have no impact on FRSH.

Conclusions

The preceding analysis indicates that beneficial uses of all Waters of the State within the project study will be adequately protected during project construction, operations, and decommissioning activities. While some beneficial uses, such as WILD, will have temporal impacts associated with the 50-year period of operation, mitigation to be implemented in coordination with the California Department of Fish and Game will ensure that wildlife species and their habitat are fully protected. The LID approach to project design, development and implementation of construction and operations SWPPPs and DESCP, implementation of mitigation to be specified by CDFG, and implementation of a Rehabilitation and Restoration Plan upon project closure will ensure that impacts to all beneficial uses of Waters of the State are avoided, minimized or mitigated.

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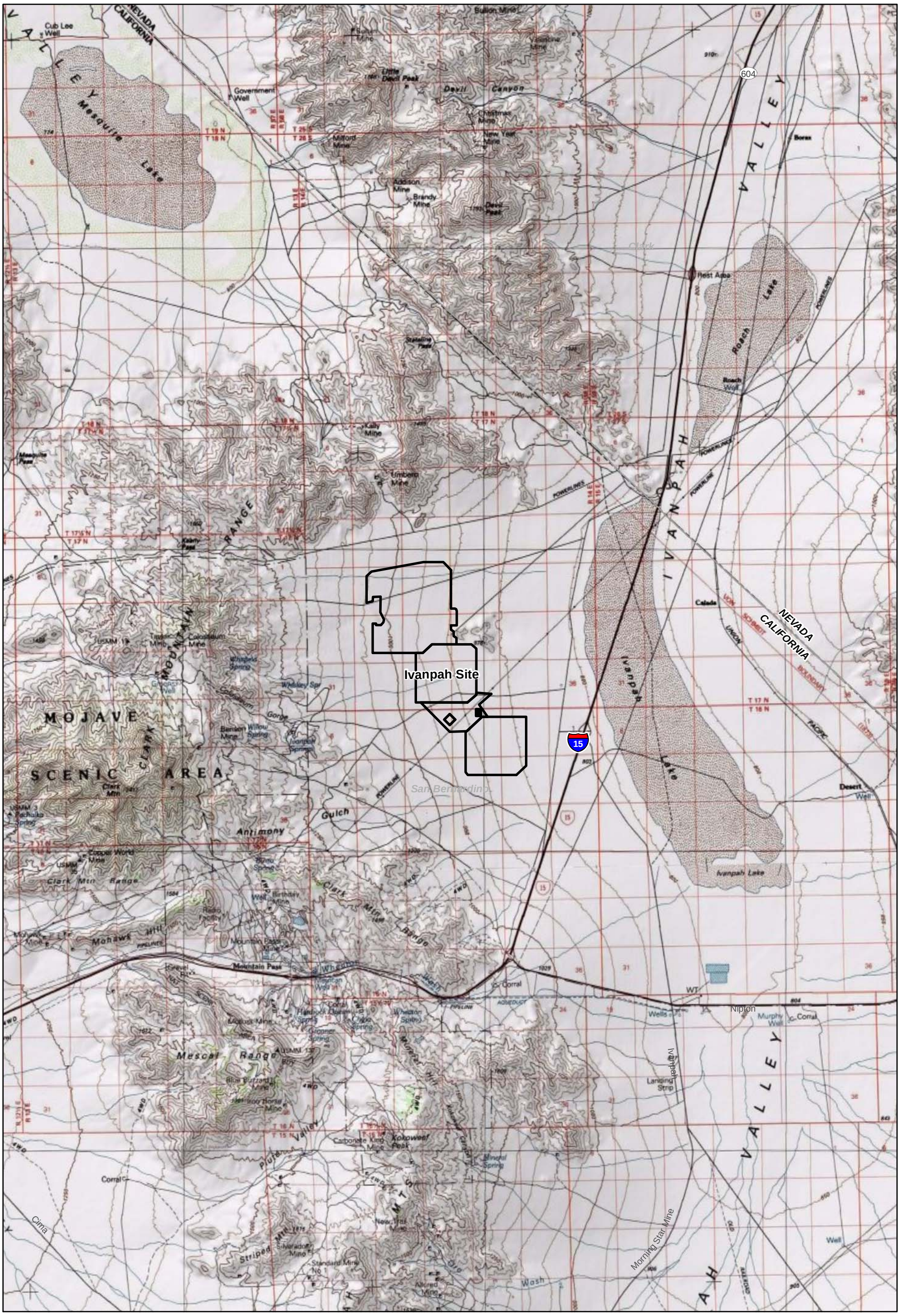

LEGEND

Project Site

N

0 5,000 10,000

Feet

Figure 1
Regional Setting
Ivanpah Solar Electric Generating System Project
San Bernardino County, CA

CH2MHILL

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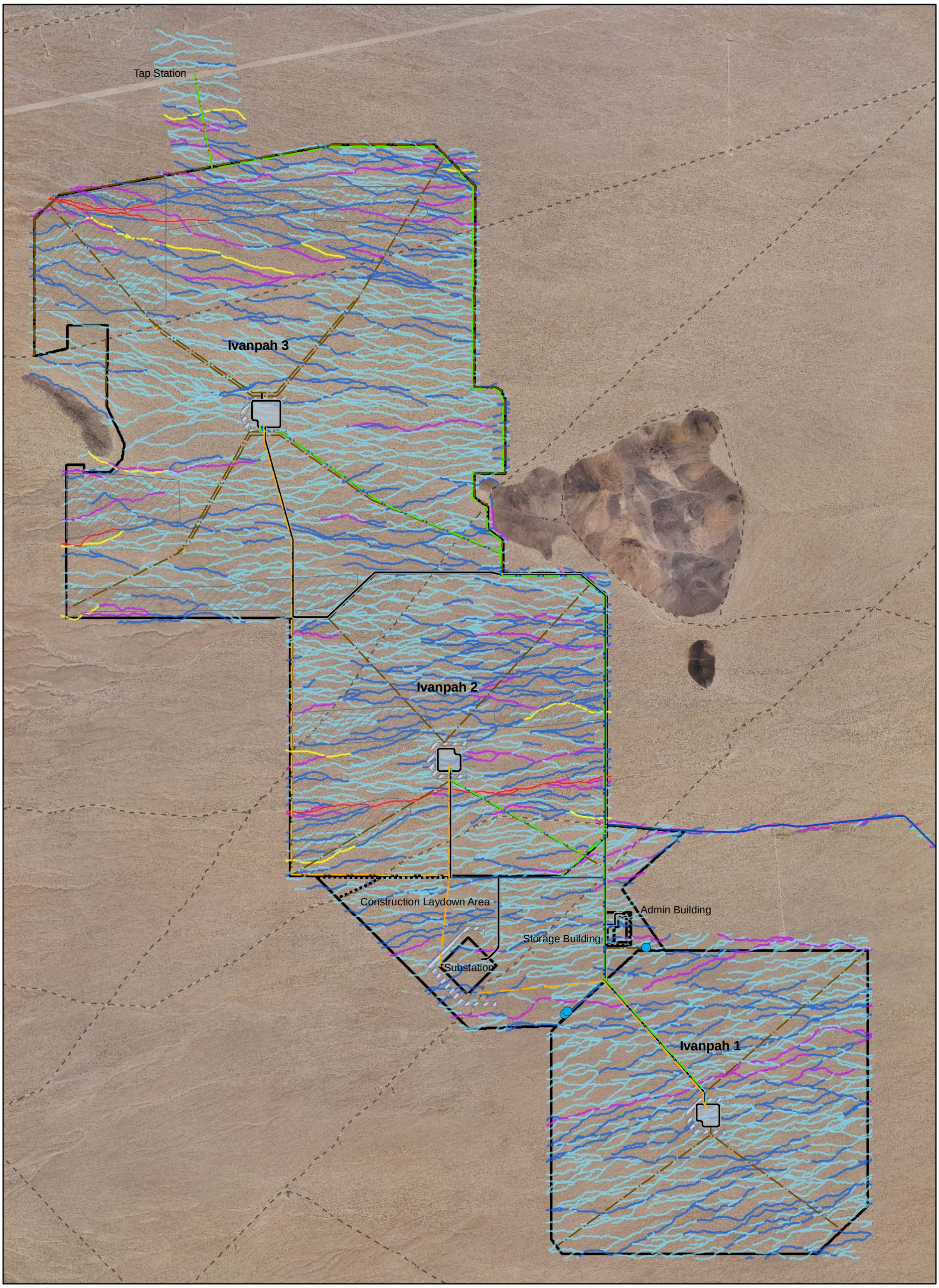

LEGEND

- Wells

Ephemeral Wash Category
- 1 (36 Feet to 85 Feet: Avg 60.5ft)
- 2 (21 Feet to 35 Feet: Avg 28ft)
- 3 (11 Feet to 20 Feet: Avg 15.5ft)
- 4 (5 Feet to 10 Feet: Avg 7.5 ft)
- 5 (1 Feet to 4 Feet: Avg 2.5 ft)

Proposed Utility Features
- Overhead Line
- Gas Line
- Water Line

Proposed Roads
- Dirt Roads
- Gravel Road
- Paved Road
- Colosseum Road (Paved)
- Existing Trails

Site Features
- Power Block
- Diversion Channel
- Proposed Grading Areas
- Project Site

0 1,000 2,000
Feet

N

Figure 2
Waters of the State and Project Features
Ivanpah Solar Electric Generating System Project
San Bernardino County, CA

CH2MHILL

SAC \\ZION\SACGIS\PROJ\352897_IVANPAH\MAPFILES\2009_UPDATED_FIGURES\WASHES_REPORT\FIGURE2_WATERS_OF_THE_STATE.MXD SSCOPES 8/24/2009 09:46:16

INSERT FIGURE 3, Dredge/Fill Impact Areas within Waters of the State, Ivanpah 1

[Note: This is an E-size drawing. Five copies are being provided to the CEC. Electronic copies will be provided to other parties upon request.]

INSERT FIGURE 4, Dredge/Fill Impact Areas within Waters of the State, Construction Logistics Area

[Note: This is an E-size drawing. Five copies are being provided to the CEC. Electronic copies will be provided to other parties upon request.]

INSERT FIGURE 5, Dredge/Fill Impact Areas within Waters of the State, Ivanpah 2

[Note: This is an E-size drawing. Five copies are being provided to the CEC. Electronic copies will be provided to other parties upon request.]

INSERT FIGURE 6, Dredge/Fill Impact Areas within Waters of the State, Ivanpah 3

[Note: This is an E-size drawing. Five copies are being provided to the CEC. Electronic copies will be provided to other parties upon request.]

EXHIBIT DR641B-1

Representative Photos of the Ephemeral Drainages

Overview of the project area – looking southeast towards the Ivanpah Dry Lake

Overview of the project area – looking west towards the Clark Mountains

Characteristic creosote brush scrub habitat found throughout the project area

Characteristic creosote brush scrub habitat found throughout the project area

Representative Category 1 Wash (36 feet to 85 feet wide)

Representative Category 1 Wash (36 feet to 85 feet wide)

Representative Category 2 Wash (21 feet to 35 feet wide)

Representative Category 2 Wash (21 feet to 35 feet wide)

Representative Category 3 Wash (11 feet to 20 feet wide)

Representative Category 3 Wash (11 feet to 20 feet wide)

Representative Category 4 Wash (5 feet to 10 feet wide)

Representative Category 4 Wash (5 feet to 10 feet wide)

Representative Category 5 Wash (1 foot to 4 feet wide)

Representative Category 5 Wash (1 foot to 4 feet wide)

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *IVANPAH SOLAR ELECTRIC GENERATING SYSTEM*

DOCKET NO. 07-AFC-5
PROOF OF SERVICE
(Revised 7/20/09)

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DECLARATION OF SERVICE

I, John Carrier, declare that on September 9, 2009, I served and filed copies of the attached, Data Response Set 1P dated September 9, 2009. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/ivanpah].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

___x___ sent electronically to all email addresses on the Proof of Service list;

___x___ by personal delivery or by depositing in the United States mail at Sacramento** with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses NOT marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

___x___ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (*preferred method*);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 07-AFC-5
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

John L. Carrier, J.D.

**or by other delivery service, e.g., Fed Ex, UPS, courier, etc.

*indicates change