3 Operations
3.1 Site Preparation & Development

**Wellpads:** Twenty eight (28) of the twenty nine (29) wellpads are existing and/or the site of currently soil remediation projects from previous operations. Twenty six (26) of the wellpads do not require additional grading, but will require new base, which will be placed on top of existing grade. Sites M and O are currently undergoing soil remediation, but will require grading to accommodate the larger number of wells proposed. Site Z is a combination of an existing well pad, equipment storage area and farmed land which will be expanded to accommodate the new proposed well pad, which was chosen in consultation with the farmer and surface owner. Approximately 6,000 cubic yards of grading will be required at Size O, 4,175 cubic yards of grading will be required at Size M, and 21,345 cubic yards of grading will be required at Size Z. Cut/fill is expected to balance onsite. Heavy equipment (scrapers, dozers, backhoes) will be used to develop Sites O, M and Z. Grading of Sites O, M and Z is expected to take 2-3 weeks/site.

Each wellpad will require development of pipeline manifold racks, cement pads for the gas separator and ancillary equipment and power lines/transformers. The additional development for each pad is expected to take 2-4 weeks per pad, and will coincide with the drilling schedule. Typical equipment associated with wellpad development will be light trucks, heavy delivery trucks, boom trucks and cement trucks. Traffic trips and emissions associated with well pad development are included in the traffic and air calculations.

**Exploratory Phase:** During the Exploratory Phase only the tank battery, Pads O/M and associated pipelines and power will be developed.

**Development Phase:** Should the project move into a Development Phase, the remaining Pads and pipelines will be developed.

**Tank Battery:** The 4.5 acre Tank Battery Site is currently the site of remediation activities by the previous operator, including bioremediation and a stockpile. The location does not require expansion of the Site boundaries, however, grading of approximately 30,380 cubic yards will be required to level the pad and over excavate areas beneath the tanks and structures. Cut/fill is expected to balance onsite and grading is expected to take 4-6 weeks. The bulk of construction is
expected to occur intermittently over years 1-3 following final permit issuance as part of the Exploratory Phase. Typical equipment will be light trucks, heavy delivery trucks, welders, electricians and cement trucks. Traffic trips and emissions associated with Tank Battery development are included in the traffic and air calculations.

Roadways: There are no anticipated development or improvements required for roadways, other than for dust control measures.

Pipelines and Utilities: Pipelines for oil, water and gas will interconnect each well pad to the Tank Battery and to adjacent leases. The lines will range from 2” to 8” and will be steel or HDPE. Total lineal footage of the pipeline route is approximately 23,232’. The majority of the lines will be above ground, follow existing roadways and will be placed on sleepers (eg: cement block similar to a parking block). No grading is anticipated for the above ground lines. A small section of pipelines may be buried within existing, private paved roadways to limit disruption to agricultural activities. It is estimated that approximately 1,000 cubic yards of grading may be required for buried pipelines. As part of the Exploratory Phase, the pipeline route connecting Pads O/M to the tank battery will be approximately 1,000 lineal feet. If required, installation of a dry gas line from SoCal gas main line on Foxen Canyon Road to the tank battery (approximately 14,000 lineal feet (2.7 miles)) may be installed. As part of the Development Phase, pipelines will traverse the intermittent blue-line creek in Bradley Canyon either through trenches or a 200’ pipeline suspension bridge to interconnect Pads X, Y, Z, AA, and AB to the Tank Battery and the sales line. The footings for the bridge will be from existing well pads located outside the top of banks of the creek resulting in no construction within the confines of the creek. Grading for the footings will be required, and is estimated at less than 100 cubic yards. The suspension bridge will include two high grade steel conduits which will contain the pipelines. The bridge conduits and associated berms are designed to contain all fluids in case of catastrophic pipeline failure to prevent spills into the creek. Pipelines to the adjacent property north and east to allow for possible future connection to a DOT regulated sales pipeline at Foxen Canyon Road will also be installed during
the Development Phase. At full buildout, the pipeline route for the entire project will be approximately 23,232 lineal feet. See Section 5.1 for details on the proposed suspension bridge. Pipeline materials will be delivered to the project site by truck, then constructed onsite by welding crews.

PG&E high voltage lines and private above ground lines remaining from previous operations exist on the property. The project will install an extension to the existing power system to bring power to each well pad and the Tank Battery. The extension will be via overhead lines on new power poles which will generally follow existing roadways (see Section 5.1 for route and details). The poles will be <40’ tall and spaced at approximately 200’ from other poles. New transformers (pole mounted and pad mounted) will be installed at various locations. Materials will be delivered via truck and installed onsite by qualified electricians.

**General Conditions:** All Site Preparation and Development activities would occur during normal business hours between 7:00 am and 5:00 pm, Monday through Friday and excluding holidays. Permits issued by applicable agencies would be obtained prior to construction. All activities would be managed by an onsite construction supervisor using licensed contractors. Portable toilets will be utilized during the construction phase for employees and contractors. Silt and/or temporary construction fencing will be installed per recommendations from qualified biologists and archeologists to protect resources, if required. Dust control, SWPP, and BMP will be implemented per standard grading conditions during construction.

### 3.2 Drilling

**Drilling Operations:** A drilling rig that is an estimated 100-feet tall and capable to drill to at least 5,000 feet will be utilized for drilling the wells. Each well may take an average of six days to drill and the applicant may drill up to 30 wells per year. Once commenced, drilling of a well will continue until completed (eg: 24 hours/day). Fresh water will be required for drilling as the
recycled brine water is not suitable for the drilling mud. Each well would require approximately 33,000 gallons of water during drilling. Water used for drilling will be from potable water sources (see Section 3.4). The applicant is proposing a maximum of 30 wells drilled per year. Metal storage containers located either on the well pad or Tank Battery will be utilized during drilling to temporarily store drill cuttings. Drilling fluids shall be separated from the drill cuttings and trucked off site. Drill cuttings will be mixed with Solibond (a non-hazardous agent that dehydrates and solidifies drill cuttings) and either used for berm material or hauled to a landfill that accepts non-hazardous material. A temporary tank holding water dedicated for a fire emergency will be on location while drilling. No sumps will be dug or used as part of the drilling process and no cellars will be used for the wells. Upon completion of drilling, steel casing will be cemented into the wellbore to maintain integrity and protect the non-oil producing zones. Each well will be equipped with tubing, rods and a pumping unit which will be painted a neutral color to blend in with the natural surroundings.

3.2.1 Replacement Wells

Wells may experience mechanical failures over time or a depletion of the zone it is producing from. The project proposes the ability to redrill replacement wells, if necessary, on a 1:1 basis. The replacement well would occur on the same drilling pad as the well being replaced, and would only occur upon plug and abandonment of the replaced well, and full sign off by appropriate agencies. At no time will there be more active or idle wells than the total wells approved for the project.

3.3 Operations

Tank Battery: The proposed project aims to accomplish the County stated goal of consolidated and shared co-located facilities (LUCD 35.52.050.B.1.d) by combining production from all well pads and leases into a single tank battery. The Tank Battery will include oil storage tanks, water storage tanks, water plant, fire suppression system, heater treaters, boilers, gas separators, vapor recovery, loading racks, compressors, pumps, flares and other ancillary equipment (see Table 2b and/or Section 5.1 for complete list of equipment) and will interconnect to each well pad via pipeline.
**Liquid processing at the Tank Battery:**

- **Stage 1** – Produced fluids will be transported from the well pads to the Tank Battery;
- **Stage 2** – Produced fluids flow through a gas separator to strip gas from the fluids. Gas is sent to the vapor recovery compressor, remaining fluid moves to Stage 3;
- **Stage 3** – Produced fluids flow through heated vessels (Heater Treater and/or a Free Water Knock Out (FWKO)). Heating the produced fluids causes additional viscosity reduction and allows oil, gas and water to separate.
- **Stage 4** – Storage of Fluid & Gas.
  - Oil flows from the heated vessels to the oil stock tanks.
  - Produced water flows to the water tanks.
  - Gas is captured by the vapor recovery compressor.
- **Stage 5** – Output from Tank Battery
  - Oil that is ready for sale\(^5\) will be shipped one of two ways, either:
    - Via tanker trucks, or
    - Via pipeline to the future oil sales line at/near Foxen Canyon Road;\(^6\)
  - Produced water in the water tanks will either be:
    - Recycled to use as feed water for steam;
    - Injected into a US EPA approved subsurface geologic interval;
  - Natural gas will either be:
    - Consumed on site,
    - Transported, via pipeline, to a third party,
    - Injected into a US EPA approved subsurface geologic interval, or,
    - Flared.

Employees, operators, pumpers and contractors will be located at the Tank Battery. It is expected that up to 12 full time employees plus 2 contractors may be onsite per day at full build out and will operate out of a new two story 2,400 sf office, a 3,200 sf workshop and 960 sf operator

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\(^5\) If the oil doesn't meet refinery specifications it may repeat Stages 2 and 3.

\(^6\) Subject to construction of the pipeline, capacity and commercially acceptable terms for delivery and sales.
building. Onsite parking will be provided within the Tank Battery area. Typical operating hours would be 7:00 am and 5:00 pm, Monday through Friday, and as needed on weekends, holidays or during emergencies. An additional skeleton crew of operators will be onsite nights, weekends and holidays for 24x7 coverage. Domestic water for the offices will be provided via existing onsite water wells. It is estimated that up 2 acre feet per year of fresh groundwater may be used for domestic, dust control and fire protection purposes.

Oil wells and equipment will be monitored twenty four hours a day using SCADA (supervisory control and data acquisition), a system operating with coded signals over communication channels so as to provide control of remote equipment. The SCADA computer server will be located onsite and the Tank Battery and operators can monitor the system either onsite or from mobile devices.

**Fire Protection:** A dedicated water tank (1,000 bbl) and fire suppression system will be located at the Tank Battery.

**Cyclic Steam Process:** Each well may be employ the Cyclic Steam Recovery Process to aid in the extraction of oil. Due to the viscous nature of the crude oil, heat, in the form of steam, is introduced into the reservoir to aid the flow of fluids to the wellbore. Heat significantly reduces the viscosity of the in-place oil making it easier to recover. Steaming consists of heating water in a steam generator and injecting the steam into a well for approximately ten days. The steam will then be allowed to “soak” in the well for two to seven days before the well is returned to production.

During the Exploratory Phase, one (1) 25 MMBtu portable steam generator will be utilized and located at the Tank Battery. Should the Development Phase be implemented, the project will include five (5) steam generators: one (1) 85 MMBtu stationary unit located at the Tank Battery, one (1) 50.0 MMBtu stationary unit located at Site Z, and three (3) 25 MMBtu portable units which will be moved amongst the remaining well pads as necessary to steam the wells. The stationary steam generators are approximately 12’ by 70’ by 15’ and the portables steam generators are approximately 9’ by 40’ by 14’.
At peak production, the project may require up to 300 acre feet of water per year, the majority of which will be provided from recycled, non-potable water obtained from operations and wells producing from non-potable water aquifers. The non-potable water will be processed to operational specifications via an onsite water recycling plant. Included in the 300 acre feet, up to 23 acre feet of fresh water may be utilized annually by the project to be used for initial operations, domestic uses, drilling, dust control and fire suppression, and will be provided by an existing onsite well, or additional wells that may be drilled.

Fuel gas for combustion equipment will initially be provided by a combination of propane and produced field gas. As fuel gas requirements increase, additional gas for operations may be supplied by SoCal Gas via a pipeline extension from Foxen Canyon Road or from other local oil operations. Please note, the Exploration Phase may include a subphase where only 3-5 wells are drilled to assure that the reservoir is not depleted. The applicant may use propane during this “subphase” as fuel to kick the project off.

The steam generators will be painted a neutral color to blend in with the natural surroundings.

**NOTE: No wells on the property will be hydraulically fractured as a means of enhancing crude oil production.**

*Light Crude Oil*: High-gravity, crude oil (+/- 30 degrees API gravity) will be mixed with the native crude oil to reduce viscosity and make the oil ready for market. It is estimated that up to 800 barrels of LCO per day may be added to the 4,000 barrels per day crude oil produced in the UCCB Project. The LCO will be trucked to the project site and stored in tanks at the Tank Battery. LCO is expected to come from other oil production sites within 180 miles of the project. It is then transported from the storage tanks to individual wells via pipeline. At the wellhead, the LCO is put into the wellbore down the casing where it mixes with the native crude in the well resulting in a higher gravity crude making extraction easier. The mixed native crude/LCO is then pumped to the surface and piped back to the central tank battery.
**Produced Oil:** Each well will be have a pumping unit, and the units will be equipped with pump off controllers for automation and more efficient control during production. Produced fluids from the wells will be transported to the Tank Battery via pipelines, then either sold via pipeline or trucked up to 100 miles from the site. Each well may produce between 10 and 200 barrels of oil per day and total production, at full build out, could reach 4,000 barrels per day.

**Produced Water:** Produced water will be treated and used in the steaming operations described above or injected into an US EPA approved subsurface geologic interval (the Sisquoc or Monterey Formations).

**Natural Gas Production from Wells:** Natural gas production from the proposed wells will be transported to the UCCB Tank Battery via pipeline then 1) used in operations, 2) transported to an off-lease third party, 3) injected into approved subsurface geologic intervals or 4) flared.

3.4 Water Use

**Requirement.** The project will require water i) during drilling, ii) for steaming operations and iii) potable water for offices, dust control and fire protection. At peak production, the project may require up to 300 acre feet of water per year, the majority of which will be provided from recycled, non-potable water obtained from oil operations and wells producing from non-potable water aquifers. The produced non-potable water will be processed via an onsite water recycling plant. Included in the 300 acre feet, up to 23 acre feet of fresh water may be utilized annually by the project which will be used for initial operations, domestic uses, drilling, dust control and fire suppression. The volumes of water used will be lower at the beginning of the project, increase as wells are drilled, experience a peak usage, then decrease as the field production declines. The majority of the water will be used for steaming operations. In addition to steaming operations, approximately 2 AF/Y will be used for domestic purposes, dust control and fire and will be static through the life of the project. A temporary use of approximately 2 AF/Y will be used at the
beginning of the project during construction (note: steaming is either not conducted or low usage during this time). A one-time use of fresh water will occur during drilling averaging approximately 33,000 gallons per well (.011 AF).

Supply. Water for the project will be provided through a combination of fresh groundwater, non-potable groundwater and recycled water from operations, either from the project or adjacent operators. There are two ag/residential wells located on the East half of Section 14 and a well on the West Half of Section 14 that is currently being used for ongoing remediation activities by other parties. None of the wells are located within 250’ of a proposed oil or injection well (see Section 5.3.9). The fresh water wells on the East Half will not be utilized by the project. The water well on the West half of the property will be utilized by the project for drilling operations, potable water for the offices/dust/fire, and steaming operations. Up to sixteen (16) additional non-potable water wells may be drilled at the wellpads as required by the project. The project is proposing a maximum usage of 23 acre feet of fresh groundwater per year, the remainder will come from non-potable water wells and recycled water from operations. New potable water wells will be completed in the Paso Robles formation. As referenced in Section 2.15.5 and presented in Appendix 5.3.5, the June 24, 2015, report titled “Water Source Study, UCCB Project, Cat Canyon Oil Field, Santa Barbara County, California” by Katherman Exploration Co., LLC (“Katherman Water Report”), describes the depth of a well into the Paso Robles Formation as being between 750’ and 900’. The estimated water in storage within the Paso Robles interval under the UCCB properties is approximately 39,800 acre-feet (AF). A Paso Robles well is estimated to have the capacity to produce between 0.7 and 0.9 AF per day.

For future operational flexibility, an additional potable water reservoir target may be the Careaga Formation. Described on Page 6 of the Katherman Water Report, the depth of a well into the Careaga Formation will be between 900’ and 1,100’ (page 6 of the Katherman Water Report). The estimated water in storage within the Careaga interval under the UCCB properties is approximately 42,700 acre-feet (AF). A Careaga well is estimated to have the capacity to produce 0.9 AF per day based on a 12-hour pumping day.
3.5 Beneficial Reuse

The project proposes several areas of beneficial reuse:

- Berm material: the project proposes to use excess dirt from drilling as berm material around well pads. Prior to placement, dirt will be stored either on visqueen or in metal containers on existing well pads;
- Recycled Water: the project proposes to recycle produced, non-potable water for use in operations. The water recycling equipment will be located at the central tank facility;
- Natural Gas: the project proposes to use gas produced from the wells to supplement use of utility gas;
- The applicant is evaluating the use of turbines to create electricity from produced natural gas, however the turbines are not part of the application at this time.

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