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APPLICANT'S SUPPLEMENTAL RESPONSE TO DATA REQUEST 16 AND 26: ADDITIONAL INFORMATION REGARDING PROJECT DESCRIPTION

In this section of Applicant's Supplemental Response to CEC Staff Data Requests 16 and 26, Applicant describes the changes to the Project Description that will result from removing RMS 3 and has updated the Project Description Chapter to be consistent with the Boiler Optimization that was presented as integral to Applicant's response to Data Request Number 16.

Per staff's request, Applicant uses a strike-out/underline format to identify changes to pertinent sections of the Project Description section of the Application for Certification of the Rio Mesa Solar Electric Generating Facility. The Project Description sub-sections that have been modified are listed in the table of contents below. If there has been no change to a Project Description sub-section, then the section is labeled "no changes" in the table of contents below.

This section also includes several revised figures originally provided in the Applicant's Response to Data Adequacy Review on November 18, 2011. Please refer to the figure list in the table of contents.

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SECTION 2 PROJECT DESCRIPTION

2.1 INTRODUCTION

2.1.1 Application for Construction

This Application for Certification (AFC) for the Rio Mesa Solar Electric Generating Facility (Rio Mesa SEGF or Project) has been prepared in accordance with the California Energy Commission's (CEC) Power Plant Site Certification Regulations (CEC-140-2008-001-REV1, current as of July 2008). In addition, this AFC includes elements necessary for the United States (U.S.) Bureau of Land Management (BLM) to permit the Project through the National Environmental Policy Act (NEPA). The "Applicant" for purposes of this AFC comprises Rio Mesa Solar I, LLC and~~,~~ Rio Mesa Solar II, LLC~~, and Rio Mesa Solar III, LLC~~, owners of the ~~three~~ two separate solar plants and certain shared facilities being proposed. These ~~three~~ two Delaware limited liability companies will hold equal one-~~third~~ half shares in the ownership of shared facilities and will separately own their respective plants. They are wholly owned by Rio Mesa Solar Holdings, LLC (a Delaware limited liability company) which is in turn wholly owned by BrightSource Energy, Inc. (BrightSource), a Delaware corporation and the ultimate parent company. The Applicant will use BrightSource's solar thermal technology for the Rio Mesa SEGF.

Consistent with the CEC's past practice, the Applicant requests that the final Orders of Approval for the Rio Mesa SEGF AFC recognize that each plant will be independently owned and operated,[1] and that during the construction and/or operation phase, the Conditions of Certification shall apply severally and individually to the respective Rio Mesa Solar I, LLC~~,~~ and Rio Mesa Solar II, LLC ~~and Rio Mesa Solar III, LLC~~ plants, such that non-compliance of one plant shall not be deemed non-compliance by another plant

2.1.2 Location and Jurisdiction

The proposed project ~~site~~ ,Rio Mesa SEGF, will consist of ~~three~~ two plants ~~is~~ situated solely on private land leased from the Metropolitan Water District of Southern California (MWD). The project site is located on the Palo Verde Mesa in Riverside County, California, 13 miles southwest of Blythe~~, and is located partially on private land and partially on public land administered by BLM~~. Portions of the Project gen-tie line, upgraded Bradshaw Trail access road, and 33kV construction/emergency backup power supply line are located on public lands managed by the BLM. (see Figure 2-1, rev: Composite Map~~;~~) ~~all figures are located at the end of this section, see also figures 5.13-1a and 5.6-2 for maps showing settled areas, parks, recreational areas and wilderness areas).~~

The first plant, a 250 megawatt (MW) (nominal) facility known as Rio Mesa I, will be constructed at the southeastern end of the project and owned by Rio Mesa Solar I, LLC. The second plant, another 250 MW (nominal) facility known as Rio Mesa II, will be located in the ~~central~~ northwestern portion of the project site and owned by Rio Mesa Solar II, LLC. A common facilities area including a switchyard will be located adjacent to the far northern reach of the RMS-1 solar field on MWD property. ~~Rio Mesa III, a~~

[1] See the Orders of Approval for the Ivanpah Solar Electric Generating System (07-AFC-5), Document CEC-800-2010-004 CMF.

~~third 250 MW (nominal) facility, will be constructed in the northern portion of the project site and owned by Rio Mesa Solar III, LLC~~.

A Plan of Development (POD) and Form SF-299 right-of-way (ROW) grant application for use of the BLM land for linear facilities associated with the Project (gen-tie line, 33kV construction/emergency backup power supply line, and access road) was resubmitted by Rio Mesa Solar ~~III~~Holdings, LLC to the BLM Desert District office in Moreno Valley, California and Palm Springs South Coast Field Office on ~~July 8, 2011~~June 22 2012. The project site has been previously disturbed by military training operations during World War II, and investigative activities resulting from the proposed SunDesert Nuclear Power Plant by San Diego Gas and Electric (SDG&E) in the 1970s. Additionally, existing transmission lines traverse the project site.

~~The legal description of the land administered by BLM on which a portion of the Rio Mesa SEGF will be located is:~~

> ~~*Portions of Sections 2, 3, 10, 11, 14, and 15, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.*~~

The legal description of the land administered by BLM on which the generator tie-line (gen-tie line) will be located is:

> *Portions of Sections 7, 8, 9, 15, 16, 17, 22, 23, ~~25,~~ 26, and 35, Township 07 South, Range 21 East, San Bernardino Meridian, Riverside County, California.*
>
> *Portions of Sections 2, 11, 14, and 15, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.*

The legal description of the private lands under lease from MWD on which the balance of the Rio Mesa SEGF facility will be located is:

> *All of Section 28 and portions of Sections 15, 16, 20, 21, 22, 23, 27, 29, 33, and 34, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.*

Four additional features, consisting of linear corridors used for site access and electrical service lines, also are part of the Project. For purposes of defining the approximate ROW for each 200-foot corridor, the areas extending 100 feet on either side of centerline are included in the ROW descriptions. The legal descriptions of the land on which these four linear features will be located are as follows:

Bradshaw Trail Access Road Corridor:

> *Portions of Sections 12 through ~~14~~15, Township 08 South, Range 21 East, and Portions of 7 and 18, Township 08 South, Range 22 East, San Bernardino Meridian, Riverside County, California.*

33 kV Service Line Corridor New ROW:

Portions of Sections 12 through 14, 22 and 23, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.

33 kV Service Line Corridor Existing ROW Overbuild:

Portions of Sections 3 through 10, 17, and 18, Township 08 South, Range 22 East, San Bernardino Meridian, Riverside County, California.

34th Avenue Access Road Corridor:

Portions of 23 through ~~26~~27, Township 08 South, Range 21 East, San Bernardino Meridian, Riverside County, California.

Based on the CEC's exclusive jurisdiction for the licensing of thermal power plants of 50 MW or more and given that the Project gen-tie line, construction/emergency power, and access road will be situated partially on BLM lands and considered a major federal action under the NEPA, the Project will require certification both by the CEC and BLM. The Applicant anticipates that the BLM's and CEC's certification processes will be conducted in parallel, though each agency will produce its own documents. The BLM grant applications will cover ~~about 4,100 acres (the property boundary and~~ the portions of the Project gen-tie line route study area, upgraded Bradshaw Trail access road, and 33 kV construction/emergency backup power supply line located on public lands administered and managed by the BLM ~~property~~). However, it is anticipated that ~~but~~ the NEPA analysis will cover the entire project area (i.e. both private land and BLM land). The CEC application also will cover the entire project area.

2.1.3 Land Required

Each 250 MW plant requires about 1,850 acres (or 2.9 square miles) of land to operate. The total area required for ~~all three~~both plants, including the shared facilities, is approximately ~~5,750~~3,805 acres. Rio Mesa Solar Holdings, LLC holds ~~an~~ a lease option agreement with the Metropolitan Water District of Southern California (MWD) for approximately 6,741 acres in which area is planned for development of the ~~southern portion of the~~ Project. In addition Rio Mesa Solar ~~III~~Holdings, LLC, has applied for a ROW grant from BLM for ~~two areas: a 2,800 acre parcel in which the northern portion of the project site is located, and an~~ the ~~area in~~portions of public lands administered by the BLM on which the common generator tie line (gen-tie line), 33kV construction/emergency power, and upgraded Bradshaw Trail access road will be located. ~~Portions of this~~ This ROW will be assigned to Rio Mesa Solar I, LLC ~~for the gen-tie line~~, and to Rio Mesa Solar II, LLC ~~for the gen-tie line and portions of the solar field~~. The gen-tie line will link the project facilities to the new Southern California Edison (SCE) Colorado River Substation (CRS), see Figure 2-2, Project Features Map. Although project development will be phased, the AFC analyzes the Project as though all phases will be simultaneously operational.

2.1.4 Proposed Project

The proposed project will include ~~three~~ two solar concentrating thermal power plants and a shared common area to include shared systems. Each solar concentration thermal power plant will utilize a solar power boiler, located on top of a dedicated concrete tower, and solar field based on heliostat mirror technology developed by BrightSource, known as "LPT". The reflecting area of an individual heliostat (which includes two mirrors) is about 19 square meters [205 square feet (sq. ft.)]. The heliostat (mirror) fields will focus solar energy on the solar power boiler, referred to as "solar receiver steam generator" (SRSG) which converts the solar energy to superheated steam. In each plant, a Rankine cycle non-reheat steam turbine receiving this superheated steam will be directly connected to a rotating generator that generates and pushes the electricity onto the transmission system steam.

Each power plant will generate electricity using solar energy as its primary fuel source. However, auxiliary boilers will be used to operate in parallel with the solar field during partial load conditions and occasionally in the afternoon when power is needed after the solar energy has diminished to a level that no longer will support solar-only generation of electricity. These auxiliary boilers will also assist with daily start-up of the power generation equipment and night time preservation.

Each plant in the Project will have ~~five~~ two natural-gas-fired boilers as follows:

- ~~Three~~ One packaged natural-gas-fired auxiliary boiler~~s~~ used –to minimize the amount of time required for startup each morning, and for -power augmentation. It is assumed that ~~the auxiliary boilers will be operated~~power augmentation will occur primarily in the later afternoon/early evening.
- One "night-time preservation" boiler that will provide overnight heat to systems.
- ~~One "start-up" boiler that will be used to minimize the amount of time required for startup each morning.~~

The power generation equipment will be started up each morning before sunrise, and shut down every evening when insolation drops below the level required to keep the steam turbine generators (STGs) on line except as described above.

The main parameters for the plants are presented in Table 2.1-1.

Table 2.1-1
Main Plant Parameters

Plant	Capacity (Nominal MW)	No. of Heliostats (approximately)	Annual Production Solar Boiler (Net MWHs)	Annual Production Nat. Gas Boilers (Net MWHs)	Total Annual Production (Net MWHs)	Utility Interconnection
Rio Mesa I	250 MW	85,000	705,300	~~30,000~~7,000	~~735,300~~ 712,300	SCE 220 kV
Rio Mesa II	250 MW	85,000	705,300	~~30,000~~7,000	~~735,300~~ 712,300	SCE 220 kV
~~Rio Mesa III~~	~~250 MW~~	~~85,000~~	~~705,300~~	~~30,000~~	~~735,300~~	~~SCE 220 kV~~

kV = kilovolt
MW = megawatt
MWH = megawatt hour
SCE = Southern California Edison

The shared facilities (located in the common area) will include a combined administration, control, maintenance and warehouse building,— heliostat assembly building, evaporation ponds, groundwater wells, water treatment plant, , construction laydown and parking areas, mobile equipment maintenance facilities for the maintenance crew and operators, and natural gas tap and meter station. A and a common switchyard. The common switchyard will be installed on siteis where all three plant substation underground transmission lines from both plant substation will terminate. Electricity will be transmitted on a common gen-tie line and tower system from the switchyard to SCE's new CRS, located approximately 9.7 miles to the northwest of the project site. These shared facilities will be jointly and equally owned by all threeboth project companies.

The plants will be operated and maintained by a common crew of operators, working out of the administration and maintenance complex located in the common area, as well as a operators and technicians at each power block east of Rio Mesa II.

The Construction Logistics Area (CLA), which is located east of the existing WAPA and TransCanada transmission line Rights of Way, will include construction and material storage, staging, and laydown areas, heliostat assembly facilities, construction trailers, and parking areas,

A common gas tap/meter station will be constructed and installed east of RMS-1 power block at the terminus of the eastern spoke road. The common gas tap/meter station will be owned by TransCanada or one of its subsidiaries.

2.1.5 Infrastructure

2.1.5.1 Water

Raw water will be drawn daily from on-site wells located in the common area. The wells will be designed to have sufficient capacity to supply water required for operation of the Project. Groundwater will pass through a treatment system before being used for potable water, service water, firewater, boiler make-up water, auxiliary cooling water, and to wash the heliostats. A raw water treatment plant will be located in the common area to clean raw well water for use by the Project. The treatment plant will be designed to remove impurities and make the water suitable for use in process production and mirror washing

To save water, due to the desert environment in which the site is located, each plant will use an air-cooled condenser (ACC) for the main steam cycle. Water consumption, therefore, will be minimal [estimated at no more than 84.5 acre-feet (ft) per year (afy) for each of the three plants, and 6.54.3 afy for the common area, for a total of 260 173.3 afy]. Water consumption during construction will peak at no more than 400 afy. Major contributors to water use during construction will include dust control activities and on-site concrete batch plants. The land lease agreement with MWD allows for access to up to 600 afy of water.

2.1.5.2 Gas (no changes)

2.1.5.3 Electricity (no changes)

2.1.5.4 Waste (no changes)

2.1.6 Access to Site

Access to ~~the three~~both plants will be via Bradshaw Trail ~~34th Avenue~~ (primary) as paved or unpaved, and 34th Avenue ~~Bradshaw Trail~~ off of State Route 78 (to the east). The access road will travel adjacent to agricultural land before reaching the mesa and project site. The 34th Avenue access is being explored with an option to reach the crest of the mesa on the north and on the south side of the major wash that is ~~to the~~ directly to the west of 34th Avenue. In addition to the access road, each plant will have perimeter access/maintenance roads.

The following sections describe the generating facility design and operation (Section 2.2), applicable laws, ordinances, regulations, and standards (LORS) (Section 2.3), Project engineering (Section 2.4), and facility closure procedures (Section 2.5).

2.2 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (NO CHANGES)

2.3 GENERATING FACILITY DESIGN AND OPERATION

This section describes the conceptual design and proposed operation of the facilities.

2.3.1 Process Description

The heliostat fields will focus solar energy on the SRSG on top of the power towers to produce steam. Each heliostat array will be comprised of four to eight sections with distinct focal lengths for the mirrors. In each plant, one Rankine-cycle non-reheat steam turbine will receive live steam from the SRSG, which will be located in the power block at the top of its own tower (see Figure 2-3, Power Block Plot Plan).

Each plant will include a start-up/auxiliary steam boiler~~s~~ that may be required during transient cloudy conditions in order to maintain the turbine on-line. After the clouds pass, production will resume from solar thermal input. After the solar thermal input resumes, the turbine will be returned to full solar production and the start-up/auxiliary boiler~~s~~ will be shut down. The daily volume of energy generated by the plant may be extended, as described above, using the start-up/auxiliary boiler~~s~~. In addition to the boiler~~s~~, each plant will use an air-cooled condenser or dry cooling to minimize water usage. Auxiliary equipment supporting the SRSG, solar field, and turbine/generator at each plant will include the following:

- Boiler feedwater and condensate pumps
- Feedwater heaters
- Deaerator

- Condensate polisher
- Wet-surface air cooler (WSAC) (hybrid auxiliary cooler)
- Air-cooled condenser for main process steam
- Transformers
- Emergency diesel generators
- Diesel and motor-driven fire pumps

The facilities will be connected to the SCE grid through a new 220 kV line that will be built as part of the Project and will run north approximately 10 miles to connect to the approved CRS. This new substation will be operated for the benefit of the Project and other interconnection customers in the region. The new substation is targeted by SCE to become operational in 2013.

2.3.2 Power Cycle (no changes)

2.3.3 Solar Field, Solar Receiver Boiler, Steam Turbine Generator, and Condenser (no changes)

2.3.3.1 Solar Tower (no changes)

2.3.3.2 Solar Receiver Steam Generator (SRSG) (no changes)

2.3.3.3 Solar Field Including Heliostats, Mirrors, and Layout Principles (no changes)

2.3.3.4 Steam Turbine Generator (no changes)

2.3.3.5 Air Cooled Condenser (no changes)

2.3.4 Major Electrical Equipment and Systems

The following sections describe the various power supply systems associated with the Project.

2.3.4.1 AC Power—Transmission

Power will be generated at 21 kV by the ~~three~~ two STGs and then stepped up by transformers for transmission to the grid. The plants will connect to the utility at 220 kV. Surge arresters will be provided at the high-voltage bushings of the step-up transformers to protect the transformers from surges on the system caused by lightning strikes or other system disturbances. The transformers will be set on concrete pads within containments designed to contain the transformer oil in the event of a leak or spill. Fire protection systems will be provided for the transformers. The high-voltage side of the step-up transformers will be connected to a switchyard at each plant. From the plant switchyards, power will be transmitted via a 220 kV transmission line to a common area switchyard. The common area switchyard then will be connected to the SCE CRS. A detailed discussion of the transmission system is provided in Section 3 of the AFC.

2.3.4.2 AC Power—Distribution to Auxiliaries (no changes)

2.3.4.3 125V DC Power Supply System (no changes)

2.3.4.4 Uninterruptible Power Supply System (no changes)

2.3.5 Natural Gas Fuel System (no changes)

2.3.6 Water Supply and Use

This subsection describes the quantity of water required, the sources of the water supply, and water treatment requirements. Water balance diagrams for the 250 MW plants are included as Figure 2-6a and Figure 2-6b.

Raw water will be drawn from wells located within the common area. Each 250 MW plant will require up to 84.585 afy, raw water make-up, or a total of 260 169 afy for the entire 750 500 MW (nominal) Rio Mesa SEGF. This does not includes approximately 5 4.3 afy for common area uses. The make-up flow rates are based on pumping for 24 hours per day, 365 days per year. The actual system design will include higher pumping rates for operational and emergency needs.

A treated water tank sized to accommodate a two-day reserve of process water that will include makeup for the demineralizer and WSAC will be located in the common area. A separate mirror wash tank will be provided in the power block area. In addition, a combined service water/firewater storage tank that has sufficient capacity for service water and a dedicated 2-hour reserve volume for firewater will be provided in the each power block area. A dedicated firewater storage tank, with the capacity to fight a 2-hour fire, also will be provided in the common area.

The Rio Mesa SEGF will operate an average of 8 to 16 hours a day, 7 days a week throughout the year, with the exception of a scheduled shutdown in winter for maintenance (at a time negotiated with the transmission system operator). The water treatment plant is planned to be operated continuously during the night in order to minimize cost while using off-peak energy. A more detailed description of the water supply system, treatment, and permits is provided in AFC Section 5.15, Water Resources.

2.3.6.1 Water Requirements

A breakdown of the estimated average daily quantity of water required for operation of the facilities is presented in Table 2.2-1. The daily water requirements shown are estimated based on the plant operating at full load.

Table 2.2-1
Average Daily Water Requirements with All ThreeBoth Plants in Operation

Water Use	Average Daily Use (gpd)	Annual Use (afy)
Process and heliostat wash	226,200150,800	253.5169
Potable water service	4,8003,200	6.54.3

Abbreviations/Acronyms:
afy = acre-feet per year (based on an annual operation of approximately 3,600 hours/year)
gpd = gallons per day

2.3.6.2 Water Supply

The plants will use air-cooled condensers to save water. Water consumption will, therefore, be minimal. Water will be used mainly to replace boiler blowdown, provide supplemental cooling for critical plant auxiliary systems, and provide water for washing heliostats. The latter is required for the ~~two~~three-week washing cycle associate with the heliostats in order that they function at full performance. Because of dust created during site grading, the washing cycle may be more frequent during this time period (i.e., when one plant is operating and another power block and associated roads are being graded), but the increase in the washing cycle is not likely to more than double. Based on this calculation, during construction, total water usage at the plant may peak at 400 afy.

2.3.6.3 Water Quality (no changes)

2.3.6.4 Water Treatment (no changes)

Reverse Osmosis Membrane Filtration (no changes)

Mixed-Bed Demineralizer (no changes)

Potable Water Treatment System (no changes)

2.3.7 Plant Cooling Systems (no changes)

2.3.8 Waste Management (no changes)

2.3.8.1 Wastewater Collection, Treatment, and Disposal (no changes)

Plant Drains and Oil/Water Separator (no changes)

Raw Water Treatment System Waste (no changes)

Power-Cycle Makeup Water Treatment Wastes (no changes)

Boiler Blowdown

Boiler blowdown consists of water discharged from each SRSG to maintain the water chemistry within acceptable ranges. Boiler blowdown from the SRSG will be routed to the SRSG flash tank. Flash steam from the flash tank will be recovered back into the steam cycle via the deaerator. Condensate from the flash tank will be further flashed to the atmosphere, then cooled and recovered in the treated water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

Blowdown from the night-time preservation, start-up/ and auxiliary boilers will be collected in blowdown tanks and recovered in the treated water storage tank. As an alternative, blowdown may be discharged to the wastewater collection tank for treatment.

2.3.8.2 Sanitary Waste Collection and Disposal (no changes)

2.3.8.3 Solid Wastes (no changes)

2.3.8.4 Hazardous Wastes (no changes)

2.3.9 Management of Hazardous Materials (no changes)

2.3.10 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the auxiliary and start-up/auxiliary boilers will be controlled using state-of-the-art systems. To ensure that the systems perform correctly, continuous or parametric (predictive) emissions monitoring systems for nitrogen oxides (NOx) and carbon monoxide (CO) will be employed as required by the Mojave Desert Air Quality Management District (MDAQMD). Section 5.1, Air Quality, includes additional information on emission control and monitoring.

2.3.10.1 NOx Emission Control (no changes)

2.3.10.2 Particulate Emission Control (no changes)

2.3.10.3 Continuous Emission Monitoring

For each gas-fired auxiliary boiler that may requireIt is not anticipated that a continuous emission monitoring system (CEMS) will be required as no fossil fueled boiler will exceed 250 MMBTU/hr. , the exhaust gas primary elements will be connected to a common CEMS. The CEMS will sample, analyze, and record fuel gas flow rate, NOx and CO concentration levels, and percentage of oxygen (O_2) in the exhaust gas from each of the auxiliary boiler stacks. The CEMS will transmit emission data to a data acquisition system (DAS) that will store the data and generate emission reports in accordance with permit requirements. The DAS will also include alarm features that will send signals to the plant DCS when the emissions approach or exceed pre-selected limits.

2.3.10.4 Predictive Emission Monitoring

For each of the start-up/auxiliary boilers, a predictive emissions monitoring system (PEMS) will be used. PEMS are allowed on boilers that are rated at less than 250 MMBTU/hr. PEMS can be classified as a software-based CEMS in which key operating parameters are correlated to pollutant emission rates. A mathematical model is developed which then “predicts” emission levels based on the operating parameters.

2.3.11 Fire Protection (no changes)

2.3.12 Plant Auxiliaries (no changes)

2.3.12.1 Lighting (no changes)

2.3.12.2 Grounding (no changes)

2.3.12.3 Distributed Control System (no changes)

2.3.12.4 Cathodic Protection (no changes)

2.3.12.5 Service Air (no changes)

2.3.12.6 Instrument Air (no changes)

2.3.13 Transmission Lines Description, Design, and Operation

Rio Mesa I~~,~~ and II~~, and III~~ will be interconnected to the SCE grid through the CRS which will be interconnected to SCE's Palo Verde-Devers 500 kV line, which passes approximately 10 miles north of the site on an east-west ROW (see Figure 2-2, Project Features Map). SCE has developed a service plan for the CRS to interconnect with additional projects and allow for future growth. The new CRS and other system upgrades will be for the benefit of Rio Mesa SEGF and other interconnecting customers in the region, as well as future growth. Construction of the CRS will be completed before the Rio Mesa SEGF comes on line, and is currently projected to occur in 2013-2014. Power from each Rio Mesa plant will be interconnected to the California Independent System Operator (CAISO) grid via a common 220 kV gen-tie line to the new CRS. Figure 2-7 provides a single-line diagram of the plant transmission system. Interconnection is discussed in greater detail in Section 3.0, Transmission System Engineering.

2.3.14 Telecommunications (no changes)

2.3.15 Project Construction

Construction of the entire generating facility, from site preparation and grading to commercial operation, is expected to take place from the Fourth Quarter of 2013 to the First Quarter of 2016. Major milestones are listed in Table 2.2-2; however, the construction order may change. Construction of the shared facilities will occur during construction of the first plant.

Table 2.2-2
Project Schedule Major Milestones

Activity	Date
Plant 1 (Rio Mesa I)	
Begin Construction	Fourth Quarter 2013

Start-up and test	Third Quarter 2015
Commercial operation	Fourth Quarter 2015
Plant 2 (Rio Mesa II)	
Begin construction	First Quarter 2014
Start-up and test	Fourth Quarter 2015
Commercial operation	First Quarter 2016
~~Plant 3 (Rio Mesa III)~~	
~~Begin construction~~	~~Second Quarter 2014~~
~~Start-up and test~~	~~First Quarter 2016~~
~~Commercial operation~~	~~Second Quarter 2016~~

Based on an approximate 35~~36~~-month construction period, there will be an average and peak workforce of approximately 840 and 2,200~~1,040 and 2,500~~, respectively. The workforce will consist of construction craft people, supervisory, support, and construction management personnel. The peak construction site workforce level is expected to occur in months 22 and 23~~Month 21~~. During some construction periods and during the start-up phase of the project, some activities will occur 24 hours per day, 7 days per week.

Table 2.2-3 provides an estimate of the average and peak construction traffic during the 35~~36~~-month construction period for the plants and associated linear facilities.

Table 2.2-3
Average and Peak Construction Traffic[3]

Vehicle Type	Peak Daily Round Trips	AM Peak Trips			PM Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Construction Worker Vehicles[1]	27562740	1378754	0	1378754	0	1378754	1378754
Delivery Vehicles (including heavy trucks)[2]	31848	8012	406	12018	0	406	406

Source: Bechtel Power Corporation, *Forecast Traffic Impact - Rio Mesa_090711052412_On Site Batch Plant Rev 2.xls*

1 Peak workforce was conservatively analyzed at 1378 1,370 worker vehicle trips during peak month of construction. These 55% of these worker vehicle trips were conservatively assumed to commute during the morning (7-9 AM) and evening (4-6 PM) peak hours.

2 Delivery vehicles were adjusted into Passenger Car Equivalent (1 Heavy Vehicle = 3 PCE) vehicle in the traffic impact analysis. Analysis assumed 50 percent of 53 8 (actual trucks) delivery vehicles arrive and 25 percent leave during the 7 to 9 AM peak hour; 25 percent leave during the 4 to 6 PM peak hour. Numbers shown on the table are passenger car equivalent adjusted.

3 Construction Worker Vehicles peak and Delivery Vehicles Peak do not occur concurrently. The Delivery Vehicles peak actually occurs prior to the Construction Worker Vehicles peak as it is necessary to supply the site with materials and equipment prior to bringing in the workers.

The construction laydown and parking area will be located in and around the common facilitieseast of the project solar field, as well as those areas of each solar plant that are either outside the edges of the heliostat fields, or not previously or currently under construction in and around the power block area (see Figure 2-8). Construction access will generally be from Bradshaw Trail and 34th Avenue and Bradshaw Trail to the plant entrance road. Materials and equipment will be delivered by truck.

2.3.16 Generating Facility Operation

Management, engineering, administrative staff, skilled workers, and operators will serve bothall three plants. Rio Mesa SEGF is expected to employ up to 150 100 full-time employees: 30 with Rio Mesa I, 30 with Rio Mesa II, and 30 with Rio Mesa III, as well as 6040 for the common area. The facility will be operated 7 days a week, typically up to 16 hours per day.

Detailed long-term maintenance schedules are currently unavailable, but will include periodic maintenance and overhauls in accordance with manufacturer recommendations. Replacements of solar field components are anticipated to occur at a rate of 0.5 percent per year, on average. The unskilled labor demand will include 12 hours of nightly mirror washing, with the entire solar field being washed over a period of 2 3 weeks.

The annual plant availability is expected to be 92 to 98 percent, however, it is possible that plant availability will exceed 98 percent during a given 12-month period.

The facility may be operated in either of the modes described below.

- Operation will occur at maximum continuous output for as many hours per year as thermal input allows.

- Shutdown may occur due to equipment malfunction, transmission line disconnect, or scheduled maintenance.

2.4 ENGINEERING (NO CHANGES IN SUMMARY PARAGRAPH)

2.4.1 Facility Design (no changes)

2.4.1.1 Facility Safety Design (no changes)

Natural Hazards (no changes)

Emergency Systems and Safety Precautions (no changes)

Fire Protection Systems (no changes)

On-site Fire Protection Systems (no changes)

Local Fire Protection Services

Rio Mesa SEGF is within the jurisdiction of Riverside County Station #44 in Ripley, California, which provides fire services in the area. Their approximate response time is 14-16 minutes. Station #44 has a Type 1 engine. Three staff members are on duty at all times (two firefighters and one paramedic).

The Hazardous Materials Risk Management Plan (see Section 5.5, Hazardous Materials Handling) for the plants will include all information necessary to allow firefighting and other emergency response agencies to plan and implement safe responses to fires, spills, and other emergencies.

Personnel Safety Program (no changes)

2.4.2 Facility Reliability (no changes)

2.4.2.1 Facility Availability (no changes)

2.4.2.2 Redundancy of Critical Components

The following subsection identifies the redundancy of equipment that will exist as it applies to Project availability. A summary of the equipment redundancy is shown in Table 2.3-1. The final design could differ from what is described in Table 2.3.1.

Table 2.3.1
Equipment Redundancy

Component	Required per Power Plant	Project Spare Equipment stored in Common Area

Table 2.3.1
Equipment Redundancy

Component	Required per Power Plant	Project Spare Equipment stored in Common Area
Boiler Circulation Pumps	4 – 25% installed ~~including VFD and UPS~~ (100% represents MCR conditions)	1~~2~~ – 25% spare pump ~~including VFD and UPS~~ per Project
Air Compressor	2 – 100% installed	-
Compressed Air Dryers	2 – 100% installed	-
ACC Vacuum Pumps (normal operation)	2 – 100% installed	-
ACC Vacuum Pump (night operation)	1 – 100% installed	-
CCW Pumps	2 – 100% installed	-
CCW Booster Pumps	2 – 100% installed	-
SRSG Boiler Feed Pumps – Main, Backup, and Startup~~Booster~~ Pumps~~ Set~~	1 – 100% Turbine-driven Main BFP, including booster pump, with turbine drive installed. 1 – 50%~~100%~~ electric motor-driven Backup BFP, including booster pump, with VFD ~~fluid coupling~~ installed (50% of MCR conditions) 1 – 25% electric motor-driven Startup BFP with VFD installed (25% of MCR conditions)	1 – Spare Main~~100% Turbine-driven BFP~~ pump cartridge & key spare parts for turbine drive and one spare booster pump per Project in storage consisting of a spare pump cartridge (both booster & main pump) & key spare parts for turbine drive 1 – complete spare Backup pump, including booster pump with electric drive and VFD per Project~~100% electric motor-driven BFP per Facility in storage consisting of a spare pump cartridge (both booster & main) with common electrical drive and fluid coupling~~ 1 – complete spare Startup pump with electric drive and VFD per Project
Condensate Pump	2 – 50% (including VFD)	1 – 50% (including motor and VFD) per Project in storage
Condensate Polisher/Pre-filter	2 – 100% installed (off-site regenerated)	~~Spare cation and anion resin available in storage~~
ACC duct drain pump	2 – 100% (including VFD) installed	
~~Auxiliary Boiler - Feed Pump~~	~~1 – 100% per boiler installed including VFD (3 Total)~~	~~1 – 100% spare pump and driver with VFD per Project~~
Night Preservation Boiler - Feedwater Pump	2 – 100% installed	

Table 2.3.1
Equipment Redundancy

Component	Required per Power Plant	Project Spare Equipment stored in Common Area
~~Startup/~~Auxiliary Boiler – - Feedwater Pump	2 – 100% installed (including VFD)	
Demineralized Water Transfer Pump	2 – 100% installed	
Sump Pumps	2 – 100% per sump installed	
Diesel Fire Pump	1 – 100% installed	
Electric Fire Pump	1 – 100% installed	
Jockey Fire Pump	1 – 100% installed	
Well Water Pump	1~~2~~ – 100% installed	1 – 100% spare pump per project in storage
Well Water Pump (Common Area)	2~~3~~- 100% installed	1 – 100% spare pump per project in storage
Generator Step-up (GSU) Transformer	1 – 100% installed	1 – GSU Transformer per project in storage
Unit Auxiliary Transformer	1 – 100% installed	1 – UAT Transformer per project in storage
Station Service Transformer	1 – 100% installed	
~~Station Service Transformer~~	~~1 – 100% installed~~	
Battery Chargers	2 – 100% per plant for main power block DC 1 – 100% per plant for Backup Protection 2~~1~~ – 100% for Common Area for switchyard DC system 1 – 100% for Common Area for Backup Protection	

Table 2.3.1
Equipment Redundancy

Component	Required per Power Plant	Project Spare Equipment stored in Common Area
Uninterruptible Power Supply	2 – 100% for DCS/ESD, SFINCS and Solar Filed 2 – 100% for SRSG DCS and Tower SFINCS equipment (including battery) 1 – 100% for office IT equipment (including battery) 2 – 100% for CCR equipment in Common Area 1 – 100% for office IT equipment (including battery) in Common Area ~~1 – 100% Power Block UPS~~ ~~1 – 100% Solar Field UPS~~ ~~1 – 100% SRSG UPS~~ ~~1 – 100% UPS for each BCP~~ ~~2 – 100% for Common Area UPS~~	

2.4.3 Power Block (no changes)

2.4.3.1 Steam Generation Subsystems (no changes)

2.4.3.2 Steam Turbine Generator Subsystems (no changes)

2.4.3.3 Distributed Control System (no changes)

2.4.3.4 Condensate System (no changes)

2.4.3.5 Boiler Feedwater System

The boiler feedwater system will transfer feedwater from the deaereator to the SRSG. The system will consist of the deaerator, one turbine-driven boiler feedwater pump, including booster, one motor-driven boiler feedwater pump, including booster pump, and three HP feedwater heaters. Separate boiler feedwater pumps will be provided with the night-time preservation~~,~~ and start-up/~~, and~~ auxiliary boilers.

2.4.3.6 Boiler Feedwater Chemistry Control (no changes)

2.4.3.7 Demineralized Water System (no changes)

2.4.3.8 Raw Water Treatment System (to be located in the Common Area) (no changes)

2.4.3.9 Wastewater Treatment System (no changes)

2.4.3.10 Wet-Surface Air Cooler Chemistry Control (no changes)

2.4.3.11 Power Cycle Makeup and Storage

The power cycle makeup and storage subsystem will provide demineralized water storage and pumping capabilities to supply high-purity water for system cycle makeup. Major components of the system will consist of the demineralized water storage tank (2 days of operational storage at peak load), and demineralized water transfer pumps that will distribute water from the demineralized water storage tank for the following uses:

- steam cycle make-up
- auxiliary/start-up boiler make-up
- ~~startup boiler make-up~~
- night-time preservation boiler make-up
- air-cooled condenser condensate storage tank fill
- air-cooler condenser vacuum pump make-up
- condensate polisher sluice water

2.4.3.12 Compressed Air (no changes)

2.4.4 Construction Logistics Area ~~Common Area~~

An approximately 103-acre ~~120-acre common~~ Construction Logistics A~~a~~rea (CLA) will be established on the eastern border of the site east of the WAPA and TransCanada transmission lines to accommodate construction parking, office, equipment, and conference trailers, equipment staging assembly and material storage, a tire cleaning station and other construction support facilities. The CLA will be served by power from the local 33kV distribution system. The surface areas within the CLA area will be stabilized and dust suppression maximized in areas subject to heavy daily traffic.

2.4.5 Common Area

A Common Area to accommodate an administration/control room, warehouse, and maintenance complex; an onsite substation; asphalt-paved visitor and employee parking area, potentially a tire cleaning station,~~;~~ and landscape areas will be established at the north east portion of the Unit 1 solar field west of the

WAPA transmission line (Figure 2.1-2). The administration complex will occupy approximately 6 acres and will be served by power from the local 33 kV distribution system and water from water supply wells located in the common area.

The common area will also be used for temporary construction parking areas, construction trailers, a tire cleaning station, and other construction support facilities. The surface areas within the common area that are used for construction will be stabilized and dust suppression maximized in areas subject to heavy daily traffic.

~~2.4.4.1~~2.4.5.1 *Fuel Availability*

Natural gas will be delivered via pipeline as described above and in Section 4.0, Natural Gas Supply.

~~2.4.4.2~~2.4.5.2 *Water Availability*

The Project will use up to ~~260~~ 173.3 afy of well water for operations. Water will be treated for reuse to limit the impact to the desert environment. Access to up to 600 afy of well water has been contracted from MWD within the lease agreement.

Potable water for drinking, safety showers, fire protection water, service water, and sanitary uses will be provided from the on-site wells and will be treated appropriately.

The ability of water to meet the needs of Rio Mesa SEGF is discussed in more detail in Section 5.15, Water Resources.

~~2.4.4.3~~2.4.5.3 *Project Quality Control (no changes)*

Project Stages (no changes)

Quality Control Records (no changes)

2.5 FACILITY CLOSURE (NO CHANGES IN SUMMARY PARAGRAPH)

2.5.1 Temporary Closure

For a temporary facility closure, where there is no release of hazardous materials, security of the facilities will be maintained on a 24-hour basis, and the CEC~~. The CEC and BLM (for the portions of the Project located on BLM land)~~ will be notified. Other responsible agencies will also be notified, as necessary and appropriate. Depending on the length of shutdown necessary, a contingency plan for the temporary cessation of operations will be implemented. The contingency plan will be conducted to ensure conformance with all applicable LORS and the protection of public health, safety, and the environment. The plan, depending on the expected duration of the shutdown, may include the draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. All wastes will be disposed of according to applicable LORS, as discussed in Section 5.14, Waste Management.

Where the temporary closure includes damage to the facility, and there is a release or threatened release of regulated substances or other hazardous materials into the environment, procedures will be followed as set forth in a Risk Management Plan (RMP) and a Hazardous Materials Business Plan (HMBP) to be developed as described in Section 5.5, Hazardous Materials. Procedures will include methods to control releases, notification of applicable authorities and the public, emergency response, and training for plant personnel in responding to and controlling releases of hazardous materials. Once the immediate problem is solved, and the regulated substance/hazardous material release is contained and cleaned up, temporary closure will proceed as described above for a closure where there is no release of hazardous materials.

2.5.2 Permanent Closure (no changes)

2.6 REFERENCES (NO CHANGES)

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