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3.0 CONSTRUCTION PROCEDURES

3.1 CONSTRUCTION TIMING (PHASING)

3.1.1 Processing Facilities and Utilities

The Project will be implemented in phases to maximize efficiency and help moderate construction and operational peak activity levels. The majority of the processing facility construction for the field redevelopment will occur in two major phases; Phase I and Phase II.

Phase I plant and infrastructure construction will take place in the years preceding the first steam injection (“Year -3” through “Year -1”) and continue into Year 1 (first year of steam injection). Phase I will include the site preparation, grading, and installation of the following:

- Portions of the steam generation site including three 85 million British thermal units/hour thermal enhanced oil recovery once through steam generators;
- One 62.5 million British thermal units/hour produced gas once through steam generator;
- One emergency flare;
- Production group station including two de-gassing vessels;
- Portions (one processing train) of the central processing facility processing equipment;
- Oil storage, metering, and trucking facilities;
- 115 kilovolt electrical transmission line connection, existing substation improvements, and new onsite substation; and
- Natural gas pipeline.

Phase II plant and infrastructure construction will take place in Year 4 and Year 5 and will include installation of the following:

- Remaining equipment at the steam generation site including three 85 million British thermal units/hour thermal enhanced oil recovery once through steam generators; and
- Remaining equipment (second processing train) at the central processing facility.

3.1.2 Field Infrastructure

Grading of well pads and roadways, installation of intra-field gathering and distribution pipelines, installation of intra-field electrical distribution, well drilling and completion, and well hookups will occur throughout a multi-year field infrastructure program beginning in Year -2 (Phase I) and continuing through Year 30 (Phase II). The major Project construction tasks and their anticipated timeframes are depicted in Figure 3.1-1 – Construction Schedule Overview (Note: Figure has been revised for consistency with updates to Table 3.2-1).
### 3.2 EQUIPMENT AND PERSONNEL REQUIREMENTS

Table 3.2-1 – Equipment and Personnel - Peak Estimates provides an annualized summary of anticipated equipment and personnel requirements during construction for each of the major Project components (processing facilities, field infrastructure, and utilities). Equipment and personnel requirements vary throughout the course of any given year and across the life of the Project; therefore, peak year counts and timing are provided.

**Table 3.2-1. Equipment and Personnel - Peak Estimates**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Proposed Timing</th>
<th>Year of Peak Timing</th>
<th>Peak Monthly Count</th>
<th>Peak Monthly Hours&lt;sup&gt;1&lt;/sup&gt;</th>
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<tr>
<td>Project Site Access</td>
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<tr>
<td>Processing Facilities Pad Grading</td>
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<td>26</td>
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<tr>
<td>Central Processing Facility and Production Group Station Construction</td>
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<td>-2 through -1</td>
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<tr>
<td>Steam Generation Site Construction</td>
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<td>(except 1)</td>
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<tr>
<td>Well Hookups&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>Fresh Water Pipeline</td>
<td>-2</td>
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<sup>1</sup> Work Schedule assumes six days/week, ten hours per day. Hours were calculated based on an average of 4.5 weeks per month.

<sup>2</sup> Well Drilling and Well Hookups are reported as total labor hours and total equipment hours in the peak month.

Source: Aera Energy LLC, 2014 (table has been revised for consistency with Air Quality Impact Analysis)
### CONSTRUCTION SCHEDULE

#### OVERVIEW

**Project Name:** EAST CAT CANYON OIL FIELD REDEVELOPMENT PROJECT  
**Project Number:** 1002-0455  
**Date:** August 2015

<table>
<thead>
<tr>
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</table>

**Notes:**
- In-field Electrical Distribution installation continues through Year 10.
- Well Drilling and Well Hookup construction activities continue through Year 20.
3.3 PROJECT SITE ACCESS AND STAGING AREAS

The primary Project site entrance is located at 6516 Cat Canyon Road. Vehicles and equipment entering the Project site travel across Cat Canyon Creek via an existing culvert crossing located just outside of the Aera property boundary. As proposed, the Project will utilize the existing crossing during the initial Project construction (Phase I; Year -3), while concurrently constructing a new Project site entrance located approximately 300 feet northwest (downstream) of the existing entrance. The new Project site entrance is being developed to safely enable two-way traffic into and out of the Project site. This existing Project site entrance will remain in place following construction of the new Project site entrance across Cat Canyon Creek. The Project will also include improvements to a secondary access located along Long Canyon Road, on the eastern boundary of the Project site. The Long Canyon Road entrance will be available for construction, operational and emergency vehicle access only. The Long Canyon Road entrance will also be constructed during the initial Project construction (Phase I; Year -3). During Phase II, two smaller east side entrances from Long Canyon Road will be constructed to provide adequate access to new well pads. These smaller entrances are expected to utilize “Arizona” swale crossings over a shallow drainage area. Creating three entrances on the east side maximizes the use of the existing roadway (Long Canyon) and minimizes disturbance. Refer to Section 2.2.4 for additional details regarding Project site entrances.

The two main Project site entrances will be connected via a primary site access road, which will be graded and paved concurrently with site entrance construction activities (Phase I; Year -3 through Year -2). This primary roadway allows for construction and operational access to the processing facility locations and construction staging areas. Construction staging for the processing facilities and field infrastructure (including well drilling program) will occur entirely on the Project site and has been considered within the design of the Project (Figure 3.3-1 – Project Site Access and Staging Areas).

3.4 PROCESSING FACILITIES

3.4.1 Construction Methodology

Initial grading for the three primary processing facilities pads (e.g., central processing facility, production group station, and steam generation site), will occur in Phase I (Year -3 through Year -2), prior to the first steam injection. Construction of the processing equipment within each facility will be divided by Project phase, as identified within Figure 3.4-1 – Central Processing Facility- Equipment Installation by Phase and Figure 3.4-2 – Steam Generation Site- Equipment Installation by Phase. Detailed equipment information for each processing facility site is located in Appendix B – Supporting Technical Documents.

The following paragraphs outline construction procedures associated with grading and installation of the processing facilities. Procedures associated with construction of field infrastructure (i.e., well pad and roadway grading, well drilling and completion, intra-field electrical distribution) and utilities (i.e., natural gas pipeline, electrical transmission service, etc.) are covered in later sections.
1. Staging - Material and equipment will be gathered on-site.

2. Inspection - Material and equipment will be inspected for quality assurance. Construction equipment will be verified to meet applicable environmental regulations. Equipment operators and field workers will be verified to possess the proper qualifications.

3. Civil - Soil will be graded and excavated. Concrete equipment foundations, pipe supports, pads and containment will be poured. New road and truck pull-in area will be paved.

4. Equipment - Major vessels and equipment will be set on foundations.

5. Supports - Pipe supports will be installed.

6. Plant Piping - Piping, valves and instrumentation will be installed between equipment and vessels. Welds will be radiographed and connections strength tested.

7. Electrical - Electrical panels, conduit, and power wiring will be installed.

8. Instrumentation - Instrumentation signal wiring and tubing will be installed. Terminations will be made at the instrumentation and connections will be tested.

9. Corrosion Control - Piping and non-galvanized structural steel will either be insulated or primed and painted. Buried steel piping will be coated or wrapped with protective coatings. Cathodic protection will be used to protect buried steel piping from external corrosion. Insulating kits will be used to isolate above-ground from buried piping.

10. Start-Up Preparation - All valves and instrumentation will be put in normal operating positions/modes for start-up. All safety devices will be checked for proper operation.

11. Personnel Training - Operators, mechanics and instrument mechanics will be trained to operate and maintain the plant.

12. Start-Up - Plant will be started and tested for proper operation. Any problems or issues will be resolved.

13. Operation - Normal operation will commence.

3.5 FIELD INFRASTRUCTURE

Development of field infrastructure includes grading of well pads and roadways, installation of intra-field gathering and distribution pipelines, installation of intra-field electrical distribution, well drilling and completion, and well hookups. Field infrastructure construction activities will occur over a multi-year program throughout Phases I and II (Figure 3.1-1 – Construction Schedule Overview).
FIGURE 3.3-1

Source: County of Santa Barbara, TJCross 8-20-2014, DPSI 2013 Land Survey
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Notes: This map was created for informational and display purposes only.

Aera Energy LLC Property

Laydown Areas

Project Footprint
Phase I
Primary Site Access Road
Phase II

EAST CAT CANYON OIL FIELD REDEVELOPMENT PROJECT

PROJECT NUMBER: 1002-0455
DATE: September 2014

PROJECT SITE ACCESS AND STAGING AREAS
3.5.1 Well Pads and Roadways

3.5.1.1 Construction Methodology

The following paragraphs summarize the sequence of general construction procedures associated with the grading and installation of wellpads and associated access roadways.

**Preliminary Activities.** Before construction commences, a detailed geotechnical investigation will be performed to identify subsurface conditions which will dictate the final engineering design work. Construction specifications will be developed based on site-specific data (e.g., geotechnical information, site topography, environmental limitations, etc.) and on established sets of construction and testing standards such as the American Society for Testing and Materials, Construction Standards Institute, American Society for Civil Engineers, etc. Aera maintains a robust Quality Assurance/Quality Control Program to ensure that design and construction standards and specifications are customized to site-specific conditions and comply with all applicable Federal, State and local codes and good industry practice.

**Site Preparation and Mobilization.** Site preparation and mobilization activities include the installation of temporary construction trailers, material and equipment deliveries, installation of temporary electrical power, and installation of erosion and sediment control measures, exclusion fencing, and signage. Site surveys will be conducted to stake out the line and grade of subgrade.

**Clearing and Grubbing.** Areas within the surveyed Project disturbance limits will be cleared of all vegetation and other deleterious material utilizing heavy equipment. Where appropriate, vegetation will be chipped and utilized for soil stabilization on slopes less than ten percent.

**Roadway and Well Pad Construction.** Road and pad locations will be rough graded and compacted, balancing excavation and embankment volumes of soil (to the extent feasible) to within rough grade tolerances (typically .20 feet to .30 feet of finished subgrade). Subgrade (soil surface) will then be fine graded with motor graders and compacted with smooth drum rollers to design specifications. Once the subgrade is complete, secondary roads will be capped with beneficial re-use materials (road mix). For primary service roads, aggregate road base will be imported and placed on the finished subgrade to rough grade tolerances with motor graders or scrapers. This will be followed by fine grading the aggregate road base with motor graders and compacted with smooth drum rollers to design specifications. Earthwork will be completed utilizing conventional equipment (e.g., dozers, loaders, scrapers, motor graders, excavators, sheep’s foot compactors, smooth drum rollers, water trucks, etc.).

**Final Surfacing.** An asphaltic emulsion tack coat will be sprayed on the finished road base surface at locations designated for asphalt paving. Hot mix asphalt concrete will then be imported and spread with a paving machine. Asphalt concrete will then be compacted with smooth drum/pneumatic rollers to design specifications.
3.5.2 Well Drilling and Completion

Well drilling and completion and well-related infrastructure will occur over a multi-year program from “Year -2” through “Year 30” in support of production operations (Figure 3.1-1 Construction Schedule Overview; Figure 3.5-1 – Well Types and Locations\(^1\)).

3.5.2.1 Pad Area and Drilling Rig

Well locations have been carefully selected to minimize disturbance by reusing existing well pads, where feasible, and to most effectively produce oil from the subsurface reservoir. Well pads have been designed to minimize the amount of surface disturbance while meeting the technical constraints of drilling and operation of the wells and containment requirements for spill and storm water runoff management. Approximately 72 well pad locations are proposed, ranging in size from approximately 16,077 square feet for lower density well sites to 306,499 square feet for pads encompassing multiple wells. Approximately 189.5 acres (including 52.7 acres or 27.8 percent of existing disturbed areas) will be permanently used and maintained for well pads during the life of the Project assuming all drilled wells become permanent wells (Table 2.2-1 – Estimated Project Disturbance Area).

The majority of the wells drilled at the Project site will be directionally drilled from multi-well pad locations. This will require the wells to be slightly angled but will reduce total pad “footprint” and the associated required grading. On the multi-well pads, an approximate distance of 25 to 50 feet will be maintained between adjacent wells to allow room for pumping units and well servicing equipment (Figure 3.5-2 – Typical Well Surface Equipment). The drilling rig will have a 90-foot tall mast. This allows the drilling rig to move 80-foot sections of casing, or two joints at one time. This is commonly referred to as a “doubles” drilling rig. Well pads have been designed to accommodate a doubles drilling rig and its associated equipment (Figure 3.5-3 - Typical Rig Layout). In addition to the drilling equipment footprint, the drilling location must also allow for movement and equipment associated with cementing, well completions, logging, and forklift operations.

Drilling rigs will operate 24 hours per day while drilling. A rig equivalent to the Golden State Drilling #14 rig (cantilever model; hydraulically raised) will be used for drilling the wells. The Golden State Drilling #14 or equivalent rig will have a 90 foot tall mast which sits on the drill rig floor. The drill rig floor will sit approximately 14 feet off the ground. Details on Golden State Drilling #14 are included in Appendix O – Drilling Rig Specifications. Additional drilling equipment will include: fluid handling equipment, waste storage containers, mud handling system, blow out prevention equipment, spill prevention equipment, hydrogen sulfide detection equipment, two mud pumps, active mud tank, two mud docks and storage, pipe trailer, pipe racks, water tank, mud logging unit, forklift, cuttings bin, cat walk, and trailer (“dog house”). Note, the equipment listed is for a typical drilling operation, the exact equipment list and layout may vary depending on the specific well to be drilled.

No Project wells of any type will be hydraulically fractured.

\(^1\) Due to their inactive status, Aera has decided to remove water wells Bonetti-WS1 and McCroskey-WS11 from the Project design. These wells have been removed from Figure 3.5-1; however, the proposed freshwater pipelines to these wells remain as part of the Project footprint and are included in all pertinent impact calculations within Section 4.0 (Environmental Analysis).
This map was created for informational and display purposes only.

Source: County of Santa Barbara, TJCross 8-20-14, DPSI 2013 Land Survey
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
Notes: This map was created for informational and display purposes only.

OIL FIELD REDEVELOPMENT PROJECT

PROJECT NAME: EAST CAT CANYON
PROJECT NUMBER: 1002-0455
DATE: February 2015

WELL TYPES AND LOCATIONS

- Aera Energy LLC Property
- Surface Well Locations
- ✦ Fresh Water Well
- △ Observation Well
- Production Well
- Upper Sisquoc Water Production Well
- Steam Injection Well
- Upper Sisquoc Water Injection Well

FIGURE

3.5-1
PRODUCTION WELL

STEAM INJECTION WELL

FRESH WATER WELL

SISQUOC WATER INJECTION WELL

SISQUOC WATER PRODUCTION WELL
3.5.2.2 Construction Methodology

The planned drilling and production operations will be performed in accordance with onshore well regulations (Subchapter I, Chapter 4, Division 2, Title 14 of the California Code of Regulations, beginning with section 1712). These regulations apply statewide and are enforced by the California Division of Oil, Gas, and Geothermal Resources. All drilling and completion activities will be designed to minimize adverse impacts to the environment in accordance with good oilfield practices.

Additionally, each well to be drilled requires that a “Notice of Intent to Drill” and drilling program be submitted to the California Division of Oil, Gas, and Geothermal Resources for approval.

The construction and drilling of an oil and gas well requires multiple steps. Prior to the drilling rig arriving on location, a conductor pipe is installed with diverter valves on it. These valves allow any fluid that flows into the wellbore to be diverted and controlled. The drilling rig and supporting drilling equipment is then set up on location and the drilling process begins. A drill bit is placed into the conductor pipe and drilling begins. This is called the “spud” of a well.

To progressively deepen the wellbore, a downward force must be exerted on the drill bit. This downward force is provided by the drill pipe that is attached to the drill bit. As the bit continues to drill downward, more pipe is attached on top thereby increasing the weight on the bit. The drill bit rotates as it moves down the wellbore. The rotating action is produced by a rotary table, top drive, or motor; depending on which drilling rig type is being utilized.

Rock cuttings are generated as the drill bit spins on the rock formation it is drilling through. These cuttings must be removed from the wellbore by drilling fluids (drilling mud). The drilling fluids are pumped through the drill pipe, out of the openings in the drill bit and then back up between the space between the drill pipe and the hole (this is referred to as the annulus). The mud handling equipment at the surface separates the cuttings from the mud, and recycles the mud to be used again. In addition to circulating the drill cuttings, drilling mud provides lubrication and cooling to the drilling bit and well control by changes to the drilling mud weight.

Once the wellbore is drilled to a specified depth, the drill pipe is pulled out of the hole and casing is installed. Casing is pipe that is permanently installed in the wellbore to stabilize the hole, prevent entry of wellbore fluids, and help to prevent the exit of drilling muds out of the wellbore. Once the casing has been run to the specified program depth, it is then cemented in place. Cement is pumped down the inside of the casing string and circulated up the annulus. Cement volumes are calculated by the hole and casing geometry plus a specified excess percentage. For this Project, casing and cementing specifications will follow the requirements of the California Division of Oil, Gas, and Geothermal Resources Field Rule # 307-026, which regulates drilling and completion activities in the Cat Canyon Field, East Area. Cement volumes are always greater than the annulus volume. Cement is displaced down the inside of the casing by water and a rubber wiper plug. The wiper plug ensures cement is being displaced sufficiently and doesn’t allow for water to channel through the cement. This helps to ensure the wellbore will have a secured casing shoe. Water displaces the plug and cement down the inside of the casing string until the wiper plug reaches the insert valve. Once the wiper plug reaches the insert valve the displacement pressure increases significantly which signifies the cement has been displaced.
to the proper depth. The insert valve ensures that cement stays in place and does not "U" tube back into the casing string. The cement then sets, sealing the outside of the casing to the wellbore.

A smaller drill bit is then placed into the wellbore and the well is drilled deeper. This process continues with subsequently smaller drill bits and smaller casing strings being installed until the completion depth is reached. For the Project site wells, three casing strings will be installed: a conductor casing, a surface casing to cover the base of fresh water and a production casing string. In the oil production wells a production liner will also be installed and suspended off of the production casing.

Completions are typically considered a “cased” hole completion or a “liner/screen” completion (Figure 3.5-4 - Well Schematics for Oil Production and Steam Injection Wells), as defined below. The oil production wells and fresh groundwater wells will utilize an liner/screen completion; all other well types will be a cased hole completion.

- Cased hole completion. The casing is perforated with holes to allow produced fluids to flow into the wellbore or allow injected fluids (steam) to flow into the formation.
- Liner/screen completion. A piece of slotted pipe is suspended off of a cemented casing string and extends into the producing formation. The produced fluids enter the wellbore and flow into the liner through the slots. Some liner/screen completions utilize a sized gravel pack for sand control. Gravel sand is pumped in the annulus of the production liner and then tightly packed into place. This keeps the liner/screen interval stable and acts as a filter for formation sand trying to enter the wellbore.

Throughout the drilling process tests are performed to ensure the integrity of the wellbore. Pressure tests are done on each casing string to confirm that the cement is solid and the casing string can hold pressure. Prior to cement casing strings, well logs are run to gather information to better understand the formations and pressures that are present in the wellbore. The proposed drilling programs for both a liner/screen completion and a cased hole completion are outlined in Table 3.5-1 – Proposed Drilling and Completion Programs.

### Table 3.5-1. Proposed Drilling and Completion Programs

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<thead>
<tr>
<th>Liner/Screen Completion</th>
<th>Cased Hole Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct a drilling pad</td>
<td>Construct a drilling pad</td>
</tr>
<tr>
<td>Set a conductor pipe</td>
<td>Set a conductor pipe</td>
</tr>
<tr>
<td>Move in and set up the drilling rig</td>
<td>Move in and set up the drilling rig</td>
</tr>
<tr>
<td>Directionally drill to beneath the base of fresh water</td>
<td>Directionally drill to beneath the base of fresh water</td>
</tr>
<tr>
<td>Run and cement a casing string at the base of fresh water</td>
<td>Run and cement a casing string at the base of fresh water</td>
</tr>
<tr>
<td>Install blowout prevention and test blowout prevention and casing string to 500 pounds per square inch</td>
<td>Install blowout prevention and test blowout prevention and casing string to 500 pounds per square inch</td>
</tr>
</tbody>
</table>
### Liner/Screen Completion
- Directionally drill to the top of the Brooks sand
- Run and cement casing string to the top of the Brooks sand
- Install blowout prevention and test blowout prevention and casing string to 1,000 pounds per square inch
- Directionally drill to the base of the Brooks sand
- Run well logs on Wireline
- Run a perforated liner and other subsurface completion equipment
- Run tubing with pump barrel or hold down, load well with completion fluid(s)
- Install wellhead equipment
- Secure well

### Cased Hole Completion
- Directionally drill to the base of the Brooks sand
- Run well logs on Wireline
- Run and cement a casing string from surface to the base of the Brooks sand
- Install wellhead tree
- Secure well
- Perforate well in the target zone prior to steam injection

#### 3.5.2.3 Well Drilling Fluids and Cuttings Disposition

The drilling process will use a water-based drilling mud system. The primary components of this mud system are gel and water. A water-based polymer will be used to provide viscosity in lifting cuttings and help prevent fluid loss to the formation. On average, the drilling process will produce up to 270 barrels of mud and 60 barrels of cuttings per day. Injection wells take approximately 6.2 days to drill, resulting in 1,674 barrels of mud and 372 barrels of cuttings per well. Production wells take approximately 8.6 days to drill, resulting in 2,322 barrels of mud and 516 barrels of cuttings per well. The drilling fluids and cuttings will either be re-used on-site (i.e., cuttings may be used on-site for fill and road base material) or solidified and then transported offsite to an approved facility for recycling or disposal.

#### 3.5.2.4 Hydrogen Sulfide Monitoring

Hydrogen sulfide gas is known to occur in the Brooks and overlying formations. The Aera “Hydrogen Sulfide Policy” will be followed throughout the drilling operations. The Hydrogen Sulfide Policy addresses monitoring equipment requirements, personnel responsibilities, first aid, and evacuation procedures. Continuous ambient air monitoring for both hydrogen sulfide and lower explosive limits will be in effect for the entire drilling process.

#### 3.5.2.5 Blowout Prevention Equipment

Blowout prevention systems are safety systems that are used in the drilling of an oil and gas well. These systems prevent the uncontrolled release of reservoir fluids and shut off flow to prevent spills and material releases.
A blowout prevention system consists of a stack, actuation systems, a choke manifold, kill systems and other equipment. Blowout prevention equipment will be used during drilling and removed once the well has been completed and secured.

Blowout prevention equipment will conform to the California Division of Oil, Gas, and Geothermal Resources' publication M07 "Blowout Prevention Equipment in California, Equipment Selection and Testing" 2006 Edition.

3.5.2.6 Lighting System

The drilling operation will provide sufficient lighting to ensure safe working conditions. Vapor proof lighting and wiring will meet the California Division of Occupational Safety and Health specifications. Lighting will be placed as described in Section 2. The top of the derrick will have a red beacon to address potential aviation hazards.

3.5.3 Intra-Field Gathering and Distribution Pipelines

3.5.3.1 Construction Methodology

The Project includes installation of a system of on-site gathering and distribution lines for various co-located services, including production gathering, steam distribution, source water gathering, reservoir maintenance distribution, fuel gas distribution, softened water transfer, and separated produced gas (Figure 2.4-3 – Intra-Field Pipelines). The fresh water distribution system is discussed separately within Section 3.6 – Utilities.

The field gathering and distribution system has been designed to locate pipeline corridors primarily along roadways on raised pipe supports to minimize external corrosion. Construction sequencing/timing will be concurrent with the well pad and roadway development with the exception of the pipeway corridor leading from the central processing facility to the production group station and steam generation site. This corridor will not be located along roadways and construction will begin in Year -1.

The following paragraphs summarize the sequence of general construction procedures associated with the installation of intra-field pipelines.

**Mobilization and Staging.** Mobilization activities include the installation of temporary construction trailers, material deliveries, and equipment deliveries to the Project site. Project site access and staging areas, as described above, will be utilized for pipe materials. In addition to the staging area, pipe material will be strung along the pipeline alignment, as needed, just prior to installation. Construction equipment will be staged along the alignment and will progress with the pipe installation.

**Surveying, Staking and Flagging.** The centerline will be marked at line-of-site intervals, at points of intersection (including offset stakes marking the edges of the right-of-way), and at all known underground facilities. Other utilities will be identified through the use of pipeline locators and other appropriate means. In addition, any environmentally sensitive areas (e.g., biological, cultural, and/or hydrological resources) will be clearly marked, where appropriate, to restrict or monitor, as appropriate, construction activities and equipment in these areas.
FIGURE 3.5-4

EAST CAT CANYON
OIL FIELD REDEVELOPMENT PROJECT

PROJECT NUMBER: 1002-0455
DATE: September 2014

WELL SCHEMATICS FOR OIL PRODUCTION AND STEAM INJECTION WELLS

Source: Aera Energy LLC 2/2014
Clearing and Grading. Grading will be conducted as outlined in Section 3.5.1 regarding Project well pads and roadways. Where necessary, existing vegetation will be cleared and the construction right-of-way will be graded to provide safe and efficient operation of construction equipment. In general, the width of the cleared area will be minimized to avoid undue disturbance of adjacent resources.

Hauling and Stringing. The pipe will be hauled by truck to one of the staging areas. Cranes will then unload the pipe at the staging area and then load it onto stringing trucks to be delivered to the pipeline construction location and strung along the alignment just prior to installation. Once on the pipeline construction location, sideboom tractors will unload the joints of pipe, placing them along the alignment for future line-up, welding, and installation.

Pipe Bending, Welding, Inspection, and Coating. The pipe will be weld fitted and in some cases, may be bent in the field utilizing track-mounted pipe-bending equipment, which will progress with the pipe installation. Any bends that are required (i.e., to avoid substructures or changes in the alignment) can be determined, measured, and completed for installation. The pipe joints will be fitted together using external or internal line-up clamps. These clamps hold the ends of each pipe joint in position until at least 50 percent of the first welding pass (hot pass) is completed. Following the fitting crew, the welding crew will apply the remaining weld passes. All field welding will be performed by qualified welders in accordance with the American Pipeline Institute Standard 1104 (Welding Pipe Lines and Related Facilities) and applicable subsections of American Society of Mechanical Engineers B31 (Piping Code Section). All welds will be visually inspected and approximately ten percent of the welds will be radiographically (x-ray) inspected for quality assurance.

Pipeline Installation and Testing. The welded pipe segments or individual pipe lengths will be lifted and attached to pipe supports by sideboom tractors. In addition to standard mill testing of all pipe and fittings, hydrostatic testing will be performed after construction and before startup. All hydrostatic testing water will be reused, recycled, and/or discharged in a manner to minimize erosion and in accordance with all applicable permits. After the pipeline has been hydrostatically tested and dewatered, the contractor will run several utility pigs of various types to remove as much water as possible and any remaining small debris from within the pipeline. Debris is expected to be minimal; any remaining residue will be removed from the pipe during this procedure. All residual water or material will be collected in a tank and re-used or disposed of in accordance with local and state dewatering requirements.

3.5.4 Intra-Field Electrical Distribution

3.5.4.1 Construction Methodology

The intra-field electrical distribution system will be constructed concurrently with the well pad and roadway development with the exception of the overhead distribution line leading from the central processing facility to the production group station and steam generation site, which will be constructed in Year -1. Pole installation will include the following basic steps:

- Deliver new pole at pole site;
- Auger new hole using line truck attachment or hand dig if the line truck cannot access the site;
- Install bottom section; and
- Install top section.

Once poles are erected, conductor will be strung from conductor pull and tension sites at the end of the power line interconnection alignment. Reels of conductor and overhead shield wire will be delivered to the pulling and tensioning sites. These sites will be selected to avoid new grading and vegetation removal. The conductors and shield wires will be attached to the power poles and then pulled into place from these locations. Crews will then install insulators and sheaves. Sheaves are rollers attached to the lower end of the insulators at the end of each pole structure cross-arm. The sheaves allow crews to pull sock lines, which are rope or wire used to pull power line interconnection conductors into place. Once the equipment is set up, a light-weight vehicle will pull the sock line from one pole to the next. At each pole, the sock line will be hoisted to the cross-arm and passed through the sheaves on the ends of the insulators. Conductor will then be attached to the sock line and pulled through each supporting structure while under tension. Once each conductor is pulled into place, it is pulled to a pre-calculated sag and then tension-clamped to the end of each insulator. The final step of the conductor installation process is to remove the sheaves and install vibration dampers and accessories.

3.6 UTILITIES

3.6.1 Natural Gas Pipeline

The Project will require the installation of a new natural gas pipeline that will be designed, built, operated and maintained by the Southern California Gas Company. The proposed Project includes a 14-mile, 8-inch natural gas pipeline and associated facilities to provide 13 million cubic feet per day of natural gas delivery pressure of 50 to 300 pounds per square inch to the Project site. The new pipeline will be fed from the existing Southern California Gas Line 1010 at Divide Station along Graciosa Road and will terminate at the proposed central processing facility located in the southwest corner of the Project site (Figure 2.6-1 - Proposed Natural Gas Import Pipeline Route). Additional project description details are included in Appendix T – Southern California Gas Pipeline Project Description. The excavation and rights-of-way obtained may also be used to install other utilities such as communications lines.

3.6.1.1 Access and Staging Areas

The natural gas pipeline component of the Project will be accessed by existing public roadways and dirt roadways that intersect paved roadways adjacent to the route. No new roads will be constructed as part of this component of the Project and no existing roads will require additional grading or improvements for pipeline construction activities.

Southern California Gas Company has identified the need for approximately three staging areas to store pipe and provide a location for the contractor to stage equipment and materials during construction. The staging areas will be located in previously disturbed areas to the extent feasible. The size of each staging area will be contingent on available land, but will generally be kept to the minimum size necessary to facilitate construction of the Project. The approximate location of each staging area is provided in Table 3.6-1 – Natural Gas Pipeline Staging Areas.
Table 3.6-1. Natural Gas Pipeline Staging Areas

<table>
<thead>
<tr>
<th>Staging Area</th>
<th>Approximate Size</th>
<th>General Location</th>
<th>Nearest Station Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1 acre</td>
<td>Corner of Orcutt Road and Clark Avenue</td>
<td>170+00</td>
</tr>
<tr>
<td>B</td>
<td>1 acre</td>
<td>West of Dominion Road on the north side of Clark Avenue</td>
<td>424+00</td>
</tr>
<tr>
<td>E</td>
<td>1 acre</td>
<td>North side of Dominion Road</td>
<td>590+00</td>
</tr>
</tbody>
</table>

Additional workspace will be required to facilitate specialized construction techniques, such as horizontal directional drill, horizontal bores, and drainage crossings. The extra workspace will be used to store spoil and equipment needed to complete construction in areas where specialized techniques are required. Extra workspace is shown on the alignment sheets included in Appendix T (Attachment A).

3.6.1.2 Construction Methodology

Construction and installation of the natural gas pipeline will be achieved through a combination of conventional trenching, jack-and-bore, and horizontal direction drill methods [Figure 3.6-1 – Typical Pipeline Construction, Figure 3.6-2 – Typical Jack and Bore Work Area, Figure 3.6-3 – Typical Horizontal Directional Drill (First Pass), and Figure 3.6-4 – Typical Horizontal Directional Drill (Second and Third Pass)]. The sequence of construction activities for the natural gas pipeline component of the Project is described in detail in Appendix T and is summarized below.

Notifications. Notifications will be made to local permitting agencies, all property owners and tenants within 300 feet of the Project boundary, emergency response providers, and the general public (via signage, etc.). A detailed Traffic Control Plan will be included with the encroachment permit for the portions of the Project located within public roadways. The construction contractor will notify Underground Service Alert who will notify service providers of intended construction to prevent damage to existing utilities and resulting service disruptions to utility customers.

Mobilization and Staging. Mobilization activities include the installation of temporary construction trailers, material deliveries, temporary security fencing, and equipment deliveries to the job site. Prior to construction, the contractor will establish staging areas for materials and equipment storage as described above. Temporary power will be supplied to the staging areas by portable generators or through connections to nearby electrical lines, if available. In addition to the staging area, pipe material will be strung along the pipeline right of way, as needed, just prior to installation. Construction equipment will be staged along the route and will progress with the pipe installation.

Surveying, Staking and Flagging. The centerline will be marked at line-of-site intervals, at points of intersection (including offset stakes marking the edges of the right-of-way), and at all known underground facilities. Other utilities will be identified through the use of pipeline locators
and other appropriate means. In addition, any environmentally sensitive areas (i.e., biological, cultural, and/or hydrological resources) will be clearly marked, where appropriate, to monitor or restrict construction activities and equipment from these areas as appropriate.

**Clearing and Grading.** Minimal grading and topsoil removal is anticipated because the majority of the temporary construction easement occurs along the previously disturbed road shoulders. Where necessary, existing vegetation will be cleared and the construction right-of-way will be graded to provide safe and efficient operation of construction equipment. In general, the width of the cleared area will be minimized to avoid undue disturbance of adjacent resources.

**Hauling and Stringing.** The pipe will be hauled by truck to one of the staging areas. Cranes will then unload the pipe at the staging area and then load it onto stringing trucks to be delivered to the construction right of way and strung along the trench just prior to installation. Once on the right of way, sideboom tractors will unload the joints of pipe, placing them along the trench line for future line-up, welding, and installation.

**Trenching.** The typical trench will be approximately five feet deep and between two and five feet wide. The trench will be excavated using rubber-tired backhoes, ditching machines, and track excavators. Substructures will be exposed by potholing before using excavating equipment. Excavated soils may be preserved and used as backfill materials at the site of origin. Materials deemed unsuitable for backfill will be disposed of offsite in accordance with all applicable regulations. Trench dewatering will be required if groundwater infiltrates the pipeline trench. Discharge of trench water will be conducted according to all applicable laws, ordinances, and regulations. Excavated soil will be hauled offsite and excavations backfilled with clean fill.

**Horizontal Directional Drilling.** Horizontal directional drilling is a highly specialized boring technique that will likely be used to install the pipe beneath U.S. Highway 101 and Cat Canyon Creek. This method involves drilling along a vertical arc that will pass beneath the freeway and creek. The first step will involve drilling a fluid filled pilot bore. The pilot bore will then be enlarged by pulling a reamer back through the hole. The reamer will enlarge the size of the pilot bore, to that required for the pipeline. Lubrication containing water and bentonite clay, referred to as drilling mud, will be used to aid the drilling and to coat the walls of the borehole and maintain the opening. A wire line magnetic guidance system will be used to ensure that the angle, depth, and exit point abide by the detailed engineering plans. Once the hole is approximately six to 12 inches larger than the pipe, the pipeline will be pulled through the boring alignment.

**Jack and Bore.** Jack and bore tunneling will be utilized at road crossings, where required. This methodology includes excavating push-pits on each side of the crossing, using a boring machine to excavate a horizontal hole under the major structure, and inserting a steel casing or directly installing pipe sections.
Source: SPEC Services, Inc.
Notes: This figure is a generic depiction of the pipeline construction techniques that will be implemented at the Project site. Dimensions listed are not specific to the East Cat Canyon Oil Field Redevelopment Project and will not be reflected on Project construction plans.
Auger is in 10’ lengths, pit length is bore machine length plus work room plus multiples of 10’. Bore pits are typically 15 to 30’ wide.

1. Bore Machine
2. Entry Pit
3. Receiving Pit
4. Carrier Pipe
5. Carrier Stock Pipe
6. Welding Machine

Receiving pit is big enough to make tie-in weld.
**TYPICAL HORIZONTAL DIRECTION DRILL (FIRST PASS)**

**Source:** SPEC Services, Inc 2002

**The Technique...**

**Drilling the profile**
A small diameter pilot hole is drilled to a pre-determined path using a mud-motor or jet bit on the end of the pilot string. The pilot string is drilled up to 80 meters in length, then the washover pipe is advanced until it is approximately 30 meters behind the drill bit. Alternate pilot string and drilling operations take place until the exit point is reached.

**First Pass**

---

**Road, River, Canal and Rail crossings**

**Typical Application**
Enlarging the hole
Pre-reaming operations are carried out to enlarge the drilled hole to a size suitable for accepting the product pipe. Pull-back pipe is added behind the reamer. Depending upon the pipe diameter to be installed several pre-reamed operations may be necessary, each progressively enlarging the hole.

Second Pass

Installing the Pipe
The pull-back is connected to a ‘cleaning’ reamer which in turn connects to a swivel joint, (to prevent pipe rotation) that is attached to the pipeline towhead. The drill rig is then used to pull the product pipe into the preformed hole.

Third Pass

Source: SPEC Services, Inc 2002
Pipe Bending, Welding and Coating. The pipe will be bent in the field utilizing track-mounted pipe-bending equipment, which will progress with the pipe installation. Once the trench is excavated, any bends that are required (i.e., to avoid substructures or changes in the alignment) can be determined, measured, and completed for installation. The pipe joints will be fitted together using external or internal line-up clamps. These clamps hold the ends of each pipe joint in position until at least 50 percent of the first welding pass (hot pass) is completed. Following the fitting crew, the welding crew will apply the remaining weld passes. All field welding will be performed by qualified welders in accordance with the American Pipeline Institute Standard 1104 (Welding Pipe Lines and Related Facilities) and 49 Code of Federal Regulations 192. Although the pipe will be coated prior to delivery to the Project site, all coated pipe has an uncoated area three to six inches from each end to prevent the coating from interfering with the welding process. Once the welds are made, the field joint (i.e., the area around the weld) will be coated with an epoxy coating. New pipeline segments will be inspected to locate and repair any faults or voids in the pipeline coating prior to being lowered into the trench. In areas where the pipe is joined within the ditch, "bell holes" will be dug at each pipe joint to facilitate access for welding and joint coating application. These welds will typically be made in the ditch, with the pipe at its final elevation and alignment.

Weld Inspection. Although the applicable regulations only require radiographic inspection of a certain percentage of the circumferential welds, 100 percent of the welds will be radiographically inspected in accordance with 49 Code of Federal Regulations 192 and California Public Utilities Commission General Order 112-E. All radiographs will be recorded and interpreted for acceptability in accordance with American Petroleum Institute 1104. All rejected welds will be repaired or replaced as necessary and re-radiographed. The inspection reports will be kept for the life of the pipeline.

Line Lowering, Backfill and Compaction. The welded pipe segments or individual pipe lengths will be lifted and lowered into the trench by sideboom tractors. Cradles with rubber rollers or padded slings will be used so the tractors can lower the pipe without damaging the pipe’s protective coating. The native material excavated from the pipeline trench will either be reused as backfill or will be hauled offsite to an approved landfill, and clean, engineered fill will be imported for backfill. In addition, sand and rock-free soil may be imported to pad or shade the pipe prior to backfilling. These materials will come from a commercially available, local source. Once backfilling has been completed in public roads and streets, the backfill material will be compacted with compaction rollers and/or hydraulic tampers. It will then be compaction-tested to ensure that all trench locations are compacted in accordance with standard engineering practices and permit requirements. In areas where topsoil segregation is required, the topsoil will then be restored to its original grade and contour. All trenches will either be fenced, backfilled, or covered with steel plates at the end of each workday.

Aboveground Equipment Installation. The majority of aboveground equipment will be pre-fabricated at a staging area and then transported to the respective locations for final assembly and tie-in to the pipeline facilities. Valve and meter set assembly locations will be either paved or graveled. After installation, all above-grade piping and equipment will be painted and the valve will be enclosed by a chain-link fence.
Hydrostatic Testing. In accordance with U.S. Department of Transportation standards, the entire pipeline and the horizontal direction drilled segment will undergo hydrostatic testing prior to operation using water obtained from a local water source. The hydrostatic test water will be pumped into the test sections, pressurized to design-test pressure, and maintained at that pressure for a minimum of eight hours. Up to 150,000 gallons of water will be required to test the pipeline. The actual volume of water will be dependent on the number of test sections and the sequence of the test. The pipeline will likely be divided into two to three test segments. Once the test has been completed on the first segment, the water will be transferred into the second segment of pipe. Once the second segment (or third if three segments are used) test has been completed, the water used will be analytically tested and discharged, as approved by the Regional Water Quality Control Board and landowners. All hydrostatic testing water will be discharged in a manner to minimize erosion and in accordance with all applicable permits.

Pigging. Pipeline pigs are devices that are inserted into and travel throughout the length of a pipeline driven by a product flow. There are two types of pigs that will be used on this pipeline - smart pigs and utility pigs. Utility pigs are used to perform functions, such as cleaning or dewatering. Smart pigs (also called in-line inspection tools) provide information on the condition of the line, as well as the extent and location of any problems. After the pipeline has been hydrostatically tested and dewatered, the contractor will run several utility pigs of various types to remove as much water as possible and any remaining small debris from within the pipeline. Debris is expected to be minimal; any remaining residue will be removed from the pipe during this procedure. All residual water or material will be collected in a tank and disposed of in accordance with local and state dewatering requirements.

Cleanup and Restoration. For trench areas along roadways, restoration activities will generally commence within approximately 14 days of trench backfilling. All construction material and debris will be removed and disposed of at appropriate landfills or recycled. Within public roads, restoration of the paved surface will be completed in a timeframe and manner as required by the encroachment permit. Valve stations, as well as horizontal directional drill and bore locations, will require approximately six to eight weeks to complete. In upland areas, the right of way will be regraded to its approximate pre-construction contour and restored to pre-construction conditions, as specified by the property owner and in compliance with all relevant permits. All staging areas and temporary extra workspaces will be recontoured to pre-construction conditions and will be restored in accordance with prearranged landowner requirements. Soil will be decompacted and reseeded in accordance with the landowners' requests and applicable permits. All paving repairs will be made in accordance with current city and/or county requirements. As a final step, the route within unpaved portions of the roadway shoulder or private right of way will be marked with approximately five-foot-high line markers placed in accordance with U.S. Department of Transportation standards.

3.6.2 Electrical Transmission Line

The existing facilities on the Project site are currently being served electrical power from Pacific Gas and Electric Company’s distribution system via the Palmer Substation. The Project will require transmission-level service as the Project site load demand increases. The expected maximum electric load of the Project is approximately 12 megawatts.
Aera has submitted an application to Pacific Gas and Electric Company to interconnect a new Aera-owned substation to Pacific Gas and Electric Company’s electric transmission system. As part of the Project, Pacific Gas and Electric Company will construct, operate, and maintain a new approximately 0.3-mile 115 kilovolt power line to the Aera-owned substation located at the Project site. This power line will interconnect into Pacific Gas and Electric Company’s Sisquoc-Santa Ynez Switch Station 115 kilovolt power line (Figure 2.6-4 – Proposed Electrical Line Route).

3.6.2.1 Access and Staging Areas

Access. Access roads expected to be used to access the offsite portions of the electrical transmission line route are existing dirt roads currently used for oil field and ranching operations and maintenance. Portions of some existing access roads may need to be reestablished through vegetation clearing. Vegetation will be mowed and shredded or removed from access roads either by hand or using mowing equipment on rubber tracks to clear access roads. Overland access from existing access roads or along the proposed easement is anticipated in some areas; no grading, vegetation clearing, or trimming is expected across the grassy areas; however, any unanticipated vegetation removal will be restored in accordance with approved Project plans. In addition, any environmentally sensitive areas (i.e., biological, cultural, and/or hydrological resources) will be clearly marked, where appropriate, to monitor or restrict construction activities and equipment from these areas as appropriate.

Helicopter access may be required if Pacific Gas and Electric Company determines that overland routes are insufficient for adequate access. From the laydown area, the helicopter will transport pole materials to and from the pole sites along the proposed easement. The helicopter is expected to be used for one to two days between 7:00 a.m. and 4:00 p.m. to complete the pole installations. Any need for roadway closures or rolling stops will be identified and will be coordinated with the appropriate jurisdictions.

Temporary Staging, Laydown, and Work Areas. The temporary staging area will likely be located within the existing Pacific Gas and Electric Company-owned Palmer Substation property located along Cat Canyon Road (Figure 3.6-5 – Electrical Transmission Installation-Staging and Laydown Areas). The secure staging area will be used for material and equipment storage, a reporting location for workers, and worker and Project vehicle parking. Palmer Substation is surrounded by a chain-link fence and access gate. Minor site preparation may be required for the temporary staging area. Three temporary laydown areas are identified for potential use along the power line route, as shown on Figure 3.6-5– Electrical Transmission Installation- Staging and Laydown Areas. Laydown areas 1 and 2 need no grading or vegetation clearing. They are relatively flat, accessible by existing access roads, overland route, or helicopter. Laydown area 3 is located near the terminus of the transmission line at the connection to the new substation located at the Project site. Project site grading activities associated with construction of the central processing facility will allow for the temporary establishment of laydown area 3.

Pole work areas will likely be located approximately every 300 to 350 feet within the future right-of-way at new pole locations. Where final design allows, power pole work areas will overlap. Final design will determine final power pole locations. Pole assembly and installation is expected to occur in approximately 40- by 100-foot work areas around each proposed pole location within the proposed easement. Poles will be delivered and assembled using line trucks. If pole sites
are not accessible by ground equipment, new poles will be delivered to the staging area and will be installed by helicopter and ground crews. Construction vehicles are anticipated to access work areas on existing access roads and via overland routes. Construction vehicles and equipment are expected to be staged alongside the access road in the project right-of-way unless other arrangements have been made with the property owner. Minimal vegetation trimming or clearing will be needed at most work areas to access the pole locations. Tree trimming is not anticipated. No grading or slope stabilization activities in the work areas are anticipated. No restoration activities in the work areas will be needed; vegetation trimming and clearing is routine and provides operations and maintenance access.

3.6.2.2 Construction Methodology

**Substation Improvements.** Pending final design of the electrical transmission line, improvements may be required at the Pacific Gas and Electric Company-owned substations (i.e. Sisquoc or Palmer). Work at both substations may be expected to occur within the existing substation property. Site preparation and removal of some existing structures may be a part of construction.

**Powerline Removal/Construction.** Final design will determine if there is any pole removal required along the Sisquoc-Santa Ynez 115 kilovolt power line near the point of interconnection.

The Project will require up to approximately three new poles on the Sisquoc-Santa Ynez 115 kilovolt power line near the point of interconnection and up to approximately eight poles along the new transmission line. These poles will likely be a combination of tubular steel poles and light duty steel poles. Pole installation consists of the following basic steps:

- Deliver new pole at pole site;
- Auger new hole using line truck attachment or hand dig if the line truck cannot access the site;
- Pour concrete foundation for tubular steel poles;
- Install bottom section by line truck, crane, or helicopter;
- Install top section by line truck, crane, or helicopter; and
- Install switches where necessary. There may be up to approximately three supervisory control and data acquisition operable or other switches at the point of interconnection and elsewhere.

Once poles are erected, conductor will be strung from conductor pull and tension sites at the end of the power line interconnection alignment. A diagram of typical conductor stringing is provided in Figure 3.6-6 – Typical Conductor Stringing. The average distance is 4,000 feet between pull and tension sites.

Power line construction will generally follow the same procedures as outlined in Section 3.5.4 above. Prior to pulling and tensioning, workers will install temporary guard structures where the line crosses Cat Canyon Road to prevent sock line or conductors from dropping onto the road.
Figure 3.6-5: East Cat Canyon Oil Field Redevelopment Project

- **Project Name:** EAST CAT CANYON OIL FIELD REDEVELOPMENT PROJECT
- **Project Number:** 1002-0455
- **Date:** September 2014

**Map Legend:**
- Aera Energy LLC Property
- Project Footprint
- Proposed 115kV Service Line
- Proposed Laydown Area - 100'x100'
- Approximate Route of Existing 115kV Line
- Proposed Staging Area within Existing Palmer Substation

Source: County of Santa Barbara, NAIP 2012 Image, PGE, Aera Energy LLC, TJCross 8/20/14, DPSI 2013 Survey

Notes: This map was created for informational and display purposes only.

**Electrical Transmission Installation Staging and Laydown Areas**

- **Palmer Substation - Staging Area**
- **Laydown Area 1**
- **Laydown Area 2**
- **Laydown Area 3**

*Figure 3.6-5 - Electrical Transmission Installation - Staging and Laydown Areas.mxd*
FIGURE 3.6-6
EAST CAT CANYON
OIL FIELD DEDEVELOPMENT PROJECT
PROJECT NUMBER: 1002-0455
DATE: September 2014
TYPICAL CONDUCTOR STRINGING

Source: PG&E, 2011
**Erosion and Sediment Control.** A Storm Water Pollution Prevention Plan will be prepared to cover construction activities associated with installation of the electrical transmission line. This plan will be prepared in accordance with the Regional Water Quality Control Board guidelines and other applicable Best Management Practices. Implementation of the plan will help stabilize disturbed areas and waterways and will reduce erosion and sedimentation. The plan will designate Best Management Practices that will be followed during construction activities.

**Cleanup Activities.** All construction debris will be picked up and hauled away for recycling or disposal during construction. A final survey will be conducted to ensure that cleanup activities have been successfully completed as required.

Access roads will not be re-vegetated; they will continue to be used for operations and maintenance. Other than work to establish tree-to-line clearances and radial clearances at the base of the power poles, vegetation clearing and grading are not anticipated for any staging areas, pull and tension sites, or pole site work areas; therefore, no restoration is expected.

3.6.3 Fresh Water Distribution System

Fresh groundwater for the Project will come from up to three source wells which currently exist on the Project site, or replacements of the same. The fresh water distribution system will likely consist of approximately 24,055 linear feet of three to four inch high density polyethylene pipe or a spooled fiberglass reinforced polyester pipe and will be buried approximately one to four feet underground. Installation will primarily follow previously disturbed roads and pathways. Other areas of installation will temporarily disturb up to a 12-foot wide corridor.

3.6.4 On-site Septic System

The Santa Barbara County Department of Environmental Health Services requires permits for operation of sewage disposal systems. The Project septic systems will be designed by a qualified environmental professional and all County requirements for soils analysis, percolation testing, groundwater testing, design, and construction/installation will be satisfied.

3.7 MATERIAL RE-USE AND WASTE DISPOSAL

Preparation of the Project site will include removal of any debris from former operations. Debris will be reused or recycled to the extent feasible, or disposed of at the Santa Maria Regional Landfill.

Project construction activities may encounter areas that contain petroleum hydrocarbon-containing soils. Aera plans to excavate the petroleum hydrocarbon-containing soils within the Project disturbance areas for beneficial re-use either on-site, at other Aera locations, or at the Santa Maria landfill, in accordance with the Soil Beneficial Re-Use Plan developed for the Project (Appendix K).

The Project has been designed to balance cut and fill across the Project site (to the greatest extent feasible); any excess cut material will be managed on-site.

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2 Due to their inactive status, Aera has decided to remove water wells Bonetti-WS1 and McCroskey-WS11 from the Project design. Water well McCroskey-WS12 will provide all fresh water needs for the Project.