Section 1. **Project Understanding**

Introduction

Chevron U.S.A. Inc. (Chevron) and Seneca Resources (Seneca) (jointly referred to as Applicants) have individually submitted applications to Fresno County (County) for Conditional Use Permits (CUP) for certain uses of land (oil and gas exploration, drilling and production and related facilities) within the State-designated Coalinga Oil Field and Coalinga East Extension Oil Field administrative boundaries. These lands are located on Applicant-owned and leased properties within the administrative boundary established by the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR). The Conditional Use Permit (CUP) applications comprise the proposed project and are referred to collectively as the Coalinga Oil Field Improvement Project (Project). Each is discussed in greater detail below.

Chevron CUP Application

Chevron has submitted an application package to the Fresno County Public Works and Planning Department to request environmental review for use by State and local agencies to ensure environmental clearance for ongoing oil production activities at the Project site.

Chevron's objectives for the Project are listed below:

- Exercise Chevron's mineral rights to develop the Project Site's oil resources to help meet energy needs on a local, State, and Federal level.
- Allow for continued operations and improvements, including upgraded facilities, steam generators, steam generator modifications, and future water disposal and steam injection wells, within the Project site over an estimated term of approximately 20 years.
- Provide additional oil production in a safe and environmentally responsible manner.
- Maintain consistency with the Fresno County General Plan and Zoning Ordinance, which recognizes and allows for oil (petroleum) production in the County.
- Provide continuing jobs to support Chevron operations, which in turn help promote a strong and viable economy.
- Promote economic development that will enhance the local and regional economy and maintain economic diversity.

Regional Setting

The Project is located within southwestern Fresno County (County). The geography of the County is diverse, containing mountainous areas, agricultural land uses, and valley areas. The Project site is located on the western side of California's Central Valley within Pleasant Valley, which is bound on the west by the Coast Ranges (Diablo Range) and on the east by the Sierra Nevada Mountains. Figure 1, Regional Location Map, illustrates the Project site within a regional context and depicts existing operational boundaries (parcels) that constitute the Project site.

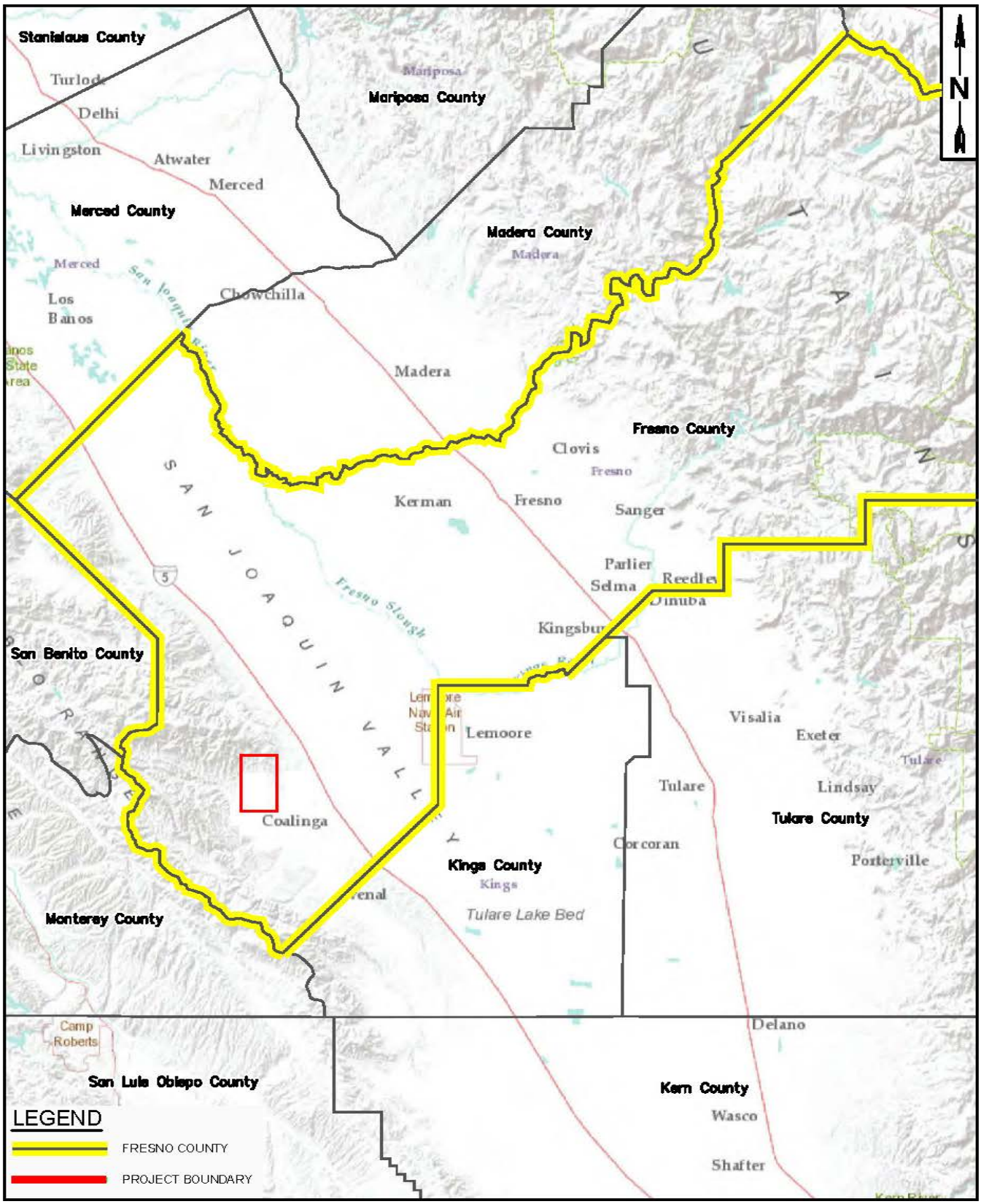

Figure 1. Regional Location Map

Project Location and Setting

The Project will occur on Chevron-owned and leased properties within the administrative boundary of the Coalinga Oil Field and Coalinga East Extension, established by DOGGR. The upgraded facilities are proposed to be located at or near existing developed areas located on the Project site within the Main Area and Nose Area of the Chevron Coalinga Field, as shown on Figure 2.

The primary area of the Project site is approximately six miles west of I-5 and 0.5 mile west of the center of the City of Coalinga, in the southwestern portion of Pleasant Valley within unincorporated Fresno County, California (refer to Figure 3, Project Site Plan and Existing Facilities Map). According to the Fresno County General Plan map, the Project site is designated as Exclusive Agricultural (20- or 40-acre minimum parcel sizes) (County of Fresno, 2016). Also, approximately half of the Project site would be located within the City of Coalinga's Area of Influence for city planning purposes.

The Project site is approximately 17,600 acres in size, and falls within portions of the United States Geologic Survey Coalinga and Polvadero Gap Quadrangles (Township 19 South, Range 14 East, Section 36; Township 19 South, Range 15 East, Section 31 and 32; Township 19 South, Range 16 East, Section 31; Township 20 South, Range 14 East, Sections 1, 11, 12, 13, 14, 23, 24, 25, 26, and 36; Township 20 South, Range 15 East, Sections 1, 5, 6, 7, 12, 13, 17, 18, 19, 30, and 31; Township 20 South, Range 16 East, Sections 6, 7, 8, 17, 18, 19, and 20).

Existing Conditions

A description of existing facilities and wells and associated operational processes, as well as related activities and operations and maintenance (O&M) activities, is set out below to provide the "baseline conditions" to which potential environmental impacts associated with the Project, described in Section 2.2, Project Description, are compared. In order to be able to evaluate the incremental increase in associated environmental impacts from the Project, this section includes a comprehensive overview of existing major facilities (including existing steam generators), existing wells and associated oil and gas production processes, and O&M activities, all of which will be considered part of the baseline conditions.

Existing operations within the Coalinga and Coalinga East Extension oil fields are supported by two OCPs, one WCP, 37 existing natural-gas fired steam generators; and a variety of wells, facilities and other infrastructure. Existing facilities are summarized in Table 1, Existing Oil Field Components, and key components are depicted in Figure 3. As presented in Table 1*,* there are approximately 1,180 active production, injection, and observation wells in operation at the Coalinga and Coalinga East Extension oil fields. Additional support facilities include administrative buildings, storage yards/warehouse, and percolation ponds.

Chevron is proposing the Coalinga Oil Field Improvement Project (Project), which will enable Chevron to continue to recover crude oil and natural gas, though in a more efficient manner, from its existing oil field properties through construction and operation of upgraded oil production and treatment facilities.

The Project includes the improvements that may be necessary over a 20-year period, including: upgraded Oil Cleaning and Water Cleaning Plants; an upgraded solids drying facility; the upgrade of the Water Injection Plant currently under construction; conversion of existing idle wells or drilling of new wells for excess water injection; new steam generators; retrofit of existing steam generators; and installation of other supporting equipment ("Project Components"). Implementation of the Project Components also has the potential to affect existing operations and maintenance activities and require improvements to existing infrastructure, as described further in the Project Description. Whether all or only some of the Project Components will be constructed or operated will ultimately be driven by market conditions and ongoing regulatory developments.

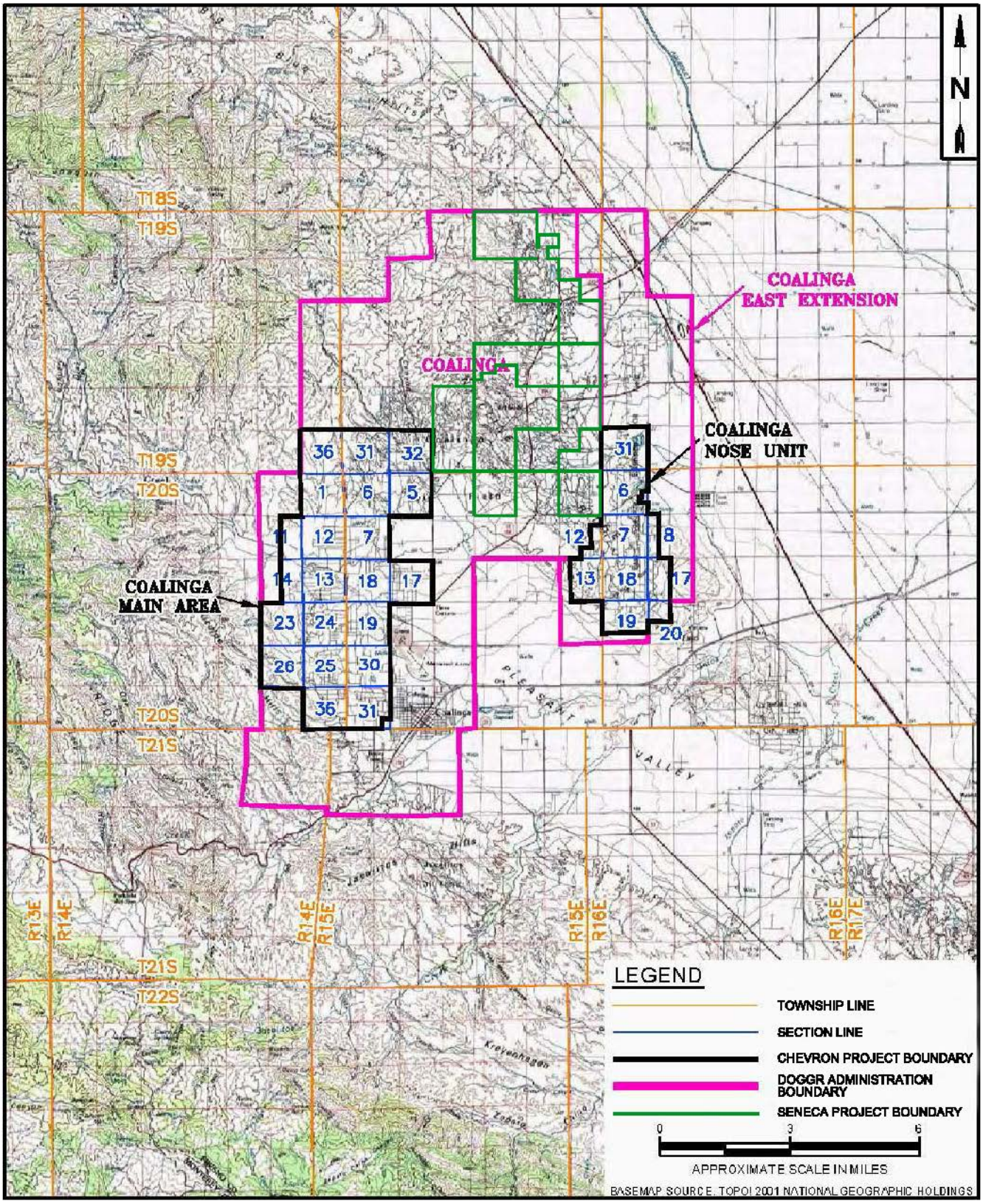

Figure 2. Project Location Map

Table 1 Existing Chevron Oil Field Components

Existing Major Components (Refer to Section Below)	Approximate Quantity or Characteristic As of January 1, 2016
Cogeneration Facilities (1.6.5)	3
Gas Handling and Distribution (1.6.8)	3
Internal Combustion Engines (1.6.9)	3
Gauge Settings (1.6.10)	44
Administrative Buildings Center (1.6.11)	1
Storage Yards (1.6.12)	1
Aboveground Storage Tanks/ Vessels (1.6.13)	57
Solids Drying Facility (1.6.14)	1
Percolation Ponds (1.6.15)	11
Total Active Production, Injection, and Observation Wells (1.6.6)	
Producers	850
Continuous Injectors	150
Temperature Observation	180
Subtotal, Active Wells	1,180
Coalinga Nose Unit	
Oil Cleaning Plant (1.6.1)	1
Producer Wells (1.6.6)	3
Water/Brine Disposal Wells (1.6.7)	2

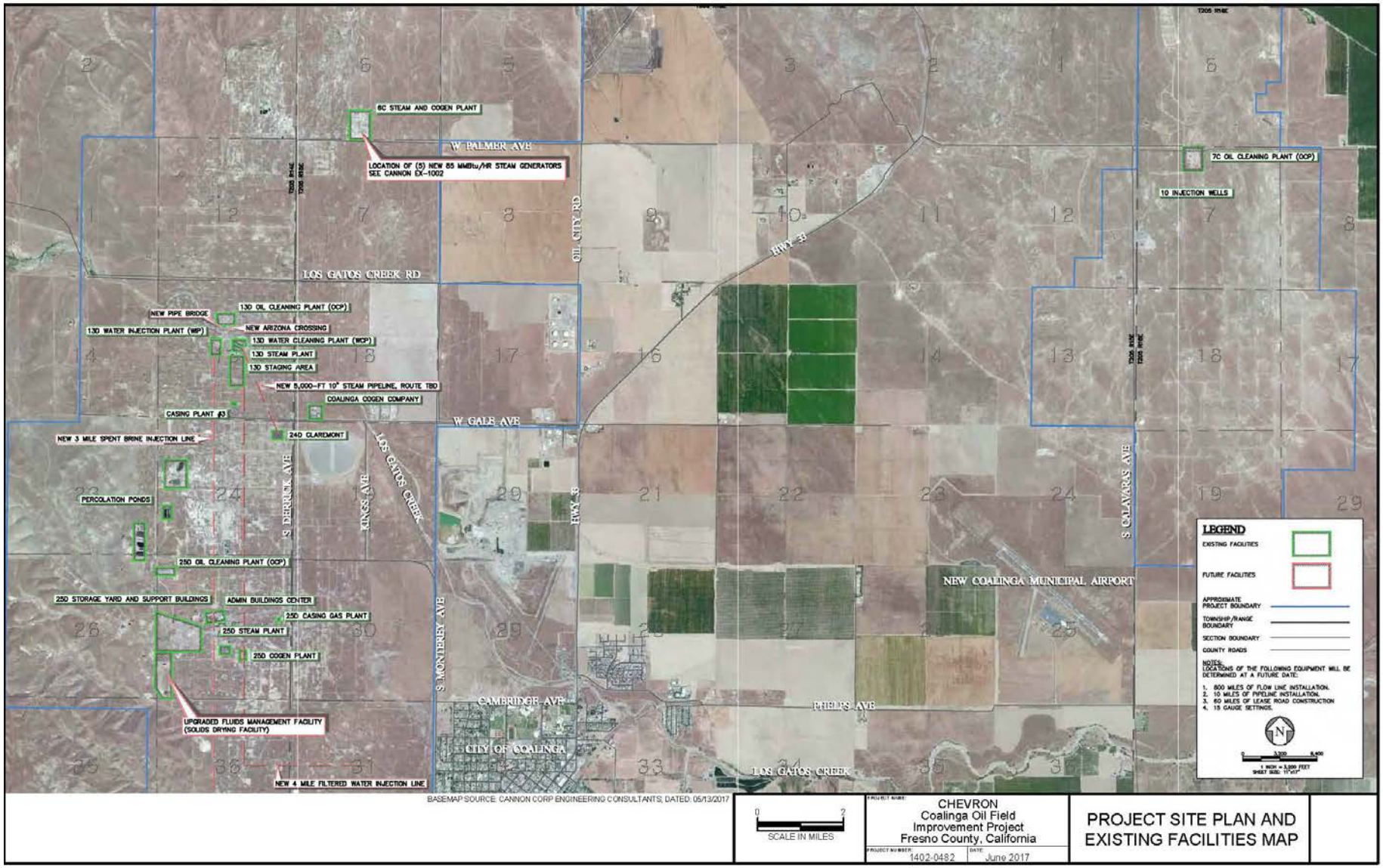

Figure 3. Project Site Plan and Existing Facilities Map; Chevron

The Project does not propose DOGGR-regulated components outside the existing administrative boundary of the Coalinga Oil Field or Coalinga East Extension.[1] Exploratory wells or other expansions outside of the DOGGR administrative boundary would be subject to a separate permit process.

Project Description

The following section provides a detailed discussion of the Project components. Refer to Figure 3 for the locations of existing and planned facilities.

Components associated with the Project are presented in Table 2, Project Components, and may include:

- Upgraded Oil Cleaning Plants at 13D and 25D;
- Upgraded Water Cleaning Plant at 13D;
- Upgraded water injection plant (WIP) and pipeline;
- Upgraded Solids Drying Facility;
- New steam generators, steam generator retrofits, and associated equipment;
- New wells, other facilities and infrastructure; and
- Associated operational activities, including routine maintenance, repair, and replacement.

New oil and gas wells would include those designed for EOR methods such as steamflood and cyclic steam, replacement wells, and wells in new areas (within the current DOGGR administrative field boundaries). New facilities are needed to support the EOR efforts.

Upgraded Oil Cleaning Plants

The Chevron Coalinga Field is currently served by two OCP located in USGS quadrangles 13D and 25D. The Project includes upgrades to separate well-stream components – crude oil, gas, condensates, water, and solids – for processing, on-site use, distribution, and/or disposal. Proposed upgrades at 13D OCP may include a 2,000-bbl oil sales tank, a LACT upgrade with piping upsize at oil sales meter, a VRU compressor upgrade, installation of a production inlet cooling system, and upgraded wastewater tank VRU connections. The upgrades proposed at the 25D OCP include a VRU compressor upgrade, installation of a production inlet cooling system, and upgraded wastewater tank VRU connections. The upgraded OCPs will have the capacity to process up to 17,000 bbls of oil per day, and up to 250,000 bbls of water per day. Activities required to construct and operate the OCPs are described below.

Construction

Construction at the upgraded OCPs will consist of minor civil earthwork, foundation work, structural installation, and mechanical and electrical installation. Tanks will be constructed on-site and will require truck deliveries and/or haul trips and the operation of off-road equipment consisting of cranes, excavators, loaders, graders, dozers, backhoes, and various types of on- road vehicles. Vessels and electricity-driven pumps will be prefabricated and delivered to the Project site for installation and configuration for facility operation. The upgraded facilities will be contained within previously disturbed areas at the existing OCPs. A concrete foundation for each of the above-mentioned tanks, vessels, pumps, and compressors will be constructed. Typical construction equipment will include haul trucks, cranes, graders, and dozers. Equipment usage and workforce estimates for construction of the upgraded OCPs are presented later in this section.

[1] Division of Oil, Gas, and Geothermal Resources. 1998. California Oil and Gas Fields Volume 1 - Central California. Department of Conservation. Sacramento, CA.

Table 2 Project Components for Chevron CUP Application

Major Components	Total Potential New by Buildout Year – 2037[a]
Major Facilities and Infrastructure	
New and/or upgraded oil cleaning plants	2
New and/or upgraded water cleaning plant	1
New and/or upgrading of water injection plant (WIP) and pipeline	1
Solids drying facility	1
Steam Generators	5
Steam Generator Retrofits[b]	2
Gauge Settings	15
Roadways	< 60 miles[c]
Natural Gas/Softwater Pipelines	<10 miles
Flowlines	< 800 miles
Production, Injection, and Observation Wells[d]	
Producers	1,000
Continuous Injectors	500
Temperature Observation	160
Well Subtotal:	1,666
Well Improvements	
Replacement Wells	100
Well Workovers/Sidetracks	1,000
Well Abandonments (Plugging & Abandonment [P&A])	700
Water Disposal Wells	
Water Disposal Wells	95[e]

Notes:

[a] Buildout year is for the purposes of CEQA analysis. Development at the oil field is anticipated to continue beyond this timeframe, but the type and extent of future development beyond 20 years is sufficiently speculative at this time that future consideration will likely be required to determine if further CEQA review is warranted, as determined by the lead agency.

[b] Steam generator retrofits would be utilized as substitutes for new steam generators.

[c] Assumes each new well will require approximately 500 linear feet of new road.

[d] Not including Replacement Wells shown below.

[e] Total number includes replacement wells drilled. No more than 30 wells will be in operation at any one time.

Operation

Operation of the upgraded OCPs will be similar to existing operations described above in Oil Cleaning Plants. The upgraded OCPs will include new tanks, vessels, vapor recovery units, pumps, and compressors that will be operated to separate well-stream components – crude oil, gas, condensate, water, and solids – for processing, on-site use, distribution, and/or disposal.

The water taken from the separation process is sent to the upgraded Water Cleaning Plant, where additional hydrocarbons and suspended solids are removed before the water is used in EOR processes and/or disposed into a water disposal well. Oil separated during this process will be recovered and sent by pipeline to the slop oil

tanks for shipment to an off-site refinery. The upgraded OCPs would have a total capacity of 25,000 bbls of oil per day.

Upgraded Water Cleaning Plant

The Chevron Coalinga Field is currently served by one WCP located at the Section 13D area. The Project includes construction of an upgraded WCP at 13D to meet the soft-water demand for each of the proposed new steam generators. This plant encompasses facilities for both water de-oiling and water softening. The de-oiling unit will consist of surge tanks, induced- gas flotation cells (also referred as WEMCOs) and walnut shell filters where the free oil is separated from the water. The WCP will consist of resin beds in vessels, through which the mineral-laden raw water will be pumped; it will also include filtered water, softened water, fresh/spent brine and other tanks as well as pumps. The water-softening resin will be replenished or refreshed with salt water brine. Proposed upgraded facilities at the 13D WCP include the following items: two multi-media filter replacements or repairs, one new water softener repair/replacement, two new spent brine tanks, one new filtered water tank, and one pump and metering skid. Activities required to construct and operate this facility are described below.

Construction

Construction will include the following general steps: site preparation and grading; foundation pad construction; tank and material delivery; set-up, and configuration. The upgraded facilities will be contained within previously disturbed areas at the existing WCP. The facility upgrades will include construction of foundations for storage tanks, process vessels (softeners and filters), and associated equipment including pumps, compressors, heat exchangers, filter presses, and electrical equipment.

Construction will include installation of three new tanks. Tank sizes may be up to 25,000 bbls. The chemicals used at the WCP are not expected to vary significantly from what is currently utilized on-site.

Typical construction equipment will include haul trucks, cranes, graders, and dozers. Equipment usage and workforce estimates for construction of the upgraded water cleaning plant are presented later in this chapter.

Operation

Once the produced water has gone through oil/water separation at the upgraded OCPs, the WCP will further treat it for reuse and/or on-site disposal. Water will be treated to remove various materials, including residual oil, solids, dissolved hydrocarbons, and water-soluble chemicals used to optimize oil production. Water will then be either sent to the Water Injection Plant or softened to remove calcium and magnesium and prepare it for use in on-site steam generation. The proposed WCP will have the capacity to process up to 310,000 bbls of produced water per day and will soften up to 210,000 bbls of water per day.

Upgraded Solids Drying Facility

The Chevron Coalinga Field is currently served by one Solids Drying Facility (SDF) located within Section 25D. The Project includes an upgraded SDF. When oilfield tanks are cleaned, a slurry containing oil, water, and solids must be removed. Vacuum trucks are used to remove the slurry from the tanks and transport them to the SDF. Fluids used in drilling operations are also taken to the SDF. These fluids include primarily drilling mud (a combination of bentonite clay and other non-hazardous additives) and water.

Construction

The construction activities associated with the Solids Drying Facility will be limited to new concrete containment pads, measuring 160-feet by 160 feet total, and installation of a new electrically-operated centrifugal separator (or equivalent).

Operation

The SDF facility separates solids from oil and water using a combination of heat, gravity separation and centrifuges. Solids are stored onsite within a contained area until they can be hauled off-site to a permitted solid

waste disposal facility. Water and oil are recycled back to the oil and water cleaning plants. A large portion of the water is re-used in steam generation. Equipment used within the facility will include rubber-tired loaders, backhoes, and track- mounted excavators, similar to existing, ongoing activities.

Steam Generators and Associated Equipment

The Chevron Coalinga Field has 37 existing steam generators and associated equipment. The Project includes construction and operation of up to five (5) new steam generators, each with a maximum heat rating of 85 MMBtu/hr, and associated gas treatment equipment including scrubber vessels, tanks, heating devices, pumps, belts and hoses. Steam generators and associated facilities would be located either within one of three existing steam plants (i.e., 6C Steam and Cogeneration Plant within Section 6 [Township 20 South, Range 15 East], 13D Steam Plant within Section 13 [Township 20 South, Range 14 East], or 25D Steam Plant within Section 25 [Township 20 South, Range 14 East]). Activities associated with construction and operation of the proposed steam generators are described below.

Construction

Steam generator construction typically includes site preparation and grading; foundation pad construction; equipment delivery, set-up and configuration; and testing. Steam generators each require approximately a 30-foot by 115-foot space, which would be cleared and graded prior to equipment placement. The new steam generators would be placed within existing steam generator facilities. A concrete pad would be constructed to provide foundation support for the equipment. Flat-bed trucks would be used to haul and deliver equipment to the Project site. Once equipment is delivered and placed on the concrete foundation, it would be configured for steam distribution and tested prior to initial operation. Construction activities would also include installation of piping and associated infrastructure to support natural gas and water usage during operation.

In general, installing and constructing one steam generator requires three to six months, depending on the operating location, equipment size, and configuration. Typical equipment used during construction includes a grader, dozer, crane, cement pumps, bulk cement trucks, and haul trucks. Equipment usage and workforce estimates for steam generator construction are presented later in this chapter.

Operation

Chevron anticipates that the new steam generators would operate 24 hours per day and 365 days a year, between 90 and 100 percent load to support future operations. Oil field steam generators are designed to produce wet steam in the range of 50 to 80 percent quality[2] and at pressures up to 2,700 pounds per square inch (PSI) for injection into oil reservoirs to enhance the recovery of viscous crude oils. Steam leaves the steam generation plant and enters the field steam distribution system. The distribution system transports the steam to measurement and contract equipment located at each gauge setting.

The steam generators will be designed and permitted to burn Public Utilities Commission-quality natural gas with a sulfur content not exceeding 1.0 grain of sulfur per 100 standard cubic feet. Steam generators would utilize primarily produced water, but water from the City of Coalinga domestic water supply may also be used in small quantities as needed. Refer to Section 2.2.12 for more detail on water usage during the course of the project.

Steam Generator Retrofits

The Project may include retrofits of up to two (2) existing, 58.5 MMbtu/hr natural-gas fired steam generators. The proposed modifications include modifying the internal water/steam piping within the heat recovery convection section (referred to as “split-flow”) and increasing the burner size from 58.5 to 62.5MMBtu/hr. The split-flow will allow for a 50 percent increase in steam generation and improved fuel efficiency for each of the two modified

[2] Steam quality refers to the percent of inlet water mass that has been converted to vapor phase, e.g., 70 percent steam quality would have 30 percent of the original water in liquid phase.

steam generators. The two steam generators that may be retrofitted would be relocated to the 13D Steam Plant. Activities associated with construction and operation of the proposed steam generator modifications are described below.

Construction

Construction activities associated with the potential steam generator modifications would include the following general steps: removal of steam generator convection section; site preparation and foundation work; relocation of steam generator equipment components from various existing locations (to the 13D Steam Plant in Section 13, Township 20 South, Range 14 East); installation and configuration of new convection section and burner; and installation of piping and associated infrastructure to support natural gas and water usage during operation.

The timing of the steam generator retrofits has not been determined at this time. In general, one steam generator retrofit would require three to six months, depending on the operating location and configuration. Typical equipment used during construction includes a grader, dozer, crane, cement pumps, bulk cement trucks, and haul trucks. Construction equipment usage and workforce estimates for steam generator modifications are presented later in this chapter.

Operation

The modified steam generators would operate 24 hours per day and 365 days a year, and would be designed to burn PUC-quality natural gas, similar to operational activities described above for the proposed new steam generators.

Well Development

As delineated in Table 2, the Project includes all new well development activities for the duration of the 20-year project timeframe. Well development activities include new well drilling (including infills), P&A, and workovers, similar to existing operations. Chevron estimates that an average of 50 new producer wells will be drilled annually, with a maximum of 75 wells drilled annually. The Project includes installing and operating new injection and producing wells to support steamflood and cyclic steam EOR methods. Also, in accordance with DOGGR regulatory requirements, Chevron intends to complete the plugging and abandonment of up to 700 idle or nonproductive wells for the duration of the 20-year Project timeframe. Proposed well development activities are described below.

Production, Injection, and Observation Wells

The Project includes installation and operation of various well types. As with existing wells, each well type may vary in diameter and completion casing sizes. Wells will be designed with cemented surface casing and production casing (cemented solid string and perforated or slotted liner). Primary production wells will be operated with artificial lift pumping units. Steam injection wells will be monitored and controlled manually. The installation process will be the same or similar to existing well drilling activities, as described in Section 1.6.6, Production, Injection, and Observation Wells. Well operation is dependent on the EOR method utilized for oil and gas production, as described under Oil and Gas Recovery Activities.

Future steam injection and associated crude oil production will follow the existing processes and procedures. Steam will be generated by existing and new steam generators. Steam injection will be delivered through both existing and additional central gauge settings and steam distribution manifolds where injection rates to each well are controlled.

The approximate number and type of construction equipment, activity duration, and workers needed to complete well drilling activities are presented later in this chapter. Well drilling activities are expected to occur essentially anywhere within the Project site over the 20- year Project timeframe. The locations of the new wells will be determined as the Project progresses. Of the total number of wells, approximately 45 wells per year may be in previously undisturbed areas of the Project site.

Table 5 includes a list of temporary operational equipment that may be required to test initial production from exploration or appraisal wells. This equipment would be utilized for no more than 180 days at any one location.

Abandonments, Workovers, and Replacements

Chevron proposes to complete approximately 700 well abandonments concurrently with proposed well drilling and improvement activities. Well abandonments and re-abandonments will utilize multiple workover rigs, with activity focused in the areas where thermal development is targeted. The activities will be consistent with those described under Existing Conditions.

The approximate number and type of construction equipment, activity duration, and workers needed to complete P&A activities are presented later in this chapter. Well P&A activities are expected to occur within the Project site over the 20-year Project timeframe.

Acid treatments at oil and gas fields typically include two processes to improve production, which are performed during well completion or well workover activity. These acid treatments are 1) used to enhance formation characteristics (e.g., improve permeability); or 2) cleanout the wellbore. At Coalinga, acid treatments are being considered only for water disposal well workovers, for cleanout of the wellbore.

Wellbore cleanout is a typical maintenance activity which involves jetting the wellbore and perforations with acid solution to remove cement residue, drilling mud, scale, and perforation debris from the wellbore. Acid types and concentrations most commonly used for wellbore cleanout treatment range from 10 to 15 percent hydrochloric acid (additives may include corrosion inhibitor, iron control, surfactant demulsifier, and others). Acid volumes per treatments are dependent on length of the treatment interval and degree of damage. Estimated acid volumes commonly range between 2,000 to 20,000 gallons of blended acids. Specific acid types, concentration and volumes mixed are dependent upon individual well conditions.

Water Disposal Wells

Chevron proposes to install up to 95 new water disposal wells over the course of the 20- year project (approximately 30 disposal wells will be operating at any one time). Pumps used for water injection and disposal are designed for a maximum injection pressure so that surface injection pressure and rate of injection do not exceed the prescribed levels set by DOGGR's UIC approval process. Several water disposal wells are anticipated to be completed, up to a total of 95 wells, to support Chevron's ongoing and future water disposal needs.

The approximate number and type of construction equipment, activity duration, and workers needed to complete disposal well drilling activities are presented later in this chapter. Disposal well drilling activities are expected to occur within the Project site over the 20-year Project timeframe.

Gauge Settings and Flowlines

The Project includes construction and operation of up to fifteen (15) gauge settings to support operation of the new oil and gas wells. The proposed equipment and infrastructure (flowlines) would be located throughout the Coalinga and Coalinga East Extension oil fields. Activities required for constructing and operating the proposed gauge settings facilities are described below.

Construction

Construction would include site preparation, equipment and material delivery, equipment configuration, and testing. Site preparation would include disturbance of a 0.5-acre area to allow for equipment staging and configuration.

Operation

Gauge settings, and flowlines (described in more detail below under Pipeline and Related Infrastructure Installation and Maintenance), would be maintained in accordance with applicable regulatory standards and

requirements throughout their operating life. The equipment would be remotely operated from a central control facility. Pipeline corrosion protection and control would be achieved through protective coating and cathodic protection. A cathodic protection system involves the application of direct current electricity from an external source to oppose the discharge or corrosion current from the surrounding soil.

Other Infrastructure and Activities

Additional infrastructure will be required to support new wells and process facilities. This infrastructure includes roads, pipelines, and electrical infrastructure.

Road Construction and Maintenance

Chevron anticipates that less than 60 miles of existing roads would be constructed or modified as part of the Project (approximately 500 linear feet per well). Most new oil wells will be located within the developed area of the oil field that is currently accessed by existing roads. Heavy equipment will be required for construction or modification of the roads, including graders, backhoes, loaders, rollers, and trucks. The majority of roads will be surfaced with gravel and maintained regularly as needed during the course of the Project's 20-year span.

Pipeline and Related Infrastructure Installation and Maintenance

The Project would use a network of existing and new pipelines to transport natural gas, oil, water, and/or steam between wells and facilities. New pipelines would be installed aboveground and would be installed consistently with the existing network and standard. The 13D WCP upgrade will include a new four-mile long pipeline for filtered water injection, and a new three-mile long pipeline for spent brine injection. The approximate locations of these new pipelines are shown on Figure 3.

The proposed steam generators would require new pipelines and infrastructure from existing and proposed facilities to provide fuel for equipment operations and steam generation. The fuel supply line for steam generator operations would include a separate two-inch steel pipeline. The Project will include a 5,000-foot long, 10-inch diameter steam pipeline that will extend from the 13D steam plant to the 24D Claremont lease. Refer to Figure 3 for the proposed location of the new steam pipeline.

New flowlines would be constructed to distribute steam to proposed new wells. Less than ten miles of new flowlines would be constructed to support new well operations including steam injection. New flowlines would be mostly installed within areas previously disturbed by oil field operations.

Construction

The pipelines will be primarily installed aboveground using sleepers or on above ground pipe racks/supports. The supports will require drilling of a shallow hole using a truck-mounted auger, placement of a welded steel support, and backfill of the hole with concrete. The pipelines will be brought onto the Project site in 40-foot segments by trucks and welded in the field by qualified welders.

Operation

Operation of the pipelines will consist of routine maintenance activities, including periodic vegetation/weed removal using mechanical (grubbing) and herbicide applications.

Electrical Infrastructure

A new substation and expansions of the existing 12-kilovolt network to provide a permanent supply of electricity to the new wells and facilities will be required. The substation will connect the Coalinga Cogeneration Facility to the existing/expanded 12-kilovolt network, which will allow the field to receive electricity either from that facility or from PG&E's network. These activities would generally occur in previously disturbed areas and along existing rights-of-way or roads. Electrical line extensions consist of installing new power poles and transformers and may also include cross-country vehicular travel. Although minor, permanent habitat disturbance will occur at each power pole location and additional temporary disturbance will occur during installation activities.

Material Handling and Disposal

Construction and operation associated with the Project would include material use, handling, storage, and disposal of non-hazardous and hazardous materials. Hazardous materials would be stored, handled, and used in accordance with applicable local, State, and Federal regulations. Hazardous material handling, waste storage, and emergency response procedures will be implemented in accordance with site-specific Hazardous Materials Business Plan, Emergency Response Plan, and the Spill Prevention, Control and Counter-measures Plan.

The Project would require the use of hazardous materials, including but not limited to acids, anti-foamer, bases, bentonite, corrosion inhibitor, demulsifier, diesel fuel, emulsifier, gasoline, perforating charges, gear lubricant, hydraulic fluids, herbicides and pesticides, lubricant oils, mineral oil, natural gas, anti-scalant, acetylene, oxygen, and argon. Storage of these materials is dependent on chemical properties and use. Materials will be stored in compatible containers such as high-density polyethylene drums, carbon steel tanks, and steel drums. Some hazardous materials, such as natural gas, perforating charges, pesticides, and herbicides, will not be stored on-site. The Project would not create a need for additional types of hazardous materials, but construction and operation of the Project would increase the quantity of certain hazardous materials.

The construction phase of the Project would generate hazardous and non- hazardous wastes. These wastes would include acidic liquids, hydrocarbon solvents, waste oil, paints, contaminated debris (inorganic solid waste), drilling mud, creosote coated wood, petroleum-impacted soil, and universal wastes. Depending on the nature and source of the waste, materials will be transported for off-site disposal or reused on-site.

The operations phase of the Project would also generate hazardous and non- hazardous wastes. These wastes would include creosote-coated wood, hydrocarbon solvents, waste oil, paints, contaminated debris (inorganic solid waste), drilling mud, petroleum-impacted soil, decommissioned oil field equipment, heavy oil/water, spent brine, tank sludge, and universal wastes. Depending on the nature and source of the waste, materials will be transported for off-site disposal at a permitted disposal facility or reused on-site. No hazardous wastes will be stored on-site for more than 90 days.

Utility Usage

The Project would result in an increase in utility usage resulting from operation of new wells, steam generators, and modified facilities. The estimated annual usage of utilities, both purchased and produced, during the Project buildout year (2037) is presented in Table 3, Project Utility Usage Summary (Buildout).

Table 3 Project Utility Usage Summary (Chevron Buildout)[a]

Utility Description	Purchased	Produced	Total	Units
Electricity	19	169	188	MWh/yr
Natural Gas	8,560	200	8,360	MMscf/yr
Water	1,500,000[b]	70,080,000[c]	71,380,000	bbls/yr

Acronyms:
MWh/yr = megawatt hours per year
bbls/yr = barrels per year
MMscf/yr = million standard cubic feet per year

Notes:
[a] Includes total oil field utility usage from existing operations plus Project.
[b] Water used for administrative building domestic use, cogen water, site wash down, and dust control.
[c] Net Water re-injected as steam.

New electrical demand associated with the Project would include, for example, fixed station lighting at the OCPs and WCP and new wells requiring electric-driven pumping units. Electric power will be taken from the Coalinga Cogeneration Facility and the existing 25D Cogeneration plant and there will be full back-up from PG&E. New natural gas usage associated with the Project would include operation of the new steam generators along with an increased operation of the existing retrofitted steam generators.

Water would be needed for several different aspects of the Project. For example, during construction, water would be required for dust control and to obtain appropriate compaction of soil placed back into excavation areas. Once the upgraded facilities have been installed, water would be needed for steam production and hydrostatic testing. Both treated and untreated produced water (water associated with crude oil production) from the Chevron Coalinga Field would be supplied from the existing WCP. Treated water will be utilized for steam production and other industrial needs. Fresh water is currently purchased from the City of Coalinga, and the future fresh water uses are anticipated to remain steady or decrease, depending on the availability of supplies from the City of Coalinga or other potential purveyors.

New oil and gas wells would include those designed for Enhanced Oil Recovery (EOR) methods such as steamflood and cyclic steam, replacement wells, and wells in new areas (within the current DOGGR administrative field boundaries). New facilities would predominantly be constructed in areas previously disturbed by oil and gas operations, within property leased or owned in fee by Chevron. The approximate permanent land disturbance associated with major project components is presented in **Table 4**.

Table 4 Land Disturbance Summary; Chevron CUP

Components	Approximate Disturbance Area (Acres) Includes previously disturbed lands
Cleaning Plants	
Upgrades to existing Oil Cleaning Plants	4
Upgrades to existing Water Cleaning Plants	2
Well Pads (each)	2[a]
Gauge Settings (each)	0.5
Roads	150[b]
Pipelines	Varies

Notes
[a] Assumes 100-ft by 200-ft permanent disturbance area and remainder as temporary disturbance for well pad cut and fill grading
[b] Assumes 20-ft wide roads

Construction Equipment and Workforce Estimates

Temporary construction activities associated with the new wells, facilities, and infrastructure would require operation of various on- and off-road equipment for construction. The estimated type and number of equipment, duration of activity, and number of workers required for construction of the Project are presented in Table 5, Equipment and Employees: Construction. Numbers may vary; therefore, reasonable maximum approximations have been used.

Table 5 Equipment and Employees: Construction for Chevron Improvements

Equipment Description	Estimated Horsepower	Equipment Quantity	Estimated Workforce (Workers/Day)[a]	Estimated Schedule (Days/Yr)	Duration of Use (Hrs/Day)
Facilities					
Site Preparation				**30**	
Scraper	250-365	2	30	30-60	6
Grader	250	2			6
Skip Loader	75-125	1			6
Compactor	75-125	1			6
Rubber Tired Loader	250	1			6
Air Compressor	150	1			8
Dump Truck	250	2			6
Pickup Truck	NA	5			4
Construction				**365**	
Air Compressor	150	2	50	365	6
Forklift	250	2			6
Rubber Tired Loader	250	1			6
Compactor	125-250	1			6
Bore/Drill Rig	450	2			6
Crane	250	1			6
Scissor Lift	75	1			4
Material Handling Equipment	75-250	2			8
Tractors/ Backhoes	50-250	1			6
Welders	250	1			6
Other Construction Equipment	75	2			6
Concrete Mixer	250	2			4
General Industrial Equipment	250	2			6
Dump Truck	250	1			4
Haul Trucks	350-500	5			8
Pickup Truck	NA	20			4
Roller	250	1			4
Steam Generators					
Site Preparation				**30**	
Scraper	250-365	2	30	30	6
Grader	250	2			6
Skip Loader	75-125	1			6
Compactor	75	1			6
Rubber Tired Loader	250	1			6
Air Compressor	150	1			8
Dump Truck	250	2			6
Pickup Truck	NA	5			4

Equipment Description	Estimated Horsepower	Equipment Quantity	Estimated Workforce (Workers/Day)[a]	Estimated Schedule (Days/Yr)	Duration of Use (Hrs/Day)
Steam Generator Installation and Steam Generator Retrofits				**365**	
Air Compressor	150	2	20	365	6
Forklift	250	2			6
Rubber Tired Loader	250	1			6
Compactor	250	1			6
Bore/Drill Rig	450	2			6
Crane	250	1			6
Scissor Lift	75	1			4
Material Handling Equipment	250	2			8
Tractors/ Backhoes	250	1			6
Welders	50-250	1			6
Other Construction Equipment	75	2			6
Concrete Mixer	250	2			4
General Industrial Equipment	250	2			6
Dump Truck	250	1			4
Haul Trucks	350-500	5			8
Pickup Truck	NA	20			4
Wells					
New/Replacement Wells and Infrastructure [b]				**365**	
Rubber Tired Loader	250	1	11	365	6
Tractors/ Backhoes	250	2			4
Cranes	250	2			4
Drill Rig	250	1			6
Concrete Truck	250	1			6
Tractor/Trailer	250	1			4
Air Compressor	120	1			6
Generator	120	1			6
Water Truck	250	1			4
Pickup Truck	NA	4			4
Well Workovers				**365**	
Workover Rig	250	1	11	365	6
Cement Truck	250	1			6
Pump	50	1			6
Tractor/Trailer	250	1			6
Crane	250	1			6
Pickup Truck	NA	5			6
Well Plugging and Abandonment				**365**	
Workover Rig	250	1	up to 17	365	6
Cement Truck	250	1			6
Pump	50	1			6
Tractor/Trailer	250	1			6
Crane	250	1			6

Equipment Description	Estimated Horsepower	Equipment Quantity	Estimated Workforce (Workers/Day)[a]	Estimated Schedule (Days/Yr)	Duration of Use (Hrs/Day)
Pickup Truck	NA	5			6
Roads and Infrastructure					
Road Construction				**90**	
Backhoe/Front Loader	125	1	6	90	6
Track Type Dozer	150	1			6
Motor Grader	250	1			6
Haul Truck	250	1			8
Water Truck	250	1			6
Pickup Truck	NA	4			6
Pipelines (Steam, Gas, Water)				**90**	
Air Compressor	50	1	6	90	6
Backhoe	100	1			6
Generator	100	1			6
Rubber Tired Loader	250	2			6
Grader	250	2			6
Crane	250	1			4
Haul Truck	250	2			10
Water Truck	250	5			10
Pickup Truck	NA	15			4
Welder	50	2			6
Side boom	180	1			4
Cement Truck	250	1			4

Notes:
[a] Peak daily workforce during proposed construction activities is estimated at 80 workers per day and could include concurrent activities associated with installation of proposed steam generators, new and replacement wells and infrastructure, well workovers, plugging and abandonment activities, and road construction.
[b] Infrastructure could include flowlines, gauge settings, well pumping unit, and associated well components.

Operations Equipment and Workforce Estimates

A summary of the proposed equipment used and workers employed under future buildout conditions at the Chevron Coalinga Field is provided in Table 6, Future Equipment (Operations). The projected number of future full-time employees is not expected to increase over the existing average of 160 persons. Numbers may vary over time; therefore, reasonable maximum approximations have been used.

Table 6 Future Equipment (Chevron Operations)

Equipment Description	Equipment Quantity	Estimated Schedule (Days)	Duration of Use (Hrs/Day)
Oil Cleaning Plants (2)			
Tanks	8	365	24
Vessels	4		24
Vapor Recovery Units (VRU)	2		24
Heat Exchangers	4		24
Pumps	15		24
Water Cleaning Plant/Water Injection Plant			
Tanks	15	365	24
De-oiling System	1		24
Filtration System	1		24
Ion Exchange Softening System	1		24
Chemical Softening System	1		24
Water Pumps	6		24
Steam Generators			
Natural Gas Fired Steam Generators	9	365	24
Natural Gas Fire Steam Generator Retrofits	7		24
Solids Drying Facility			
Tanks	8	365	24
Vessels	4		24
Pumps	4		24
Temporary Facilities for New Wells [a,b]			
Vapor Recovery Compressor Skid (Electric)	1	180	24
Gas Separation Vessel	1		24
Gas Flare Skid	1		24
Offgas Flare	5		8
Propane Tank	2		24
Oil Transfer Pump Skid	1		24
Generator	2		8
Portable Storage Tanks (500 bbls capacity)	4		24
Tanker Trucks	5		8

Notes:
N/A – Not Applicable
[a] Future operations of new and replacement wells would vary year-to-year and may result in temporary increases in workforce demand at the Chevron Coalinga Field
[b] Due to the variation in well type, location, and configuration, most wells do not require additional operating equipment. Therefore, the equipment inventory represents the approximate temporary equipment need for all new/replacement wells per year.

Permits and Approvals

A list of approvals and permits required to implement the improvements planned by Chevron is provided below in **Table 7**.

Table 7 List of Permits and Approvals-Chevron

Permit/Approval	Agency
Sundry Notice	Bureau of Land Management (BLM)
Lease Line Agreements	BLM
Utilization Agreement Compliance	BLM
Land Use Permits	BLM
Permit to Drill	BLM
Right of Way	BLM/Land Owners
Commingling Agreements	BLM/Chevron
Air Permits	San Joaquin Valley Air Pollution Control District (SJVAPCD)
Demolition or Renovation Asbestos Notification (NESHAP)	SJVAPCD
Dust Control Plan or Notification	SJVACPD
Well Permits	California Division of Oil, Gas, and Geothermal Resources (DOGGR)
Spill Prevention Control and Countermeasures	U.S. Environmental Protection Agency and California Department of Fish and Wildlife, Oil Spill Prevention and Response (CDFW/OSPR)
Hazardous Materials Business Plan	Fresno County Environmental Health Department
National Pollutant Discharge Elimination System Construction General Permit (SWPPP)	Regional Water Quality Control Board, Central Valley Region
Fresno County Ministerial Permits	
Building/Electrical Permits	Fresno County
Grading Permit	Fresno County
Transportation and Encroachment Permits	Fresno County

Schedule

It is anticipated that Project components would begin being constructed approximately in 2019 and that construction would continue through approximately 2038. Specific schedules may be subject to change as construction and operational timelines become more refined. Although Chevron anticipates production will continue beyond this time frame, the scope of development at the field would occur beyond the 20-year time frame and is sufficiently speculative that future consideration will likely be required to determine if further California Environmental Quality Act (CEQA) documentation is warranted.

Senaca CUP Application

Seneca is proposing the Coalinga Oil Field Improvement Project (Project), which will enable Seneca to continue to recover crude oil and natural gas, though in a more efficient manner, from its existing oil field properties through construction and operation of new oil production and treatment facilities.

The Project includes the improvements that may be necessary over a 20-year period, including: new and/or upgraded Oil Cleaning Plants; Water Cleaning Plants; solids drying facilities; the increase of water disposal wells; conversion of existing idle wells or drilling of new wells for excess water injection; new steam generators; new

vapor recovery units and installation of other supporting equipment ("Project Components".) Implementation of the Project Components also has the potential to affect existing operations and maintenance activities and require improvements to existing infrastructure. Whether all or only some of the Project Components will be constructed or operated will ultimately be driven by market conditions and ongoing regulatory developments.

The Project does not propose DOGGR-regulated components outside the existing administrative boundary of the Coalinga Oil Field.[3] Exploratory wells or other expansions outside of the DOGGR administrative boundary would be subject to a separate permit process.

Regional Setting

The Project is located within southwestern Fresno County (County). The geography of the County is diverse, containing mountainous areas, agricultural land uses, and valley areas. The Project site is located on the western side of California's Central Valley within Pleasant Valley, which is bound on the west by the Coastal Ranges (Diablo Range) and on the east by the Sierra Nevada Mountains. Figure 1 Regional Location Map, illustrates the Project site within a regional context and Figure 2 Project Location Map depicts existing operational boundaries (parcels) that constitute the Project site.

Project Location and Setting

The Project will occur on Seneca-leased properties within the administrative boundary of the Coalinga Oil Field, established by the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR). The new facilities are proposed to be located on the Project site.

The primary area of the Project site is approximately two miles west of 1- 5 and six miles northeast of the City of Coalinga, in the southwestern portion of Pleasant Valley within unincorporated Fresno County, California. According to the Fresno County General Plan map, the Project site is designated as Exclusive Agricultural (40-acre minimum parcel sizes) (County of Fresno, 2016).

The Project site is approximately 8,149 acres in size, and falls within portions of the United States Geologic Survey Coalinga and Domengine Ranch Quadrangles (Township 19 South, Range 15 East, Sections 2, 3, 11, 12, 13, 22, 23, 25, 28, 33, 35 and Township 20 South, Range 15 East, Sections 1 and 3).

Existing Conditions

Existing operations within the Coalinga oil field are supported by two Oil Cleaning Plants, one Water Cleaning Plant, and a variety of wells, facilities and other infrastructure. At present, there are approximately 190 active production, injection, and observation wells in operation. Additional support facilities include administrative buildings, storage yards/warehouse, and storage tanks. A description of existing facilities and wells and associated operational processes, as well as related activities and operations and maintenance (O&M) activities, is set out below to provide the "baseline conditions" to which potential environmental impacts associated with the Project, are compared. In order to be able to evaluate the incremental increase in associated environmental impacts from the Project, this section includes a comprehensive overview of existing major facilities (including existing steam generators), existing wells and associated oil and gas production processes, and O&M activities, all of which will be considered part of the baseline conditions.

Existing facilities are summarized in Table 8, Existing Oil Field Components-Seneca, and key components are depicted in Figure 4, 5, and 6, Existing Facilities Map. As presented in Table 8, there are approximately 190 active production, injection, and observation wells in operation at the Coalinga oil field. Additional support facilities include a field office/ trailer and storage yards.

[3] Division of Oil, Gas, and Geothermal Resources. 1998. California Oil and Gas Fields Volume I-Central California. Department of Conservation. Sacramento, CA.

Table 8 Existing Oil Field Components-Seneca

Existing Major Components (Refer to Section Below)	Approximate Quantity or Characteristic As of August 1, 2016
Oil Cleaning Plants	2
Water Cleaning Plant	1
Water/Brine Disposal Wells	7
Gauge Settings	5-6
Administrative Buildings Center	1
Storage Yards	2
Aboveground Storage Tanks/ Vessels	9
Total Active Production, Injection, and Observation Wells	
Producers	172
Continuous Injectors	13
Temperature Observation	5
Subtotal, Active Wells	190

Project Description

Components associated with the Project are presented in Table 9, Major Proposed Project Components of Seneca's Conditional Use Permit Application, and may include:

- New Oil Cleaning Plant at 28A;
- New Water Cleaning Plant at 28A;
- New and/or upgraded water disposal wells and pipeline;
- New or upgraded Solids Drying Facility;
- New steam generators and associated equipment;
- New vapor recovery unites and associated equipment;
- New wells, other facilities and infrastructure; and
- Associated operational activities, including routine maintenance, repair, and replacement.\

New oil and gas wells would include those designed for EOR methods such as steamflood and cyclic steam, replacement wells, and wells in new areas (within the current DOGGR administrative field boundaries). New facilities are needed to support the EOR efforts.

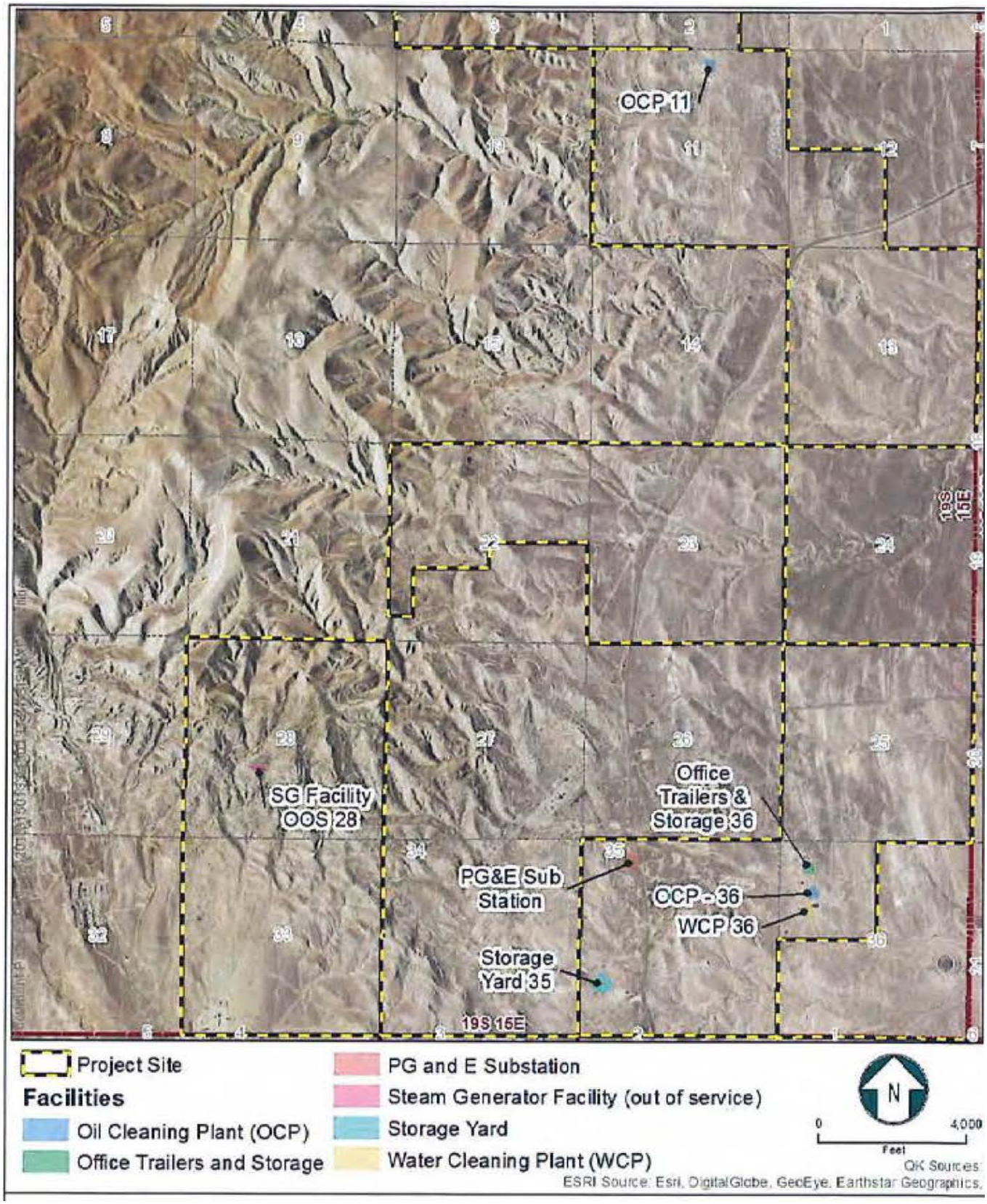

Figure 4 Existing Facilities-Seneca

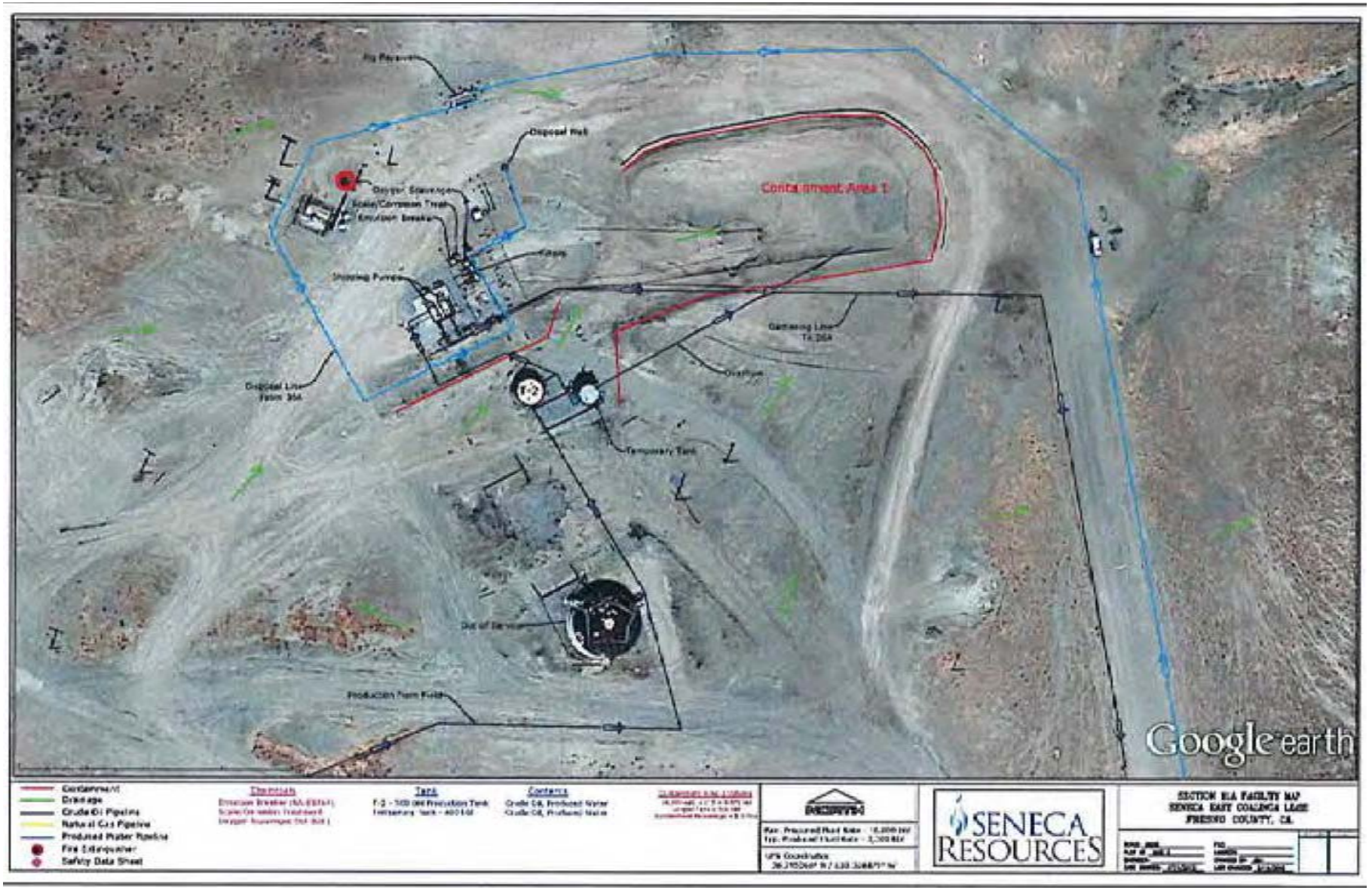

Figure 5 Section 11 A Facilities-Seneca

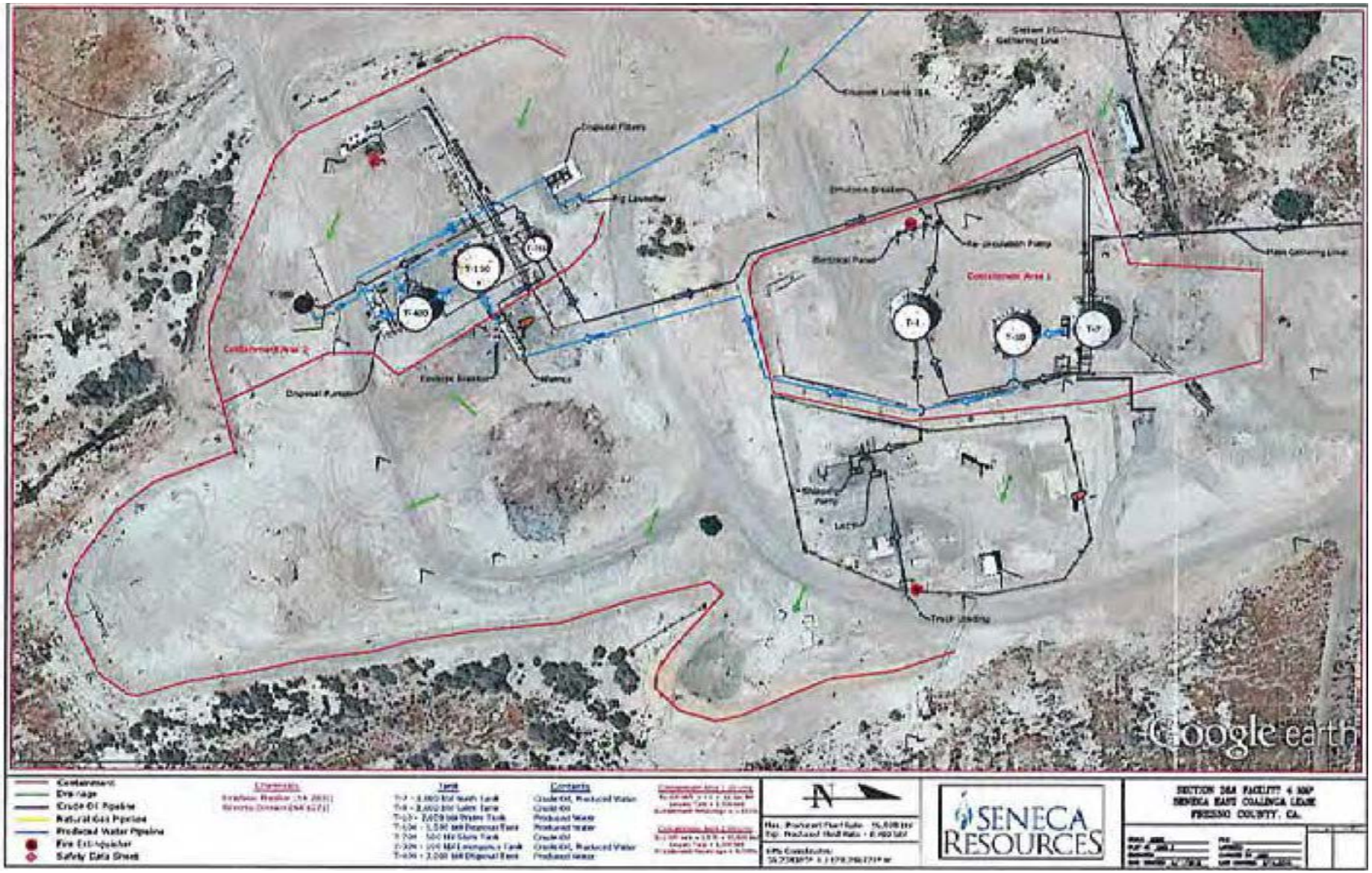

Figure 6 Section 36A Facilities-Seneca

Table 9 Major Proposed Project Components of Seneca's Conditional Use Permit Application

Major Components	Total Potential New by Buildout Year – 2037[a]
Major Facilities and Infrastructure	
New and/or upgraded oil cleaning plants	2
New and/or upgraded water cleaning plant	1
Solids drying facility	1
Steam Generators	5
Gauge Setting	20
Roadways	<60 miles[b]
Natural Gas/Softwater Pipelines	<10 miles
Flowlines	<800 miles
Production, Injection, and Observation Wells[c]	
Producers	798
Continuous Injectors	612
Temperature Observation	167
Well Subtotal	1,577
Well Improvements	
Replacement Wells	240
Well Workovers/Sidetracks	357
Well Abandonments (Plugging & Abandonment [P&A])	34
Water Disposal Wells	
Water Disposal Wells	95[d]

Notes:
[a] Buildout year is for the purposes of CEQA analysis. Development at the oil field is anticipated to continue beyond this timeframe, but the type and extent of future development beyond 20 years is sufficiently speculative at this time that future consideration will likely be required to determine if further CEQA review is warranted, as determined by the lead agency.
[b] Assumes each new well will require approximately 500 linear feet of new road.
[c] Not including Replacement Wells shown below.
[d] Total number includes replacement wells drilled. No more than 30 wells will be in operation at any one time.

New or Upgraded Oil Cleaning Plants

The Coalinga Field is currently served by two OCP located in Sections 11 and 36 (refer to Figure 2). The Project includes construction of new and/or upgraded OCPs to separate well-stream components - crude oil, gas, condensates, water, and solids - for processing, on-site use, distribution, and/or disposal. The proposed OCPs will be located within the existing oilfield boundary. The proposed OCPs will have the capacity to process up to 5,000 bbls of oil per day, and up to 50,000 bbls of water per day. The proposed OCPs will include a sales-oil tank, a sales oil/reject tank; and a slop tank. Additional equipment includes free water knockout vessel/tanks wash tanks, heat exchangers, electric-driven pumps and a VRU including gas compressors. Activities required to construct and operate the OCPs are described below.

Construction

Construction of the proposed OCPs will consist of site preparation, civil earthwork, foundation work, structural installation, and mechanical and electrical installation. Tanks will be constructed on-site and will require truck deliveries and/or haul trips and the operation of off-road equipment consisting of cranes, excavators, loaders, graders, dozers, backhoes, and various types of on-road vehicles. The free water knockout vessels and

electricity-driven pumps will be prefabricated and delivered to the Project site for installation and configuration for facility operation. Site preparation will include grading approximately five acres at each location within areas mostly disturbed by previous oil field activities. Unpaved or paved roads will be constructed around the perimeter and/or within the proposed OCPs. A concrete foundation for each of the above-mentioned tanks, vessels, pumps, and compressors will be constructed. Typical construction equipment will include haul trucks, cranes, graders, and dozers. Equipment usage and workforce estimates for construction of the proposed OCPs are presented later in this section.

Operation

Operation of the proposed OCPs will be similar to existing operations described above under Oil Cleaning Plants. The proposed OCPs will include new tanks, free water knockout and/or heater treater vessels, heat exchangers, vapor recovery units, pumps, and compressors that will be operated to separate well-stream components - crude oil, gas, condensate, water, and solids - for processing, on-site use, distribution, and/or disposal. The operation of the proposed OCPs will be similar to the current process utilized at existing facilities.

The water taken from the separation process is sent to the proposed Water Cleaning Plant, where additional hydrocarbons and suspended solids are removed before the water is used in EOR processes and/or disposed into a water disposal well. Oil separated during this process will be recovered and sent by pipeline to the slop oil tanks for shipment to an off-site refinery. The proposed OCPs would have a total capacity of 5,000 bbls of oil per day.

New or Upgraded Water Cleaning Plant

The Coalinga Field is currently served by one WCP located at the Section 36. The Project includes construction of one new or upgraded WCP to meet the soft-water demand for each of the proposed new steam generators. This plant encompasses facilities for both water de-oiling and water softening. The de-oiling unit will consist of surge tanks, induced-gas flotation cells (also referred as WEMCOs) and walnut shell filters where the free oil is separated from the water. The WCP will consist of resin beds in vessels, through which the mineral-laden raw water will be pumped; it will also include filtered water, softened water, fresh/spent brine and other tanks as well as pumps. The water-softening resin will be replenished or refreshed with salt water brine. Activities required to construct and operate this facility are described below.

Construction

Construction will include the following general steps: site preparation and grading; foundation pad construction; tank and material delivery; set-up, and configuration. Site preparation will include grading approximately five acres within an area mostly disturbed by previous oil field activities. The facility may include unpaved or paved roads around the perimeter and/or within the proposed facility and will include construction of foundations for storage tanks, process vessels (softeners and filters), and associated equipment including a de-gasifier, pumps, compressors, heat exchangers, filter presses, electrical infrastructure, and substation.

Construction will include installation of tanks for produced water (surge tanks), filtered water, brine recycling and disposal, and soft water storage and distribution. Tank sizes may be up to 2,000 bbls. The chemicals used at the WCP are not expected to vary significantly from what is currently utilized on-site. Typical construction equipment will include haul trucks, cranes, graders, and dozers. Equipment usage and workforce estimates for construction of the proposed water cleaning plant are presented later in this chapter.

Operation

Once the produced water has gone through oil/water separation at the proposed OCPs, the WCP will further treat it for reuse and/or on-site disposal. Water will be treated to remove various materials, including residual oil, solids, dissolved hydrocarbons, and water-soluble chemicals used to optimize oil production. Water will then be either sent to the Water Injection Plant or softened to remove calcium and magnesium and prepare it for use in on-site

steam generation. The proposed WCP will have the capacity to process up to 5,000 bbls of produced water per day and will soften up to 50,000 bbls of water per day.

Solids Drying Facility

The Project includes a new and/or upgraded Solids Drying Facility (SDF). When oilfield tanks are cleaned, a slurry containing oil, water, and solids must be removed. Vacuum trucks are used to remove the slurry from the tanks and transport them to the SDF. Fluids used in drilling operations are also taken to the SDF. These fluids include primarily drilling mud (a combination of bentonite clay and other non-hazardous additives) and water.

The SDF separates solids from oil and water using a combination of heat, gravity separation and centrifuges. Solids are stored onsite within a contained area until they can be hauled off-site to a permitted solid waste disposal facility. Water and oil are recycled back to the oil and water cleaning plants. A large portion of the water is re-used in steam generation.

Steam Generators and Associated Equipment

Steam generators are fired using natural gas to heat softened produced water from the WCP to make steam for use within the oil field for various processes. Steam generators are equipped with air pollution control devices to meet strict permit limits and achieve compliance with local and Federal regulatory requirements.

The Coalinga Field has 3 dormant steam generators and associated equipment. The Project includes construction and operation of approximately ten (5) or more new steam generators, each with a maximum heat rating of 85 MMBtu/hr, and associated gas treatment equipment including scrubber vessels, tanks, heating devices, pumps, belts and hoses. Steam generators and associated facilities would be located within a new steam generation plant. Activities associated with construction and operation of the proposed steam generators are described below.

Construction

Steam generator construction typically includes site preparation and grading; foundation pad construction; equipment delivery, set-up and configuration; and testing. Steam generators each require approximately a 30-foot by 115-foot space, which would be cleared and graded prior to equipment placement. The new steam generators would be placed in areas where there would be minimal new soil, native vegetation, and habitat disturbance. A concrete pad would be constructed to provide foundation support for the equipment. Flat-bed trucks would be used to haul and deliver equipment to the Project site. Once equipment is delivered and placed on the concrete foundation, it would be configured for steam distribution and tested prior to initial operation. Construction activities would also include Installation of piping and associated infrastructure to support natural gas and water usage during operation. For construction of a steam generator plant, several steam generators would be arranged in rows with a central pipeway for gas and steam piping.

In general, installing and constructing one steam generator requires three to six months, depending on the operating location, equipment size, and configuration. Typical equipment used during construction includes a grader, dozer, crane, cement pumps, bulk cement trucks, and haul trucks. Equipment usage and workforce estimates for steam generator construction are presented later in this chapter.

Operation

Seneca anticipates that the new steam generators would operate 24 hours per day and 365 days a year, between 90 and 100 percent load to support future operations. Oil field steam generators are designed to produce wet steam in the range of 50 to 80 percent quality[4] and at pressures up to 2,700 pounds per square inch (PSI) for

[4] Steam Quality refers to the percent of inlet water mass that has been converted to vapor phase, e.g., 70 percent steam quality would have 30 percent of the original water in liquid phase.

injection into oil reservoirs to enhance the recovery of viscous crude oils. Steam leaves the steam generation plant and enters the field steam distribution system. The distribution system transports the steam to measurement and contract equipment located at each gauge setting.

The steam generators will be designed and permitted to burn Public Utilities Commission - quality natural gas with a sulfur content not exceeding 1.0 grain of sulfur per 100 standard cubic feet. Steam generators would utilize primarily produced water.

Well Development

As delineated in Table 9, the Project includes all new well development activities for the duration of the 20-year project timeframe. Well development activities include new well drilling (including infills), P&A, and workovers, described under *Oil and* Gas *Recovery Activities.* The Project includes installing and operating new injection and producing wells to support steamflood and cyclic steam EOR methods. Also, in accordance with DOGGR regulatory requirements, Seneca intends to complete the plugging and abandonment of up to 34 idle or nonproductive wells for the duration of the 20-year Project timeframe. Proposed well development activities are described below.

The continuous steam EOR method utilized at the Coalinga Field is described under *Oil and* Gas *Recovery Activities.* Operational activities associated with a well are dependent upon the EOR method utilized to support oil and gas production. In general, an oil and gas production well operates using artificial lift (i.e., a pumping unit) to produce a mixture of oil and water. The oil/water mixture is pumped though pipelines to on-site production facilities for on-site processing, reuse and/or disposal.

In general, an EOR injection well is a vertical pipe that places steam deep underground to enhance oil and gas production. The type of injection well, fluid injected, and configuration are dependent upon the EOR method utilized for the production process. An OB is a well drilled to monitor and measure temperature within the formation, and is typically localed in close proximity to production and injection wells.

Production, Injection, and Observation Wells

The Project includes installation and operation of various well types. As with existing wells, each well type may vary in diameter and completion casing sizes. Wells will be designed with cemented surface casing and production casing (cemented solid string and perforated or slotted liner). Primary production wells will be operated with artificial lift pumping units. Steam injection wells will be monitored and controlled manually. The installation process will be the same or similar to existing well drilling activities, as described in *Production, Injection, and Observation Wells.* Well operation is dependent on the EOR method utilized for oil and gas production, as described under *Oil and* Gas *Recovery Activities.*

Future steam injection and associated crude oil production will follow the existing processes and procedures. Steam will be generated by existing and new steam generators. Steam injection will be delivered through additional central gauge settings and steam distribution manifolds where injection rates to each well are controlled.

The approximate number and type of construction equipment, activity duration, and workers needed to complete well drilling activities are presented later in this chapter. Well drilling activities are expected to occur essentially anywhere within the Project site over the 20-year Project timeframe.

Table 13 includes a list of temporary operational equipment that may be required to test initial production from exploration or appraisal wells. This equipment would be utilized for no more than 180 days at any one location.

Abandonments, Workovers, and Replacements

Seneca proposes to complete approximately 34 well abandonments concurrently with proposed well drilling and improvement activities. Well abandonments and re-abandonments will utilize multiple workover rigs, with activity focused in the areas where thermal development is targeted. The activities will be consistent with those described under *Existing Conditions.*

The approximate number and type of construction equipment, activity duration, and workers needed to complete P&A activities are presented later in this chapter. Well P&A activities are expected to occur within the Project site over the 20-year Project timeframe.

Acid treatments atoll and gas fields typically include two processes to improve production, which are performed during well completion or well workover activity. These acid treatments are 1) used to enhance formation characteristics (e.g., improve permeability); or 2) cleanout the wellbore. At Coalinga, acid treatments are being considered only for water disposal well workovers, for cleanout of the wellbore.

Wellbore cleanout is a typical maintenance activity which involves jetting the wellbore and perforations with acid solution to remove cement residue, drilling mud, scale, and perforation debris from the wellbore. Acid types and concentrations most commonly used for wellbore cleanout treatment range from 10 to 15 percent hydrochloric acid (additives may include corrosion inhibitor, iron control, surfactant demulsifier, and others). Acid volumes per treatments are dependent on length of the treatment interval and degree of damage. Estimated acid volumes commonly range between 2,000 to 20,000 gallons of blended acids. Specific acid types, concentration and volumes mixed are dependent upon individual well conditions.

Water Disposal Wells

Seneca proposes to install up to 95 new water disposal wells over the course of the 20- year project (approximately 30 disposal wells will be operating at any one time). As described under *Water/Brine Disposal Wells,* disposal wells are injection wells. Pumps used for water injection and disposal are designed for a maximum injection pressure so that surface injection pressure and rate of injection do not exceed the prescribed levels set by DOGGR's Underground Injection Control approval process.

The approximate number and type of construction equipment, activity duration, and workers needed to complete disposal well drilling activities are presented later in this chapter. Disposal well drilling activities are expected to occur within the Project site over the 20-year Project timeframe.

Gas Handling and Distribution

Centralized gas handling and processing facilities are operated at oil and gas fields to treat gas recovered during production. Gas from crude oil production comes in two forms described as "associated" and "dissolved." The associated gas exits the wellhead as a free gas or "casing gas," while the dissolved gas is produced in solution with the oil itself. The associated gas stream or casing gas is compressed through the casing gas collection system (i.e. pipelines), blended with Public Utility Commission (PUC)-quality gas, and distributed to fuel the various on- site steam generators utilized in EOR processes such as steamflood. The dissolved gas stream entrained in the crude oil exits the well entrained in the production fluids and is transferred via pipeline to the oil cleaning plant. The gas from the separation process is captured in the facility's vapor recovery system and is also used/blended as fuel for the generation of steam. The project proposes installing on-site gas handling and processing facilities, which would consist of vapor recovery units located at the 28A and 36 OCPs.

Gauge Settings and Flowlines

The Project includes construction and operation of gauge settings to support operation of the new oil and gas wells. The proposed equipment and infrastructure (flowlines} would be located throughout the Coalinga oil field. Activities required for constructing and operating the proposed gauge settings facilities are described below.

Construction

Construction would include site preparation, equipment and material delivery, equipment configuration, and testing. Site preparation would include disturbance of a 0.25-acre area to allow for equipment staging and configuration.

Operation

Gauge settings, and flowlines (described in more detail below under *Pipeline and Related Infrastructure Installation and Maintenance),* would be maintained in accordance with applicable regulatory standards and requirements throughout their operating life. The equipment would be remotely operated from a central control facility. Pipeline corrosion protection and control would be achieved through protective coating and cathodic protection. A cathodic protection system involves the application of direct current electricity from an external source to oppose the discharge or corrosion current from the surrounding soil.

Other Infrastructure and Activities

Additional infrastructure will be required to support new wells and process facilities. This infrastructure includes roads, pipelines, and electrical infrastructure.

Road Construction and Maintenance

Seneca anticipates that less than 60 miles of existing roads would be modified or improved as part of the Project (approximately 500 linear feet per well). Most new oil wells will be located within the developed area of the oil field that are currently accessed by existing roads. Heavy equipment may be required, including graders, backhoes, loaders, rollers, and trucks.

Pipeline and Related Infrastructure Installation and Maintenance

The Project would use a network of existing and new pipelines to transport natural gas, oil, water, and/or steam between wells and facilities. New pipelines would be installed aboveground and would be installed consistently with the existing network and standard.

As described under*, Steam Generators and Associated Equipment,* the proposed steam generators would require new pipelines and infrastructure from existing and proposed facilities to provide fuel for equipment operations and steam generation. The fuel supply line for steam generator operations would include a separate two-inch steel pipeline.

New flowlines would be constructed to distribute steam to proposed new wells. Less than ten miles of new flowlines would be constructed to support new well operations including steam injection. New flowlines would be mostly installed within areas previously disturbed by oil field operations.

Electrical Infrastructure

A new substation and expansions of the existing 12-kilovolt network to provide a permanent supply of electricity to the new wells and facilities will be required. These activities would generally occur in previously disturbed areas and along existing rights-of-way or roads. Electrical line extensions consist of installing new power poles and transformers and may also include cross-country vehicular travel. Although minor, permanent habitat disturbance will occur at each power pole location and additional temporary disturbance will occur during installation activities.

Material Handling and Disposal

Construction and operation associated with the Project would include material use, handling, storage, and disposal of non-hazardous and hazardous materials. Hazardous materials would be stored, handled, and used in accordance with applicable local, State, and Federal regulations. Hazardous material handling, waste storage, and emergency response procedures will be implemented in accordance with site-specific Hazardous Materials Business Plan, Emergency Response Plan, and the Spill Prevention, Control and Counter-measures Plan.

The Project would require the use of hazardous materials, including acids, anti-foamer, bases, bentonite, corrosion inhibitor, demulsifier, diesel fuel, emulsifier, gasoline, perforating charges, gear lubricant, hydraulic fluids, herbicides and pesticides, lubricant oils, mineral oil, natural gas, anti-sealant, acetylene, oxygen, and argon. Storage of these materials is dependent on chemical properties and use. Materials will be stored in compatible containers such as high- density polyethylene drums, carbon steel tanks, and steel drums. Some hazardous materials, such as natural gas, perforating charges, pesticides, and herbicides, will not be stored on-site. The Project would not create a need for additional types of hazardous materials, but construction and operation of the Project would increase the quantity of certain hazardous materials.

The construction phase of the Project would generate both hazardous and non-hazardous wastes. These wastes would include acidic liquids, hydrocarbon solvents, waste oil, paint, contaminated debris (inorganic solid waste), drilling mud, petroleum-impacted soil, and universal wastes. Depending on the nature and source of the waste, materials will be transported for off- site disposal or reused on-site.

The operations phase of the Project would also generate both hazardous and non-hazardous wastes. These wastes would include hydrocarbon solvents, waste oil, contaminated debris (inorganic solid waste), drilling mud, petroleum-impacted soil, decommissioned oil field equipment, heavy oil/water, spent brine, tank sludge, and universal wastes. Depending on the nature and source of the waste, materials will be transported for off-site disposal or reused on- site. No hazardous wastes will be stored on-site for more than 90 days.

Utility Usage

The Project would result in an increase in utility usage resulting from operation of new wells, steam generators, and modified facilities. The estimated annual usage of utilities, both purchased and produced, during the Project buildout year (2037) is presented in Table 10, Project Utility Usage Summary (Bulldout).

Table 10 Project Utility Usage Summary (Buildout)

Utility Description	Purchased	Produced	Total	Units
Electricity	[B]	0	[B]	MWh/yr
Natural Gas	3,600	139	3,739	MMscf/yr
Water	1,500,000[C]	25,000,000[d]	26,500,000	bbls/yr

Acronyms:
MWh/yr = megawatt hours per year bbls/yr = barrels per year
MMscf/yr= million standard cubic feet per year
Notes:
[a] Includes total oil field utility usage from existing operations plus Project.
[b] Water used for administrative building domestic use, cogen water, site wash down, and dust control.
[c] Net Water re-injected as steam.

Water would be needed for several different aspects of the Project. For example, during construction, water would be required for dust control and to obtain appropriate compaction of soil placed back into excavation areas. Once the new/upgraded facilities have been installed, water would be needed for steam production and hydrostatic testing. Both treated and untreated produced water (water associated with crude oil production) from the Coalinga Field would be supplied from the existing WCP. Treated water will be utilized for steam production and other industrial needs. Fresh water is currently purchased from the City of Coalinga, and the future fresh water uses are anticipated to remain steady or decrease, depending on the availability of supplies from the City of Coalinga or other potential purveyors.

Land Disturbance

Project Components would predominantly be constructed in areas previously disturbed by oil and gas operations, within property leased or owned in fee by Seneca. The approximate permanent land disturbance associated with major project components is presented in **Table 11**.

Table 11 Land Disturbance Summary; Seneca CUP

Components	Approximate Disturbance Area (Acres) Includes previously disturbed lands
Cleaning Plants	
New and/or upgrades to existing Oil Cleaning Plants (total)	10
New and/or upgrades to existing Water Cleaning Plant (total)	5
New Steam Generation Plant (each)	2
Well Pads (each)	2[a]
Gauge Settings (each)	Varies
Roads	150[b]
Pipelines	Varies

Notes

[a] Assumes 100-ft by 200-ft permanent disturbance area and remainder as temporary disturbance for well pad cut and fill grading

[b] Assumes 20-ft wide roads

Construction Equipment and Workforce Estimates

Temporary construction activities associated with the new wells, facilities, and infrastructure would require operation of various on- and off-road mobile source equipment. The estimated type and number of equipment, duration of activity, and number of workers required for construction of the Project are presented in Table 12, Equipment and Employees: Construction. Numbers may vary; therefore, reasonable maximum approximations have been used.

Table 12 Equipment and Employees: Construction for Seneca Improvements

Equipment Description	Estimated Horsepower	Equipment Quantity	Estimated Workforce (Workers/Day)[a]	Estimated Schedule (Days/Yr)	Duration of Use (Hrs/Day)
Facilities					
Site Preparation				**30**	
Scraper	250-365	2	30	30-60	6
Grader	250	2			6
Skip Loader	75-125	1			6
Compactor	75-125	1			6
Rubber Tired Loader	250	1			6
Air Compressor	150	1			8
Dump Truck	250	2			6
Pickup Truck	NA	5			4
Construction				**365**	
Air Compressor	150	2	50	365	6
Forklift	250	2			6
Rubber Tired Loader	250	1			6
Compactor	125-250	1			6
Bore/Drill Rig	450	2			6
Crane	250	1			6
Scissor Lift	75	1			4
Material Handling Equipment	75-250	2			8
Tractors/ Backhoes	50-250	1			6
Welders	250	1			6
Other Construction Equipment	75	2			6
Concrete Mixer	250	2			4
General Industrial Equipment	250	2			6
Dump Truck	250	1			4
Haul Trucks	350-500	5			8
Pickup Truck	NA	20			4
Roller	250	1			4
Steam Generators					
Site Preparation				**30**	
Scraper	250-365	2	30	30	6
Grader	250	2			6
Skip Loader	75-125	1			6
Compactor	75	1			6
Rubber Tired Loader	250	1			6
Air Compressor	150	1			8
Dump Truck	250	2			6
Pickup Truck	NA	5			4

Equipment Description	Estimated Horsepower	Equipment Quantity	Estimated Workforce (Workers/Day)[a]	Estimated Schedule (Days/Yr)	Duration of Use (Hrs/Day)
Steam Generator Installation				**365**	
Air Compressor	150	2	20	365	6
Forklift	250	2			6
Rubber Tired Loader	250	1			6
Compactor	250	1			6
Bore/Drill Rig	450	2			6
Crane	250	1			6
Scissor Lift	75	1			4
Material Handling Equipment	250	2			8
Tractors/ Backhoes	250	1			6
Welders	50-250	1			6
Other Construction Equipment	75	2			6
Concrete Mixer	250	2			4
General Industrial Equipment	250	2			6
Dump Truck	250	1			4
Haul Trucks	350-500	5			8
Pickup Truck	NA	20			4
Wells					
New/Replacement Wells and Infrastructure [b]				**365**	
Rubber Tired Loader	250	1	11	365	6
Tractors/ Backhoes	250	2			4
Cranes	250	2			4
Drill Rig	250	1			6
Concrete Truck	250	1			6
Tractor/Trailer	250	1			4
Air Compressor	120	1			6
Generator	120	1			6
Water Truck	250	1			4
Pickup Truck	NA	4			4
Well Workovers				**365**	
Workover Rig	250	1	11	365	6
Cement Truck	250	1			6
Pump	50	1			6
Tractor/Trailer	250	1			6
Crane	250	1			6
Pickup Truck	NA	5			6
Well Plugging and Abandonment				**365**	
Workover Rig	250	1	up to 17	365	6
Cement Truck	250	1			6
Pump	50	1			6
Tractor/Trailer	250	1			6
Crane	250	1			6

Equipment Description	Estimated Horsepower	Equipment Quantity	Estimated Workforce (Workers/Day)[a]	Estimated Schedule (Days/Yr)	Duration of Use (Hrs/Day)
Pickup Truck	NA	5			6
Roads and Infrastructure					
Road Construction				**90**	
Backhoe/Front Loader	125	1	6	90	6
Track Type Dozer	150	1			6
Motor Grader	250	1			6
Haul Truck	250	1			8
Water Truck	250	1			6
Pickup Truck	NA	4			6
Pipelines (Steam, Gas, Water)				**90**	
Air Compressor	50	1	6	90	6
Backhoe	100	1			6
Generator	100	1			6
Rubber Tired Loader	250	2			6
Grader	250	2			6
Crane	250	1			4
Haul Truck	250	2			10
Water Truck	250	5			10
Pickup Truck	NA	15			4
Welder	50	2			6
Side boom	180	1			4
Cement Truck	250	1			4

Notes:

[a] Peak daily workforce during proposed construction activities is estimated at 80 workers per day and could include concurrent activities associated with installation of proposed steam generators, new and replacement wells and infrastructure, well workovers, plugging and abandonment activities, and road construction.

[b] Infrastructure could include flowlines, gauge settings, well pumping unit, and associated well components.

Operations Equipment and Workforce Estimates

A summary of the proposed equipment used and workers employed under future buildout conditions at the Seneca Coalinga Field is provided in Table 13, Future Equipment (Seneca Operations). The projected number of future full-time employees is not expected to increase over the existing average of 160 persons. Numbers may vary over time; therefore, reasonable maximum approximations have been used.

Table 13 Future Equipment (Seneca Operations)

Equipment Description	Equipment Quantity	Estimated Schedule (Days)	Duration of Use (Hrs/Day)
Oil Cleaning Plants (2)			
Tanks	8	365	24
Vessels	4		24
Vapor Recovery Units (VRU)	2		24
Heat Exchangers	4		24
Pumps	15		24
Water Cleaning Plant/Water Injection Plant			
Tanks	15	365	24
De-oiling System	1		24
Filtration System	1		24
Ion Exchange Softening System	1		24
Chemical Softening System	1		24
Water Pumps	6		24
Steam Generators			
Natural Gas Fired Steam Generators	9	365	24
Natural Gas Fire Steam Generator Retrofits	7		24
Solids Drying Facility			
Tanks	8	365	24
Vessels	4		24
Pumps	4		24
Temporary Facilities for New Wells [a,b]			
Vapor Recovery Compressor Skid (Electric)	1	180	24
Gas Separation Vessel	1		24
Gas Flare Skid	1		24
Offgas Flare	5		8
Propane Tank	2		24
Oil Transfer Pump Skid	1		24
Generator	2		8
Portable Storage Tanks (500 bbls capacity)	4		24
Tanker Trucks	5		8

Notes:
N/A – Not Applicable
[a] Future operations of new and replacement wells would vary year-to-year and may result in temporary increases in workforce demand at the Chevron Coalinga Field
[b] Due to the variation in well type, location, and configuration, most wells do not require additional operating equipment. Therefore, the equipment inventory represents the approximate temporary equipment need for all new/replacement wells per year.

Permits and Approvals

A list of approvals and permits required to implement the improvements planned by Seneca is provided below in **Table 14**, List of Permits and Approvals-Seneca.

Table 14 List of Permits and Approvals-Seneca

Permit/Approval	Agency
Sundry Notice	Bureau of Land Management (BLM)
Lease Line Agreements	BLM
Utilization Agreement Compliance	BLM
Land Use Permits	BLM
Permit to Drill	BLM
Right of Way	BLM/Land Owners
Commingling Agreements	BLM/Chevron
Air Permits	San Joaquin Valley Air Pollution Control District (SJVAPCD)
Demolition or Renovation Asbestos Notification (NESHAP)	SJVAPCD
Dust Control Plan or Notification	SJVACPD
Well Permits	California Division of Oil, Gas, and Geothermal Resources (DOGGR)
Spill Prevention Control and Countermeasures	U.S. Environmental Protection Agency and California Department of Fish and Wildlife, Oil Spill Prevention and Response (CDFW/OSPR)
Hazardous Materials Business Plan	Fresno County Environmental Health Department
National Pollutant Discharge Elimination System Construction General Permit (SWPPP)	Regional Water Quality Control Board, Central Valley Region
Fresno County Ministerial Permits	
Building/Electrical Permits	Fresno County
Grading Permit	Fresno County
Transportation and Encroachment Permits	Fresno County

Schedule

It is anticipated that Project components would begin being constructed approximately in 2018 and that construction would continue through approximately 2037. Specific schedules may be subject to change as construction and operational timelines become more refined. Although Seneca anticipates production will continue beyond this time frame, the scope of development at the field would occur beyond the 20-year time frame and is sufficiently speculative that future consideration will likely be required to determine if further California Environmental Quality Act (CEQA) documentation is warranted.