Tessera Solar
power from stirling energy systems

December 23, 2009

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Mr. Christopher Meyer
CEC Project Manager
Attn: Docket No. 08-AFC-13
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Mr. Jim Stobaugh
BLM Project Manager
Attn: Docket No. 08-AFC-13
Bureau of Land Management
P.O. Box 12000
Reno, NV 89520

RE: SES Solar One Project
Southern California Edison Project Description for SES Solar One 275 MW Early Interconnection Facilities

Dear Mr. Meyer and Mr. Stobaugh,

Tessera Solar hereby submits the Southern California Edison Project Description for SES Solar One 275 MW Early Interconnection Facilities. I certify under penalty of perjury that the foregoing is true, correct, and complete to the best of my knowledge.

Sincerely,

Felicia L. Bellows

Felicia L. Bellows
Vice President of Development

Southern California Edison Project Description for SES Solar One 275 MW Early Interconnection Facilities Submitted by SCE on December 16, 2009

Background

The following project description is provided in relation to the early interconnection request made by Stirling Energy Systems (SES) to Southern California Edison (SCE). As discussed below, SES requested SCE to review how much latent system capacity is available for use on SCE's existing system prior to completion of the system facilities proposed for interconnection of the 850MW for the SES Solar One Project.

SES Solar One Generation Interconnection Study Overview:

Stirling Energy System, Inc. (SES) applied to the California Independent System Operator (CAISO) for the interconnection of their 850MW Solar One Project to the CAISO Grid at the existing SCE Pisgah Substation 220kV Bus under the terms of SCE's Transmission Owner (TO) Tariff.

SCE prepared a System Impact Study (SIS) dated March 7, 2006, to analyze the impact of the 850MW Project to the SCE Transmission System.

In addition, SCE prepared a Technical Study (TAS I) to evaluate transient stability associated with the interconnection of the 850MW SES Solar One Project.

Subsequent to these two studies, a number of queued ahead generation projects withdrew from the CAISO Interconnection Queue resulting in a need to perform a reassessment of the impacts originally identified in the SIS and the TAS I.

SCE prepared a new Technical Assessment II (TAS II) dated June 13, 2008, to analyze the impact of the 850MW Project to the SCE Transmission System reflecting the withdrawal of previously-queued projects.

The Interconnection Facilities Study dated November 6, 2008, addressed the scope of work and the cost estimate for the construction of all the Interconnection Facilities and System Upgrades required for the interconnection of the 850MW Project.

During the preparation of the several reports discussed above, SES Solar requested SCE to investigate the possibility of interconnection a portion of its 850MW generation to the existing Pisgah Substation and the related 220kV system before the completion of the 500kV upgrades.

In compliance with this request, SCE prepared an LGIP Optional Interconnection Study Report ("Optional Study") to analyze the maximum amount of generation that could be interconnected to the existing Pisgah 220kV Bus and related 220kV Transmission Lines and transmitted the results to CAISO in January 2008.

On January 9, 2008, the CAISO issued the Optional Study Report indicating that that SES Solar One Project could be allowed to interconnect up to 275MW generation to the existing Pisgah 220kV Bus and related 220kV Transmission System contingent on the installation of a new Special Protection Scheme to drop the SES Solar One Project's generation under certain contingencies.

The intent of the early interconnection of up to 275MW is that it would be a temporary interconnection until the 500kV upgrades identified in the Interconnection Facilities Study are in service, and the full requested generation output of 850MW could be connected to the upgraded transmission system. When completed, the 500 kV upgrades will allow the export of approximately 1,400 MW of additional generating capacity between the Lugo and Pisgah Substations. This will accommodate not only all of the power produced by SES Solar One but other proposed generating facilities.

A second Optional Study Agreement ("Interconnection Optional Study"), dated October 12, 2009, detailed the scope of work and cost estimate for the early interconnection of 275MW of the SES Solar One generation to the existing Pisgah Substation 220kV Bus and related 220kV Transmission Lines.

Please note, final engineering has not been performed for the 275MW early interconnection, and is pending the execution of a Large Generator Interconnection Agreement ("LGIA") for the proposed SES Solar One Project. Negotiations for the LGIA are nearing completion.

Therefore, SCE anticipates the 275 MW early interconnection project descriptions, which is based at this time on conceptual engineering, to be as follows:

Pisgah Substation Expansion

Engineering Plan, Description and Location: SCE is planning to do the following work at Pisgah Substation:

- Expand SCE's existing Pisgah 220kV Substation (northwest area of the substation to create a new area of approximately 270 feet by 100 feet) within SCE's existing 220kV right-of-way (ROW)
- Install a new double-breaker 220kV line position to terminate the new SES Solar One 220kV Gen Tie Line
- Install motorized disconnect switches on each of the existing SCE Lugo No.1 and No.2 220 kV line positions at the substation
- Install special protection scheme (SPS) relays inside the existing mechanical electrical equipment rooms (MEER)
- Install new remote terminal unit (RTU) inside the existing MEER
- Install miscellaneous Telecommunications equipment inside the existing MEER.

Construction Activities: The expansion of Pisgah Substation would require extending the graded substation pad to the west. It is estimated that the grading activities would disturb an area approximately 300 feet by 125 feet (0.9 acre) to provide the proposed 270-foot by 100-foot internal expansion. Because the surface elevation of the new expansion area would be higher than the surface elevation of the surrounding desert floor, it is anticipated that approximately 10,000 cubic yards of new soil would be required to achieve the desired level.

After the area has been graded, new chain-link fencing would be installed and the portion of the old fencing would be removed.

Following the completion of the site improvements, below grade construction would begin with the expansion of the substation ground grid into the new area, followed by the excavation for conduits and for equipment and structure foundations. Above grade construction would include the erection of steel structures, the installation of the new 220 kV circuit breaker and ancillary electrical equipment, the installation of overhead connecting cables and of new control and monitoring devices within the control building.

Once the installation of the substation equipment has been completed, a four-inch thick layer of crushed rock would be placed on the surface of the expansion area. There would be no asphalt concrete paving as part of this project element.

Upon completion of these activities, extensive testing would be required to insure safe and reliable operation prior to the energization of the new position.

SCE 220kV Gen-Tie Configuration

Engineering Plan, Description and Location*:* SCE will build approximately 1-2 new 220kV structures within the existing 200kV ROW and/or within the expanded Pisgah Substation fence line to support the gen-tie line coming from the SES Solar One Project to facilitate the 220kV service drop from the last SES Solar One Project's gen-tie structure into the Pisgah Substation. At this time, the actual structure types, configurations and locations have not yet been determined or engineered and will be subject to further engineering and coordination with SES.

Construction Activities: The establishment of a marshalling yard will not be necessary for the construction of the transmission structures and the stringing of the conductor to complete the gen-tie circuit from SES Solar One into Pisgah Substation. Although, a temporary equipment and material staging area would be established for short-term utilization within the existing SCE ROW near the new transmission structure locations and/or at Pisgah Substation.

Equipment and materials to be stored at the temporary equipment and material staging area may include:

- Construction trailer
- Construction equipment
- Conductor / wire reels
- Transmission structure components
- Overhead ground wire/Optical ground wire cable

- Hardware
- Insulators
- Consumables, such as fuel and joint compound
- Portable sanitation facilities
- Waste materials for salvaging, recycling, and/or disposal

The size of the temporary equipment and material staging area would be dependent upon a detailed site inspection and would take into account, where practical, suggestions by the SCE Crew Foreman or the SCE Contractor selected to do the work; an area of approximately 0.5 to 1.5 acres may be required. Land disturbed at the temporary equipment and material staging area, if any, would be restored to preconstruction conditions following the completion of construction.

This portion of the project involves construction within an existing SCE ROW. It is assumed that existing public roads as well as existing transmission line roads would be used during construction. Transmission line roads are classified into two groups: access roads and spur roads; access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along line ROWs; spur roads are roads that lead from access roads and terminate at one or more structure sites. However, it is also assumed that rehabilitation work may be necessary in some locations for existing transmission line roads to accommodate construction activities. This work may include the re-grading and repair of existing access and spur roads. These roads would be cleared of vegetation, blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable width of 14 feet (preferably with 2 feet of shoulder on each side).

The construction of this project may require new spur roads to access the new transmission line structure locations. Similar to rehabilitation of existing roads, all new spur road alignments would first be cleared and grubbed of vegetation. Roads would be blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable width of 14 feet (preferably with 2 feet of shoulder on each side) but may be wider depending on final engineering requirements and field conditions. Access and spur road gradients would be leveled so that any sustained grade does not exceed 12 percent. All curves would have a radius of curvature of not less than 50 feet, measured at the center line of the usable road surface. Spur roads would usually have turnaround areas near the structure locations.

The new structure locations would first be graded and/or cleared of vegetation as required to provide a reasonably level and vegetation-free surface for footing and structure construction. Site preparation for the temporary laydown area required for the assembly of the structure would first be cleared of vegetation and graded as required to provide a reasonably level and vegetation-free surface for footing and structure construction. The area needed for the laydown and the assembly of the structure is approximately 200 feet by 200 feet (0.92 acre). Erection of the structure will require an erection crane to be set up adjacent to and 60 feet from the centerline of the structure. The crane pad would be located within the laydown area used for structure assembly. If the existing terrain is not suitable to support crane activities, a temporary 50 feet by 50 feet (0.06 acre) crane pad will be constructed.

The structure would require drilled, poured-in-place, concrete footings that would form the structure foundation. Actual footing diameters and depths for each of the structure foundations would depend on the soil conditions and topography at the site and would be determined during final engineering.

The foundation process starts with the drilling of the hole for the structure. The hole would be drilled using truck or track-mounted excavators with various diameter augers to match the diameter requirements of the structure. The excavated material will be distributed at the structure site or used in the rehabilitation of existing access roads. Alternatively, the excavated soil may be disposed of at an off-site disposal facility in accordance with all applicable laws.

Following excavation of the foundation footing for each structure, steel reinforced rebar cage(s) would be set, survey positioning of the anchor bolts and/or stub angles would be verified, and concrete would then be placed. The steel reinforced rebar cage(s) would be assembled off site and delivered to the structure location by flatbed truck. A typical transmission structure would require approximately 15 to 80 cubic yards of concrete delivered to the structure location depending upon the type of structure being constructed, soil conditions, and topography at each site. The transmission structure footings will project approximately 1-3 feet above the ground level.

Foundations in soft or loose soil and that extend below the groundwater level may be stabilized with drilling mud slurry. Mud slurry will be placed in the hole after drilling to prevent the sidewalls from sloughing. The concrete for the foundation is then pumped to the bottom of the hole, displacing the mud slurry. The mud slurry brought to the surface is typically collected in a pit adjacent to the foundation, and then pumped out of the pit to be reused or discarded at an off-site disposal facility in accordance with all applicable laws.

Concrete samples would be drawn at time of pour and tested to ensure engineered strengths were achieved. A normally specified SCE concrete mix typically takes approximately 28 days to cure to an engineered strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to begin the erection of the structure.

During construction, existing concrete supply facilities would be used where feasible. If concrete supply facilities do not exist in certain areas, a temporary concrete batch plant would be set up. If necessary, approximately 2 acres of property would be sub-partitioned from a marshalling area for a temporary concrete batch plant. Equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos. Dust emissions would be controlled by watering the area and by sealing the silos and transferring the fine particulates pneumatically between the silos and the mixers.

The assembly would consist of hauling the structure components from the staging yard to their designated laydown site using semi-trucks with 40-foot trailers. Crews would then assemble portions of each structure on the ground at the structure location, while on the ground, the top section may be pre-configured with the necessary insulators and wire-stringing hardware before being set in place. An 80-ton all-terrain or rough terrain crane would be used to position the base section on top of previously prepared foundation. When the base section is secured, the remaining portions of the structure would then be placed upon the base section and bolted together.

After construction is completed, the transmission structure site would be graded such that water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the structure footing. The graded area would be compacted and would be capable of supporting heavy vehicular traffic.

Wire-stringing includes all activities associated with the installation of conductors. This activity includes the installation of primary conductor and OPGW or ground wire, vibration dampeners, weights, spacers, and suspension and dead-end hardware assemblies. Insulators and stringing sheaves (rollers or travelers) are typically attached during the steel erection process.

A standard wire-stringing plan includes a sequenced program of events starting with determination of wire pulls and wire pull equipment set-up positions. Advanced planning by supervision determines circuit outages, pulling times, and safety protocols needed for ensuring that safe and quick installation of wire is accomplished.

Wire-stringing activities would be conducted in accordance with SCE specifications, which is similar to process methods detailed in Institute of Electrical and Electronics Engineers Standard 524-2003, Guide to the Installation of Overhead Transmission Line Conductors.

Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected, where possible, based on availability of dead-end structures at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setups. In some cases, it may be preferable to select an equipment setup position between two suspension structures. Anchor rods would then be installed to provide dead-ending capability for wire sagging purposes, and also to provide a convenient splicing area.

To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire-stringing activities.

The following four steps describe the wire installation activities proposed by SCE:

- Step 1: Sock Line, Threading: Typically, a lightweight sock line is passed from structure to structure, which would be threaded through the wire rollers in order to engage a camlock device that would secure the pulling sock in the roller. This threading process would continue between all structures through the rollers of a particular set of spans selected for a conductor pull.

- Step 2: Pulling: The sock line would be used to pull in the conductor pulling cable. The conductor pulling cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel. A piece of hardware known as a running board would be installed to properly feed the conductor into the roller; this device keeps the bundle conductor from wrapping during installation.

- Step 3: Splicing, Sagging, and Dead-ending: After the conductor is pulled in, the conductor would be sagged to proper tension and dead-ended to structures.

- Step 4: Clipping-in, Spacers: After the conductor is dead-ended, the conductors would be secured to all tangent structures; a process called clipping in. Once this is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

The dimensions of the area needed for the stringing setups associated with wire installation are variable and depends upon terrain. The preferred minimum area needed for tensioning equipment set-up sites requires approximately an area of 150 feet by 500 feet (1.72 acres); the preferred minimum area needed for pulling equipment set-up sites requires approximately an area of 150 feet by 300 feet (1.03 acres); however, crews can work from within slightly smaller areas when space is limited. Each stringing operation would include one puller positioned at one end and one tensioner and wire reel stand truck positioned at the other end.

For stringing equipment that cannot be positioned at either side of a dead-end transmission structure, field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension.

The puller and tensioner set-up locations require level areas to allow for maneuvering of the equipment. When possible, these locations would be located on existing level areas and existing roads to minimize the need for grading and cleanup.

The puller and tensioner set-up locations associated with the transmission structures would be temporary and the land would be restored to its previous condition following completion of conductor stringing activities. The final number and locations of the puller and tensioner sites will be determined during final engineering for the Proposed Project and the construction methods chosen by SCE or its Contractor.

An overhead ground wire (OHGW) for shielding or an optical ground wire (OPGW) for shielding and communication purposes would be installed on the transmission line. Final engineering will determine which configuration is installed. The OHGW/OPGW would be installed in the same manner as the conductor; it is typically installed in conjunction with the conductor, depending upon various factors, including line direction, inclination, and accessibility. Following installation of the OPGW, the strands in each segment are spliced together to form a continuous length from one end of a transmission line to the other. On the last structure at each end of a transmission line, the overhead fiber is spliced to another section of fiber cable that runs in underground conduit from the splice box into the communication room inside the adjacent substation.

<u>Telecommunications Facilities Installation</u>

Two telecommunication paths are required for the SES Solar One early interconnection of 275 MW. The two separate paths are needed due to 220kV line protection and SPS requirements. The two separate telecommunications paths are:

- Constructing a new fiber optic communication line on existing poles between SCE's Pisgah and Gale substations (Pisgah-Gale Fiber Optic Cable).

- Replacing existing Overhead Ground Wires with new Optical Ground Wire on a 65-mile segment of SCE's Eldorado-Lugo 500 kV line between SCE's Lugo and Pisgah substations (OPGW Installation on Eldorado – Lugo 500kV T/L)

Note, with respect to the OPGW installation mentioned above, SCE anticipates installing a repeater station shelter, the likely size of which could be 15 feet x 20 feet, within the Eldorado-Lugo 500kV T/L ROW. This repeater station shelter will likely require a distribution power connection that could involve the installation of several wood distribution poles. The repeater station and distribution poles will involve minimal permanent ground disturbance in addition to temporary ground disturbance during construction. However, because final engineering has not yet been completed, the exact location for facilities has not been determined.

In addition, two separate telecommunications paths will be required from the SES Solar One Substation to SCE's Pisgah Substation. The paths are as follows:

- SES Solar One will install OPGW on its 220 kV Gen-tie line between SES Solar One Substation and SCE's Pisgah Substation

- SCE will install fiber optic cable between SES Solar One Substation and SCE's Pisgah Substation on a combination of existing distribution and new communication poles and/or within new underground conduits

Additional information regarding the major communications paths (Pisgah-Gale Fiber Optic Cable and OPGW Installation on Eldorado – Lugo 500kV T/L), which is based on preliminary engineering, follows below. Please note, however, with respect to the communication paths required between SES Solar One Substation and Pisgah Substation, detailed project information is not available at this time. Further, as previously noted, the OPGW path between SES Solar One and Pisgah will be constructed by SES and not SCE.

<u>Pisgah-Gale Fiber Optic Cable</u>

<u>Engineering Plan, Structures and Route:</u> The Pisgah-Gale Fiber Optic Cable will consist of one All-Dielectric Self-Supporting (ADSS) 48 strand single mode fiber optic cable between SCE's Pisgah and Gale substations to provide for telecommunication interconnection between Pisgah Substation and Gale Substation, including protective relay circuits, Supervisory Control and Data Acquisition (SCADA) circuits, data, and telecommunication services.

Approximately 151,141 feet of new fiber optic cable will be installed between the MEER at Pisgah and Gale substations. Portions of the fiber optic cable will be constructed on existing overhead transmission, distribution and communication wood pole structures. In addition portions of the cable will be constructed within newly constructed underground conduit system(s). On average, all existing overhead structures are approximately between 40 feet and 55 feet tall. Any new structures will likely be the same height, but this will be dependent on wind-loading analysis and further engineering.

The proposed Pisgah-Gale Fiber Optic Cable route is as follows: From the existing Gale Substation, proceed east from the MEER building approximately 200 feet installing underground cable in existing underground cable trench, continue east approximately 150 feet installing underground cable in existing underground conduit to existing riser pole located on SCE ROW, go up riser continue south on SCE ROW approximately 210 feet installing overhead cable on existing overhead distribution poles continue east on National Trails Highway installing approximately 16,588 feet installing overhead cable on existing overhead distribution poles, continue south approximately 90 feet installing overhead cable on existing overhead distribution poles, continue east on National Trails Highway approximately 34,678 feet installing overhead cable on existing distribution poles, continue north approximately 110 feet installing overhead cable on existing distribution poles, continue east on National Trails Highway/Pioneer Road approximately 10,935 feet installing overhead cable on existing distribution poles, continue south on Newberry Road approximately 1,800 feet installing overhead cable on existing overhead distribution poles, continue east on National Trails Highway approximately 83,200 feet installing overhead cable on existing overhead distribution poles, continue north crossing the Interstate Highway 40 and on the SCE ROW approximately 2,580 feet installing overhead cable on existing overhead distribution poles to pole # 429143S, install new riser on pole #429143S and drop down through the riser to underground and continue north east trenching approximately 600 feet installing underground cable in new underground conduit into the MEER in Pisgah Substation.

***Construction Activities*:** As noted earlier, the Pisgah-Gale Fiber Optic Cable will be a newly constructed fiber optic cable line, approximately 151,141 feet in length, on existing overhead SCE distribution wood pole structures between and into SCE's Pisgah and Gale substation MEERs. In addition, as noted earlier, portions of the cable will be constructed on newly constructed underground conduit system(s).

For the attachments (pole framing) to existing and overhead wood pole structures the fiber optic cable will utilize a five foot wood cable arm and Fiberlign high-strength engineered dielectric suspension support block. This suspension support block is oriented vertically and attached to the cable arm. One per overhead structure would be required.

For the installation in the new underground conduit and underground structures entering Pisgah Substation, the fiber optic cable will utilize a high density polyethylene smoothwall innerduct which provides protection and identification for the cable. The fiber optic cable will be installed in and throughout the length of the new underground conduit structure.

The construction of the fiber optic cable will utilize existing franchise (public ROW) locations, and existing access and spur roads. Access roads are through roads that run between and along overhead wood pole structures form the main transport route along the major extent of the fiber optic cable. Spur roads are roads that lead from the access road and dead-end into one or more overhead structure sites. The existing and new overhead structures that do not have vehicle access will be walked-in to each location by SCE crews.

Fiber optic cable stringing includes all activities associated with the installation of cables onto the overhead wood pole structures. This activity includes the installation of vibration dampeners, and suspension and dead-end hardware assemblies. Stringing sheaves (rollers or travelers) are attached during the framing process. A standard wire stringing plan includes a sequenced program of events starting with determination of cable pulls and cable pulling equipment set-up positions. At this time, exact locations of the pulling locations are not yet engineered.

Typically, fiber optic cable pulls occur every 6,000 feet to 10,000 feet on flat and mountainous terrain. Fiber optic cable splices are required at the end and beginning of each cable pull. “Fiber optic cable pulls” are the length of any given continuous cable installation process between two selected points along the overhead or underground structure line. Fiber optic cable pulls are selected, where possible, based on availability of pulling equipment and designated dead-end structures at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of fiber optic cable stringing and splicing equipment set ups. The dimensions of the area needed for stringing set ups varies depending upon the terrain, however a typical stringing set up is 40 feet by 60 feet. Where necessary due to suitable space limitations, crews can work from within a substantially smaller area.

The crews will utilize Pisgah and Gale substations as a laydown area for all material for the proposed fiber optic cable which would be delivered by truck. Material would be placed inside the perimeter of the fenced substation in a designated area during construction. The majority of the truck traffic would use major streets and would be scheduled for off-peak traffic hours. All construction debris would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable local jurisdiction regulations.

The primary marshalling yard for the Pisgah-Gale Fiber Optic Cable project element would be established inside Gale Substation, or, if room is not available, a suitable existing manned SCE facility outside the substation would be located. Materials and equipment to be staged to this yard include but are not limited to: fiber optic cable reels and hardware, heavy equipment, light trucks, and portable sanitation facilities. In addition to the materials and equipment already detailed for new construction, the following may be routed through this yard: empty fiber optic cable and innerduct reels, and other debris associated with the installation of the fiber optic cable process.

<u>OPGW Installation on Eldorado – Lugo 500kV T/L</u>

<u>Engineering Plan, Structures and Route:</u> Approximately 60 miles of the existing SCE Eldorado-Lugo 500kV T/L between Lugo and Pisgah substations will need to have one of the two existing half-inch steel overhead ground wires (OHGW) replaced with OPGW in order to accommodate the early 275 MW interconnection of SES Solar One. The replacement of the OHGW with OPGW on the existing 500kV steel lattice towers (LST) will require some modifications on the existing LSTs. The loading capacity of modified tower structures with the new OPGW needs to conform to the California Public Utilities Commission (CPUC) General Order (GO) 95 loading criteria.

Currently, SCE anticipates approximately 70 single-circuit LSTs would need to be modified, and that various types of tower modifications will be needed for the various different types of LSTs. However, as noted earlier, SCE has not yet commenced detailed engineering on the OPGW installation. Below are assumptions SCE is providing based on the likely potential modifications and typical practices. Please note, the strengthening of the LSTs for the new OPGW could require any combinations of modifications, and that each modification will consist of different steel member bundles or configurations.

The modifications of the existing 500kV LSTs may include the static peaks, tower body reinforcement, body extension, installation of horizontal diaphragms, and tower leg reinforcement. Detailed drawings and procedures for each of the tower modifications are to be developed for fabrication and installation. The modifications to be performed on each tower are identified by bundles. Each bundle will contain those components necessary to complete the required modifications, such as new steel angles to form back to back angles to the existing leg diagonals, redundant braces to the longitudinal and transverse faces, oblique braces between leg diagonals, and a new horizontal diaphragm. New redundant members will also be designed and installed at the ground peaks to support the OPGW clip-in hardware. The loading capacity of the upgraded tower structures will be able to support the loads for the new OPGW installation and meets the requirements of CPUC GO 95.

Tower modifications and installation of a new OPGW line requires access to each existing tower site for construction crews, materials, and equipment. Based on an initial review, it appears that all of the existing tower sites have existing access and spur roads these roads would be used for construction. As such, SCE does not anticipate requiring new roads to perform the work. Where needed, the existing access roads would be improved as required. After project construction, these roads would continue to be used by maintenance crews and repair vehicles for access to each tower for inspection and maintenance activities. At the end of project construction, these roads would be left in a condition equal to or better than the condition that existed prior to the start of construction. Loose rock and slide material would be removed from existing roads and used to construct dikes, fill washouts, or flatten fill slopes; all washouts, ruts, and irregularities would be filled or obliterated.

Construction Activities: All construction work for the 500kV LST modifications to accommodate the new OPGW will be performed within the existing transmission line ROW.

It is assumed that existing public roads as well as existing transmission line roads would be used during construction. Transmission line roads are classified into two groups: access roads and spur roads; access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along line ROWs; spur roads are roads that lead from access roads and terminate at one or more structure sites. However, it is also assumed that rehabilitation work may be necessary in some locations for existing transmission line roads to accommodate construction activities. This work may include:

Re-grading and repair of existing access and spur roads. These roads would be cleared of vegetation, blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable width of 14 feet (preferably with 2 feet of shoulder on each side).

Drainage structures such as wet crossings, water bars, overside drains and pipe culverts would be installed to allow for construction traffic usage, as well as prevent road damage due to uncontrolled water flow.

Slides, washouts, and other slope failures would be repaired and stabilized by installing retaining walls or other means necessary to prevent future failures. The type of structure to be used would be based on specific site conditions.

The tower modifications begin with hauling and stacking bundles of steel at tower locations per engineering drawing requirements. This activity requires use of several tractors with 40-foot trailers and a rough terrain forklift. After steel is delivered and stacked, crews would proceed with the structure modification to leg extensions, body panels, boxed sections, bridges, and peaks, as necessary. The various steel components used to reinforce the towers would be lifted into place with a minimum 80-ton all-terrain or rough terrain crane and the tower modification work would be performed by a combined erection and torquing crew.

The OPGW is typically installed in continuous segments of 19,000 feet or less depending upon various factors including line direction, inclination, and accessibility. Following installation of the OPGW, the strands in each segment are spliced together to form a continuous length from one end of a transmission line to the other.

To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of OPGW stringing activities.

The following three steps describe the OPGW installation activities proposed by SCE:

- Step 1: Pulling: To minimize ground disturbance and insure controlled conditions during the OPGW installation activities, the existing static ground wire would be used to pull in the new OPGW. The existing static ground wire would be attached to the OPGW using a special swivel joint to prevent damage to the OPGW and to allow it to rotate freely to prevent complications from twisting as it unwinds off the reel. The existing static ground wire is wound onto “breakaway” reels as it is removed. The existing static ground would be transported to a marshalling yard where it would be prepared for recycling.

- Step 2: Sagging, and Dead-ending: After the OPGW is pulled in; it would be sagged to proper tension and dead-ended to structures.

- Step 3: Clipping-in: After the OPGW is dead-ended, it would be secured to all tangent structures; a process called clipping in.

The dimensions of the area needed for the OPGW stringing setups associated with installation are variable and depends upon the terrain, however a typical stringing set up is 75 feet by 100 feet, however, and crews can work from within slightly smaller areas when space is limited.

Each OPGW segment stringing operation would include one puller positioned at one end and one tensioner and wire reel stand truck positioned at the other end. The puller and tensioner set-up locations require level areas to allow for maneuvering of the equipment. When possible, these locations would be located on existing level areas and existing roads to minimize the need for grading and cleanup.

The puller and tensioner set-up locations would be temporary and the land would be restored to its previous condition following completion of pulling activities. The final number and locations of the puller and tensioner sites will be determined during final engineering.

At the towers where the segments terminate, the OPGW cables are routed down a tower leg where the segments are spliced together. For splicing OPGW cables, special splicing lab vehicles would be used to travel to the various splicing locations. The area required for each splicing crew would be 30 feet by 40 feet. The crew would bring the OPGW cable ends into the special splicing lab vehicles and splice together the two ends. The splices are then transferred to and housed in a splice box (a 3’x3’x1’ metal enclosure) that is mounted to one of the tower legs some distance above the ground. On the last tower at each end of a transmission line, the overhead fiber is spliced to another section of fiber cable that runs in underground conduit from the splice box into the communication room inside the adjacent substation.

The modifications of the existing 500kV LSTs, removal of existing OHGW, and installation of the OPGW will require the establishment of approximately 3 to 5 temporary marshalling yards located at strategic points along the route.

Each yard would be used as a reporting location for workers and may have offices for supervisory and clerical personnel; the yards will also be used for the storage and staging of materials, the parking of private vehicles, and the parking of construction vehicles and equipment. Each yard would be approximately 2.5 to 5.0 acres in size, depending on land availability and intended use. Preparation of the marshalling yards may include the application of road base, depending on existing ground conditions at the yard site, and the installation of perimeter fencing.

Crews would load materials onto work trucks and drive to the line position being worked on that specific day. At the end of the day, they would return to the yard in their work vehicles and depart in their private vehicles. Materials stored at the marshalling yards would include:

- Construction trailers
- Construction equipment
- Steel
- Wire reels
- Wood poles
- OPGW cable
- Hardware

- Signage
- Consumables, such as fuel and joint compound
- Storm Water Pollution Prevention Plan (SWPPP) materials; such as straw wattles, gravel, and silt fences
- Portable sanitation facilities
- Waste materials for salvaging, recycling, and/or disposal

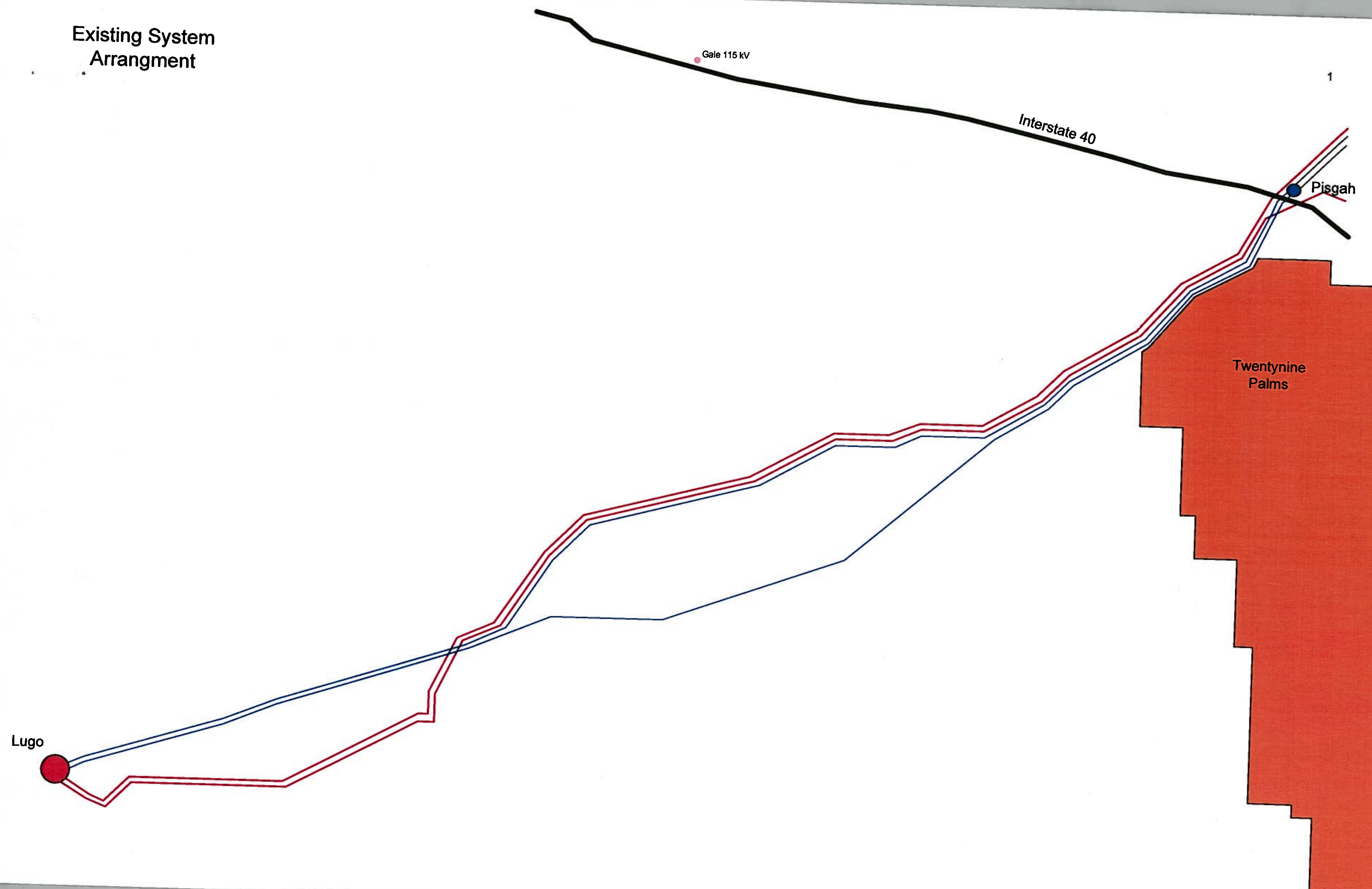
In addition to the primary marshalling yards, approximately 4 to 8 temporary secondary material staging yards would be established for short-term utilization near construction sites. Where possible, the secondary staging yards would be sited in areas of previous disturbance along and/or adjacent to the transmission line ROW. Typically, an area approximately 1 to 3 acres would be required. Preparation of the secondary staging yards may include installation of perimeter fencing and the application of road base, depending on existing ground conditions at the yard site. Land disturbed at the temporary material staging areas, if any, would be restored to preconstruction conditions or to the landowner’s requirements following the completion of construction.

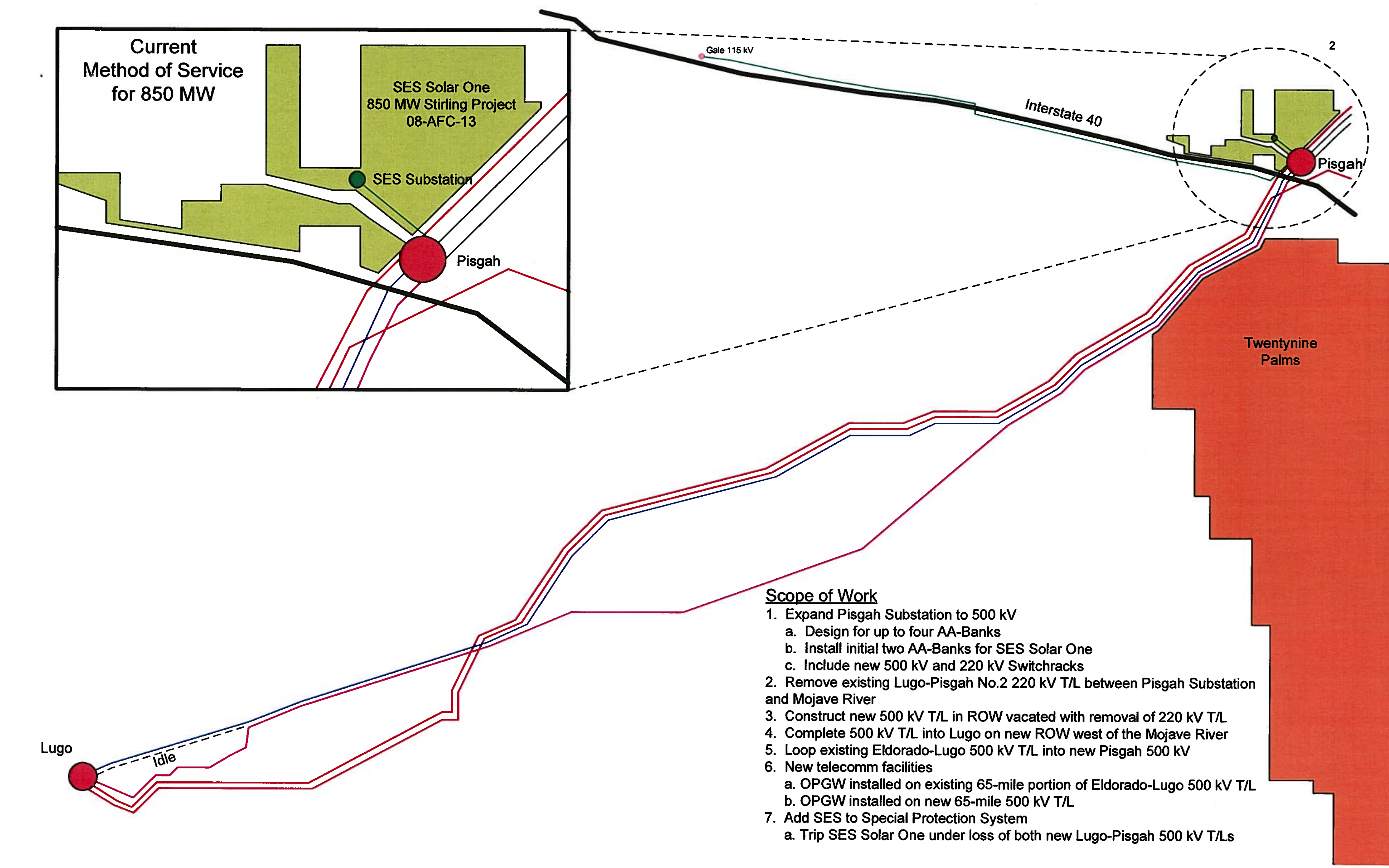
The location, size, and total number of the temporary marshalling yards and temporary secondary material staging yards are not know at this time. The selection of the location and size of these yards will be dependent upon a detailed ROW inspection and will take into account, where practical, suggestions by SCE Crew Foreman or the SCE Contractor selected to do the work, and the availability of appropriately zoned property.

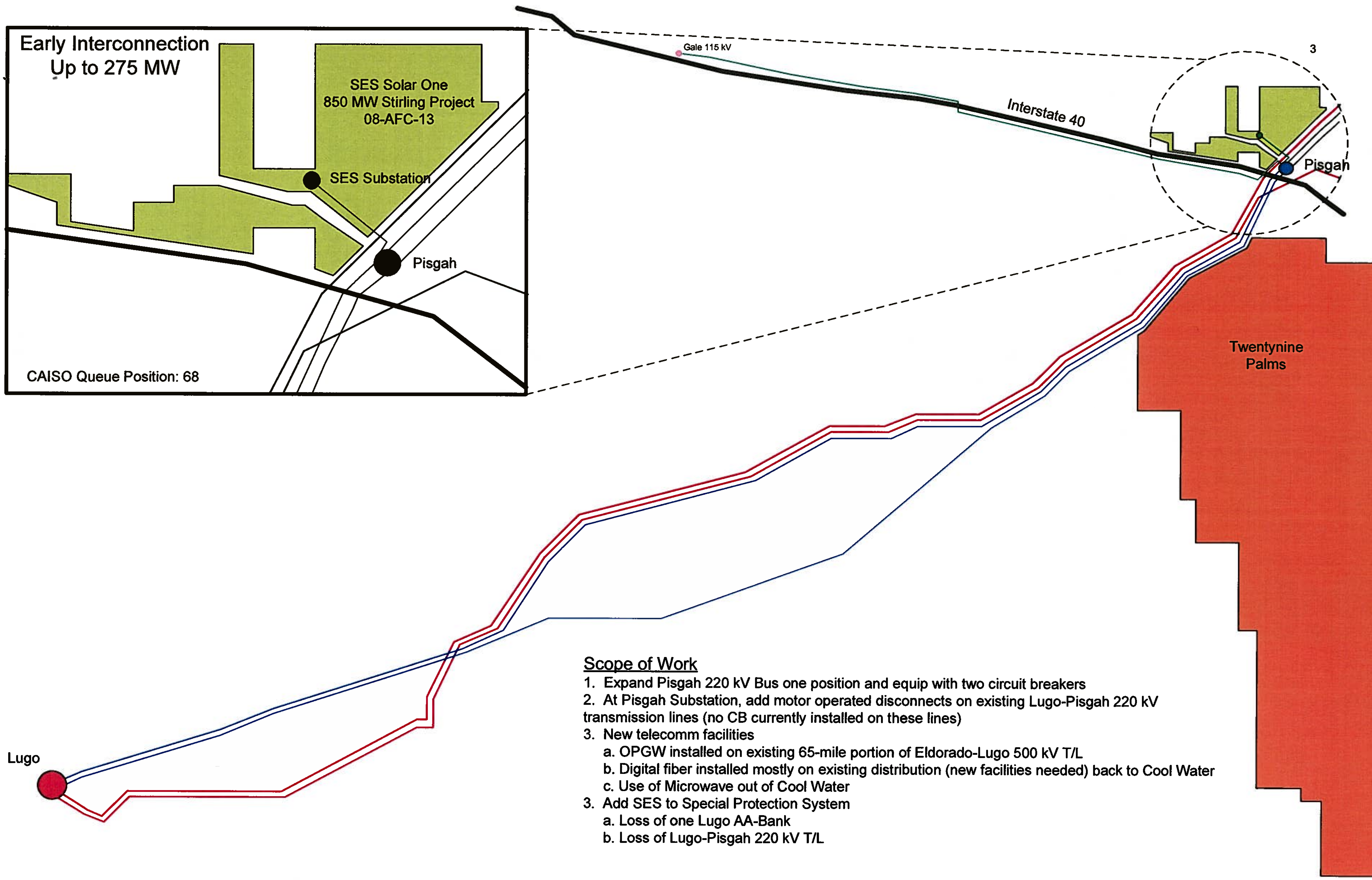
Environmental Analysis - Summary of description, impact, and mitigation

SCE assumes the CEC and BLM will provide direction with respect to performing an environmental analysis for the project elements described in the previous sections based on assumed impacts associated with the construction of the SES Solar One 275 MW early interconnection.

Existing System Arrangment

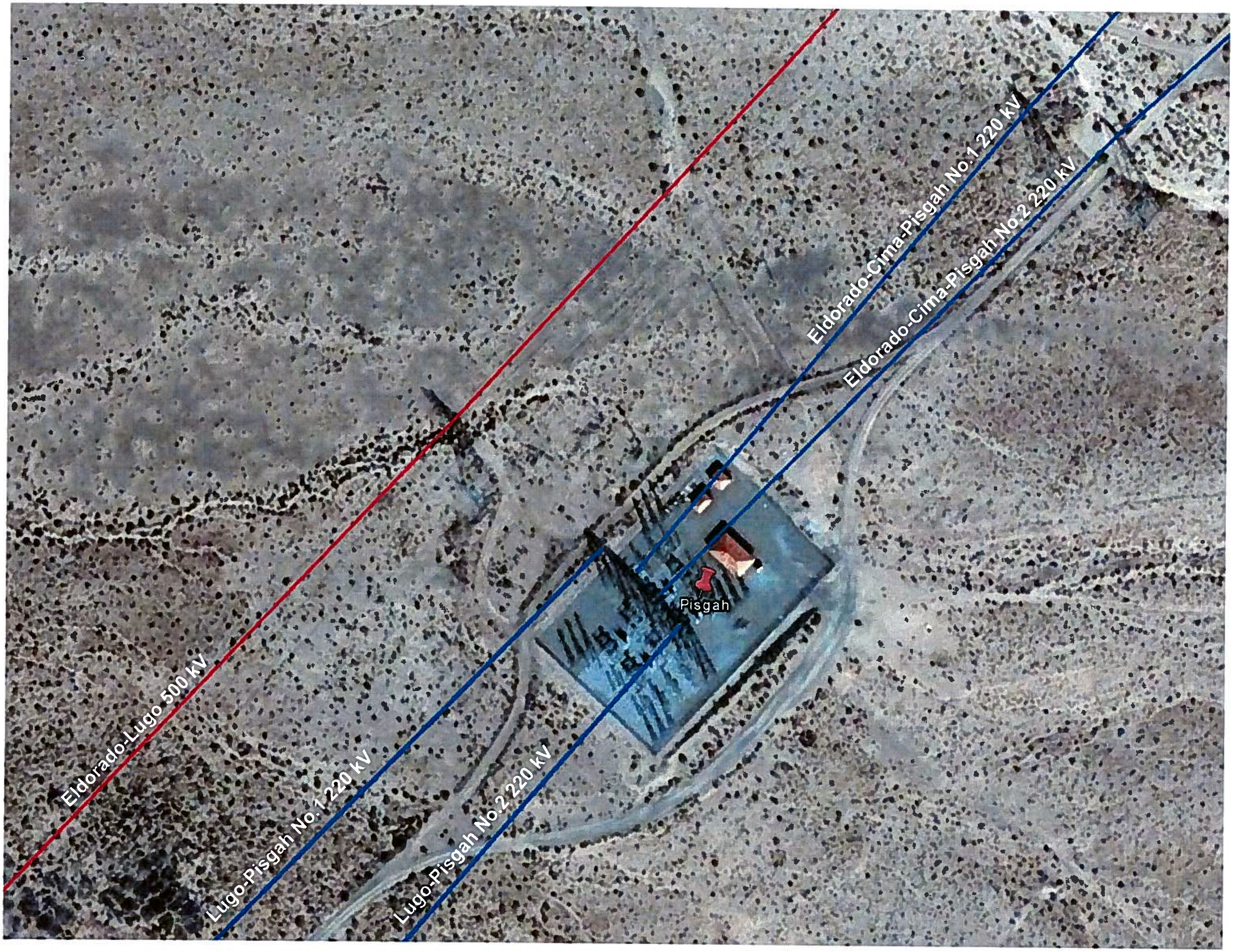



Current
Method of Service
for 850 MW
SES Solar One
850 MW Stirling Project
08-AFC-13
SES Substation
Pisgah
Gale 115 kV
Interstate 40
2
Pisgah
Twentynine
Palms
Lugo
Idle
Scope of Work
1. Expand Pisgah Substation to 500 kV
a. Design for up to four AA-Banks
b. Install initial two AA-Banks for SES Solar One
c. Include new 500 kV and 220 kV Switchracks
2. Remove existing Lugo-Pisgah No.2 220 kV T/L between Pisgah Substation and Mojave River
3. Construct new 500 kV T/L in ROW vacated with removal of 220 kV T/L
4. Complete 500 kV T/L into Lugo on new ROW west of the Mojave River
5. Loop existing Eldorado-Lugo 500 kV T/L into new Pisgah 500 kV
6. New telecomm facilities
a. OPGW installed on existing 65-mile portion of Eldorado-Lugo 500 kV T/L
b. OPGW installed on new 65-mile 500 kV T/L
7. Add SES to Special Protection System
a. Trip SES Solar One under loss of both new Lugo-Pisgah 500 kV T/Ls



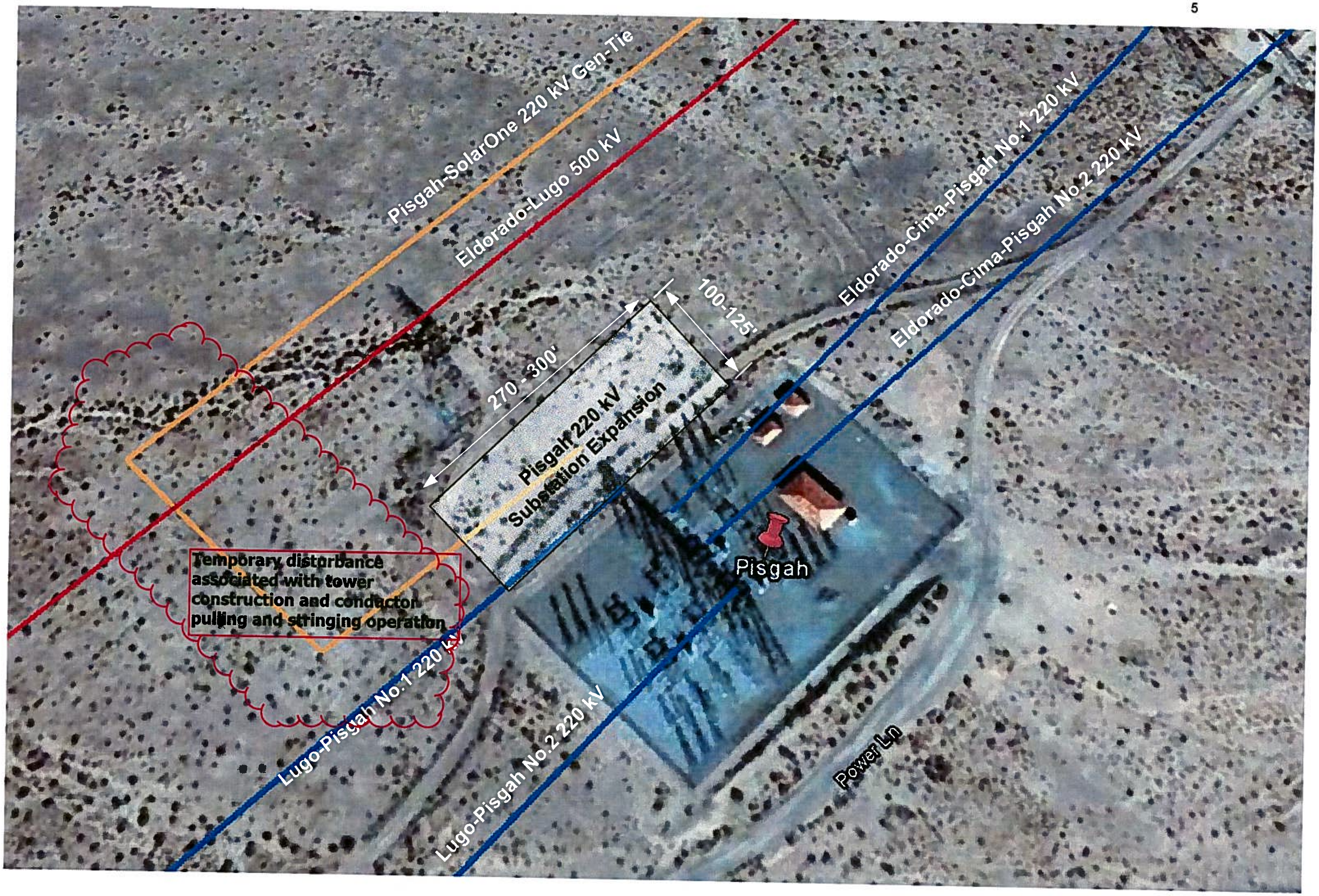
<u>Scope of Work</u>

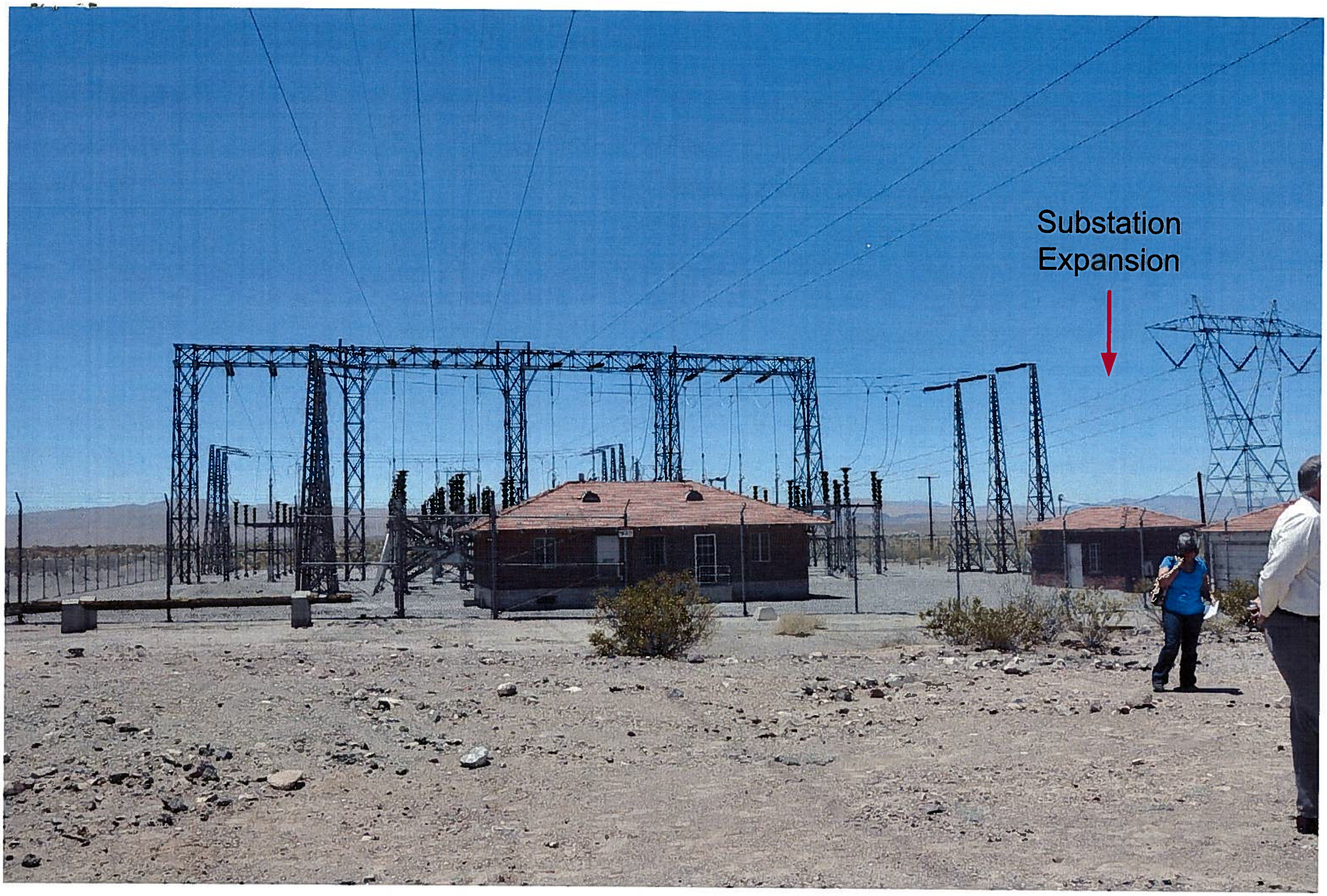
1. Expand Pisgah 220 kV Bus one position and equip with two circuit breakers
2. At Pisgah Substation, add motor operated disconnects on existing Lugo-Pisgah 220 kV transmission lines (no CB currently installed on these lines)
3. New telecomm facilities
   a. OPGW installed on existing 65-mile portion of Eldorado-Lugo 500 kV T/L
   b. Digital fiber installed mostly on existing distribution (new facilities needed) back to Cool Water
   c. Use of Microwave out of Cool Water
3. Add SES to Special Protection System
   a. Loss of one Lugo AA-Bank
   b. Loss of Lugo-Pisgah 220 kV T/L



Eldorado-Lugo 500 kV
Lugo-Pisgah No.1 220 kV
Lugo-Pisgah No.2 220 kV
Eldorado-Cima-Pisgah No.1 220 kV
Eldorado-Cima-Pisgah No.2 220 kV
Pisgah

ATTACHMENT A




Substation
Expansion

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 SES SOLAR ONE PROJECT

Docket No. 08-AFC-13

PROOF OF SERVICE
(Revised 12/2/09)

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*indicates change

DECLARATION OF SERVICE

I Corinne Lytle , declare that on December 23, 2009 I served and filed copies of the attached SCE Project Description for Solar One 275 MW Early Interconnection. 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/solarone].

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:

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

_____ by personal delivery or by depositing in the United States mail at ____________ 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:

_____ 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. 08-AFC-13
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.

original signed by

____

Corinne Lytle

*indicates change