2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter presents the Proposed Action (Alternative A) to develop wells and ancillary facilities in the West Tavaputs Plateau Project Area (WTPPA), as well as one alternative action (Alternative C) developed to further mitigate impacts to cultural resources, certain visual intrusions, noise, and public safety. Alternative B is the No Action Alternative, which assumes that neither of the action Alternatives would be approved.

2.2 ALTERNATIVE A – THE PROPOSED ACTION

Bill Barrett Corporation (BBC) proposes oil- and gas-related development activity in four exploratory units--Jack Canyon Unit (7,185 acres), Nine Mile Unit (640 acres), Peters Point Unit (10,080 acres), and Prickly Pear Unit (25,468 acres) in portions of Townships 12 and 13 South, Ranges 14-17 East (T12S-T13S, R14E-R17E), in Carbon and Duchesne Counties, Utah, approximately 30 miles east-northeast of Price, Utah (see Figure 1.1). Surface ownership in the 43,373 acres included in these four units is approximately 90.4 percent federal (managed by the Bureau of Land Management [BLM]), 9.1 percent State of Utah (managed by State of Utah School and Institutional Trust Lands Administration [SITLA]), and 0.4 percent private (see Figure 1.2; Table 2.1). Mineral ownership is 92.6 percent federal and 7.4 percent SITLA (Table 2.2). In addition to the four units, the WTPPA includes development of roads, pipelines, and compressor stations on federal, state, and private lands outside unit boundaries (Figure 1.2). BBC proposes the following actions:

- 12 vertical federal wells, three of which would be drilled from previously drilled but presently reclaimed existing well pads;
- up to 10 vertical wells on new well pads on SITLA lands;
- utilization of four well pads (either new well pads included in this analysis or existing well pads) to accommodate up to four directional wells each, depending upon the feasibility of directional drilling;
- construction of 9.05 miles of new road, including the following:
  - construction of 6.4 miles of new road on federal surface and 0.35 mile of new road on SITLA surface to access proposed federal wells and

Table 2.1 Surface Ownership in Oil and Gas Units Within the WTPPA.

Surface Ownership	Acres	Percent of Total
Federal (BLM)	39,225	90.4
State of Utah	3,960	9.1
Private (Fee)	188	0.4
Total	43,373	100.0

Table 2.2 Mineral Ownership in Oil and Gas Units Within the WTPPA.

Mineral Ownership	Acres	Percent of Total
Federal (BLM)	40,185	92.6
State of Utah	3,188	7.4
Private (Fee)	0	--
Total	43,373	100.0

  - construction of 1.1 miles of new road on federal surface and 1.2 miles of new road on SITLA surface to access proposed state wells;
- upgrading of 6.7 miles of roads, including the following:
  - upgrading of 2.6 miles of road on federal surface to access proposed federal wells and
  - upgrading of 2.1 miles of road on federal surface and 2.0 miles of road on SITLA surface to access proposed state wells;
- construction/replacement of 23.7 miles of pipeline on federal surface and 7.3 miles of pipeline on SITLA surface consisting of 20.3 miles of 4-inch pipelines and 10.7 miles of 12- to 16-inch pipeline; and
- additional compression of 1,500 horsepower (hp) at each of the three compressor sites (Dry Canyon, Sage Brush Flat, and Water Canyon).

Wells would be drilled primarily to the Wasatch and Mesa Verde Formations or to other producing formations, and drilling would begin as soon as necessary approvals are obtained from BLM.

Lease numbers, oil and gas units, federal right-of-way (ROW) requirements, and lease stipulations for the 12 federal wells and access to the state sections are presented in Table 2.3. The Section 106 compliance process has been completed. In addition, the following applicant-committed environmental protection measures would be implemented as part of the project.

- Construction would cease if any previously undetected cultural resources are discovered during construction and the BLM Authorized Officer (AO) would be notified immediately. Construction would not resume until a Notice to Proceed was issued by the AO.
- BBC would monitor and control invasive, non-native plant species and other noxious weeds on areas where project-related impacts occur.
- BBC would comply with other applicant-committed practices listed in Appendix B.

2.2.1 Drilling and Developing Wells

2.2.1.1 Construction Activities

Figure 2.1 presents a typical well pad layout. Well pads on state lands would be constructed to the same specifications as those on federal lands. Existing abandoned well pads would be used for three of the wells on federal surface (Figure 2.2). Each well pad would initially disturb approximately 2.75 acres (approximately 300 by 400 feet), for a total initial disturbance of 60.5 acres (33 acres of federal surface 27.5 acres of state surface). One to three drill rigs could operate at a given time, although it is probable that only one or two would be in operation at the same time

Construction of a typical pad would use the following types and classes of heavy equipment: a D6 or larger crawler tractor, a D12 or larger motor grader, a Class 125 or larger track hoe, a mid-sized backhoe, a 10-yard dump truck, and possibly a Class 988 loader. Equipment needs would vary depending on the site-specific conditions.

A crawler tractor would strip whatever topsoil is present and stockpile it along the edge of the well pad for use during reclamation. Brush would be distributed along the sides of the well pad. Diversion ditches and berms would be constructed with a motor grader to contain storm water and to prevent storm

Table 2.3 Lease Numbers, Oil and Gas Units, Federal ROW Requirements, and Lease Stipulations for State and Federal Wells Proposed by BBC.

Location/Well Number	Federal Lease Number and Stipulations	Unit Name	Federal ROW Needs
Federal Wells			
7-25	UTU-59970	Prickly Pear Unit	Lower Flat Iron Road
16-34	UTU-73671	Prickly Pear Unit	Lower Flat Iron Road
27-3	UTU-73670 [1,2,3]	Prickly Pear Unit	None
21-2	UTU-73670 [1,2,3]	Prickly Pear Unit	None
13-4	UTU-74385	Prickly Pear Unit	None
5-13	UTU-73665	Prickly Pear Unit	None
24-12	UTU-77513 [1,2,3]	Prickly Pear Unit	None
10-4	UTU-74386 [1,2,3,4]	Prickly Pear Unit	None
15-19	UTU-66801 [1,2,3]	Jack Canyon Unit	None
Existing Pads			
UT-10	UTU-66801 [1,2,3]	Jack Canyon Unit	None
PPH-8	UTU-66801 [1,2,3]	Jack Canyon Unit	None
PP-11	UTU-66801 [1,2,3]	Jack Canyon Unit	None
State Wells			
Section 2, T13S, R15E	NA	Prickly Pear Unit	Lower Flat Iron Road
Section 36, T12S, R15E	NA	Prickly Pear Unit	Lower Flat Iron Road
Section 32, T12S, R16E	NA	Jack Canyon Unit	Cottonwood Canyon Road
Section 2, T13S, R16E	NA	None	Peters Point Road Extension

[1] No occupancy or other surface disturbance will be allowed within 330 feet of the centerline or within the 100-year recurrence interval floodplain, whichever is greater, of the perennial streams or within 660 feet of springs, whether flowing or not. This distance may be modified when specifically approved in writing by the authorized officer of the BLM.

[2] In order to minimize watershed damage, exploration drilling and other development activity will be allowed only during the period from May 1 to October 31. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically approved in writing by the authorized officer of the BLM.

[3] Construction of access roads and drill pads on slopes in excess of 30 percent will require special design standards to minimize watershed damage. Drilling operations and any associated construction activities on slopes in excess of 50 percent may require directional drilling to prevent damage to the watershed. Exceptions to the limitations may be specifically approved in writing by the authorized officer of the BLM.

[4] Raptor surveys will be required whenever surface disturbance and/or occupancy proposed in association with oil/gas exploration occur within a known nesting complex for raptors located in the NWNW, Sec. 10, T12S, R14E. Field surveys will be conducted by the lessee/operator as determined by the AO of the BLM. When surveys are required of the lessee/operator, the consultant hired must be found acceptable to the AO prior to the field survey being conducted. Based on the result of the field survey, the AO will determine appropriate buffer zones.

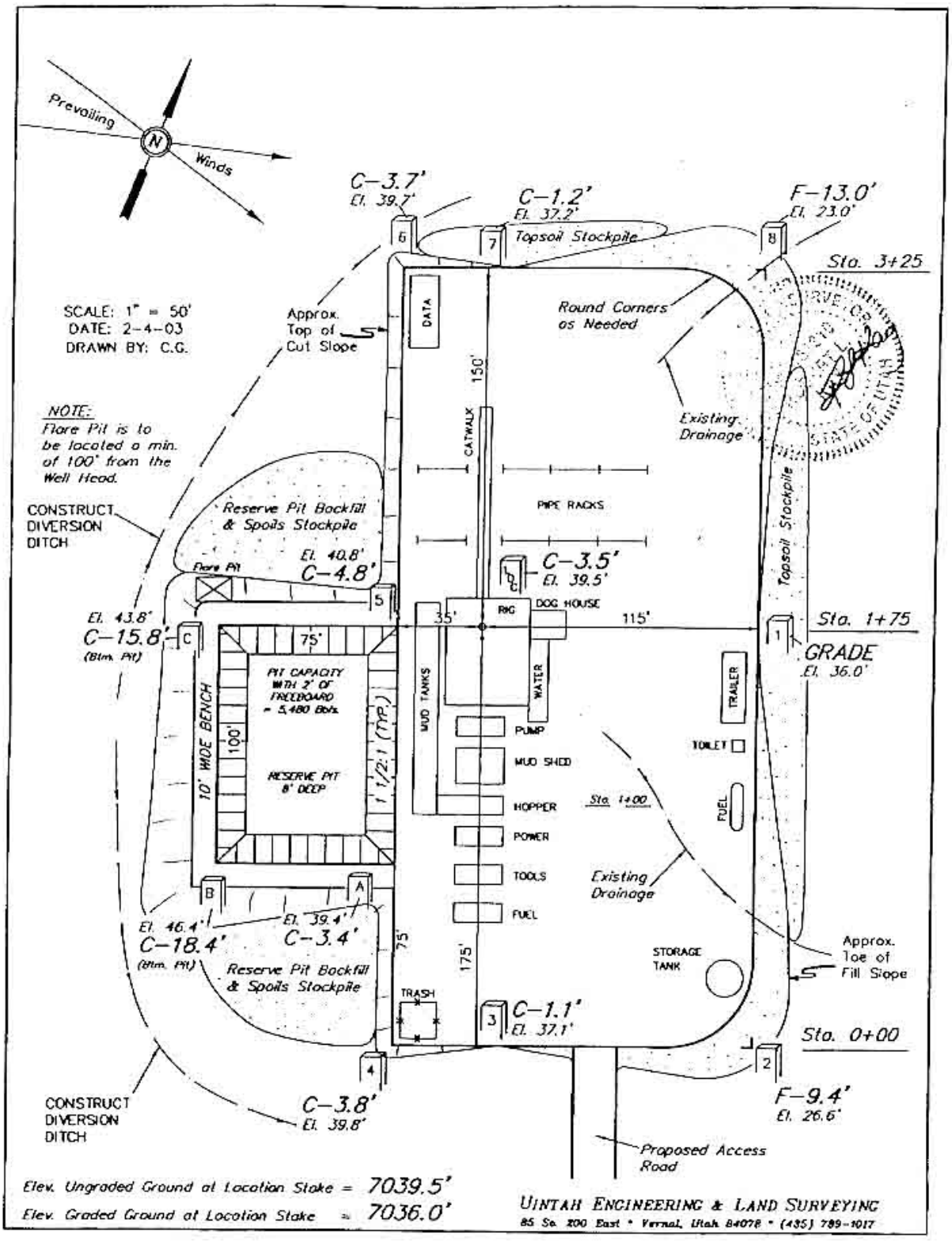

Figure 2.1 Typical Well Pad Layout.

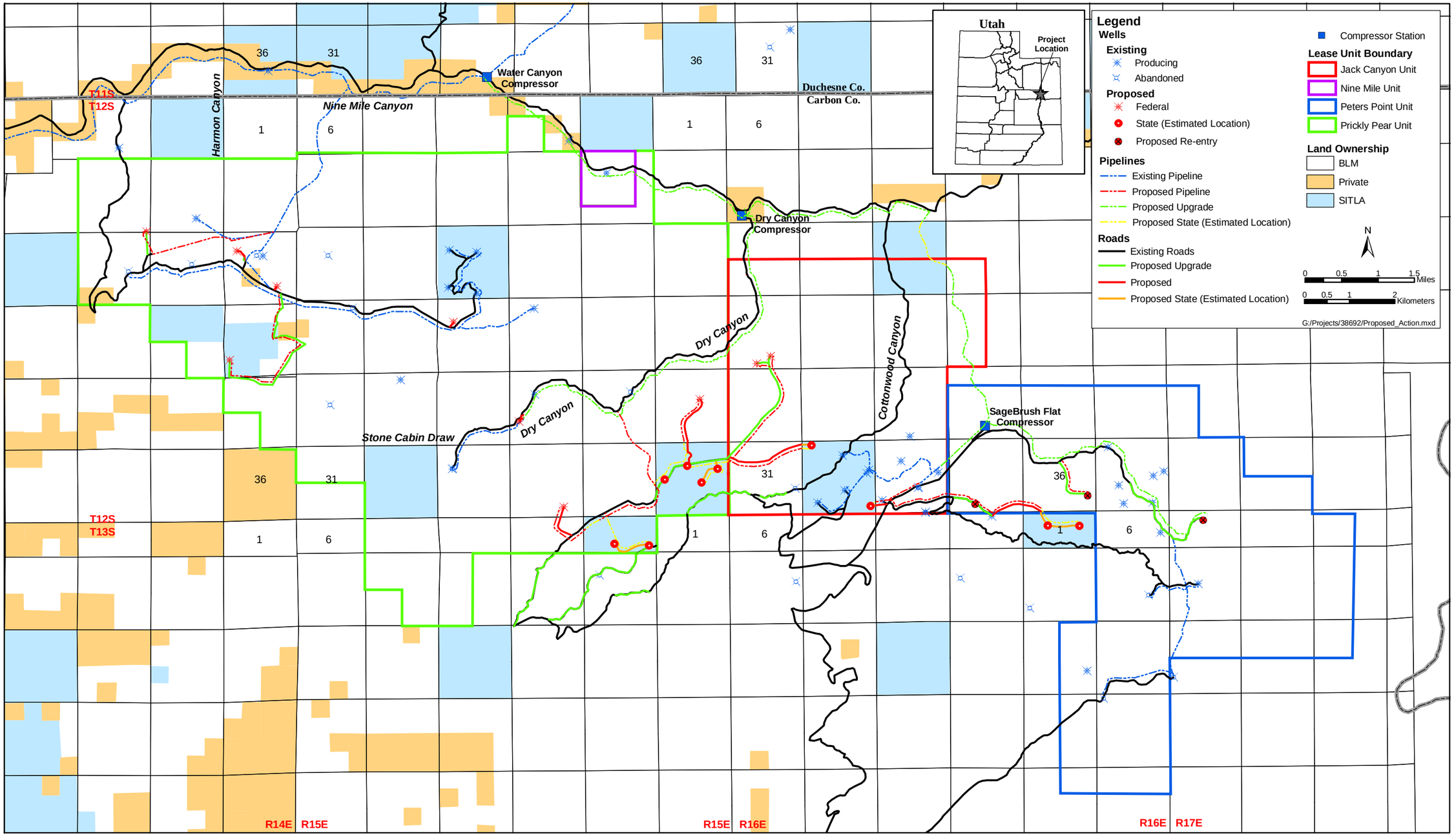

Figure 2.2 The Proposed Action.

water from washing onto the well pad. Prior to drilling operations, a fenced and lined cuttings/mud pit would be excavated adjacent to the working area of the pad by a track hoe. The pit would be lined with an impermeable liner. Fill from the pit would be stockpiled within a drainage control berm along the edge of the pit and adjacent edge of the well pad. Best Management Practices (BMPs) for erosion control and maintenance would be followed during construction and operation of the well pad. The well pad would be fully bermed to minimize erosion, and all drainage from the pad would be directed toward the reserve pit. The berm would also divert drainage from adjacent lands around areas of disturbance. Energy dissipaters such as straw bales, rock gabions, and silt fences may be used in areas where the possibility of down-cutting exists.

Flare lines would be directed so as to avoid environmental damage and as required by regulations. Flare lines would be in place on all well locations; however, in the event it becomes necessary to flare a well, a deflector and/or directional orifice would be used to safeguard both personnel and adjacent natural rock faces.

In the event that a well pad is selected for directional drilling, the pad would be enlarged by 10 feet on two sides for each additional well drilled, as well as additional area for stockpiled soil (Figure 2.3). Assuming that four directionally drilled wells were drilled from a pad, an additional disturbance of 0.7 acre would occur on each pad, and a total additional disturbance of 2.8 acres would occur for four directionally drilled wells from each of four well pads. This additional disturbance would accommodate the drilling equipment while providing a safe offset from the existing well bore. Construction methods and equipment would be similar to those described for a single well.

2.2.1.2 Drilling and Operations

Site-specific descriptions of drilling procedures would be included in the Application for Permit to Drill (APD) submitted to BLM by BBC for each proposed well. Mud rotary platform rigs with capability matched to the depth requirements of individual wells would be utilized. Information relative to size of bore (5-26 inches), depth of drilling (8,000-10,000 feet), casing, cementing, etc., would be available in the APDs at the BLM Price Field Office. Approximately 3 weeks would be required per site for drill rig setup, drilling, and rig takedown. Up to three drilling rigs may be operating in the WTPPA at any one time. Drilling each well would employ as many as 15 people during rigging/drilling/de-rigging

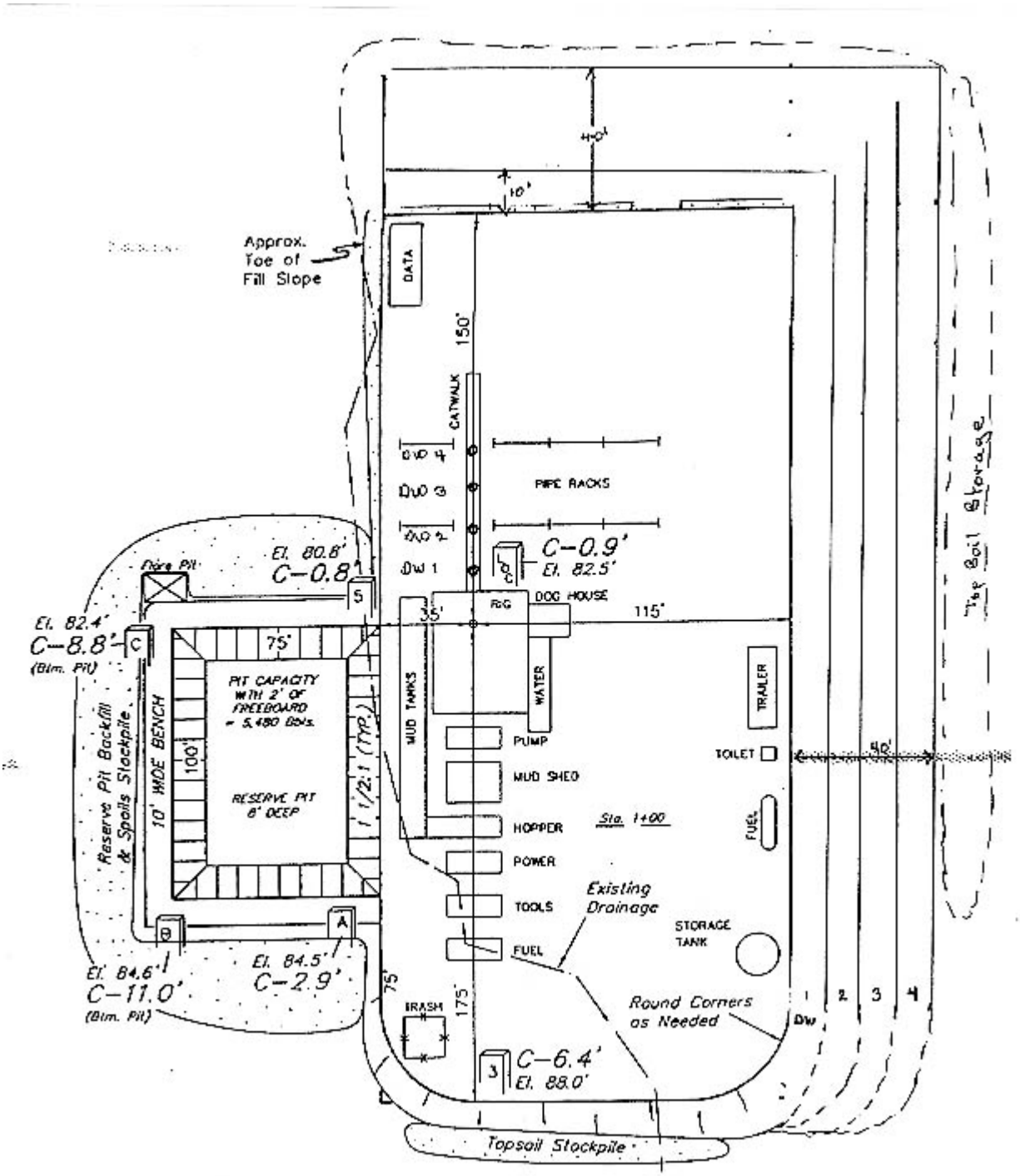

Figure 2.3 Directional Drill Well Layout.

operations. During the drilling phase, rig crews and support service companies would make approximately 20 round trips (a round trip includes travel from the Vernal or Price areas to the project site and back) every 24 hours per working drill rig, for a total of 20-60 round trips per day depending upon the number of rigs working. It is anticipated that 15,960 round trips by trucks, semi-truck transport vehicles, and delivery vehicles would occur during this project assuming all wells, including the 16 directional wells, are drilled. The 22 vertical wells would be drilled in 2 years, whereas the directional wells, if determined to be feasible, would be drilled in subsequent years. Of the 15,960 total round trips, approximately 4,620 would be made during each of the 2 years in which the 22 vertical wells were drilled, and the remaining 6,720 trips would occur in later years if and when the 16 directional wells were drilled. Public access would be maintained on all existing roads during the drilling phase.

Special Consideration for Drilling at Well 27-3. BBC would use a modified drilling system when drilling federal well 27-3 in Dry Canyon. The site occurs over alluvium that may periodically be saturated at depth. The modified system would use a small lined cuttings pit rather than a reserve pit to contain drill cuttings only. Large amounts of drill fluids or completion fluids would not be placed in the pit to preclude their entering the environment. Once drilling was completed, drilling fluids would be hauled off-site for use at another well or disposed of at an approved facility. Drill cuttings would be placed in the lined pit and buried. All surface drainage would be directed to the lined pit to prevent contamination of the alluvial aquifer. BBC would ensure that absorbent material would be kept on the well pad and that the pad surface would be composed of compacted fill to prevent the contamination of any potential subsurface aquifer. Compacted fill would consist of low-permeability native materials, if present. If native materials prove to be unsuitable, a non-porous material such as bentonite or other clay material would be used. A location layout for well 27-3 is presented in Figure 2.4.

Directional Drilling. In order to test the viability of directional drilling, BBC proposes to directionally drill up to four wells from up to four locations (up to 16 total wells). These wells would be drilled from existing producing locations in the WTPPA and/or locations proposed in this Proposed Action. The actual locations where directional drilling would occur, or if such drilling would occur, is dependent on the success of the initial vertical wells.

Drilling activities would be similar to those described previously except that directional wells would require more time and resources to drill and complete. In addition, the amount of traffic associated with

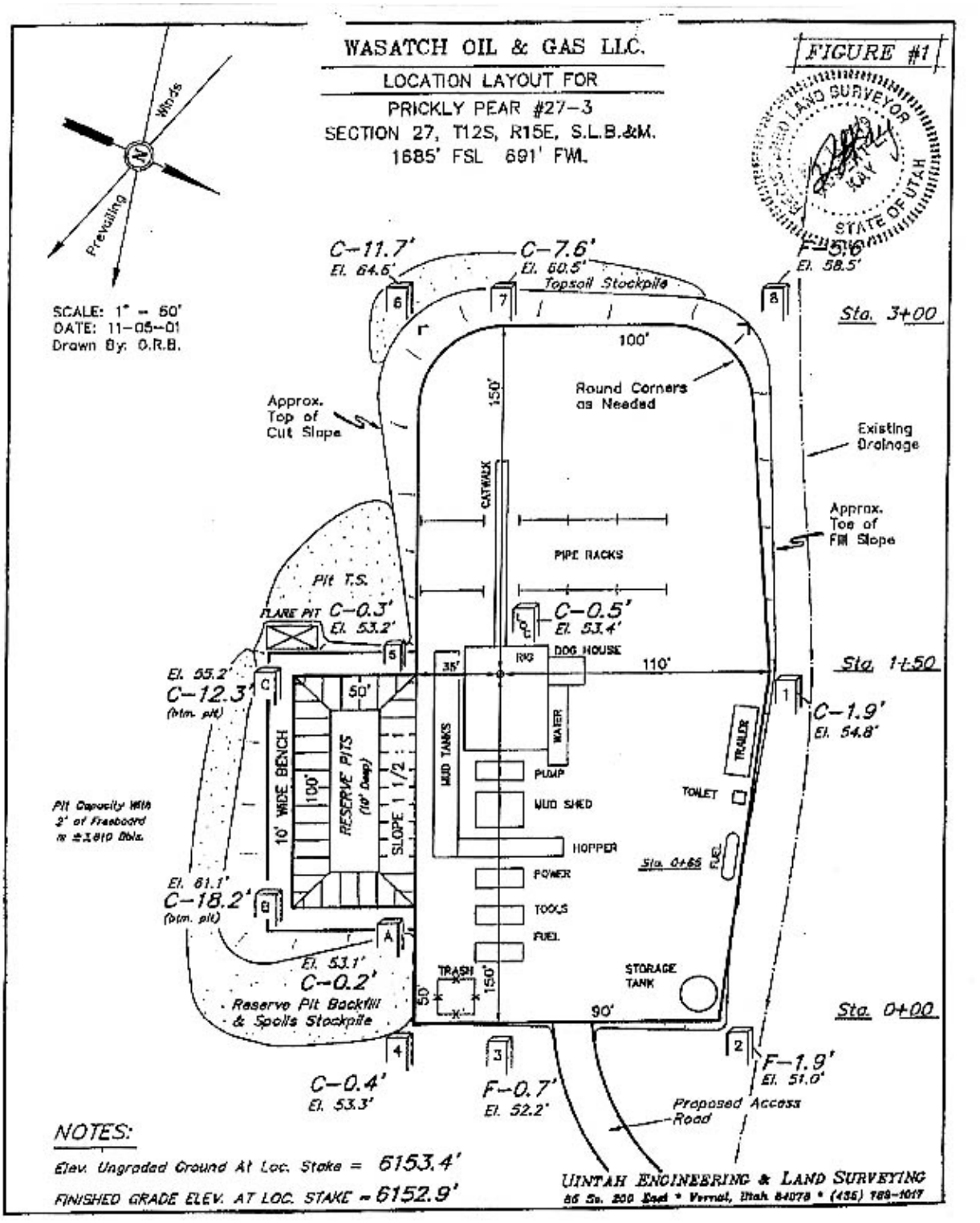

Figure 2.4 Well Pad Layout for Well 27-3.

a rig move would be either eliminated or reduced due to the limited distance that a rig would need to be moved.

2.2.1.3 Well Completion

Once the wells were drilled and assuming a viable scenario for production, completion operations would commence. This would involve setting casing to depth and perforating the casing in target production zones, followed by fracturing (fracing) the formation by injecting an agent (i.e., water and CO_2) into the formation under high pressure. The fracing material would likely contain sand or other proppant to keep the fractures no longer under pressure from closing, thereby allowing gas to escape the formation. The next phase would be to flow and test the well to determine rates of production. All of the above procedures would be completed using a truck-mounted work-over rig and would take 3-20 days, depending on conditions at the individual well, and would require an average of 145 round trips per well, a total of 5,510 round trips for 38 wells. Of the total 5,510 round trips, approximately 1,595 would be made during each of the 2 years in which the 22 vertical wells were drilling and the remaining 2,320 trips would occur in later years if and when the 16 directional wells were drilled. Completion operations would follow drilling at each well.

2.2.1.4 Production Operations

When a well is determined to be a producer, production facilities would be installed on the disturbed portion of the well pad a minimum of 25 feet from the toe of the back slope or top of the fill slope. In the event production water is encountered, a 200-400 barrel (bbl) tank would be sited. The tank would be pumped as necessary and the water transported to an approved disposal site in Myton or Roosevelt, Utah. All security guidelines identified in 43 *Code of Federal Regulations* (C.F.R.) 3162.7-5 *and Onshore Oil and Gas Order No. 3* would be followed. All permanent structures constructed or installed would be painted a flat, non-reflective standard environmental color as determined by the AO. All facilities would be painted as soon as practicable after installation. Some equipment may be excluded from this painting for safety considerations as required by the Occupational Safety and Health Administration (OSHA). All gas flow lines would be buried from production equipment to the housed meter located on the well pad. Gathering lines would be laid on the surface beyond the meter.

All facilities, equipment, and vehicles associated with the Proposed Action would be restricted to existing and proposed access roads and well pads. Each well would have a dehydration unit using glycol to separate the water from the natural gas, as well as a reboiler to evaporate the water from the glycol.

Production facilities for locations that include directionally drilled wells would be similar to those at single well sites. Additional production equipment and tankage may be required. Production from directionally drilled wells would use the gathering pipeline installed for the original vertical well. Each well would have a dehydration unit using glycol to separate the water from the natural gas, as well as a reboiler to evaporate the water from the glycol.

Existing wells in the WTPPA are currently producing approximately 1-3 million cubic feet of gas per day (mmcfd) (an average of 1 mmcfd), 0-10 barrels per day (bbl/d) of condensate (3 bbl/d typical), and 0-80 bbl/d of water (15 bbl/d average). Total production is estimated at 2-3 billion cubic feet (BCF) per well, or 44-66 BCF for the 22 vertical wells over the life of the project (LOP).

During production, wells would be visited daily by one worker driving a standard pick-up truck to the well pads for visual inspection of equipment, gauges, etc.

2.2.1.5 Road Construction

Road work would require construction of 6.4 miles of new road on federal surface and 0.35 mile of new road on SITLA surface to access proposed federal wells; construction of 1.1 miles of new road on federal surface and 1.2 miles of new road on SITLA surface to access proposed state wells; upgrading of 2.6 miles of road on federal surface to access proposed federal wells; and upgrading of 2.1 miles of road on federal surface and 2.0 miles of road on SITLA surface to access proposed state wells.

Cottonwood Canyon Road and the Flat Iron Mesa Road would access three federal wells (Prickly Pear 7-25 and 16-34 and Jack Canyon 15-19) and four SITLA sections with the proposed 10 state wells (see Figure 2.2). BBC currently holds a ROW for a portion of the Cottonwood Canyon Road (ROW UTU-40096) to an existing well in the northeast quarter of Section 11, T13S, R15E. Approximately 2.0 miles of the road would require upgrading to accommodate modern equipment. An engineer-prepared plan for the upgrading includes increasing the radius of identified tight corners, widening narrow portions of the road, and improving drainage where necessary to access the area.

In addition to road improvements to access Flat Iron Mesa, short lengths of new roads would be required from the existing road system to eight of the nine federal wells (Prickly Pear 7-25, 16-34, 21-2, 24-12, 13-4, 5-13 and 10-4 and approximately 1.2 miles to the 15-19 location). One well adjacent to the Dry Canyon road (Prickly Pear 27-3) would require a new road across the Dry Canyon channel (approximately 534 feet).

Access to plugged and abandoned (P&A) locations (UT-10, PPH-8, and PPH-11) would follow the old access roads. The road to PPH-8 has been re-contoured and reclaimed and is approximately 30 percent revegetated. Access would involve 1,118 feet of reconstruction. Access to UT-10 and PPH-11 is via an existing road that would require minor upgrades for about 8,770 feet.

Two new sections of road on federal land, including 1.07 miles located in Section 31, T12S, R16E, and 1.79 miles in Sections 34 and 35, T12S, R16E, would be required to gain access to state Section 32, T12S, R16E, and state Section 2, T13S, R16E. Approximately 3.2 miles of road would be constructed/upgraded within the state sections to access the state wells. Table 2.4 identifies the length of roads to be constructed to access each well.

The access road to the 27-3 well location would cross the incised channel of Dry Canyon. To provide yearlong access across the wash, two 36-inch diameter culverts (designed for a 6-hour/25-year event) would be placed within the incised channel and backfilled. Large rock (minimum diameter of more than 30 inches) would be used to armor the upper end of the crossing, and riprap would be placed up to 15 feet downstream from the culvert to dissipate any flows that exit the culverts. Gravel would be applied to the road surface. If the well becomes a producer, the road surface at the channel crossing would be armored with concrete to provide a stronger and less maintenance-intensive crossing.

One stream crossing across Nine Mile Creek at Harman Canyon would be upgraded. At present, vehicles drive through the stream. The new crossing would include the installation of two 31-inch x 40-inch arched culverts to pass stream flow. The crossing would be earth-filled and armored with riprap and concrete to ensure its integrity and to prevent erosion.

Road construction would occur from May 15 to October 31 on an as-needed basis to facilitate access to each location. Road improvements of an existing road would typically require the following equipment:

- a motor grader, class 12 or larger;

Table 2.4 New/Upgraded Roads Required to Access Proposed Wells.

Item	Road Length (feet)		Disturbance (40-foot wide) (acres)	
	Federal Land	State Land	Federal Land	State Land
New Roads to Federal Wells				
7-25	3,696.0	1,848.0	3.40	1.70
16-34	2,692.0	0.0	2.47	0.00
27-3	534.3	0.0	0.49	0.00
21-2	391.8	0.0	0.36	0.00
13-4	199.6	0.0	0.18	0.00
5-13	1,108.0	0.0	1.02	0.00
24-12	14,098.0	0.0	12.94	0.00
10-4	1,954.0	0.0	1.79	0.00
15-19	9,160.0	0.0	8.41	0.00
Subtotal	33,833.7	1,848.0	31.06	1.70
Road Upgrades to Federal P&A Wells				
UT-10	8,770.0	0.0	8.05	0.00
PPH-8	1,118.0	0.0	1.03	0.00
PPH-11	3,876.0	0.0	3.56	0.00
Subtotal	13,764.0	0.0	12.64	0.00
Access to Federal Wells - Total	**47,597.70**	1,848.0	43.70	1.70
New Roads to State Wells				
Sec. 32, T12S, R16E (2 Locations)	5,625.0	1,058.0	5.17	0.97
Sec. 36, T12S, R15E (4 Locations)	0.0	2,338.0	0.00	2.15
Sec. 2, T13S, R16E (2 Locations)	0.0	2,983.0	0.00	2.74
Subtotal	5,625.0	6,379.0	5.17	5.86
Road Upgrades to State Wells				
Sec. 2, T13 S, R15E (2 Locations)	5,496.0	3,377.0	5.05	3.10
Sec. 36, T12S, R15E (4 Locations)	5,764.0	6,570.0	5.29	6.03
Sec. 2, T13S, R16E (2 Locations)	0.0	784.0	0.00	0.72
Subtotal	11,260.0	10,731.0	10.34	9.85
Access to State Wells - Total	16,885.0	17,110.0	15.51	15.71
Combined Total	64,482.7	18,958.0	59.21	17.41

- a crawler tractor, class D6 or larger;
- several 10-yard end dump trucks; and
- a water truck, 3,000- to 6,000-gallon capacity.

The work force would include four to six workers to operate the equipment. Initially, two crews could operate simultaneously. However, one crew would operate for the remainder of the project.

Most existing roads used in the WTPDP would require routine maintenance. Depending on road moisture conditions, the roadway would be watered or treated with magnesium chloride, enzymes, or other approved dust suppressants to control dust and to facilitate grading. A motor grader would then clean the borrow ditches, widen sluff areas, and smooth the road surface. Low areas, areas excessively rocky, or incised areas would be graveled (0.75-inch diameter minimum) to maintain proper drainage, appropriate running surface, and the proper width.

The standard methodology for building new roads would utilize a crawler tractor or trackhoe to windrow the vegetation to one side, to remove topsoil to the opposing side, and to rough in the roadway. This would be followed with a grader or bulldozer to establish borrow ditches and crown the road surface. If culverts are required, a track hoe or backhoe would trench the road and install the culverts. Some hand labor would be required when installing and armoring the culvert. Road base or gravel would be hauled in and a grader used to smooth the running surface. Salvage gravel would be obtained from reserve pits on SITLA land.

The top of the plateau where the proposed wells would be located is relatively flat terrain. New road construction would be accomplished at a rate of approximately 1.5 miles/day. Timing of new road construction would be dependent upon the drilling schedule. Roads would be constructed 3-6 weeks prior to well pad construction. Roads constructed or upgraded in steep terrain would require more time to complete.

Roads would have a 16- to 20-foot running surface composed of a base overlaid with 0.75-inch gravel, as needed. The surface would have a crown to facilitate drainage to a borrow ditch designed to minimize erosion potential. Grades would be less than 10 percent, and the maximum degree of curve would be less than 50 degrees. The roads would have a design speed of approximately 20 miles per hour. Dust generated along the existing and proposed roads would be controlled by the use of an approved dust

suppressant. Water would be secured from approved water sources described in Section 2.2.1.7. When dust plumes exceed 200 feet in length, operations would cease until additional dust suppression was applied to the road.

To address safety-related traffic concerns, all drivers and rig crews would be advised of the hazards to recreational traffic along the access roads, as well as hazards present due to blind corners, cars parked on the road, pedestrian traffic, mountain bikers, etc. In addition, appropriate signs would be erected to warn non-project personnel about traffic hazards associated with project-related activities. Use of the access roads by BBC-related activities would not require length closure of any existing main roads. Short delays can be expected when roads are crossed for pipeline construction. Flat Iron Mesa Road would require periodic closures during upgrading.

New access roads would be built in accordance with BLM Class III road guidelines established for oil and gas exploration and development activities as described in the BLM/U.S. Forest Service (USFS) publication *Surface Operating Standards for Oil and Gas Exploration and Development* (Third Edition), *BLM Manual Section 9113*, and BLM Price Field Office *Hydrological Modification Standards for Roads* (publications available at the BLM Price Field Office) (Figure 2.5).

Approximately 77 acres would be disturbed by new roads and road upgrades.

2.2.1.6 Pipelines

Pipelines would be necessary to transport gas from producing wells to a sales gas pipeline in Nine Mile Canyon. The current pipeline capacity is inadequate to convey the current or expected production volumes. The design of the proposed gathering system, including compression, would be adequate to convey the typical expected well production rate but inadequate if all of the wells produce at the upper end of the range observed for wells currently operating in the field. New pipelines would be constructed of steel and placed on the surface, adjacent to the well access roads. Both the steep terrain of the canyon walls between the plateau and canyon bottoms and the shallow depth to bedrock on the plateau limit the feasibility of buried lines. In some situations, it would be necessary to locate a pipeline ROW independent of the access road to improve gathering system efficiency. Table 2.5 presents the length, size, and type of proposed pipelines, both new and upgraded. It also presents disturbance from pipelines not adjacent to access roads. A total of 31.0 miles of pipeline would be built or upgraded, including

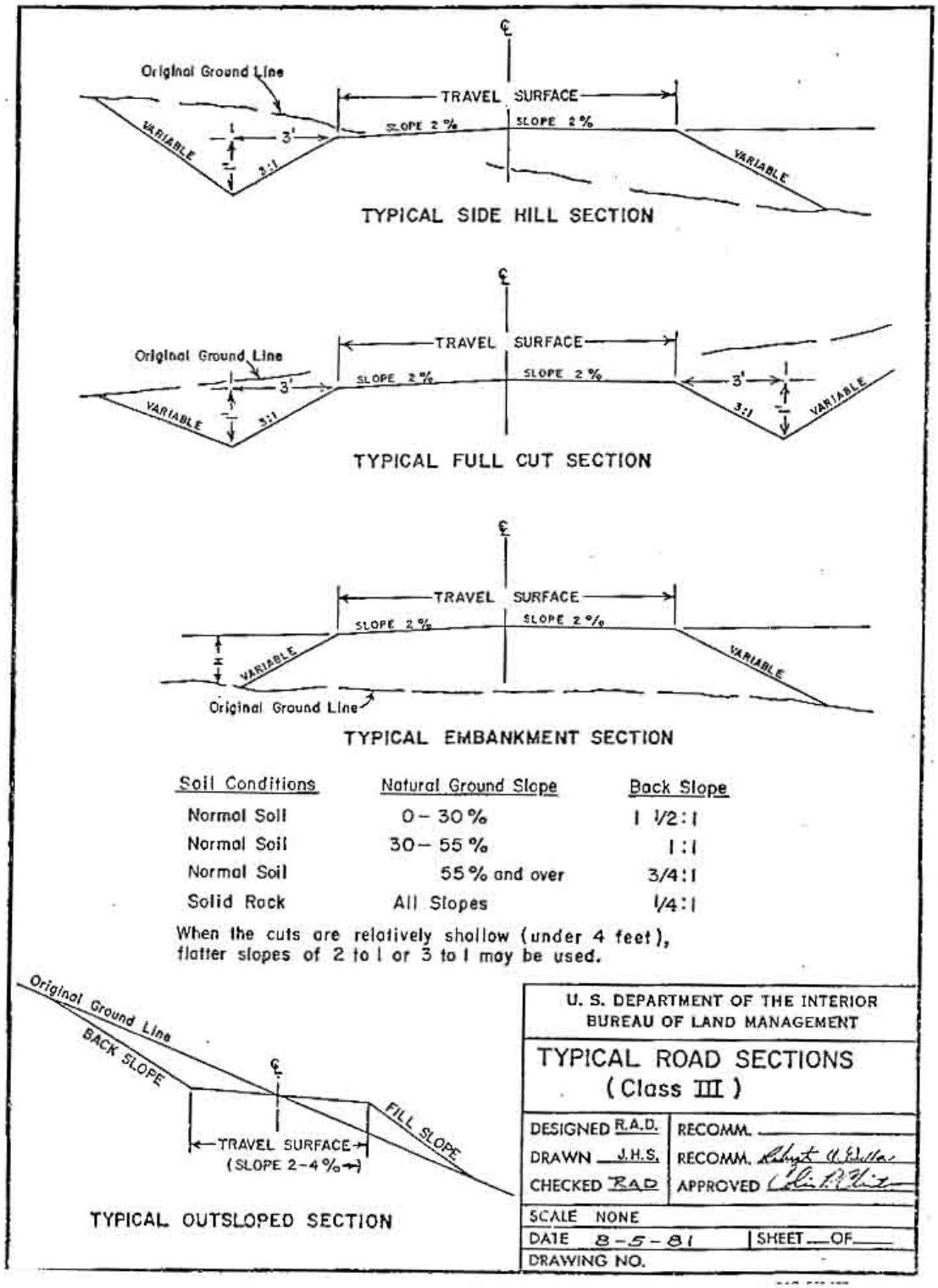

Figure 2.5 Typical Road Construction Plans.

Table 2.5 Length, Surface Ownership, Type, and Size of Pipelines, Including Disturbance by Pipelines Not Adjacent to Access Roads.

Item	Total Length of Line (feet)		Type / Diameter (inches)	Pipelines Not Adjacent to Access Roads (feet/acres)[1]	
	Federal Land	State Land		Federal Land	State Land
Pipelines to Federal Wells					
15-19	9,160.0	0	Steel / 4	0	0
7-25	3,718.0	1,790.0	Steel / 4	3,049 / 1.40	1,790 / 0.82
16-34	2,721.0	0	Steel / 4	2,679 / 1.23	0
27-3	555.0	0	Steel / 4	0	0
21-2	475.0	0	Steel / 4	0	0
13-4	319.0	0	Steel / 4	0	0
5-13	1,094.0	0	Steel / 4	0	0
24-12	14,188.0	0	Steel / 4	8,581 / 3.94	0
10-4	10,866.0	0	Steel / 4	0	0
UT-10	8,780.0	0	Steel / 4	0	0
PPH-8	1,118.0	0	Steel / 4	0	0
PPH-11	3,876.0	0	Steel / 4	0	0
Subtotal	56,870.0	1,790.0	N/A	14,309 / 6.57	1,790 / 0.82
Flat Iron Mesa to Dry Canyon	16,601.0	6,750.0	Steel / 12	11,609 / 7.75[2]	N/A
Dry Canyon to Water Canyon	22,994.0	N/A	Steel / 16	0	N/A
Dry Canyon to Cottonwood Canyon	14,705.0	N/A	Steel / 16	0	N/A
Fee Lands (Nine Mile Canyon)	2,476.0	N/A	Steel / 16	0	N/A
Subtotal	56,776.0	16,601.0	N/A	11,609 / 7.75	N/A
Pipelines to State Wells					
Sec. 2, T13S, R15E	272.0	6,341.0	Steel / 4	0	2,396 / 1.10
Sec. 36, T12S, R15E	5,764.0	8,908.0	Steel / 4	0	937 / 0.43
Sec. 32, T12S, R16E	5,625.0	1,058.0	Steel / 4	0	653 / 0.30
Sec. 2, T13S, R16E	0	3,767.0	Steel / 4	0	2,657 / 1.22
Subtotal	11,661.0	20,074.0	N/A	0	6,643 / 3.05
Total Federal, State, and Fee Surface	125,307.0 (23.73 miles)	38,465.0 (7.29 miles)		25,918 / 14.32	8,433 / 3.87
Combined Total	163,772 (31.02 miles)			34,351 (6.5 miles) / 18.19	

[1] Disturbance that would occur because pipeline is not adjacent to access road. All other pipelines would be placed next to access roads, and their disturbance is included in access road ROW disturbance.

[2] This includes 6,329 feet (2.9 acres) of 20-foot disturbance for surface lines and 5,280 feet (4.85 acres) of disturbance for buried lines.

20.3 miles of 4-inch pipelines and 10.7 miles of 12-16-inch pipelines. Approximately 12.0 miles of pipeline would be upgraded and 19.0 miles would be newly constructed. Approximately 23.7 miles (76 percent) would be installed on federal surface and 7.29 miles (24 percent) on SITLA surface. Approximately 24.5 miles (79 percent) would be installed adjacent to access roads, and the disturbance is included in the access road disturbance. The remaining 6.5 miles (21 percent) would not be installed adjacent to access roads and would disturb an additional 18.19 acres. Approximately 0.85 mile of pipeline associated with the two western state wells in Section 36, T12S, R15E, would be buried so as not to interfere with horse gathering. These pipelines would be buried next to the access road and would not add to surface disturbance. Approximately 1.0 mile (4.85 acres) would be disturbed to bury the pipeline across Flat Iron Flat to avoid interference with horse gathering.

Surface 4-inch pipelines adjacent to roads would be assembled on the roadway, lifted with a sidebar crawler or track hoe, and placed in the existing vegetation with minimal disturbance. The only buried pipelines installed would be approximately 1.85 miles on Flat Iron Flat to avoid interference with wild horse gathering that would occur with a surface pipeline. It would be installed using construction techniques detailed in Appendix B, including the following:

- The BLM Price Field Office would be contacted at least 10 days prior to the anticipated start of project. The project would not proceed until such time as authorization from BLM was received by BBC.
- A BLM representative will be on the ground at the beginning of construction.
- Snow would be removed using a motor grader.
- Vegetation would be scalped and windrowed to one side of the ROW.
- A total of 6-8 inches of topsoil would be removed and windrowed to one side.
- A trench approximately 4 feet deep would be dug and the soil stockpiled to one side, making sure the topsoil and spoil do not get mixed together.
- The pipeline would be installed, the trench backfilled, and the spoil compacted in the trench.
- Stockpiled topsoil would be placed over the compacted spoil to facilitate reclamation.
- Scalped vegetation would be placed back on ROW using a motor grader.
- The entire ROW would be reseeded in the first appropriate season after disturbance.

Several sections of existing pipelines require upgrading to accommodate the anticipated increased flow of gas. The wells on Flat Iron Mesa would be gathered into a system that would tie into an existing system

on the northwest side of Dry Canyon to access the existing compressor station and transportation line located at the mouth of Dry Canyon. The existing 2 7/8-inch surface line in the bottom of Dry Canyon is too small to transport the potential increase in gas volume. Approximately 6.3 miles of new 12- to 16-inch pipe would be placed on the surface to replace the existing 2 7/8-inch pipeline in the bottom of Dry Canyon. The line would be screened with vegetation and/or material side-cast during road maintenance. The existing surface pipeline in Dry Canyon would be cut into segments, loaded with a backhoe onto a truck staged on the existing road, and hauled out. Trucks would deliver pipe and string it adjacent to the road at its point of use. The pipe would be bent and welded, after which it would be lifted to its final position with side boom dozers and backhoes located up to 20 feet off the shoulder of the road. Construction would take 6-8 weeks, and approximately 1,200 round trips would be made by vehicles. Reclamation would follow. All of the road would be needed for pipeline construction. BBC land at the mouth of Dry Canyon may also be used for staging. No road crossings are anticipated. However, one small tributary would be crossed by trenching. The pipeline would be painted or allowed to rust, and existing vegetation and reclamation would screen the pipeline from the road. Safety measures would include road closings, signing, and flagmen as appropriate. The pipeline would be built in segments of approximately 0.25 mile to minimize impacts to traffic.

The pipeline extending down the canyon wall from Flat Iron Mesa to Dry Canyon and the pipeline from Sage Bush Flat into Nine Mile Canyon near Cottonwood Canyon would be assembled on the plateau. Well pads on the plateau would be used as the staging and work areas during pipeline construction. A crawler tractor would hold and push the proposed 12-inch steel line off the escarpment. The leading end of the line would have cables attached to another crawler with a winch located in the bottom of the canyon. Workers would help guide the line over the escarpment as the top tractor pushes and the lower tractor pulls. In order to make the line less visible, care would be taken to utilize existing topography to screen the line, wherever possible. The line would be painted or allowed to rust so as to eliminate any residual glare from the metal casing.

The existing gathering system that services wells outside the WTPPA on Peters Point Mesa would not adequately transport the volume of gas that could potentially be produced. An approximately 7.6-mile long steel surface pipeline comprised of various sizes would be replaced with 4- to 16-inch surface steel lines. This pipeline extends from the Water Canyon compressor down Nine Mile Canyon to the mouth of Cottonwood Canyon, where it is routed up the canyon wall to the pipelines in the Peters Point Mesa area.

The existing surface pipeline in Nine Mile Canyon would be cut into segments, loaded with a backhoe onto a truck staged on the existing road, and hauled out. Trucks would deliver pipe and string it adjacent to the trench at its point of use. The pipe would be bent and welded, after which it would be lifted to its final position with side boom dozers and backhoes. Construction would take up to 8 weeks. The road would be used for staging, and flagmen would be used to direct passage of vehicles. No other staging areas would be used. There would be three road crossings necessitating temporary delays (the same number and locations as with the existing line), and all would be trenched 4 feet below the surface. There would be six stream crossings (the same number and locations as with the existing line). Some would be spanned and some would be buried, as at the present time. The pipeline would be painted or allowed to rust and screened from the road using existing and planted vegetation as much as possible. Impacts to riparian vegetation would be avoided to the extent practicable. The pipeline would be built in segments of approximately 0.25 mile to minimize impacts to traffic.

All pipelines would be constructed to American Petroleum Institute/industry standards.

Disturbance from pipelines installed adjacent to access roads is included in disturbance calculations for those access roads. However, an additional 18.19 acres would be disturbed by pipelines not associated with access roads.

2.2.1.7 Dust Suppression

Dust suppression would be accomplished by using water, magnesium chloride, enzymes, or other approved suppressants. BBC anticipates applying approximately ten 100-bbl truck loads (1,000 bbl, 42,000 gallons) of water every day during dry periods (when vehicles cause a dirt plume of 200 feet or more) and could haul as much as 3,000 bbl/day when moving a rig in or out (once for each rig during the season) and when moving a frac crew in.

2.2.1.8 Water Sources and Water Use

Drilling and completion would require between 18 and 26 acre-feet of water per year. Estimates are based on the reported use of approximately 2 acre-feet of water for each well. Ground water from deep wells would be used for this purpose. For dust suppression, approximately 20 acre-feet per year of primarily surface water would be used. Estimates of water use for dust suppression are based on the use

of 10 trips with 4,200 gallon trucks per day for 100 days per year, or 12.8 acre-feet/year. In addition, 20 trips per day could be required when moving drilling rigs in and out. Therefore, estimated annual water use for dust suppression would be 20 acre-feet per year, and total annual water use would be between 38 and 46 acre-feet/year. Surface water depletion would be 20 acre-feet/year.

2.2.1.9 Compressor Stations

Three existing compressor sites are associated with the proposed gathering system: the Nine Mile site at the mouth of Water Canyon; the Dry Canyon site in Nine Mile Canyon at the mouth Dry Canyon; and the Sage Brush Flat site on Sage Brush Flat (see Figure 2.2). The Water Canyon and Dry Canyon facilities are currently operating, whereas the Sage Brush Flat facility is not. The Water Canyon and Sage Brush Flat facilities are located on BLM surface, and the Dry Canyon facility is located on private surface. All three sites would require upgrades to accommodate the current flow of gas and the increased flow of gas anticipated from the new wells.

Three new 1,500-hp compressors would be installed, as would two dehydration units. These upgrades would require 2.33 acres of new disturbance. Existing access roads and pipeline corridors would be used.

One of the compressors and dehydration units would be installed at the old Sage Brush Flat site. The site currently occupies approximately 1 acre but is not operational. Modification would entail removing 6-8 inches of topsoil from the site, windrowing it along the perimeter of the pad, and seeding it in the first available season following construction. Earth-moving activities would be completed in 2-3 days using the same equipment used in the area for road and/or well pad construction. Transporting the new compressor and dehydration unit to the site and removing any old equipment would require a work force of three to four workers for approximately 5 days.

The Dry Canyon and Water Canyon compressor sites presently operate with a single 1,500-hp compressor at each site. An additional 1,500-hp compressor would be placed at each of these sites, and a dehydration unit would be added at the Dry Canyon site. The existing building at the Dry Canyon site would enclose the new compressor, and no additional surface disturbance would be required. The Water Canyon site would be expanded from 1.5 acres to 2.79 acres. The existing compressor and dehydrator equipment would be rearranged to accommodate the new compressor. Concurrent with the compressor

upgrade, approximately 800 feet of surface line from adjacent private property to the compressor site would be replaced and buried. This work would occur within the existing disturbed ROW. Installation at each of these sites would require three to four workers for approximately 5 days.

2.2.1.10 Hazardous Materials

Upon completion of the drilling, drilling fluids would be stored and disposed of in a reserve pit on the plateau. Chemicals on the Environmental Protection Agencies *Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act of 1986* (SARA) that may be used or stored in quantities of over 10,000 pounds would be used in their entirety or disposed of annually. In the course of drilling, BBC and/or its contractors may store and use diesel fuel, sand (silica), hydrochloric acid, and carbon dioxide (gas), all described as hazardous substances in 40 C.F.R. Part 302, Table 302.4, in quantities exceeding 10,000 pounds. During production operations, natural gas condensate and crude oil, described as hazardous substances in 40 C.F.R. Part 302, Table 302.4, may be stored or used on-site in quantities exceeding 10,000 pounds. During production operations, triethylene glycol, ethylene glycol mix (50 percent), and methanol, all described as hazardous substances in 40 C.F.R. Part 302, Table 302.4, may be stored or used on-site in quantities less than 10,000 pounds. Small quantities of retail products (paint/spray paint, solvents [e.g., WD-40], and lubrication oil) containing non-reportable volumes of hazardous substances may be stored and used on-site at any time. No extremely hazardous substances, as defined in 40 C.F.R. Part 355, would be used, produced, stored, transported, or disposed of in association with the Proposed Action. Any spills of oil, gas, salt water, or any other potentially contaminating substances would be cleaned up and immediately removed to an approved disposal site in Myton or Roosevelt, Utah. Portable self-contained chemical toilets would be rented from and maintained by a commercial supplier in Duchesne County. Upon completion of operations, or as required, these toilets would be removed and the contents disposed of in an approved sewage disposal facility in Vernal or Price, Utah.

Drilling and production operations would maintain an emergency Spill Prevention, Control, and Countermeasure (SPCC) Plan that outlines the methodology to be used in the event of a spill. The SPCC Plan would describe how to contain a spill and how to facilitate rapid clean-up of any hydrocarbon spill prior to its contamination of either surface or subsurface waters. Produced liquid hydrocarbons and condensates would be stored in tanks surrounded by an impervious berm of sufficient capacity to contain 1.5 times the storage capacity of the largest tank. All loading lines and valves would be placed inside the

berm surrounding the tank or would be surrounded with berms to contain spills. The tanks would be emptied as necessary, and the liquids transported to market in Roosevelt or Altamont via 100-gallon capacity trucks.

2.2.1.11 Worker Housing

Ninety percent of the workforce associated with the project would be stationed in the Vernal, Utah, area. Ten percent would be located in Carbon County, primarily in Wellington, Utah. County Road 53 (Nine Mile Canyon) would be the primary access from Wellington, whereas Gate Canyon to its junction at Nine Mile Canyon would serve as the access from Vernal. No work camps or permanent living facilities would be used. However, up to three temporary trailers to house the well site supervisor, geologist, tool pusher, and rig hands may be on location during drilling and completion.

2.2.1.12 Reclamation

Appendix C presents the reclamation plan for areas disturbed during the West Tavaputs Plateau Drilling Program (WTPDP). All areas not needed for production would be reclaimed during the first available growing season following well completion. The reserve pits and those portions of the pad not needed for production facilities/operations would be re-contoured to promote reclamation and proper drainage. The reserve pits would be reclaimed within 6 months of the date of well completion, or when dry. Before any dirt work takes place, the reserve pit would be free of fluids. Reclamation would include reshaping any other areas unnecessary to operations, replacing salvaged topsoil, ripping or disking on the contour, and seeding and fertilizing all disturbed areas outside the work area with an approved seed mixture. Reclamation of well pads from which directional wells are drilled would occur after all well bores were completed. All of the same safeguards and stipulations referenced above and utilized for vertical drilling would be implemented on the directionally drilled wells.

Reclamation would also ensure that any range management facilities and improvements altered by project-related activities would be repaired to BLM standards. This would include the installation of cattle guards at fences crossed by all new access roads and existing roads that are required to contain livestock.

In the event the wells are not producers, or at such time the well is plugged and abandoned, the operator would submit a Notice of Abandonment to the BLM, and BLM would attach the appropriate surface rehabilitation conditions of approval. Back filling, leveling, and re-contouring would be performed as soon as possible after cessation of production and removal of structures and completion operations. The area would be reseeded with the appropriate seed mix (see Appendix C) specifically designed to simulate adjacent undisturbed vegetation, while maximizing utilization by both wildlife and domestic stock.

2.2.1.13 Workovers

Periodic workovers would be required to correct downhole problems in a producing well and to return the well to production. Workovers would not be undertaken on a set schedule but rather on an as-needed basis to increase or maintain production from the current downhole producing zone or to re-complete in a new zone. Workovers would be scheduled to avoid conflicts with wintering wildlife to the extent practicable.

A well would require a workover for any of several reasons:

- changing or replacing old tubing, rods, or pumps;
- refracturing producing formation(s) using advanced techniques designed to stimulate additional production;
- cleaning out the well bore and perforations to stimulate/facilitate production; and
- possibly "re-completing" in another potentially productive zone that was not originally completed at the time the well was drilled.

A workover would require, on average, a crew of three workers for 4 days.

2.2.1.14 Traffic Control

Traffic would be controlled using roadside signs, flagmen, and barricades as appropriate. Dust suppression would improve driver visibility during project-related activities. It is estimated that approximately 6,215 round trips would occur during each of the first 2 years, and approximately 9,040 round trips if and when the 16 directional wells would be drilled. In addition, approximately 1,440 trips would be made by water trucks during each of the first 2 years, and 2,240 trips in subsequent years if and when all 16 directional wells were drilled. An additional 1,200 trips would be required for pipeline construction, most of which would occur during the first two years.

2.2.1.15 Total Surface Disturbance

The total disturbance anticipated for the Proposed Action is approximately 171 acres. Those portions of the disturbance associated with dry holes, pad reduction after drilling, and surface pipelines would be reclaimed within one to two growing seasons following disturbance.

2.3 ALTERNATIVE B - NO ACTION ALTERNATIVE

Under the No Action Alternative, BBC would not be authorized to drill additional wells on federal surface or to access state surface/minerals over federal surface. Additional federal approvals would be required to drill on federal surface or minerals or to access state wells over federal surface. Any future proposals to access state lands to develop oil and gas resources would be reviewed and analyzed by BLM in site-specific *National Environmental Policy Act* (NEPA) documents.

2.4 ALTERNATIVE C

Potential impacts were identified during scoping related to the gathering system and compressors in Nine Mile and Dry Canyons (Figure 2.6). Alternative C was developed to address these issues, which include 1) disturbance of cultural sites while constructing the new pipelines in the existing ROWs in Nine Mile Canyon from the Water Canyon compressor site to Cottonwood Canyon and along Dry Canyon; 2) visual impacts and noise associated with the compressor site expansion at the mouth of Water Canyon; and 3) safety issues associated with a large-diameter surface line adjacent to a public road. Alternative C would be the same as the Proposed Action except as described below.

2.4.1 Nine Mile and Dry Canyon Gathering System

An alternative alignment was developed for the pipeline from the Water Canyon compressor site to the point where the pipeline departs the valley floor near the mouth of Cottonwood Canyon and for the length of the line to be upgraded in Dry Canyon (Figure 2.6). The pipeline in Nine Mile Canyon would follow a new route and would be buried rather than being laid on the surface. A 60-foot ROW would be established for construction (Figure 2.7); however, the width of disturbance would typically be less than 40 feet. Locations required to turn trucks around, for sharp bends in the pipeline alignment,

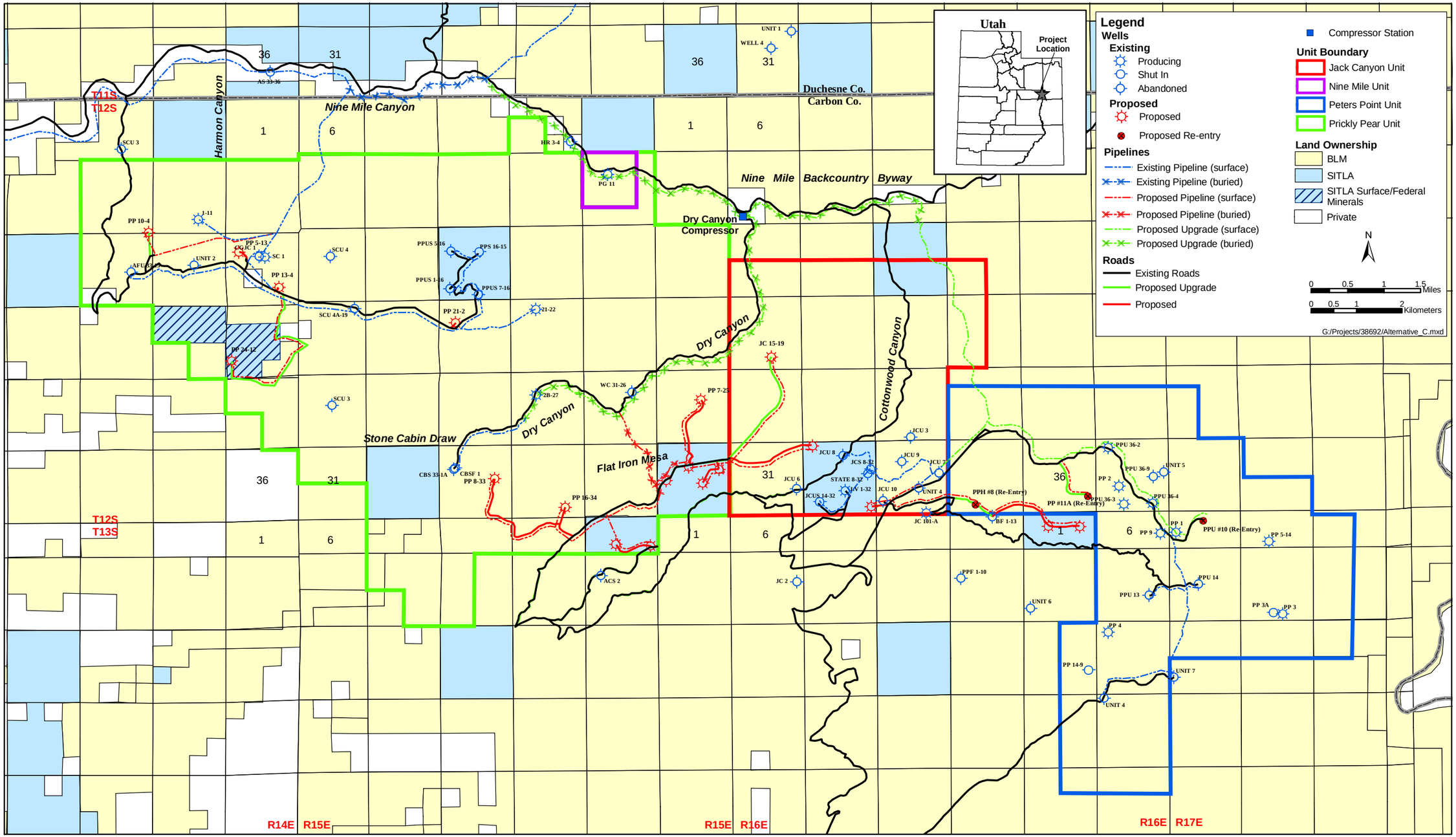

Figure 2.6 Alternative C Features.

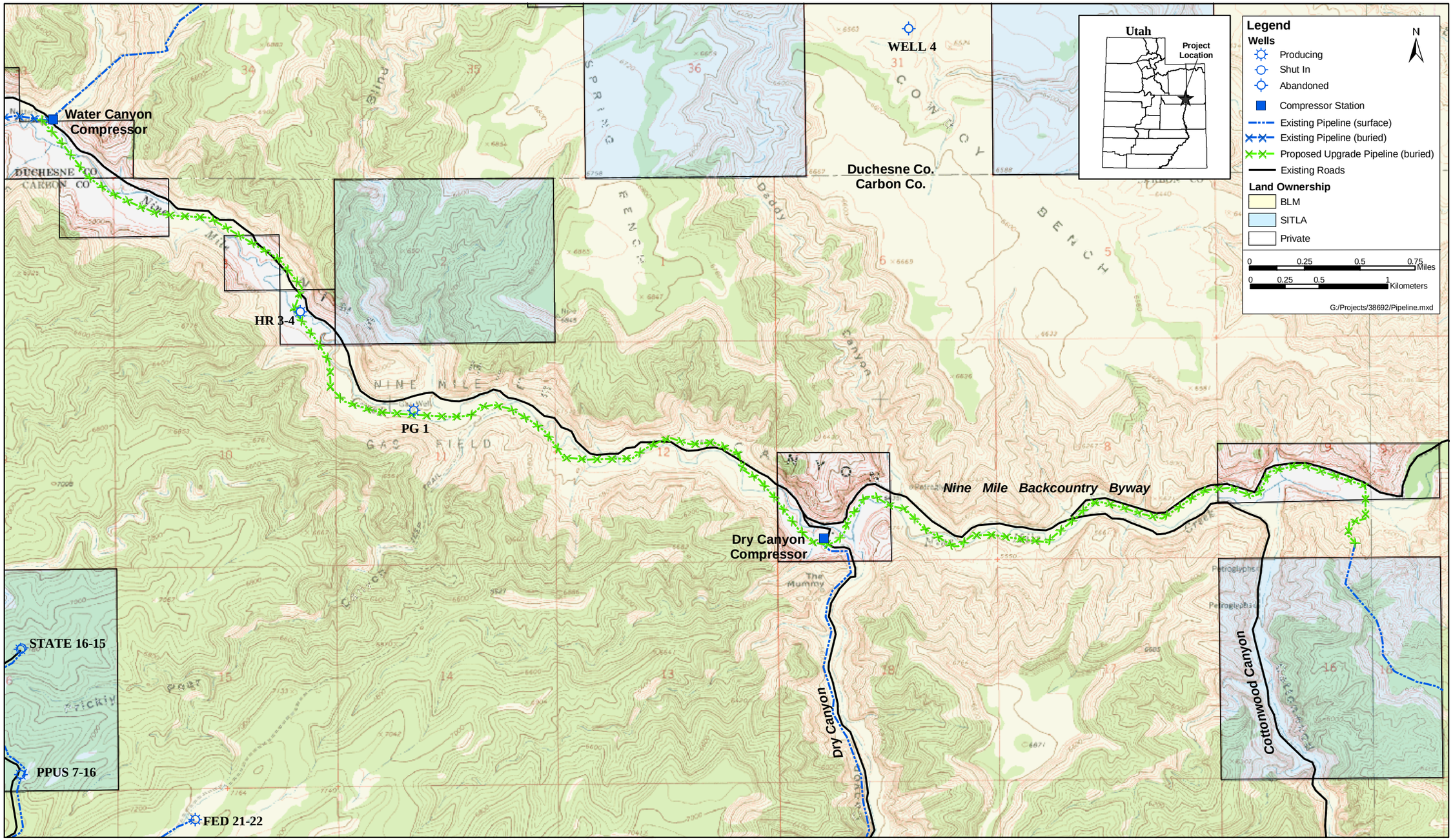

Figure 2.7 Proposed Route for Buried Pipeline in Nine Mile Canyon.

and for deeply buried sections, such as at stream crossings, would require the additional working width of the 60-foot ROW. The route is based on a geomorphic study (Lamm 2003). The route would pose the least likelihood of disrupting a cultural site, as determined by the age and depth of the deposits along the canyon floor. BBC would be required to have an archaeologist on-site during construction in the event a cultural site is encountered. The route is proposed in geologic material of sufficient depth and age to have been deposited after occupancy by prehistoric habitation. In addition, all existing data regarding cultural resources were plotted in relation to the pipeline to assist in avoiding cultural features and areas where site densities are highest.

Under Alternative C, two pipelines (12-inch and 16-inch diameters) would be buried in a common trench from the Water Canyon compressor site to the Dry Canyon compressor station. Two pipelines are necessary in this corridor to accommodate relocation of the Water Canyon compression facility to the Dry Canyon site. A single 16-inch pipeline would be buried from Dry Canyon to the point where the pipeline departs the valley floor near Cottonwood Canyon. Total surface disturbance would be 40.1 acres. From that point south, the pipeline route would follow the existing course except as described below and would remain on the surface.

As described above, the primary criteria for routing the Nine Mile Canyon pipeline in Alternative C was avoidance of cultural sites. The proposed route as identified on Figure 2.7 lies within a 300-foot corridor that has been surveyed for cultural resources and avoids all known sites. Prior to construction, the route would be refined within this corridor by BLM and BBC to optimize protection of other resources such as riparian and upland vegetation and visual resources. The Plan of Development (POD) as required by the ROW application would specify the final route and detailed construction techniques.

The 12-inch pipeline in Dry Canyon in Alternative C would also be buried and would parallel the existing road to the extent possible. The existing pipeline is on the surface on the west shoulder of the Dry Canyon road, and the new pipeline would be buried just off the east shoulder. The road would be used for work space to reduce the width of the disturbance corridor required for pipeline construction. This would result in one linear disturbance (the pipeline and the road in one corridor), rather than two linear disturbances (the road and the pipeline each in separate corridors) as described in the Proposed Action. The pipeline route would generally require clearing a 20-foot ROW on the east side of the road. When possible, the disturbed ROW would be less than 20 feet by using the existing road for as much of the work area as possible. Vegetation would be cleared using a brush hog to leave roots intact. Safety

measures would include warning signs and flagmen, as appropriate. Construction would require temporary closure of the road. The existing road would be used for staging, and land owned by BBC at the mouth of Dry Canyon may also be used for staging. Construction would take 4-8 weeks, and up to approximately 1,200 round trips would be required by worker vehicles.

Like the Dry Canyon pipeline, the Nine Mile pipeline would be buried to reduce visual impacts of a surface pipeline along the Nine Mile Canyon road (a Backcountry Byway), to reduce visual impacts to the Nine Mile Canyon Special Recreation and Cultural Management Area (SRCMA) (BLM 1995a), and because of the proposed Historic Resource District and safety issues. A 16-inch surface line in close proximity to an existing roadway and high-use recreation corridor would pose a degree of hazard to the general public and threaten the integrity of the line; whereas a buried line would be less vulnerable to vandalism and less subject to accidental rupture as a result of a vehicular accident. The pipeline ROW in Nine Mile Canyon would be for two buried pipes as illustrated in Figure 2.9, with a 60-foot ROW. When possible, the disturbed ROW would be less than 60 feet using the existing road for as much of the work area as possible. Safety measures would include warning signs, flagmen, and barricades as appropriate. Short but undetermined periods of time during construction would require temporary closure of the road. The existing road would be used for staging. Land owned by BBC at the mouth of Dry Canyon may also be used. Construction would take up to 8 weeks, and up to approximately 1,200 round trips would be required by worker vehicles. There would be six road crossings (buried) and 13 stream crossings (see Figure 2.7).

Thirteen crossings of Nine Mile Creek would be required as a consequence of the routing to avoid cultural resources. These crossings would utilize open trenching construction techniques (Appendix D) and all crossings would be buried at least 6 ft beneath the stream.

Two additional changes to the existing pipeline alignment are made under Alternative C. At the point where the Nine Mile Canyon pipeline departs in the valley floor near Cottonwood Canyon, the current pipeline alignment follows the nose of a ridge and is visually apparent. The first 1,200 feet of the alignment above that valley floor in Alternative C would be realigned to place the pipeline in a less prominent position near the axis of the drainage. The second change involves realigning a short length of pipeline located approximately half the distance between the point where the Nine Mile Canyon pipeline departs the valley near Cottonwood Canyon and the location of the Sage Brush Flat Compressor proposed under Alternative A. Approximately 150 feet of pipeline would be displaced 50 feet from the

existing route to minimize the potential for disruption of a cultural site during the pipeline replacement process.

Both pipelines would be constructed according the BMPs and applicant-committed practices presented in Appendix B.

The buried pipelines in Dry Canyon and Nine Mile Canyon for Alternative C would disturb approximately 78.4 acres (Table 2.6). They would be similar in length to the surface pipelines in the Proposed Action; however, surface pipelines would result in less surface disturbance than buried pipelines.

2.4.2 Typical Pipeline Construction Procedures for Buried Pipelines

This section provides a description of typical pipeline construction procedures that would be followed by BBC in the construction of both the Nine Mile Canyon and Dry Canyon pipelines. To ensure that uniform environmental protection and control measures are applied, agency performance standards (mitigation measures) have been developed to guide the environmental protection and compliance program for the project. These performance standards will provide the basis for BBC's final PODs, which must be completed and approved prior to construction. These performance standards also provide the basis for evaluating the project construction and operation effects on natural and human resources in Chapter 4.0, Environmental Consequences.

Table 2.6 Length and Surface Ownership of Buried Pipelines in Nine Mile Canyon and Dry Canyon, Alternative C.

	Federal (feet)	Private (feet)	Federal (acres)	Private (acres)
Nine Mile Pipeline	26,340	2,700	36.3	3.8
Dry Canyon Pipeline	27,720	0	38.3	0
Subtotal	54,060	2,700	74.6	3.8
Total	56,760		78.4	

2.4.2.1 Pre-Construction Activities

Pre-construction activities and documentation that would be completed includes a pre-construction conference to discuss the proposed construction process, the environmental compliance organization and reporting, and the environmental monitoring and reporting requirements. Biological, cultural, noxious weed, wetland, and topsoil inventory surveys would be completed and approved prior to pipeline ROW construction staking.

The boundaries of the final ROW, including temporary use areas (TUAs) and staging areas would be staked and flagged to indicate the limits of construction, changes in landownership, access points, and avoidance areas for the protection of cultural and biological resources. Noxious weed control may be required along the final ROW.

2.4.2.2 ROW Access

The construction access to the ROW will be planned in advance. This planning includes designation, mapping, and approval of planned access roads; plans for roadway upgrading and construction where necessary; signing and maintenance of public access along roads and to private driveways and roads; confirmation that required environmental survey work has been completed and approved; and changes in access plans approved. Temporary gates or cattle guards would be installed in stock fences to maintain livestock control.

2.4.2.3 Pipeline Construction

Figure 2.8 illustrates all the activities that may occur simultaneously on a pipeline construction spread. The following sections briefly describe the construction steps that would be followed by BBC.

The movement of equipment onto the construction ROW proceeds in stages. The pipeline contractor moves construction equipment onto contractor yards located in or near communities with access from the interstate, highway, and the state and county road system and where the construction spreads will start. Construction equipment includes trucks, loaders, compressors, variously sized dozers, shovels and backhoes, trenchers, cranes, side booms, generators, and bending machines. Numerous private vehicles,

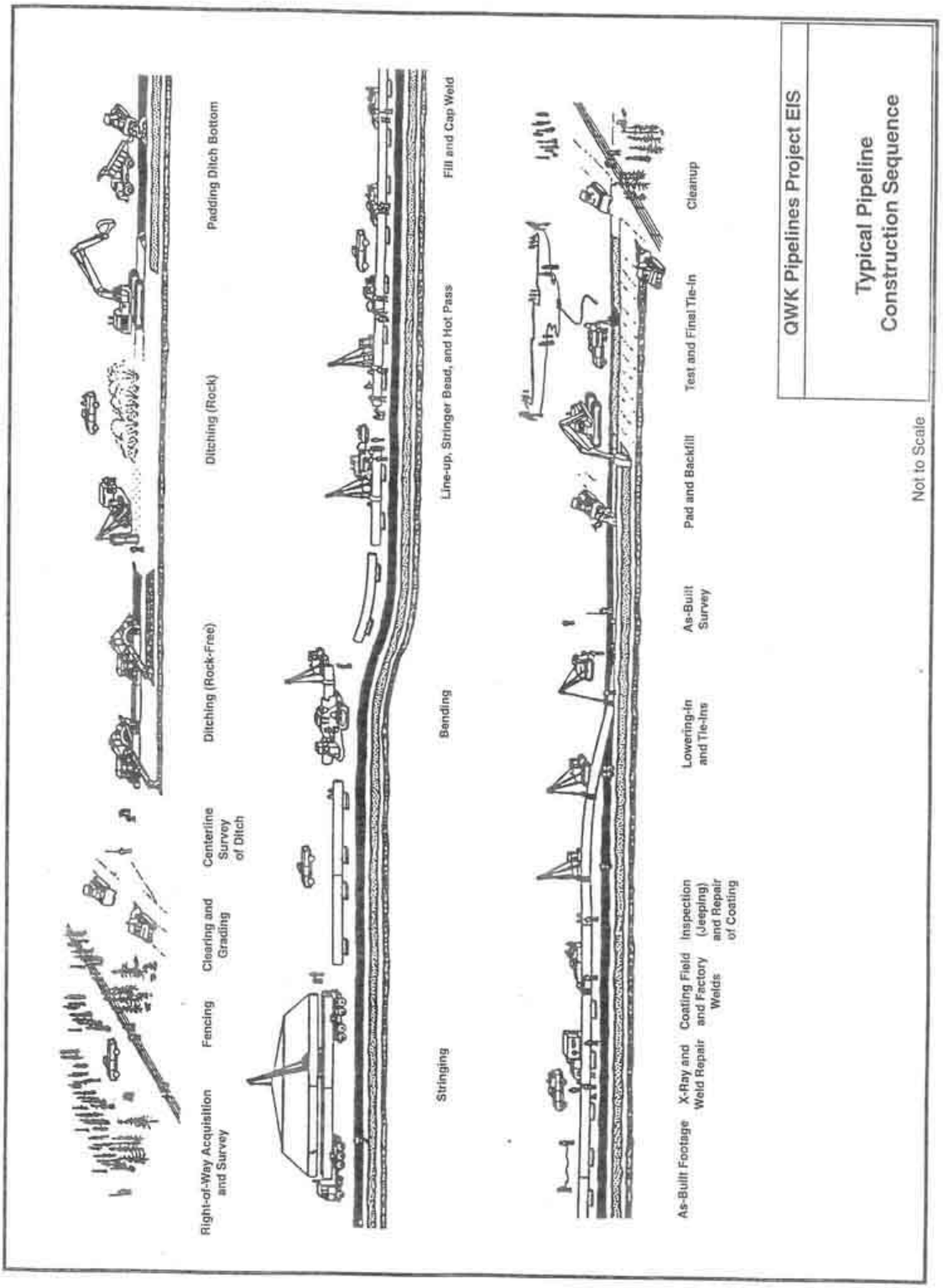

Figure 2.8 Pipeline Construction Activities.

pickups, and smaller trucks would be used for transportation. Other equipment such as tractors, disc drills, etc., would be used during reclamation. All equipment would be inspected by environmental compliance inspectors to verify that they are clean and weed-free. All field equipment would refuel at a distance of 100 feet or more from wetlands and water bodies, the boundaries of which would be staked in the field.

The clearing and grading equipment would be moved to staging areas (existing compressor sites and well pads) near the construction spread starting points. Shrubs would be cut or mowed from the construction ROW, and timber and fuel wood harvested and removed. Topsoil would be stripped to a depth specified in a topsoil stripping plan, stockpiled, and protected from erosion.

Topsoil would be segregated from subsoils on agricultural lands to maintain agricultural productivity. The ROW would be minimally graded as necessary to provide a work space for excavation and pipe laying equipment. Figure 2.9 illustrates a typical construction ROW profile.

After the working area has been prepared, trenching operations would begin. Trenches would be excavated with a trenching machine or backhoe. The trenching machine can excavate a trench of varying widths. A trenching machine would be used in areas with gentle topography and fine-textured soils, while a backhoe would be used on all remaining soil types. Trenches may be open several days until the pipe is placed and backfilling completed. Trenched roads would remain passable at all times by providing detours, and earthen plugs and escape ramps would be installed at intervals to facilitate wildlife and livestock movement. Trench depth would vary with diameter of the pipe installed. Soil cover depth would generally be 3 feet but less than 3 feet in rocky terrain. The soil cover over the pipe would be greater under roads and streams. In rocky terrain, a "rock trencher" machine would be used to minimize environmental disturbances. Backhoe hydraulic rams would assist in rock excavation where "rock trenchers" are ineffective.

Figure 2.8 illustrates pipe delivery and pipe stringing activities associated with pipeline construction. It is anticipated that the majority of the pipe for the project would be delivered to storage yards adjacent to a rail siding. The pipe would then be loaded onto trucks and hauled to the construction ROW. Pipe delivered by truck would be strung (pipe joints placed on the ground end to end next to the trench) directly onto the construction ROW.

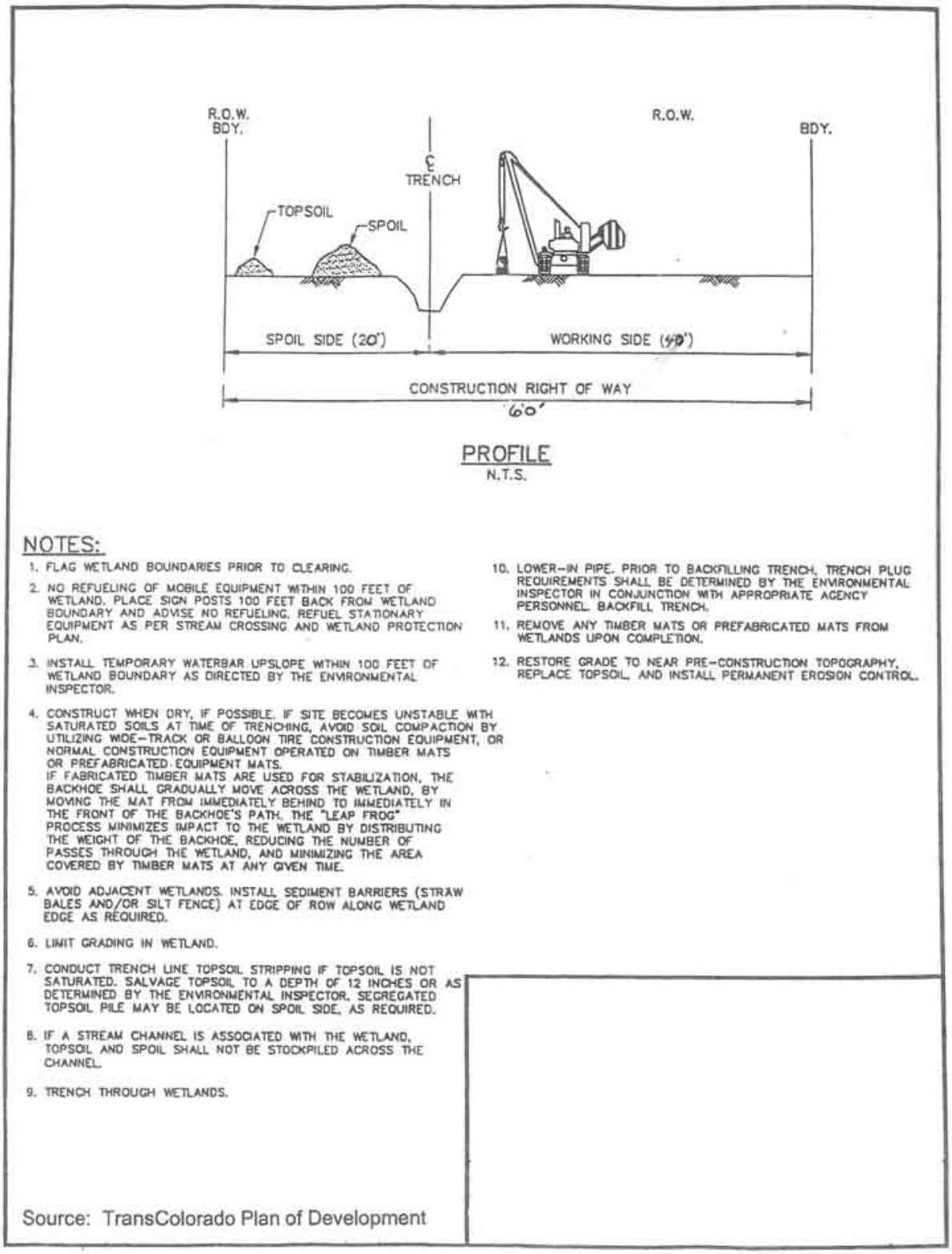

Figure 2.9 Typical Pipeline Right-of-Way.

After pipe stringing, pipe bending, lining up, welding, radiographic examination, wrapping, and coating operations would be completed. Figure 2.8 illustrates pipe installation activities associated with pipeline construction.

Pipe bending would be required for changes in topography, crossing under pipelines, roads, and utilities, and horizontal bends. Factory manufactured bends may be required to maintain the specified separation distances.

Before the pipe is placed in the ditch, selected fill material would be used to pad the pipe in areas where there are rocks in the ditch or fill material. The pipe would be lowered into the ditch by side-boom tractors. After the pipe has been placed in the ditch, fill materials would be used to pad the pipe before the ditch is backfilled.

Padding material typically consists of soils excavated from the trench; however, sand or other rock free material may be obtained from other sources. Topsoil would not be used as padding for the pipeline. Fill would be placed over the pipe to protect the pipe and coating material. Sales contracts or permits would be obtained from the affected surface-managing agency or landowner prior to obtaining any additionally required padding material.

Backfilling would be completed using the spoil previously excavated from the trench. Backfilling includes moving all the fill material back into any cuts that were necessary to construct the pipeline. Surface rock would not exceed that of adjacent areas, and the ROW would be recontoured to specifications acceptable to the AO or affected landowner.

2.4.2.4 Erosion Control and Reclamation

Excavated topsoil would be prevented from being transported into any adjacent wetlands and stream channels during construction by using siltation controls such as silt fences and hay bales. Temporary water bars would be required on steep slopes and above stream drainages.

Final reclamation would be completed within the same construction season as pipeline installation (for a detailed reclamation plan, see Appendix C). Stockpiled topsoil would be reapplied to the construction ROW and reseeded with a standard revegetation mixture or would be modified in accordance with

landowner requirements. Permanent water bars would be placed at specified intervals; stockpiled woody debris would be chopped and reapplied across the ROW. An erosion control fiber--straw, hay, or wood fiber mulch--would be applied on slopes greater than 15 percent.

To discourage public use of the ROW as a road, all access for non-essential use of the ROW would be prevented by a variety of methods (i.e., earthen berms, rocky structures, fences, signing).

Natural barriers, fences, and other range improvements (e.g., cattle guards, water pipelines, improved springs) affected by pipeline construction would be repaired immediately following construction and reclamation. These repairs would be made according to the BLM or landowner's specifications.

2.4.2.5 Pressure Testing

After the pipe has been placed in the trench, it would be tested. Natural gas produced by wells in the field would fill and pressurize the lines. After completion of the test, a nominal volume of gas would be vented until pipeline specifications are met, upon which the line will be put to use.

2.4.2.6 Construction Management, Training, and Environmental Compliance

BLM would require that construction supervisors and their employees be trained to follow performance standards and other environmental requirements during the construction process. All construction activities would be subject to field inspection to ensure that performance standards and permit conditions are met and that non-compliance actions are identified and corrected. The major controlling documents used to verify compliance include the performance standards and additional stipulations attached to the ROW grant issued by the BLM for federal lands pursuant to the *Mineral Leasing Act*, 30 *United States Code* (U.S.C.) 185, and BBC's final POD that would provide detailed maps, construction details, environmental protection plans, and other permits and approvals. BBC would be responsible for ensuring that contractors are properly equipped to prevent wildfires and to report and respond to fires should they occur. The proponents would implement a hazardous material storage and spill control and cleanup plan to ensure that fuels, lubricants, and other chemicals used during construction are not released into sensitive water bodies.

2.4.2.7 Post-Construction Monitoring and Response

Revegetation success and soil erosion monitoring would be started the first year after construction and continue throughout the LOP. Locations that are not successfully rehabilitated relative to the adjacent native vegetation would be reseeded, and permanent erosion control structures cleaned out or rebuilt.

2.4.2.8 Special Pipeline Construction

Stream and Wetland Crossings. Creek and canal crossings would would utilize open trenching construction techniques. Two open trenching techniques, including the dry trench and open-cut techniques, would be used for the installation of pipeline across water bodies. The dry trench technique involves routing the flow around the trench during trench excavation, installation of the pipeline, and backfilling. The open-cut technique allows the stream flow to continue through the work area during trench excavation, installation of the pipeline, and backfilling. Various stream crossing techniques are included in Appendix D.

Backhoes would be used to create a trench across dry washes and intermittent stream crossings. Additional TUAs would be required in these areas. The banks of the wash would be excavated to create a slope gentle enough to allow equipment to progress to the floor of the wash. Soil would be stockpiled at the top of the banks of the wash. After the pipe has been installed, the stockpiled soil would be used to restore the banks of the wash to a stable configuration. This approach could be modified to fit specific situations, such as when rock riprap or other reinforcing material is required where bank stabilization and scour may be a problem.

Road Crossings. Open trenching techniques would be used to cross unimproved roads. Installation and restoration of the surface would likely be completed in 1 day.

Visually Sensitive Areas. Visually sensitive areas have been identified during this process. Measures that would be implemented to mitigate these concerns include restoration techniques such as rim rock reconstruction, selective clearing of adjacent trees to reduce contrast, contouring, mulch/native seed planting, native soil color slope protection fabric, and painting of aboveground structure to blend with the natural soils and vegetation colors. Seed mixes would include species currently present in the project area to reduce the visual contrast with adjacent lands.

2.4.3 Compression Consolidation

To address noise and visual impact concerns related to expansion of the Water Canyon compressor site, the Alternative C was developed to not only avoid facility expansion but to eliminate the facility altogether. The removal of the existing Water Canyon compressor site would require the installation and tie in of two pipelines, a 12-inch and 16-inch pipeline, buried from the current Water Canyon site to the existing Dry Canyon site and upgrading of the Dry Canyon site to accommodate an additional compressor. All additional compressors at the Dry Canyon site would be housed and muffled. The existing compressor would be housed and the stacks extended to attenuate noise levels. The two buried pipelines in Nine Mile Canyon would use the same ROW.

The expansion of the Dry Canyon site would not create additional disturbance because the additional compressor would be added within the existing graded and fenced facility. The existing Water Canyon facility location would be reclaimed during the first growing season following removal of the facility.

The consolidation of the Water Canyon and Dry Canyon compressor sites would preclude the need to re-establish the Sage Brush Flat compressor site. An additional compressor would be added within the existing fenced and graded facility at Dry Canyon, and the Sage Brush Flat site (1 acre) would be reclaimed during the first growing season.

In summary, under this alternative all compression (four compressors) would be located at the Dry Canyon site.

2.4.4 Alternative Location of Well 27-3

Under Alternative C, the 27-3 well in bottom of Dry Canyon would be eliminated from consideration. Instead, another well location on the top of the plateau (PP 8-33, in the SENE, Section 33, T12S, R15E) is proposed. The PP8-33 well location would require an additional 7.9 acres of surface disturbance for the access road and adjacent pipeline than would be needed for the 27-3 location.

2.4.5 Traffic Control

Traffic would be controlled using roadside signs, flagmen, and barricades as appropriate. Dust suppression would be used to improve driver visibility during project-related activities. It is estimated that 6,215 round trips would occur during each of the first 2 years, and 9,040 round trips if and when the 16 directional wells would be drilled. Approximately 2,400 round trips would occur with the installation of buried pipelines in Nine Mile and Dry Canyons. In addition, approximately 1,440 trips would be made by water trucks during each of the first two years, and 2,240 trips in subsequent years if and when all 16 directional wells were drilled.

2.4.6 Total Surface Disturbance

Surface disturbance would be approximately 255 acres as compared to 171 acres for the Proposed Action. Alternative C would add 78 acres of disturbance due to the buried pipelines in Dry Canyon and Nine Mile Canyon and approximately 8 acres due to the increased length of the access road to location PP 8-33 as compared to location 27-3 in the Proposed Action. The Water Canyon and Sage Brush Flat compressor sites would be reclaimed (2.5 acres total reclaimed).

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

Alternatives reviewed and dismissed from further analysis include 1) gathering lines buried beneath the Nine Mile Canyon and Dry Canyon roads; 2) wells located in the bottoms of Dry Canyon and Nine Mile Canyon; and 3) alternative gas pipeline routes from the plateau above Dry Canyon.

2.5.1 Bury Gas Pipelines Beneath Roads in Dry Canyon and Nine Mile Canyon

Under this alternative, the main gathering lines in Nine Mile Canyon and Dry Canyon would be buried beneath the public roads in these canyons. The reasons that this possible alternative was not studied in detail are as follows: The original Nine Mile and Dry Canyon Roads were not sited with regard for archeological resources. Instead, the main objective was to construct the roads as quickly and as easily as possible. As a result, the Nine Mile Canyon Road generally follows the north side of the canyon and cuts into the canyon walls and, in many instances, directly into bedrock. As cultural surveys indicate, much of the rock art, as well as standing structures, can be found near these road cuts and on the canyon walls.

The density of these sites is exceptionally high, leading to the possibility that cultural resources may be adversely affected.

Since the road in several places is less than 20 feet in width, pipeline construction within the road would necessitate very long delays for local and tourist traffic, in many cases extending into hours. During monitoring, which may lead to discovery of archeological sites, road closures may even extend into days, as there are areas where it is not physically possible to detour around the road in places where it is built into the canyon wall adjacent to Nine Mile Creek. Using standard construction procedures, the pipeline would be buried to a depth of from 4-5 feet below the road surface. High explosives would typically be used to cut through the bedrock and open the trench. As noted, two pipelines are proposed--one 16 inch and one 12 inch--requiring a larger trench and more disturbances and blasting that may possibly damage both standing structures and rock art. In addition, due to safety concerns and the time needed to set the explosives and excavate the trench, the road would be closed. Again this may result in extended delays due to the closure of the road.

Equipment is available that can cut through rock and could avoid possible impacts from blasting; however, with use of such equipment, two issues would remain unresolved. First, even longer periods of road closure would occur with use of this equipment. Second, use of such equipment would not eliminate possible adverse effects to cultural resources.

2.5.2 Locate Wells in the Bottom of Nine Mile and Dry Canyons

BBC was obligated by a unit agreement to drill wells within the lower portions of Dry Canyon. In addition, wells proposed by BBC's predecessor were sited within the lower portions of Dry Canyon and within Nine Mile Canyon. However, based on concerns expressed by the BLM and the public regarding potential impacts to cultural sites and visual resources, this alternative is not analyzed in detail. Alternative C includes a well (PP 8-33) that is not in either canyon but meets the unit obligation requirements.

2.5.3 Pipeline ROWs from the Top of the Plateau to the Bottom of Dry Canyon

Two alternative routes for a ROW were considered to gain access from the top of the plateau to the bottom of Dry Canyon--a route traversing the ridge to the mouth of Dry Canyon, down the escarpment to

the Dry Canyon compressor site and a route farther up Dry Canyon. Both of these routes were dismissed from further analysis because of visual impacts in a Visual Resource Management (VRM) Class II area along the Nine Mile Canyon and Dry Canyon roads.