APPENDIX B: OPERATORS' PROJECT DESCRIPTION

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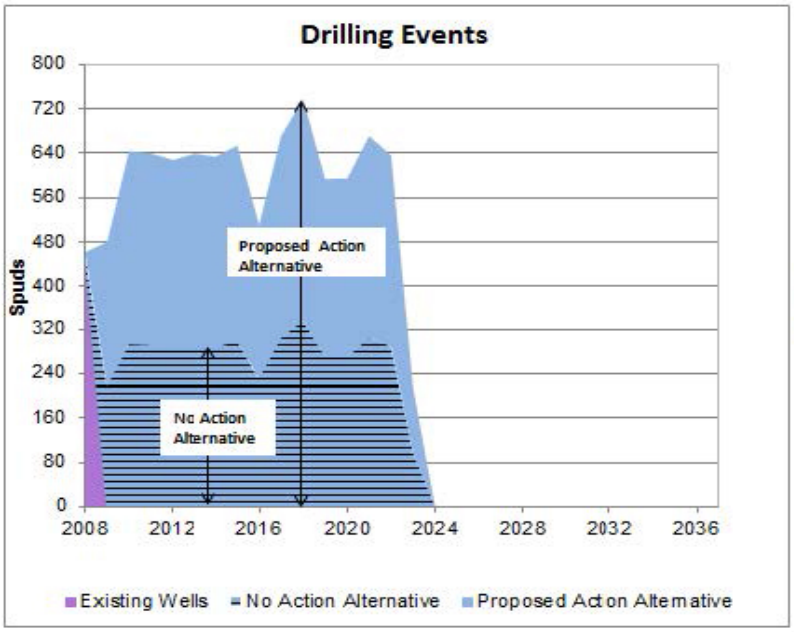
INTRODUCTION

The Continental Divide-Creston (CD-C) Operators submitted their project description for the CD-C project to the BLM in September 2006. The project description was subsequently revised in late 2007 to reflect a reduction in plans for coalbed natural gas (CBNG) development within the project area. The original project description had said that potentially 500 to 900 of the proposed 8,950 wells could be CBNG wells. The 2007 revision reduced that amount to "up to 500" CBNG [CBM] wells. The 2007 version of the project description is the one reproduced in this appendix.

Since the submittal of the revised 2007 project description, other changes and clarifications have been made to the Operators' development plans. Although no formal revision of the project description has been made, the changes have been incorporated into **Section 2.2.1, The Proposed Action**, and **Section 2.2.7, Features Common to All Alternatives,** of the CD-C Environmental Impact Statement (EIS). The changes were most often made because of advances in drilling technology since the project was originally proposed or because the analysis of project impacts necessitated a more detailed definition of the Operators' plans to adequately address the effects. The changes occurred over the five years between 2007 and 2012 and were generally evolutionary in the way they developed, with frequent emails and phone conversations discussing the changes before a decision was made to alter the development proposal. The Operators have agreed that the following descriptions of those changes and clarifications accurately reflect their intent and the project description is hereby amended as follows:

1. **Number of wells drilled annually.** Section 1-1 of the project description says that "Collectively, the Operators propose to drill approximately 8,950 wells in addition to the wells that currently exist in the Project Area." and that "All proposed wells are anticipated to be drilled during an approximate 10 to 15 year period after project approval." Throughout the EIS, this drilling proposal is characterized as an annual drilling rate of about 600 wells per year. In order, however, to calculate peak emissions for the project, the air quality analysts requested the operators' best estimate of the annual variation that could occur in drilling over the 15 year development period of the project. The operators provided an estimate based on maintaining a constant natural gas production level for the CD-C project area (CD-C Operators 2009). The estimate is not a prediction and the actual drilling rate would depend on technical, environmental, and economic conditions that are not known at this time. The operators' estimate of annual drilling is shown in the figure below; it depicts a peak year of drilling shown in 2018, when 738 wells would be drilled. The use of this estimate in the air quality analysis is described in **Section 2.1.4** of the **AQTSD**. The estimate of annual drilling is also used in the CD-C socioeconomic analysis, as described in EIS **Section 4.15.4.1**.



2. **Number of days required to drill a well.** The project description said that drilling each gas well "will take about 10 to 20 days" and that completion and testing operations typically will "require approximately 10 to 20 (up to 30) days." Given the improvements in drilling technology, the drilling time for each gas well, as described in **Section 2.2.7.2** of the EIS, **Well Construction, Drilling, and Completion Activities**, has been reduced to "about 7 to 10 days." The description of the time for completion and testing operations has been changed to "approximately 10 to 20 days."

3. **Number of drill rigs active in the project area.** The project description anticipated that the number of rigs necessary to achieve development objectives "will range from about 34 to 70 rigs at any particular time." As described in **Section 2.2.7.2, Well Construction, Drilling, and Completion Activities**, the Operators have reduced that count to "up to 25 rigs at any particular time," largely because the time needed to drill a well has decreased.

4. **Compression and gas treatment facilities.** The Operators estimated in the project description that "one large central pipeline compression facility" may be required for the project and that "as many as ten additional compressor sites" and " individual well site compression" as needed would be added to the existing infrastructure. They also said that "Compression requirements and associated horsepower estimates will be developed in association with the air quality analysis." In addition, "It is anticipated that two or more central gas processing/stabilization facilities will be needed."

   After considerable analysis and discussion, rather than trying to estimate the breakdown between the number, type, and size of compression facilities that would be needed, the Operators summarized compression needs in a single metric, the total amount of horsepower (hp) that would be required for future production. **Section 2.2.7.5** of the CD-C EIS, **Compression, Gas Treatment, and Ancillary Facilities**, now states that an estimated 24,936 hp of additional compression may be needed as the project is developed for dedicated compressor sites and for additional compression at well sites.

   In addition, the number of new central gas-processing/stabilization facilities has been reduced from two to one.

5. **Sources of water used for project development.** The project description describes the use of approximately 20,000 to 30,000 barrels of water per well for drilling operations (Section 4-1 of the project description), approximately 4,000 to 12,000 barrels of water for completion and testing

operations (Section 4-4), and approximately 2,700 gallons of water to test each mile of four-inch gas pipeline (Section 5-2). This "water will come from existing and new water supply wells within the project area, as well as from produced water sources which will conserve fresh water aquifers. Water from reserve pits may be transferred and used for drilling." (Section 4-1)

The project description does not mention the use of any surface water and subsequent discussions with the Operators indicated that it was their intention that the statements in the project description were meant to exclude the use of any surface water.

6. **Use of fresh water**. Section 4-1 of the project description states, "Fresh water will used for drilling the first 5,000 to 7,000 feet of each gas well" and then references other uses of fresh water, including in Section 4-4, Completions and Testing. The Operators have clarified that only fresh water can be used when drilling surface casing by regulation. However, other processes may not involve the use of fresh water but rather the re-use/recycling of water depending on the quality of that water and the planned use and regulatory requirements.

7. **Disposal of produced water from CBNG wells.** Section 5.4 of the project description describes the process for disposal of produced water from CBNG wells, water that could be produced in volumes of 500–1,000 barrels per day per well. The volume of water produced in CBNG development is normally much greater than the amounts produced with conventional gas production. CBNG-produced water might "be stored on-site in a lined pit or storage tank, or water-collection lines might be installed to transport water to a water-treatment facility, evaporation ponds, injection wells, subsurface drip areas and/or approved discharge points." The actual volumes produced and the methods by which the produced water would be managed are greatly dependent on the site-specific development proposals. For that reason, the BLM decided that although the project description for the CD-C project described the potential for surface discharge of CBNG-produced water, such disposal for any CBNG development within the CD-C project would be treated in a separate NEPA analysis. When the BLM receives site-specific CBNG proposals in the CD-C project area, the proposals, including the treatment of produced water, will be analyzed in a separate NEPA document at that time.

8. **Disposal of produced water from conventional wells.** Section 5.4 of the project description also describes the process for disposal of produced water from conventional wells, water that would be produced averaging 18 barrels per day per well. This water would be "disposed of via subsurface injection, surface evaporative pits, or will be used for potential beneficial use (i.e. drilling operations)." The project description does not mention the surface discharge of water produced from conventional drilling. Subsequent discussions with the Operators clarified that the statements in the project description were meant to indicate that the Operators had no plans for the surface discharge of produced water from conventional wells as a method of disposal.

9. **Water used for dust abatement.** The project description does not specifically describe the process of dust abatement, how much water might be used in the process, or where the dust abatement water would be sourced. Discussions with the Operators clarified that the 20,000 to 30,000 barrels of water per well for drilling operations described in Section 4-1 would include all water used for dust abatement. As described in Item 4 above, none of that water would come from surface sources.

1. General Project Description

1.1 PROJECT OVERVIEW

BP America Production Company and other operators (identified herein as the "Operators") propose to develop natural-gas resources within the existing Continental Divide and Creston Blue Gap natural gas fields, located in Carbon and Sweetwater counties, Wyoming. The project, known as the Continental Divide-Creston Natural-Gas Development Project, involves approximately 1.1 million acres in an area with a "checkerboard" pattern of surface ownership. The Bureau of Land Management (BLM), the State of Wyoming, and private owners issued the oil and gas leases covering these lands. The Rawlins Field Office (RFO) manages BLM surface lands and the federal mineral estate in the Project Area, which is shown on Figure 1.

Oil and gas extraction in the Project Area is guided by relevant programmatic NEPA actions including the Great Divide Resource Management Plan (1990), and the decisions made in applicable project-specific BLM NEPA documents, including the Continental Divide/Wamsutter II Natural Gas Project and the Creston/Blue Gap Natural Gas Project. The BLM operates in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA), which mandates that the BLM consider multiple uses for the lands it administers. FLPMA specifies that the BLM consider the land's inherent natural resources as well as its mineral resources when making land management decisions. The BLM's responsibility extends to environmental protection, public health, and safety associated with oil and gas operations on public lands. Mineral leasing decisions made by the BLM result in a contractual commitment from the United States to allow for exploration, development, and operations by the Operators in accordance with stipulations and restrictions incorporated within its leases. Lease rights include the right to occupy and use as much of the surface as is reasonably necessary to explore, develop, operate, and produce the subsurface oil and gas resources. The Operators understand that the decision that will result from NEPA analysis of this proposed project will pertain only to those areas in the Project Area where there are federal surface and/or federal minerals. The Operators recognize that the State of Wyoming and other local governmental agencies also have authority over various aspects of oil and gas development in all or portions of the Project Area.

Collectively, the Operators propose to drill approximately 8,950 wells in addition to the wells that currently exist in the Project Area. Up to 500 of the proposed wells could be coalbed natural gas (CBNG) wells. The Operators anticipate drilling infill wells at potentially up to 40 acres per downhole well bore. The Project Area contains several units in addition to non-unitized lands. The total number of wells drilled will depend largely on factors outside of the Operators' control that affect the ability to adequately drain the reservoir, including geologic characteristics and reservoir quality, appropriate engineering technology, economic factors, commodity prices, availability of commodity markets, and lease stipulations and restrictions.

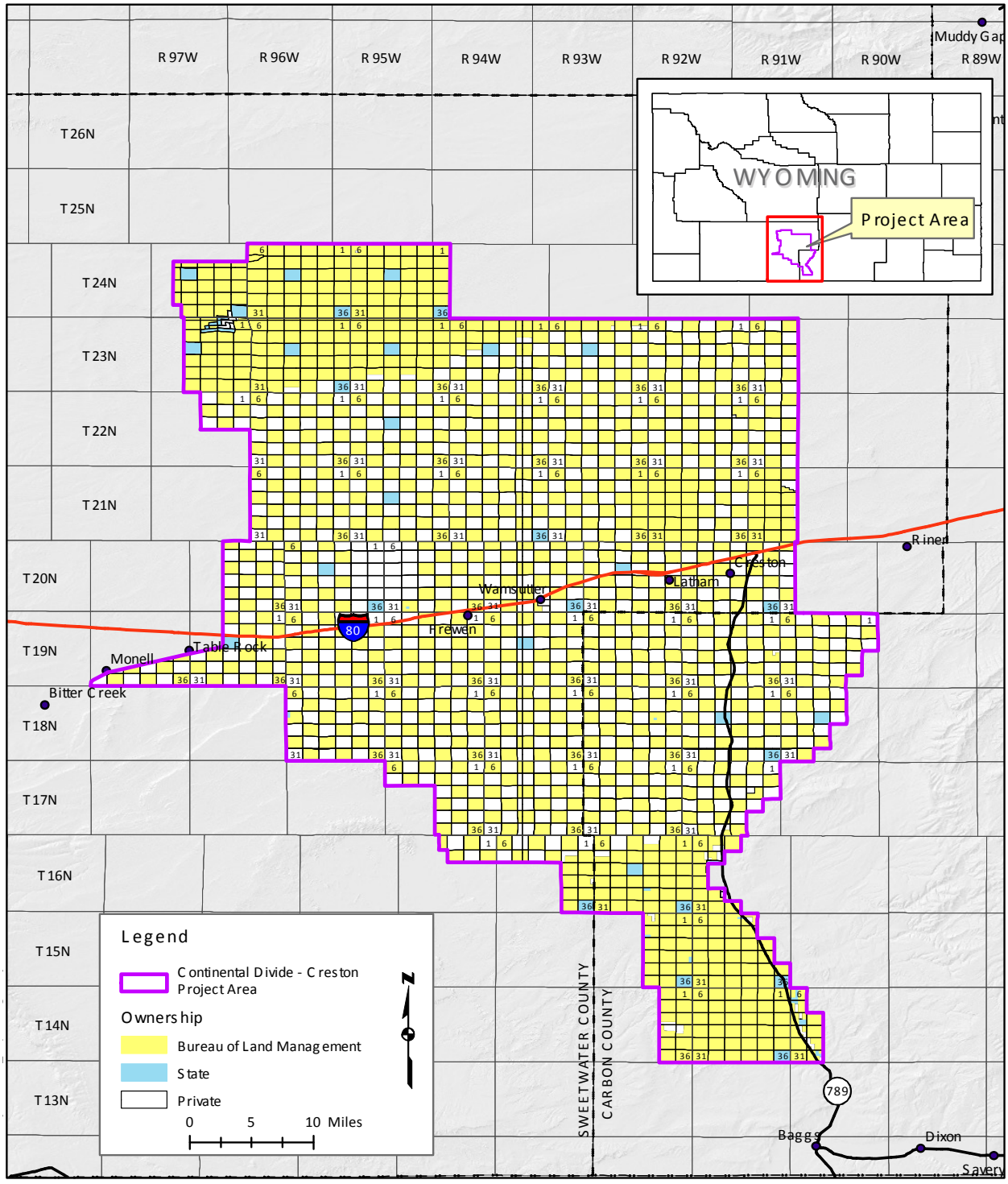
Based on current reservoir and well performance information, most gas wells will be completed in the Almond Formation (Mesa Verde Group); however, secondary reserves may be encountered in other formations (e.g. Lewis, etc.) for the natural gas wells. The CBNG development will primarily target formations such as the Fort Union (Big Red Coal) and secondary reserves may be encountered primarily in the Wasatch, Frontier, and Lance formations.

This proposal assumes that the gas wells may be drilled conventionally, i.e., with a vertical well bore on a single pad, or with multiple directional well bores from a single pad. The gas resource is primarily conventional natural gas, however, the project also includes development of CBNG. Directional drilling is not being proposed by the CBNG operators. All proposed wells are anticipated to be drilled during an approximate 10 to 15 year period after project approval. Although actual operations are subject to change as conditions warrant, the Operators' long-term plan of development is to drill additional wells at the rate of approximately 600 wells per year or until the resource base is fully developed. The average life of a well is expected to be 30 to 40 years for both the conventional gas and CBNG development.

The facilities required by the project may include roads, gas, water, and condensate gathering pipelines, overhead and buried powerlines, production facilities (separation, metering, treating, fluid storage, compression, artificial lift, etc.), disposal well and/or surface disposal facilities, equipment storage facilities, and other associated facilities. In general, gas will be transported via subsurface pipeline to centralized compression and treatment facilities although some well site compression may be included on an as-needed basis. Produced water will be transported by truck to water disposal wells or evaporation ponds, or by pipeline to treatment facilities and/or discharge points. CBNG development may require the use of various water management alternatives, which include but are not limited to; deep injection, evaporation ponds, water treatment (such as freeze thaw evaporation, reverse osmosis, ion exchange, etc), direct discharge, and sub-surface drip irrigation.

Project development will result in the use of new roads and roads previously constructed and currently used in the Project Area. New roads are expected to consist primarily of short access roads. Existing arterial roads will provide the main access to the Project Area. The project may also include the development of an overhead electrical system to provide commercial power to portions of the field, as well as lower voltage, buried power utilities to individual well pads. The overhead system is estimated to include approximately 36 miles of line. The construction disturbance width would be up to 25 feet. The overhead system would primarily follow existing road corridors and utility ROWs. The buried power utility to individual wells would be the responsibility of the Operators, and would be installed in the utility corridor adjacent to the well pad access road

The Project Area includes approximately 1.1 million acres of mixed federal, state, and private lands. The BLM manages approximately 626,355 acres (59%), the State of Wyoming owns approximately 21,600 acres (2%), and private landowners own approximately 421,360 acres (39%). The Project Area is generally located within Townships 14 through 24 North, Ranges 91 through 97 West, 6th Principal Meridian. The eastern boundary of the Project Area is about 25 air miles west of the city of Rawlins. Interstate 80 generally crosses through the center of the Project Area.



Map B-1. Continental Divide-Creston Natural Gas Development Project

1.2 SUMMARY OF SURFACE DISTURBANCE

The Operators estimated projected surface disturbance using assumptions based on past experience and anticipated activities. A summary of the estimated project-related disturbance is shown in Table 1.

Project development will result in disturbance to the federal, state, and private lands upon which the project wells will be drilled. Disturbance of the land will result from the construction and use of new roads, the construction of well pads, the installation of subsurface pipelines, and the construction or expansion of compressor facility sites or other associated facilities. Short-term disturbance refers to initial disturbance prior to interim reclamation of the reserve pits, unused portions of the location and roads, and reclamation of the pipeline route. Long-term disturbance refers to disturbance of the surface associated with the life of a well in addition to the running surface of access roads.

For analysis purposes, the following assumptions were made:

- Average access road length will be 0.25 mile.
- Road disturbance width will be 55 feet, reclaimed to a running surface of 32 feet. Permanent road right-of-way is typically 50 feet.
- Initial disturbance associated with each well will average approximately 6.3 acres for single well pads, and 2.45 acres per well bore for multiple well pads. This acreage includes the associated road disturbance. The actual acreage per well bore on multi-well pads will vary based on the number of wells bores on the pad.
- Long-term disturbance associated with each well pad will be approximately 2.6 acres for single wells and 1.2 acres per well bore for multiple well pads. This acreage also includes the associated road disturbance.
- Average gas gathering pipeline length will be 0.25 mile.
- An average width of 25 feet will be physically impacted by utility construction, including gas, water pipelines, and power, which will be totally reclaimed after construction. Utility ROWs will be built adjacent to roads wherever possible and practicable. Operators may utilize a construction corridor of up to 75' for utility installation dependent on the specifics of a given location. These corridors will be addressed in the ROW and/or APD filing procedure.
- The overhead electrical system would be approximately 36 miles long, and have a construction disturbance width of up to 25 feet.

CBNG well pads have a smaller footprint than conventional wells, however, the acres of disturbance shown in Table 1 was calculated using conventional well pad dimensions due to the relatively small percentage of CBNG wells, and because the potential number of CBNG wells cannot be well defined at this stage of project development. CBNG well pads average about 3.8 acres during initial disturbance and 1.25 acres during operations.

Average access road length was estimated by taking into account that the proposed wells will be infill wells in an area that has an existing road system. Operators will be using the Transportation Plan to minimize construction of new roads; therefore, it is reasonable to assume that most new access roads will be constructed as laterals off existing roads. Consequently, the average new access road length was estimated at 0.25 mile.

The Operators intend to construct and install pipelines adjacent to well access roads, however, it will be necessary to construct a pipeline route cross-country at some locations. Pipeline routes will be reclaimed after construction such that all surface disturbances resulting from pipeline construction will be short-term disturbance. Long-term disturbance associated with pipeline construction is expected to be very minimal after reclamation is complete.

The Operators will continue to limit long-term surface disturbance as much as possible through the implementation of a road network that minimizes the construction of new access roads and by reclaiming as much of the short term disturbance associated with roads and locations as is reasonable without limiting the requirements for ongoing and future production operations.

Table B-1. Preliminary Estimate of Surface Area Disturbance[1]
Continental Divide – Creston Natural Gas Project

Facility Type	Initial (Short Term) Disturbance Area[2] (acres)	Area of Operations[3] (Long Term Disturbance Area) (acres)
Well Pad Sites[4]	41889	17998
Utilities [5]	4897	44[9]
Water Management Facilities [6]	270	270
Compressor Facilities [7]	144	144
Total Disturbed Area	47200	18456
Percentage of the Total Project Area[8]	4.29%	1.68%

1) This table represents the total area estimated to be disturbed at the Continental Divide – Creston Development Project during its 15-year construction and 30 to 40 year operational life.

2) The initial disturbance represents the area disturbed as a result of drilling and associated construction of well pad sites, roads, gas, condensate, and water collection pipelines, compressor stations, and power supply systems.

3) Following drilling and associated construction, part of the initial disturbance will be reclaimed. The area not reclaimed will be used for operations. Once the gas resource is extracted, facilities will be removed and the area reclaimed entirely.

4) An estimated 8,950 natural gas well bores will be established in the project area.

Initial (Short Term) Disturbance Area: The initial well pad site disturbance for a vertical well will average 6.30 acres per well pad site which includes 0.9 of an acre for an access road. The initial disturbance for a directional well will average 2.45 acres per well bore completed including 0.45 acres for an access road (assumed 50% of the directional wells will need a new access road).

Area of Operations (Long Term Disturbance Area): Following drilling and well installation, reclamation will reduce the vertical well pad sites to approximately 2.6 acres which includes 0.9 of an acre for a road. Following reclamation, the long-term disturbance for directional wells is estimated at 1.2 acres per well bore which includes 0.45 acres for an access road (assumed 50% of the directional wells will need a new road).

5) Utilities include gas, condensate, and water collection pipelines, as well as buried powerline facilities. Generally, these utilities will parallel the access roads. An average width of 25 feet will be physically affected by the installation of utilities. Actual utility corridor construction width will vary by operator and site conditions. Assuming 0.25 miles of utility installation for a well pad site, an estimated 0.75 acres will be disturbed with utility installation for the well pad sites. Overhead power includes an estimated 36 miles of line, requiring a 25-foot wide construction corridor.

6) Water Management Facilities – water will be handled using a combination of evaporation ponds, enhanced evaporation, water treatment, and injection wells. An estimated 30 injection wells affecting an estimated 5 acre per well and an estimated 20 produced water handling facilities are planned affecting an estimated 3.5 acres per facility. An estimated 1-acre will be disturbed per site for access roads.

7) It is assumed that one central pipeline compression facility, estimated to affect approximately 10 acres, will be required for the project. It is assumed that 10 additional compressor stations will be required for the project. An estimated five acres will be physically affected at each compressor station site. Each compression site will require an access road assuming 32 feet width for ½ mile estimated disturbance of 2 acres per road per site.

It is assumed that two or more central Gas Processing/Stabilization Plants will be needed within the Project Area. Each is estimated to affect approximately 30 acres. Each site will require a ½ mile access road estimated at 2 acres disturbance.

8) This percentage is based on the 1.1 million acres within the EIS analysis area.

9) Once buried utilities are constructed, the disturbed area will be reclaimed in its entirety. Overhead powerlines will require a 10-foot wide permanent corridor.

2. Pre-Construction and Site Layout

Activities associated with the development may include access roads, pipeline and well pad construction, drilling and well completion, and any other ancillary facilities needed to develop the particular phase. Prior to the start of any construction activities involving a federal action on BLM managed public land, Operators will submit a site specific APD/Notice of Staking (NOS)/ROW application to the BLM that will detail the development proposal. The application will include a map showing the specific location of the proposed activities and site-specific construction plans. A Plan of Development (project description) may be submitted for multiple wells within the same area for CBNG.

The proposed development sites will be staked in the field by the applicant and inspected by the BLM to ensure consistency with the application. The appropriate NEPA documentation will be conducted to ensure that the proposal will comply with guidelines contained in the BLM's Rawlins Resource Management Plan (RMP) 2008, specific requirements contained in the EIS/Record of Decision for the project, and current BLM policy regarding oil and gas development.

Applications may be revised as necessary per discussions with BLM. The BLM may approve or deny site-specific proposals, and will attach any terms or conditions of approval to the permit. Upon receipt of BLM approval, the applicant can commence with proposed activities.

3. Construction Activities

3.1 ROADS

Since the project is an infill development in an existing well field, new road construction is not expected to be extensive. The primary access to the project area is Interstate 80. Wyoming State Highway 789, several Sweetwater and Carbon county roads, and other smaller local roads provide access within the project area. New road construction will primarily be short sections of road from the existing road network to the individual new well sites and support facilities. Some existing access roads may need to have some improvements to accommodate the increase in traffic and heavy construction equipment such as widening or gravelling.

The exact locations of proposed roads are not known at this time. Specific locations for access roads will be included in APD and ROW applications, and will be evaluated by the BLM during the onsite inspections. Road construction will be in accordance with guidelines specified in the BLM Road Standards Manual, Section 9113, and with construction standards in its Surface Operating Standards for Oil and Gas Exploration and Development (BLM Gold Book, revised 2006).

The construction width for access roads will typically be 55 feet. Standard cut and fill construction techniques will be used. Roads are usually crowned and ditched except where an operator or the BLM determine that the road can safely be constructed using less disruptive techniques. The permanent running width will not exceed 32 feet. Existing roads that require upgrading will meet standards appropriate to the anticipated traffic flow and all-weather requirements. Upgrading may include ditching, drainage, graveling, crowning, and capping the roadbed as necessary to provide a safe roadway. Maintenance practices may include dust abatement, road surface grading, and maintaining proper drainage. New roads may be graveled to accommodate year-round use, to allow the transport of heavy loads, and to minimize dust generation. Two-track roads may be constructed or utilized in some instances for access to smaller facilities. Access roads are planned to be reclaimed when no longer needed, unless the landowner or the BLM requests otherwise.

3.2 WELL PADS

The project will include the construction of 8,950 well bores from both single well pads and well pads with multiple directional well bores. Construction of a typical single well pad will require approximately 6.3 acres which includes 0.9 acres for an access road. A typical multiple well pad will disturb approximately 2.45 acres per well bore, which includes 0.45 acres for an access road. Figures 2 through 6 show examples of typical single and multiple well pads. Well pad layouts will vary between operators, but all will be constructed within the approved disturbance area.

Operators will determine the location of a proposed well by the location of the subsurface reservoir, the topography of the area, and WOGCC spacing rules. Dimensions of a drill pad will depend on topography and specific well needs. Well pads will be constructed using the native sand/soil/rock materials present. Mineral materials will not be required. Topsoil and native vegetation will be removed and stockpiled for use in the reclamation process. Balancing cut and fill areas will level locations. Construction practices may include ripping to achieve a level pad. Cut-and-fill slopes will be designed to allow for retention of the topsoil during reclamation and subsequent re-establishment of vegetation.

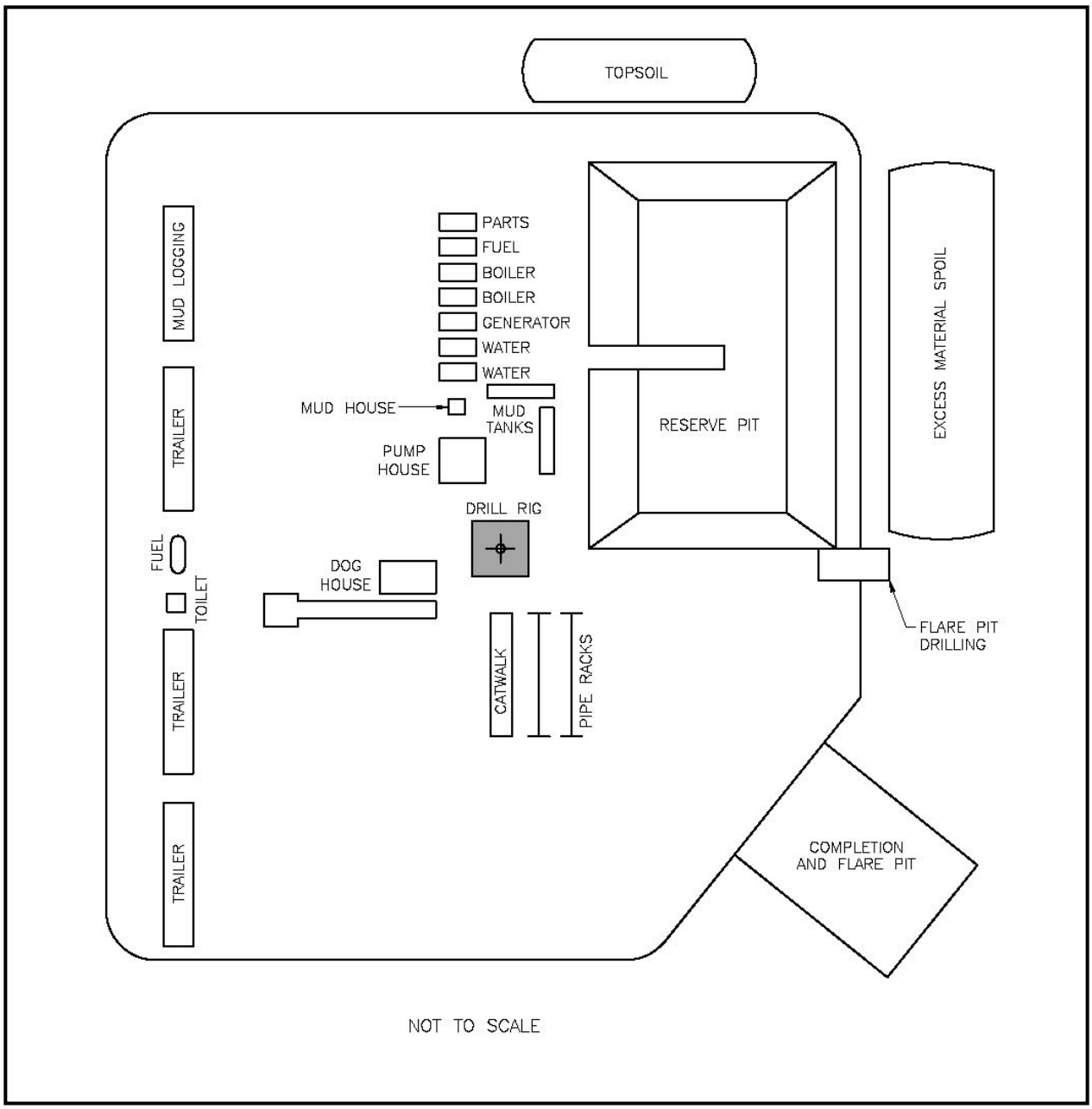


Figure B-1. Typical single well pad layout, example 1

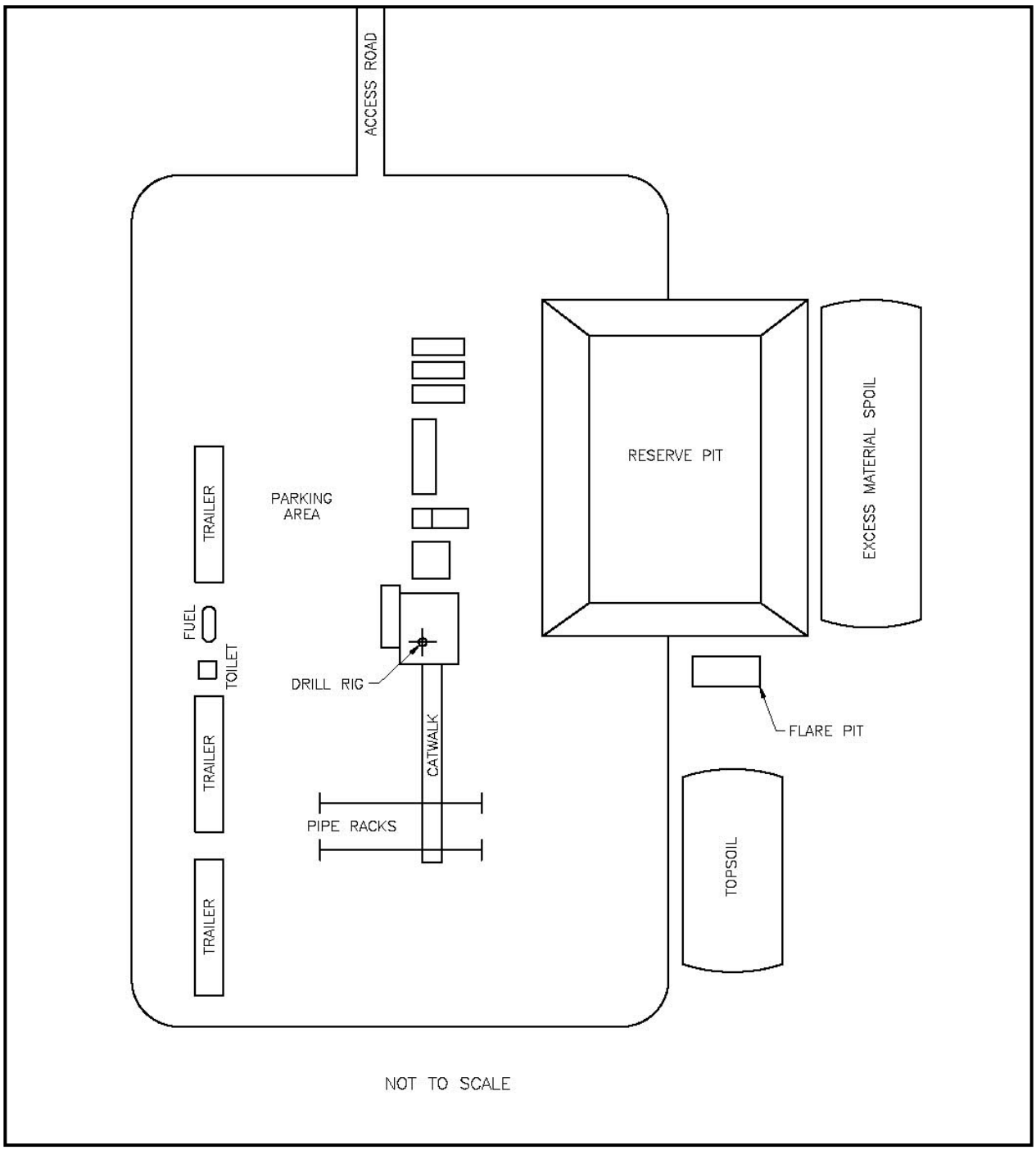


Figure B-2. Typical single well pad layout, example 2

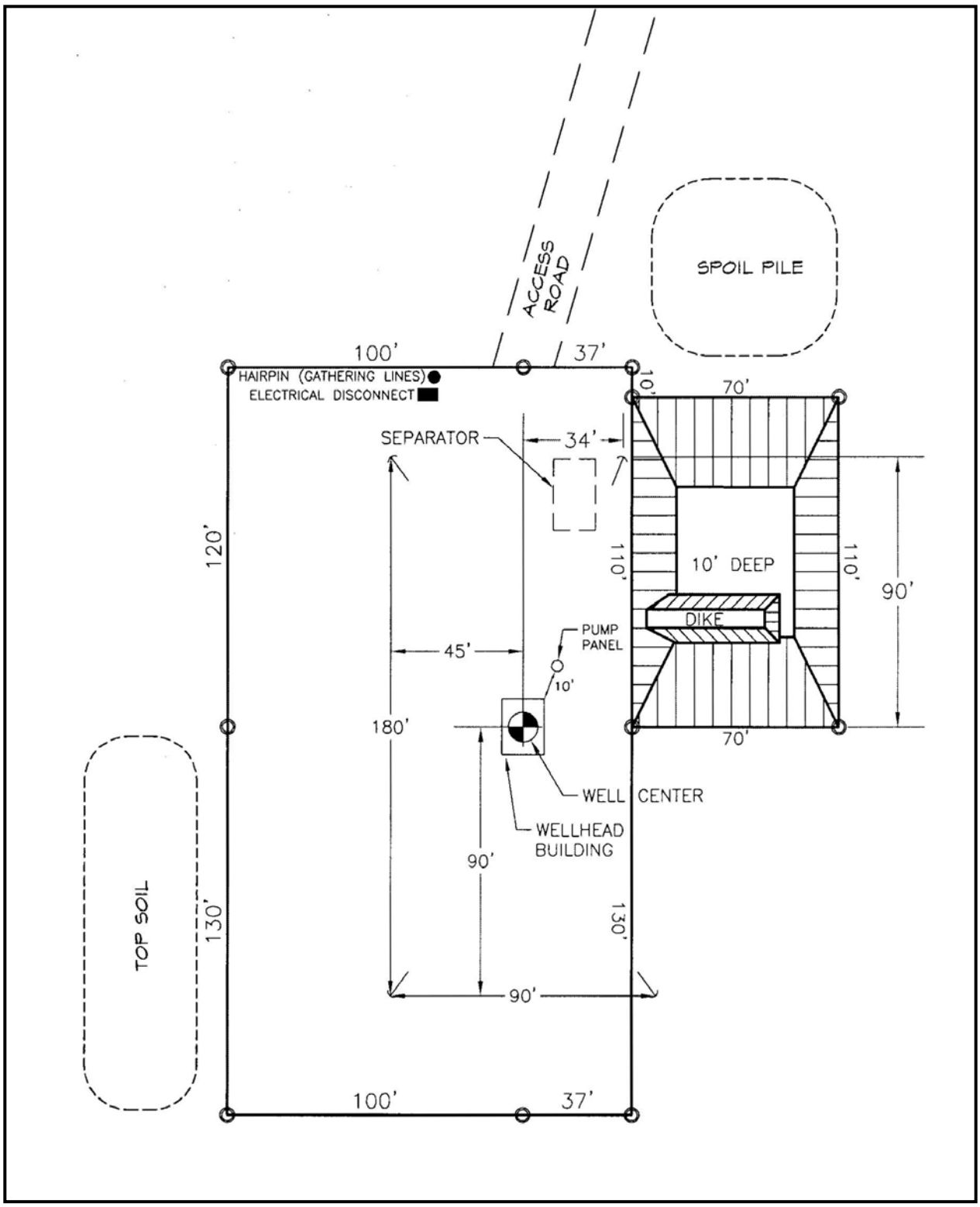


Figure B-3. Typical CBNG well site layout

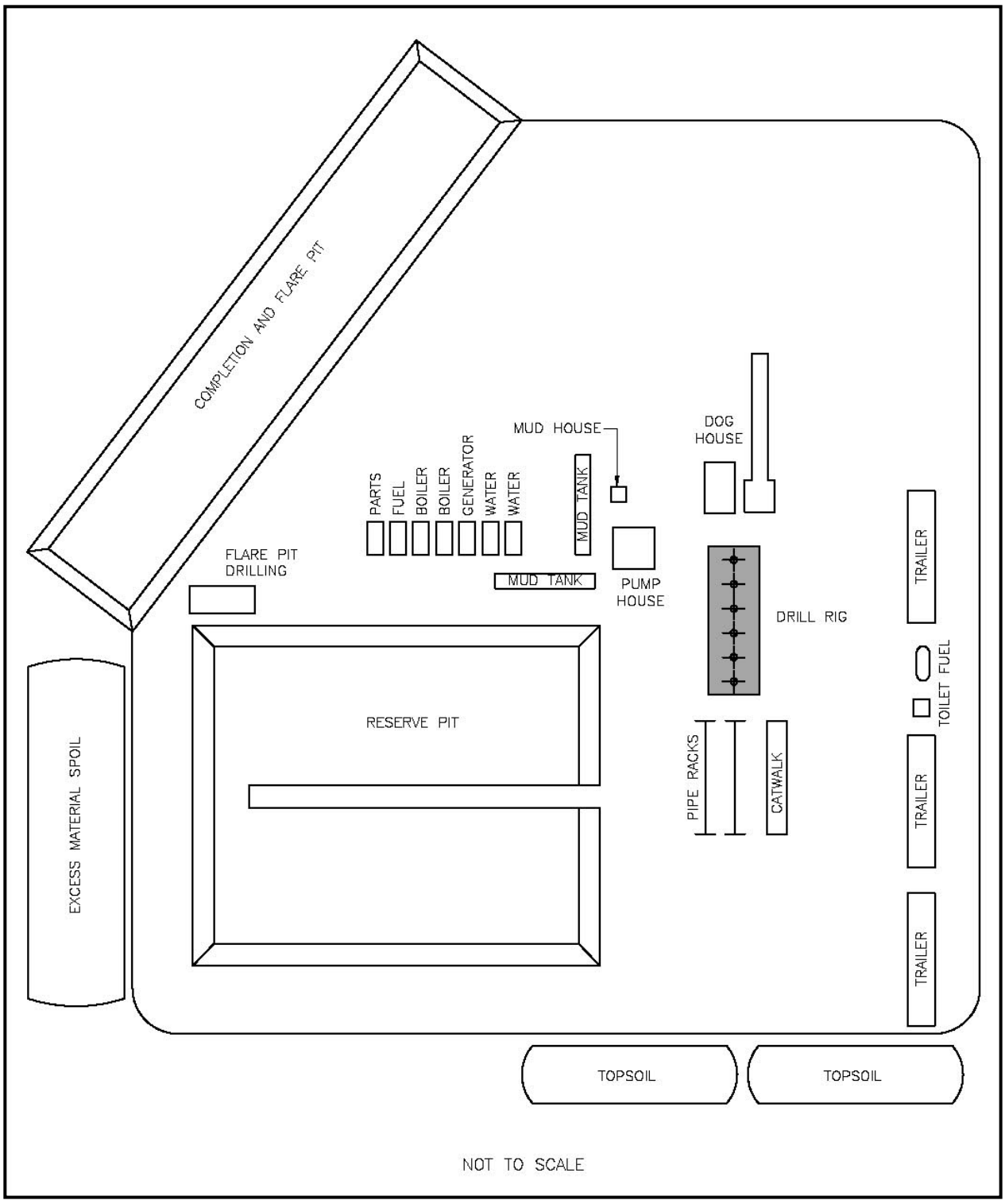


Figure B-4. Typical multiple well pad layout, example 1

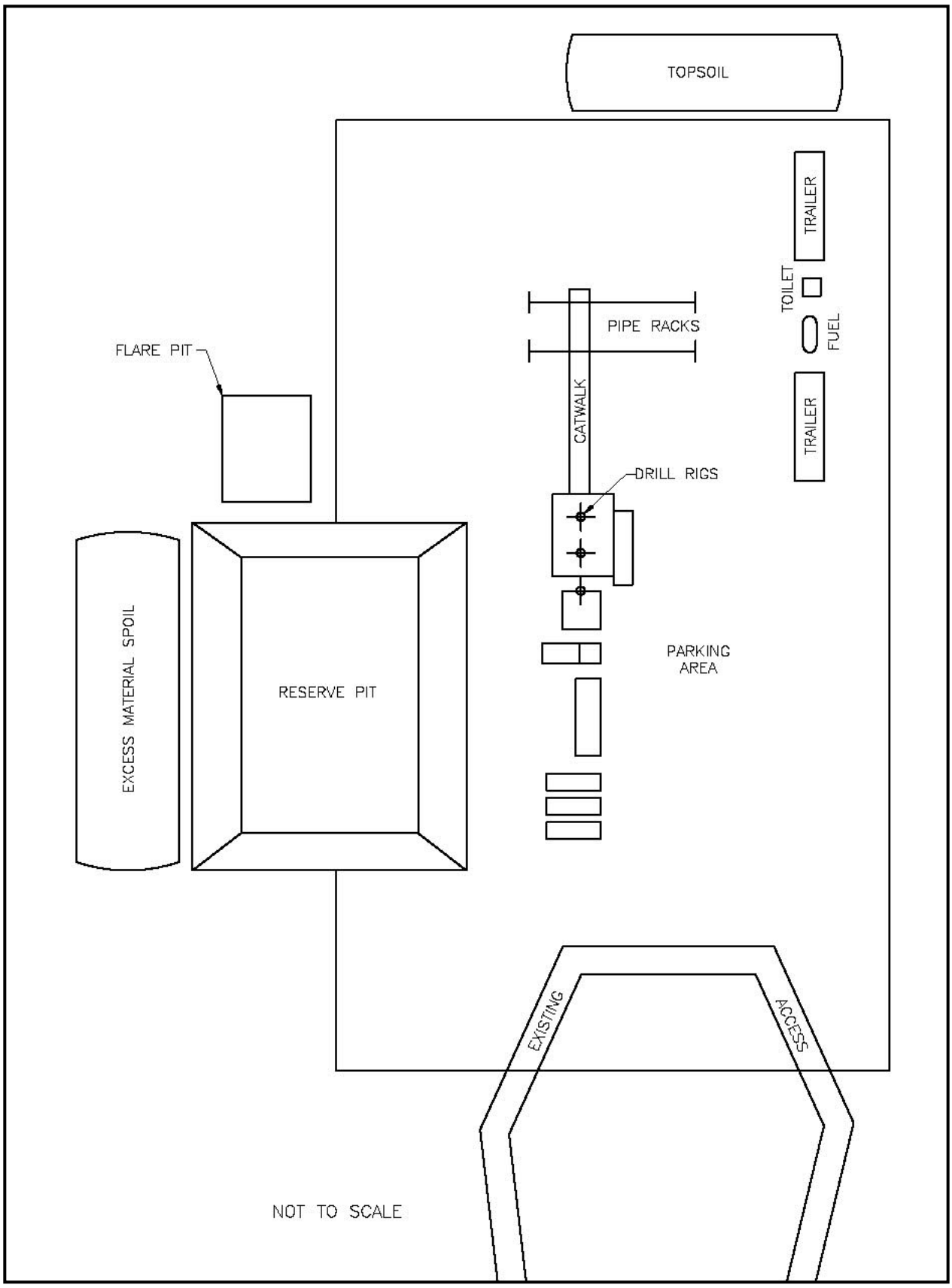


Figure B-5. Typical multiple well pad layout, example 2

Typically a well pad will include a six to eight-foot wide cellar to allow access to casing heads, mouse and rat holes adjacent to the well bore to accommodate drilling operations, a flare or completion pit, and a reserve pit. A fenced reserve pit, approximately 10 to 12 feet deep, will be excavated within the pad to temporarily store drilling fluids and cuttings. The dimensions of the pit vary according to well depth and size and shape of location. In non-environmentally sensitive areas and when a fresh water-based drilling mud is used, the reserve pit may be unlined pending evaluation of the distance to surface water, depth to useable ground water, soil type and permeability, and anticipated types of fluids that will be contained in the pit. A reserve pit will be lined if so specified in the APD after the onsite evaluation. It will also be constructed in a way that minimizes the accumulation of surface runoff into the pit through the use of strategically placed subsoil/topsoil storage areas and/or the construction of berms and diversion ditches.

Both the access road and well pad are typically constructed within three to seven days, depending on terrain and site limitations. Depending on availability of equipment and specific well construction requirements, from two to eight individuals may be present on location during construction activities at any given time. Personnel will access the location using an average of 3 to 5 light trucks each day during construction of the access and well pad. Construction equipment varies but can include bulldozers, motor graders, scrapers, backhoes, and trenchers.

During operations, interim reclamation will reduce the size of the well pads to approximately 2.6 acres for a single well pad and to 1.2 acres per well bore for multiple well pads.

4. Drilling and Completions

4.1 DRILLING

Drilling operations will be conducted in compliance with all Federal Oil and Gas Onshore Orders, all WOGCC rules and regulations, and all applicable local rules and regulations. The Operators anticipate that the drilling rig count within the Project Area will range from about 34 to 70 rigs at any particular time in order to achieve development objectives.

Following construction of the access road and well pad, a drilling rig will be transported to the well site and erected on the well pad. Wells will be drilled utilizing a conventional, mechanically powered mobile drilling rig. The rig will be erected at the drill site after the conductor pipe has been set. Drilling operations will consist of drilling surface hole, running and cementing surface casing, drilling production hole, and running and cementing production casing. The rig may then be dismantled and demobilized from the location.

Fresh water will used for drilling the first 5,000 to 7,000 feet of each gas well (500 to 1000 feet for each CBNG well), and water-based muds being used for the remainder of the drilling operation. Water will come from existing and new water supply wells within the project area, as well as from produced water sources which will conserve fresh-water aquifers. Operators will obtain all necessary permits for any water well drilling. Water from reserve pits may be transferred and used for drilling.

Drilling fluids will primarily consist of a fresh water/gel mixture with water being the main constituent. Reserve pits will be constructed so as minimize the potential to leak, break, or allow discharge and in accordance with APD Conditions of Approval (COAs). The reserve pit will be fenced on three sides during drilling operations and on the fourth side when the rig moves off the location. Fences will be constructed according to BLM requirements on Federal surface and/or Federal minerals.

During drilling operations, a blow out preventor (BOP) will be installed on the surface casing to provide protection against uncontrolled surface blowouts should reservoir pressures exceed the hydrostatic pressure of the well bore fluid. In addition, a flow control manifold consisting of manual and hydraulically operated valves will be installed below the rig floor.

Prior to setting production casing, open hole logs may be run to evaluate production potential. If deemed economically justified, steel production casing will be run and cemented in place in accordance with the well design and as specified in the APD and COAs. Evaluation logs may be run subsequent to setting and cementing production casing in some cases.

The types of casing used and the depths to which they are set will depend upon the physical characteristics of the formations that are drilled and the pressure requirements anticipated during completion and production operations. All casing will be new or inspected.

Operators propose to drill year-round within the CD-C project area, subject to environmental considerations. Well development will include single wells and directional wells. Drilling each gas well will take about 10 to 20 days, with additional time likely for directional wells, and wells deeper than 10,000 feet. CBNG wells typically take 6 to 14 days to drill. Drilling operations require approximately 8 to 10 personnel and six vehicles on location at any given time each day during normal operations. An additional 10 to 15 personnel and six vehicles will be required on location during the running and cementing of production casing. Approximately 20,000 to 30,000 barrels of water are needed to perform drilling operations for both gas and CBNG wells. Operators propose to utilize produced water as appropriate as a conservation tool.

4.2 MATERIALS MANAGEMENT

Potentially hazardous substances used in the development or operation of wells will be kept in limited quantities on well sites and at the production facilities as needed for operations. Materials will not be stockpiled at well locations. The transport, use, storage and handling of hazardous materials will follow the procedures specified by the Occupational Safety and Health Act and by the Department of Transportation (DOT) under 49 CFR, Parts 171–180. DOT regulations pertain to the packing, container handling, labeling, vehicle placards, and other safety aspects.

None of the chemicals that will be used meet the criteria for being an acutely hazardous material/substance or meet the quantities criteria per BLM Instruction Memorandum No. 93-344. Chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act in quantities of 10,000 pounds or more will not be used, produced, stored, transported, or disposed of annually during the drilling, completion, or operation of any well in the Project Area. In addition, no extremely hazardous substance, as defined in 40 CFR 355, in threshold planning quantities, will be used, produced, stored, transported, or disposed of while producing any well.

4.3 SOLID AND HAZARDOUS WASTE

Most wastes that will be generated at project locations are exempt from regulation by the Resource Conservation and Recovery Act under the oil and gas exploration and production exemption and are considered to be solid wastes. These wastes include those wastes generated at the wellhead and through the production stream and gas plant. Exempt wastes include produced water, drilling mud, well completion/workover fluids, and soils affected by these exempt wastes.

Spills and releases can result in soils that are contaminated by produced water, petroleum products, or chemicals. The Operators will develop and maintain Spill Prevention Control and Countermeasure Plans for each well in the Project Area.

4.4 COMPLETIONS AND TESTING

A typical cased well bore in the Project Area consists of conductor pipe, surface casing, and production casing. The surface and production casing/cementing programs will be designed to isolate and protect shallower formations and aquifers from the production stream and to minimize the potential for migration of fluids and pressure communication between formations.

A cementing plan is submitted with the drilling plan as part of the APD. This plan is reviewed by the BLM and/or the Wyoming Oil and Gas Conservation Commission. The BLM can request additional information or apply COAs relating to the cementing plan if necessary.

Once production casing has been cemented in place, the drilling rig may be released and completion operations will commence utilizing a well servicing rig or coiled tubing unit. In some cases completions can be performed by the drilling rig. Initial completion operations may also be conducted "rigless," utilizing cased hole wireline equipment rather than a well servicing unit or coiled tubing unit, until such time that production tubing is installed in the well or other operational requirements dictate the use of a well servicing rig. In general, the completion of the well will consist of perforating the production casing, productivity and/or formation pressure testing if deemed necessary, stimulation of the formation(s) utilizing hydraulic fracturing technology, flow back of fracturing fluids, flow testing to determine post fracture productivity, and installation of production equipment to facilitate hydrocarbon sales.

Hydrocarbons and water production rates are typically quantified and flared during testing operations, which are conducted on an as-needed basis. Flareless or reduced flaring technology may be utilized for well completions if appropriate. Hydraulic fracture stimulation is required on the majority of wells in the Project Area in order to enhance productivity. Numerous combinations of fluids and proppants have been

used historically in the Project Area in the effort to optimize stimulation results. Currently, the most common stimulation technique utilizes gelled fresh water (with CO_2 and/or N_2 frequently added for reservoir protection and enhanced flow back) and fracture proppants to provide the bridging and increased permeability necessary for productivity improvement. Sand, resin-coated sand, ceramics, or bauxite can be used as proppants in the stimulation process, depending on the design criteria of individual treatments. Gels and other chemical additives are utilized to provide the fluid viscosity necessary to ensure successful stimulation. The fracturing fluid is pumped down the well bore through the perforations in the casing, and into the formation. Sufficient rate and pressure are reached to induce a fracture in the target formation. The proppant carried in the fluid serves as a bridge to keep the created fracture open and to provide a flow path that allows reservoir fluids to move more readily into the well bore. Water used for stimulation purposes generally comes from water supply wells. Stimulation fluids recovered during flow back and subsequent production operations are temporarily contained in the completion, flare, or reserve pit.

Post stimulation flow tests allow for recovery of stimulation fluids and evaluation of well productivity. Duration of the tests will vary depending on individual well performance but typically are conducted only long enough for fluid rates to drop to a level that permanent production equipment can safely process. Gas is commonly flared during the flow back process and is measured using choke nipple calculations or through a temporary flow test separator and metering facility. Flaring takes place at the end of a horizontal flow line placed at a temporary pit designed for that specific purpose or at a vertical flare stack. Flaring occurs at a distance from the wellhead that ensures equipment and structure protection and personnel safety. Following the initial flow period, the well may be shut in until facilities are in place to allow the well to be placed on sales. In some cases, production facilities will be installed prior to completion in order to provide the capability of turning the well to sales immediately following testing. Alternatively, if flareless or reduced flaring completions technology is utilized, production facilities and flowlines will be installed prior to well completion. Special separation equipment is then needed to process the flowback to remove sand and fluids thereby allowing the gas to be turned to pipeline for sales rather than sent to flare. Fluids, primarily water, recovered during flow back operations are contained in the completion pit until they are disposed of at evaporation ponds, disposal wells, or evaporated on location.

Current technology allows for CBNG wells to be stimulated with high-pressure water and frac sands. After the well is completed, the well is either vented temporarily to atmosphere or directly tied into the gathering system. The water and CBNG will be separated downhole.

Completion and testing operations typically require approximately 10 to 20 (up to 30) days to perform, 2 to 30 personnel, and 1 to 20 vehicles on location. Approximately 4,000 to 12,000 barrels of water per well will be needed for completion and testing operations.

In the event a well proves to be uneconomic, the Operator will plug and abandon the well in accordance with federal and state regulations.

4.5 INTERIM RECLAMATION

On producing wells, the reserve pit will be reclaimed per the requirements specified in the approved APD. Reserve pits may be re-used for multiple wells being drilled from a single pad. Plastic liners, if used, will be buried onsite. The reserve pit, that portion of the location and access road not needed for production operations, and pipeline corridors will be reclaimed according to the requirements specified in the approved APD and COAs. Locations and roads will be reclaimed and reseeded back to the minimum size required as soon as possible after the well is put into production. CBNG well pads will also be reclaimed to a smaller size after the initial drilling phase, but roads typically stay at the construction dimension due to their initial minimum construction footprint. Each Operator may have a slightly different restored configuration based on original disturbance and the number of wells drilled on location. Figure 7 shows an example of a well pad layout after interim reclamation.

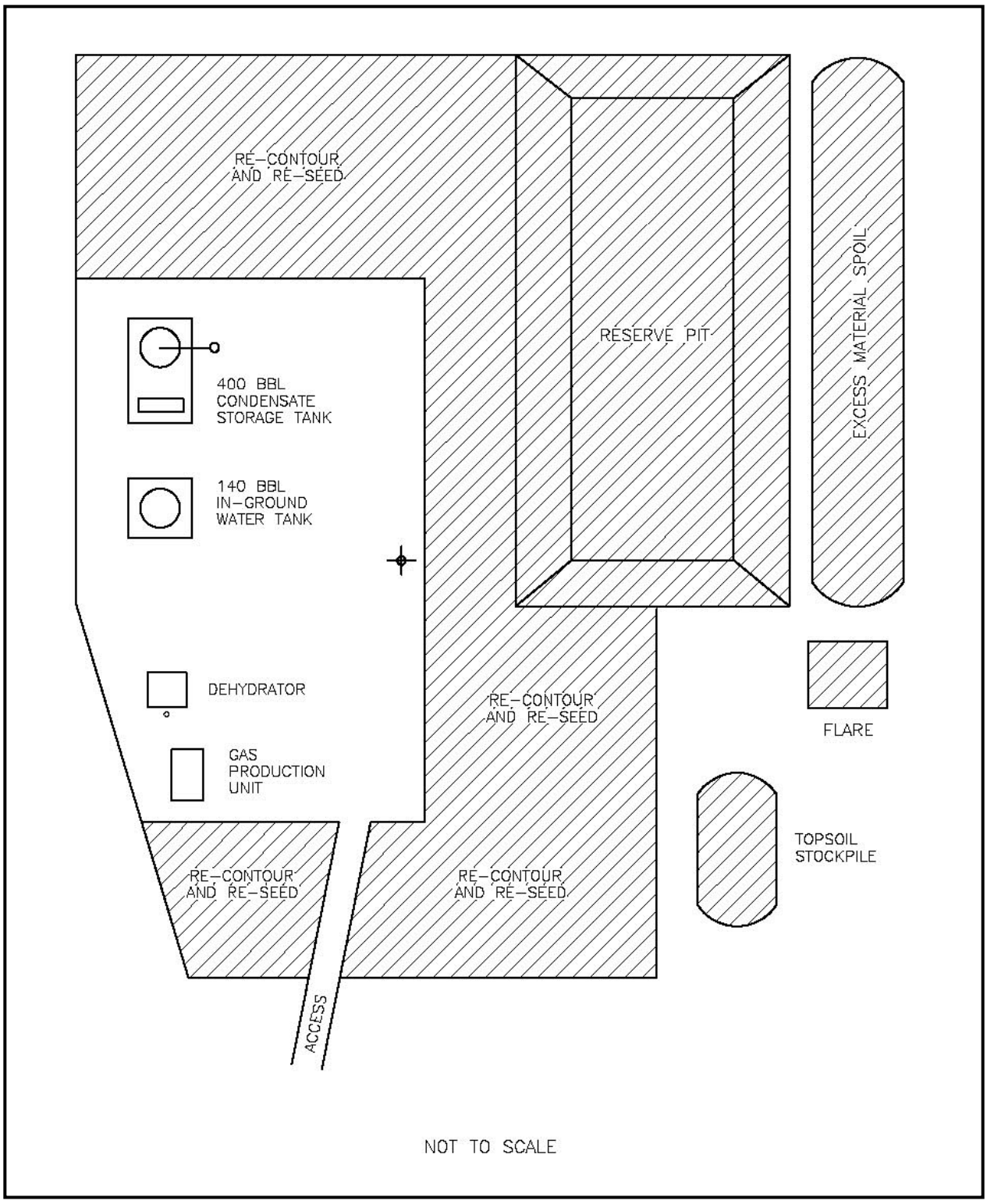


Figure B-6. Well pad after interim reclamation

5. Production and Maintenance

5.1 WELL PRODUCTION FACILITIES

Well production facilities will be installed as shown on the approved APD, with secondary containment structures built to conform to BLM, state, and federal requirements. Facilities on the well pad will typically include wellhead valves and piping, separation, dehydration, metering equipment, oil and water production tanks, a methanol storage tank and pump, and telemetry equipment. Production equipment will be fueled by natural gas or electricity. Telemetry equipment is currently used or planned for use by most Operators to improve well evaluation, operational efficiency, and to minimize well visits. Production pits will not be used. Well site compression may be utilized on an as-needed basis.

CBNG wellhead equipment may be run on diesel generators until an adequate flow of gas is present to run a gas-fired engine. Electricity may be provided to some CBNG sites in the future.

Artificial lift is equipment that is installed when production volumes drop to a level that prevents efficient removal of liquids from the well bore using reservoir energy alone. Artificial lift is presently limited to the use of plunger lift equipment , which is a passive hydraulic means of removing liquids from the well bore and does not require any increase in the disturbed surface area. Gas lift, downhole pumps, or other technology may also be employed.

All constructed or installed permanent structures (on site six months or longer) will be painted a flat, non-reflective earth-tone color as specified by the BLM. All new project facilities requiring painting will be painted within six months of installation.

5.2 PIPELINES

The Operators will continue to utilize the existing natural gas transmission lines that serve the Project Area. Operators are not responsible for the construction or operation of gas transmission lines, and new transmission lines are not included as a component of the Operators proposed project.

Gathering lines will be installed below the surface to transport the produced gas from the new wells to the gas gathering pipeline system. The gas production lines will be located adjacent and parallel to well access roads where possible to minimize surface disturbance. The exact location of a gathering line will be determined at the time of the onsite with the appropriate surface management agency. The new pipelines are expected to cross federal, state, and private surfaces in a route developed to minimize both resource conflicts and development costs within the Project Area. Approximately 45 miles of high-pressure gas lines may be installed to service multiple CBNG wells in the northwest portion of the project area. This pipeline will generally run in a north-south alignment from Wamsutter north to the Hay Reservoir area.

Pipeline construction consists of trenching, pipe stringing, bending, welding, coating, lowering pipeline sections into the trench, and backfilling. Construction operations will be confined to the ROW corridor approved in the ROW application which is variable between operators. In general, construction widths will be 50 to 75 feet when not adjacent to a road and 25 to 50 feet when adjacent to an existing or new road. Pipes installed adjacent to road ROWs are constructed outside of the borrow ditch to minimize safety concerns. The pipeline trench will be mechanically excavated with a backhoe or trencher to a minimum depth of 48 inches. The trench will be approximately 18 to 20 inches wide. Newly constructed pipelines will be hydrostatically tested to ensure structural integrity. As an example of water requirements, approximately 2,700 gallons of water will be required to test one mile of four-inch pipeline. Hydrostatic test water will be disposed of as approved by the BLM and/or the State. Pipeline corridors will be reclaimed as specified in the COA authorization. Pipelines installation will result in short term disturbance until reclamation is considered complete.

5.3 COMPRESSION, GAS TREATMENT, AND ANCILLARY FACILITIES

The existing compression infrastructure, however, will be unable to provide sufficient capacity to compress the additional gas volumes anticipated from the proposed wells. Additional compression will also be required if the Operators conclude that a reduction in gas gathering system pressure is needed at some point during the life of the project. Additional compression will be added to existing compression infrastructure where appropriate. Additionally, the Operators estimate that one large central pipeline compression facility, affecting approximately 10 acres, may be required for the project. Peak production is expected to occur in the 11th year after project approval. As many as ten additional compressor sites at 5 acres per site could be required to accommodate the maximum anticipated compression growth. Compression requirements and associated horsepower estimates will be developed in association with the air quality analysis.

Well site compression is utilized infrequently in the Project Area; however, individual well site compression could be needed on a limited basis. Well site compression will be installed on the existing well pad resulting in no additional disturbance. Well site compression typically uses 125 to 200 hp two-stage compressors. Gas fueled compression equivalent to 2500 HP per pilot will be required during the pilot phase for some of the CBNG development. Pilot testing will last for three years. Eight pilots can be expected within the EIS boundary area.

It is anticipated that two or more central gas processing/stabilization facilities will be needed within the Project Area. It is estimated that each of these facilities could affect 30 acres.

The Operators will utilize the existing facility infrastructure within the Project Area to the extent possible, including power lines and gas gathering and transmission pipelines.

5.4 PRODUCED WATER DISPOSAL

Produced water from conventional production may be stored in tanks at the well site prior to transport by water hauling trucks or transported in flowlines to collection facilities for disposal. Produced water will be disposed of via subsurface injection, surface evaporative pits, or will be used for potential beneficial use (i.e. drilling operations). Conventional wells average 18 bbls/day or produced water. Produced water, condensate and gas will be separated at the well site or at central facilities. The proposed development includes a percentage of CBNG wells. CBNG wells can produce from 500 to 1000 bbls/day of produced water. Produced water and gas will be separated at the well site. Water may be stored on-site in a lined pit or storage tank, or water collection lines may be installed to transport water to a water treatment facility, evaporation ponds, injection wells, subsurface drip areas and/or approved discharge points. Water gathering lines of various sizes will be installed adjacent to roads/gas pipelines. Any surface discharge of produced water from CBNG wells is regulated under a National Pollutant Discharge Elimination System (NPDES) permit issued by the Wyoming Department of Environmental Quality (WDEQ). Produced water quality will be monitored in accordance with State and Federal regulations.

5.5 MAINTENANCE

New wells will typically be visited daily but possibly less frequently after well performance has stabilized and telemetry equipment is installed.

Road travel will be restricted to the width of the running surface of the road. Maintenance on project roads during drilling and construction will be the responsibility of the Operators and will be consistent with the Transportation Plan, annual road plan, well-specific project plan, and BLM specifications. During the duration of the proposed project, the Operators will monitor the project roads and perform appropriate repairs. Repairs may be necessary to correct excessive soil movement, rutting, braiding around problem areas, and/or damage to cattle guards or gates.

5.6 WORKOVERS

Periodically, a workover on a well may be required. A well servicing rig is generally utilized during workover operations to perform various tasks such as well bore or surface equipment repairs, reservoir evaluation, or stimulation treatments to restore or enhance well performance. Workover operations are typically performed during daylight hours and are of short duration; however, depending on the scope of the work to be performed, workover operations can sometimes take from several days to several weeks to be completed. Unless fracture stimulation is necessary, workover operations typically require from five to 10 workers on location at any given time. During fracture treatments, an additional 10 to 20 individuals could be present on location. Additional surface disturbance is rarely necessary to conduct workover operations. Approval from the BLM Authorized Officer (AO) will be requested should the need for new surface disturbance arise.

5.7 GEOPHYSICAL OPERATIONS

Seismic surveys have been conducted on some portions of the CD-C Project Area in the past. Additional seismic surveys are currently being planned and are needed to further define the subsurface to facilitate the extraction of leased oil and gas resources. Proposed seismic surveys are currently under analysis in a separate BLM NEPA review, and are not included in this proposal.

6. Reclamation and Abandonment

Abandonment of the well and its facilities will be performed in compliance with applicable federal and state regulations as well as the COAs to the APDs. Seed mixtures applied during rehabilitation operations will comply with the specifications of the appropriate surface management agency. The Operators will cut off the casing at the base of the cellar or three feet below the final graded ground level, whichever is deeper, and cap the casing with a minimum of 0.25 inch thick metal plate. The cap will be welded in place with the well name and location engraved on the top. The cap will be constructed with a weep hole.

All surface equipment will be removed from the site. The surface will be recontoured to its original appearance, to the extent possible. Topsoil will be distributed above the former location to blend the site in with its natural surroundings. All surface disturbance will then be planted with a seed mixture as specified by the appropriate surface management agency. Reclaimed sites will be monitored to ensure erosion is prevented and the desired plant species are being re-established. Monitoring will continue until the reclamation is deemed successful, which will be defined in the project reclamation plan.

7. Operator-Committed Practices

The Operators will adhere to all lease and APD conditions in addition to all federal and state laws, regulations, and policies implemented through statute and/or resource management planning decisions implemented through NEPA. According to BLM IM No. 2004-194, best management practices to be considered in nearly all circumstances include the following:

- Interim reclamation of well locations and access roads soon after the well is put into production;
- Painting of all new facilities a color which best allows the facility to blend with the background, typically a vegetated background;
- Design and construction of all new roads to a safe and appropriate standard, "no higher than necessary" to accommodate their intended use; and
- Final reclamation recontouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography.

The Operators commit to performing these environmental protection measures during the implementation of their proposed project.

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