

Plan of Development Riley Ridge Unit Development Project Sublette County, Wyoming

Prepared for

U.S. Department of the Interior,
Bureau of Land Management, Pinedale Field Office

Prepared by

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List of Acronyms

APD	Application for Permit to Drill
AUM	animal unit month
BLM	Bureau of Land Management
BMP	best management practice
CFR	Code of Federal Regulations
CO ₂	carbon dioxide
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
H ₂ S	hydrogen sulfide
HSE	Health, Safety, and Environmental
MDU	Miami Ditch Unit
MHRF	methane and helium recovery facility
MMcf/d	million cubic feet per day
NRCS	Natural Resources Conservation Service
OSHA	Occupational Safety and Health Administration
PFYC	Potential Fossil Yield Classification
POD	Plan of Development
Project	Riley Ridge Unit Development Project
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
RRU	Riley Ridge Unit
SHPO	State Historic Preservation Office
SPCC Plan	Spill Prevention Control and Countermeasures Plan
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USDOI	United States Department of the Interior
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VRM	visual resource management
WDEQ	Wyoming Department of Environmental Quality
WYDOT	Wyoming Department of Transportation
WGFD	Wyoming Game and Fish Department
WOGCC	Wyoming Oil and Gas Conservation Commission
WOUS	Waters of the U.S.

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1.0 Introduction

This Plan of Development (POD) has been prepared for the Riley Ridge Unit Development Project (Project) in support of applications to the United States (U.S.) Department of the Interior (USDOI) Bureau of Land Management (BLM) by Denbury Onshore, LLC (Denbury). This POD provides a description of the Project and establishes the procedures for implementing Best Management Practices (BMPs) and mitigation measures. This POD should be used along with other site-specific plans and permit requirements; the POD will be updated should the Project be modified.

The Project is located on federal, state, and private lands; therefore, Denbury will need to obtain all federal, state, and local permits prior to construction. **Table 1-1** lists the federal, state, and local permits that are assumed to be required for developing the Project.

Table 1-1 List of Permits, Approvals, and Reviews

Issuing Agency/Program/ Permit Name	Permits/Approvals/ Authorizing Actions	Application Project Component
Federal Permits, Approvals, and Authorizing Actions		
USDOI (BLM)		
Onshore Oil and Gas Orders	Permitting of federal operations (drilling, completion, abandonment), drilling operations, site security, measurement of oil, flaring of gas, produced water disposal	Wells, flowlines, associated facilities, roads
Cultural resource clearances	Cultural resource permit	Antiquities Act of 1906 Archaeological Resources Protection Act of 1979 National Historic Preservation Act, Section 106 (36 Code of Federal Regulations [CFR] 800)
Subsequent well authorizations	Sundry Notices	43 CFR 3162.3-2
Right-of-way (ROW) Grant, Temporary Use Permits	ROW Grant for access roads on BLM managed land; Temporary Use Permits for facilities and pipelines	Access roads, associated facilities, and pipelines that extend outside the federal unit
U.S. Army Corps of Engineers (USACE)		
Clean Water Act Section 404 Permit	Permit for placement of fill or dredged material in WOUS	All activities requiring placement of fill material into WOUS
U.S. Fish and Wildlife Service (USFWS)		
Endangered Species Act	Informal or formal consultation for threatened and endangered species	All Project components
U.S. Environmental Protection Agency (USEPA)		
Clean Water Act (CWA)	Spill Prevention, Control, and Countermeasure (SPCC) Plans	Transfer and storage of fuels and oils

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Issuing Agency/Program/ Permit Name	Permits/Approvals/ Authorizing Actions	Application Project Component
State Permits, Approvals, and Authorizing Actions		
Wyoming Department of Environmental Quality (WDEQ)		
Wyoming Air Quality Permits	Permits for emissions from new or modified sources; prevention of significant deterioration (if applicable); control of hazardous air pollutants, hydrogen sulfide (H ₂ S), and volatile organic compounds, and New Source Review	All stationary fuel-burning sources, tanks, separators, dehydrators, and compressors, and new source review for the Sublette County Non-attainment Area
General Permit to Discharge Storm Water Associated with Large Construction Activity	Storm water construction permits; Large Construction Permit WYR10-0000	All ground disturbing activities; disturbance over 5 acres
Temporary Turbidity Waiver	Construction activities that will cause short-term or temporary violations of state water quality standard for turbidity	Stream crossings, near stream activities that will discharge storm water to stream
General Permit for Temporary Discharges	Temporary discharge of water encountered during well drilling	New well development
CWA Section 401 Certification	Review and certification for USACE 404 permits	All surface-disturbing activities affecting WOUS
Wyoming Department of Transportation (WYDOT)		
Transport Permits	Permit for oversize, over-length, and overweight loads	Transportation of equipment and materials on state highways
Wyoming Oil and Gas Conservation Commission (WOGCC)		
Oil and Gas Rules and Regulations	Drilling operations, safety regulations, pit permits, product measurement, and authorization of flaring for Fee and State wells	Wells and related facilities
Underground Injection Control Permit/Approval	Class II Injection/disposal wells	Underground injection/disposal wells
Wyoming Office of State Lands and Investments		
Authorization of activities on State land	Approval of oil and gas leases, ROWs, temporary use permits, and developments on State land	Facilities on state land
Wyoming State Engineer		
Water Agreement for Temporary Use of Water	Temporary water use for drilling operations, hydrostatic testing, and dust abatement	Drilling and pipeline construction

Table 1-1 List of Permits, Approvals, and Reviews

Issuing Agency/Program/ Permit Name	Permits/Approvals/ Authorizing Actions	Application Project Component
Wyoming State Historic Preservation Office (SHPO)		
Cultural Resource Protection and Consultation	Prepare Programmatic Agreement	All surface disturbance
Local Permits, Approvals, and Authorizing Actions		
Sublette County		
Road Use Authorization	Overweight and over length loads on county roads	Transportation of equipment and materials on county roads
Conditional Use and Special Use Permits, Zoning	New structures	Associated facilities
County Road Access	Construction of new roads that connect to county roads	Project access roads

1.1 Overview of Proposed Work

Denbury is proposing a gas development project in the Riley Ridge Unit (RRU) of the LaBarge Anticline oil and gas field located in southwest Sublette County, Wyoming, which is approximately 18 miles west/southwest of Big Piney, Wyoming (**Figure 1-1**). This development is limited in scope and constitutes some proposals that were previously analyzed in the Rand's Butte Environmental Assessment (EA) from 2008-2011. However, Denbury's proposed action in RRU may have changed location and/or include new proposals that have not been previously reviewed, but that fit within the scope of the previous EA. At this time, Denbury proposes the following:

- Drill three federal RRU wells;
- Drill one state well (the 16-24);
- Construct their associated gathering lines;
- Drill the lone Miami Ditch Unit (MDU) 31-34 well; and
- Connect two existing shut-in wells (the 12-43 and the 8-24) plus the newly drilled wells to the Methane and Helium Recovery Facility (MHRF) with flowlines.

Table 1-2 provides a summary of wells and proposed new well locations in the RRU.

The RRU wells include the 18-44 (formerly the 18-14), the 17-13, and the 10-14R, located in Township 29 North (T29N), Range 114 West (R114W), Sections 18, 17, and 10, respectively. All of these wells are located on BLM surface and/or mineral estate. Denbury also will build a short (0.1 mile) access road and will drill the 16-24 well which will be located on Wyoming state lands and minerals, also in T29N, R114W, Section 16; however, it is not a federal action and is included here for cumulative impact purposes only.

Figure 1-1 Project Location

Table 1-2 Riley Ridge Unit and Miami Ditch Wells and Proposed Locations

API Number	Well Name/ Number	Total Depth (feet)	Well Class ¹	Well Status ²	Year Completed or Abandoned	Quarter	Section- Township-Range	Formation	Comment
Deep Wells									
4903520537	RRU 8-24	16,000	G	TA	1980	SESW	8-29N-114W	Madison	Well does not have a flowline. A flowline will be built to produce this well to the gas plant. Included in the 2010 Rands Butte EA. Federal surface/minerals.
4903520603	RRU 10-14	16,215	G	SI	1981	SWSW	10-29N-R114W	Madison	Will initially be a production well. May PA after indefinite period of time. Included in the 2010 Rands Butte EA. Federal surface/minerals.
4903520670	RRU Fed 12-43	15,550	G	SI	1981	NESE	12-29N-115W	Madison	Well does not have a flowline. A flowline will be built to produce this well to the gas plant. Currently completed in the Madison Formation. Included in the 2010 Rands Butte EA. Federal surface/minerals.
4903528610	RRU 16-31		AGDW	SI		NWNE	16-29N-114W	Big Horn	Drilling; final casing in June 2013. Permitted as H ₂ S/CO ₂ injection well. Scheduled for total depth in Big Horn formation (geologic formation below the Madison formation). Currently, well to be completed to both the Madison and Big Horn formations. State surface/minerals.

Table 1-2 Riley Ridge Unit and Miami Ditch Wells and Proposed Locations

API Number	Well Name/ Number	Total Depth (feet)	Well Class ¹	Well Status ²	Year Completed or Abandoned	Quarter	Section- Township-Range	Formation	Comment
4903520272	RRU 24-16	11,950	WDW	SI	2011	SESW	16-29N-114W	Nugget	Water injection well. Included in 2010 Rands Butte EA State surface/minerals.
4903520657	RRU Fed 17-34	16,370	G	SI	1982	SWSE	17-29N-14W	Madison	Well will be produced when gas plant becomes operational. Well on the same pad as the 20-14. Included in the 2010 Rands Butte EA. Federal surface/minerals.
4903526670	RRU 20-14	17,025	AGDW	SI	2012	SWSE Surface C SW 20 BHL	17-29N-114W	Madison	H ₂ S/CO ₂ injection disposal well. Will be operated when gas plant becomes operational. This well is on the same pad as the 17-34. Included in the 2010 Rands Butte EA. Federal surface/minerals.
TBD	RRU 10-14 R	17,500	AGDW	APD submitted	2014 (proposed)	SWSW	10-29N-114W	Big Horn	Replacement for the 10-14. Planned as an H ₂ S/CO ₂ injection well. Federal surface/minerals.
TBD	RRU 17-13	17,117	G	APD submitted	2015 (proposed)	SWSW Surface NWSW BHL	17-29N-114W 17-29N-114W	Big Horn	Proposed as a production well. Will share a pad with the 18-44. Well was formerly the 17-14, but the bottomhole location changed which caused the well number to be 17-13. Federal surface/minerals.

Table 1-2 Riley Ridge Unit and Miami Ditch Wells and Proposed Locations

API Number	Well Name/ Number	Total Depth (feet)	Well Class ¹	Well Status ²	Year Completed or Abandoned	Quarter	Section- Township-Range	Formation	Comment
TBD	RRU 18-44	17,500	G	APD submitted	2017 (proposed)	SWSW 17 surface, SESE 18 BHL	17-29N-114W;	Big Horn	Proposed as a production well and will share pad with the 17-13. Formerly the 18-14 as described in the 2010 Rands Butte EA. The bottomhole location changed and well number changed to 18-44. Federal surface/minerals.
TBD	RRU 16-24	17,494	G	APD submitted	TBD	NWSW surface; SESW 16 BHL	16-29N-114W	Big Horn	APD submitted to WOGCC. A copy of the APD will be submitted with POD and will be reviewed in the National Environmental Policy Act document in the cumulative effects chapter. State surface/minerals.
TBD	MDU 31-34	17,500	G	APD submitted	2014 (proposed)	SWSE 31	31-30N-114W	Big Horn	Planned to be drilled as an exploratory and unit obligation well. Federal surface/minerals.
4903520673	North 33-24	16,505	G	PA	2006	SESW	33-30N-114W	Madison	
Frontier Formation Wells									
4903522748	RRU 14-33F	8,290	G	SI	2002	SESW	33-30N-114W	FRONTIER	Seasonal shut in.
4903523021	RRU 16-32F	8,070	G	SI	2002	SESE	32-30N-114W	FRONTIER	Seasonal shut in.
4903523035	Miami Ditch 16-29F	8,175	G	SI	2002	SESE	29-30N-114W	FRONTIER	Seasonal shut in.
Mesaverde Formation Coalbed Wells (Operated by Infinity Oil & Gas)									
4903522331	RRU 11-4-29-114	3,500	G	PA	2012	NWNW	4-29N-114W	MESAVERDE	
4903520939	RRU 5-1 WDW	8,150	WDW	PA	2012	SWNE	5-29N-114W	MESAVERDE	
4903522130	RRU Federal 5-2	4,100	G	PA	2012	SWNE	5-29N-114W	MESAVERDE	
4903522334	RRU Fed 41-5	3,460	G	PA	2012	NENE	5-29N-114W	MESAVERDE	

Table 1-2 Riley Ridge Unit and Miami Ditch Wells and Proposed Locations

API Number	Well Name/ Number	Total Depth (feet)	Well Class ¹	Well Status ²	Year Completed or Abandoned	Quarter	Section- Township-Range	Formation	Comment
4903522333	RRU Fed 44-32	3,370	G	PA	2012	SESE	32-30N-114W	MESAVERDE	
4903522332	RRU Fed 14-33	3,427	G	PA	2012	SWSW	33-30N-114W	MESAVERDE	

¹ Class: G – gas, WDW – water disposal well; AGDW – Acid gas disposal well.

² Status: PA – Plugged and abandoned; SI – shut in; TA – Temporarily abandoned; APD – Application for permit to drill.

API – American Petroleum Institute

APD – Application for Permit to Drill

CO₂ = carbon dioxide

The 17-13 and 10-14R wells will be drilled from new well pads averaging 5.0 acres in size and will be drilled to the Madison formation at a depth of about 17,000 feet utilizing standard vertical drill technology and employing H₂S gas safety protocols. The 18-44 well will be directionally drilled from the 17-13 well pad, with a bottomhole location in Section 18. Once completed, each federal Riley Ridge well will have a flowline constructed utilizing the access road corridor already in place to take the produced gases to the existing MHRF located on state land in Section 16, T29N, R114W; Once at the MHRF the gas will be treated and then shipped to market via existing infrastructure. The pipeline/access road corridor may be used for power and/or fiber optic lines to aid in production and monitoring of the wells.

Road access to these well pads will be along the existing Riley Ridge Road. Each well pad is immediately adjacent to this road.

The Miami Ditch (MDU) 31-34 well is being drilled as a unit obligation well in order to maintain the MDU. If capable of production, its flowline would run south within the RRU, paralleling the Bridger Teton National Forest boundary, and would tie into the flowline to be constructed for the RRU 12-43 well (see below). From this intersection, the flowline would continue to the 18-44/17-13 pad, where it would tie into the flowline servicing those two wells. Access to the Miami Ditch well will use the existing Middle Piney Creek Road running west from the Town of Big Piney, Wyoming. The final 2.2 miles of road to the well site will be upgraded by widening the existing road with a borrow ditch and creating a crowned and graveled travel lane.

The RRU 12-43, and the RRU 8-24 are each located in the South Piney Creek drainage. The 12-43 and the 8-24 are existing wells that will have flowlines constructed to connect them to the MHRF. The 12-43 lies just within the boundary of the Bridger Teton National Forest, and 8-24 lies approximately 1-¼ miles east, within the RRU and on the south side of South Piney Creek. The access road to these sites will be via the South Piney – Fish Creek and Middle Piney Creek roads. The flowline for 12-43 will run east, out of the National Forest and into the Riley Ridge Unit, where it would connect with the flowline servicing MDU 31-34. Past this connection point, the flowline would run south, across South Piney Creek, up a minor ridgeline to the top of Riley Ridge, where it would turn east, running along Riley Ridge to its connection point with the flowlines for RRU 17-13 and 18-44. The flowline for RRU 8-24 would run south, up a minor ridgeline toward Riley Ridge, where it would tie into the flowline servicing MDU 31-34, RRU 12-43, 17-13, and 18-44. From this connection point, the flowline would continue toward the MHRF.

Figures 1-1 and 1-2 provide the overall Project location and well location details for the five new wells and the two existing wells.

This POD provides a description of proposed work and infrastructure development, a summary of resource values, reclamation requirements and procedures, and appendices containing Applicant-committed Measures and a noxious weed control plan.

1.1.1 History of Riley Ridge and Rands Butte

RRU is located on the north end of a large geological feature known as the LaBarge Anticline or Platform. Oil and gas production has been conducted on the LaBarge anticline since the 1920s. Until the 1960s, production came from Tertiary and Mesozoic rocks from relatively shallow reservoirs. The presence of natural gas resources in deeper Paleozoic reservoirs was established in 1963 with the drilling of the Mobil Oil 22-19G Tip Unit (Section 19, T28N, R113W (Stewart and Street 1992). The well was drilled to a total depth of 15,435 feet and flowed 20 million cubic feet per day (MMcf/d) during a drill stem test of the Madison limestone interval from 13,718 to 14,033 feet. Initial reservoir pressure was measured on

Figure 1-2 Existing Surface Disturbance and Proposed Project Locations

the test at 6,459 pounds per square inch. The well was plugged back and completed in the Cretaceous. In the late 1970s and into the 1980s, development of the Madison reservoir began. ExxonMobil drilled 16 wells in three units (Lake Ridge, Fogarty Creek, and Graphite) adjacent and to the south of the RRU (Hunter and Bryan 1987). The first deep well in the RRU, RRU #8-24, was spud in September 1979 and completed in September 1980 (WOGCC 2013). Four more wells were drilled and completed from 1980 to 1982 and include the Riley Ridge 10-14, 12-43, 17-34, and 33-24 wells (**Table 1-2**). The wells were shut-in because economic conditions at the time precluded development of processing facilities to separate the inert gases from methane. The gas from the Madison reservoir contains about 20 percent methane, 65 percent CO₂, 5 percent H₂S, and 7 to 10 percent nitrogen (Stewart and Street 1992). Another gas resource is helium, which ranges from 0.5 to 1.3 percent.

The Riley Ridge Environmental Impact Statement (EIS) was issued in 1983 and it covered Madison development at Riley Ridge as well as other applicants that operated units on the LaBarge anticline. After issuance of the EIS, ExxonMobil proceeded to develop its units in 1984 with first production in 1986 (Hunter and Bryan 1987). RRU was organized as a federal exploration unit in 1981 and the original operator was American Quasar, but the original five wells at RRU have been idle for many years (WOGCC 2013). In 2000, Infinity Oil and Gas drilled several wells attempting to produce coalbed gas from the Cretaceous Mesaverde zone. Although a couple of the wells are reported to have produced oil as well as gas, the wells were all abandoned by 2012 (**Table 1-2**).

Several wildcat wells with Cretaceous objectives also have been drilled within the unit, but were plugged and abandoned. However, in 2002, Williams Production Company completed the #14-33F well in the 2nd Frontier Sandstone from interval from 7,952 to 7,964 feet. The well has produced over 11,000 barrels of oil, 1.1 MMcf of gas, and 2,763 barrels of water with last reported production in October 2012 (WOGCC 2013).

Cimarex Energy purchased the unit in 2005 and applied to build a MHRF, construct associated pipelines and roads, and install injection disposal wells. The BLM conducted an EA of this Rands Butte project to analyze potential impacts of the proposed development. A decision record was issued with a finding of no significant impact and construction on the processing plant began in late 2010. In 2011, Denbury bought the operating interest in the RRU and the Rands Butte project. The MHRF and several wells were drilled in the intervening years and are now part of the field's existing infrastructure. The plant processes methane and helium for sale and the H₂S/CO₂ will be re-injected into the 20-14 and 16-31 wells. Production pipelines also have been constructed to transport the product(s) out of the unit. A CO₂ transportation pipeline project will eventually connect the production and processing facilities to Denbury's Enhanced Oil Recovery projects in northeastern Wyoming and Montana.

Injection disposal wells were installed in 2011 and 2012 for water and H₂S/CO₂ (non-gaseous phase) which are the Riley Ridge wells 24-16 and 20-14 (**Table 1-2**). A CO₂ capture facility will be built with a capacity of 130 MMcf/d.

Outside of the RRU, Denbury operates the 16-29F well in Section 29, T30N, R114W in the Miami Ditch exploratory unit (155916X). Originally drilled and completed by Williams RMT in 2002, the well produces from the Frontier, which has produced 4,730 barrels of oil, 343.2 MMcf of gas and 18,164 barrels of water (WOGCC 2013). The well is seasonally produced because of the difficulty of conducting production operations in the winter.

2.0 Proposed Work Description

Denbury's proposed work for this POD is part of the overall development of the RRU as envisioned and analyzed in the Rands Butte EA of 2010, with some modifications and location changes. The proposed work includes activity on federal, state, and private lands and both federal and state mineral leases. The development project will occur over a 6-year period. The anticipated and planned production will occur over a 40-year period. All work will be conducted according to either BLM Onshore Oil and Gas Rules or the WOGCC rules, depending on which agency has primacy.

2.1 Proposed Work for 2014-2019

2.1.1 Construction and Drilling Operations

Well pad, access road, and other construction activities would follow guidelines set forth in the most recent edition of the "Gold Book," *Surface Operating Standards for Oil and Gas Exploration and Development*, and/or *Manual 9113 Roads* concerning road construction standards on projects subject to federal jurisdiction. Sufficient topsoil to facilitate revegetation would be segregated from subsoils during all construction and would be replaced on the surface upon completion of operations as part of the reclamation and revegetation program. Operators would employ appropriate topsoil storage technology and procedures to ensure soil viability and plant rooting potential are maintained.

2.1.2 Well Pads

The entire well pad area would be cleared of all vegetation, and all topsoil would be removed from all cut, fill, and/or subsoil storage areas. Topsoil would be stockpiled for future use in reclamation. After the topsoil has been removed, the pad would be graded to prepare a level working surface. Each well location would be designed so that the amount of cut and fill material would "balance," where feasible, thereby minimizing the need to stockpile excess subsoil adjacent to the well location until site reclamation. Materials excavated from the reserve would be stockpiled for use later in reclamation.

The area required for drilling and completion of each well would vary depending upon the total number of wells to be developed from the pad, and whether new development would occur from an existing pad. See **Table 2-1** for complete individual well pad size and status information.

Table 2-1 Well Pad Size and Status

Well #	Proposed Drilling Schedule	Well Pad Size (acres)	Total Limits of Disturbance (acres)	Comments
18-44 and 17-13	7/2015 -7/2017	5.3	6.4	Multi-well pad
16-24	July 2013	3.9	4.6	Production Well
10-14R	February 2014	3.8	4.1	Replacement for 10-14 #1, and will be a H ₂ S/CO ₂ injection well
Miami Ditch 31-34	July 2019	3.7	5.5	Unit obligation well

See individual APDs for each well for specific information, site drawings and maps.

Erosion control would be maintained through prompt revegetation and by constructing surface water drainage controls such as berms, diversion ditches, and sediment ponds as necessary at each well location. All diversion ditches and other surface water and erosion control structures at each location would be shown on topographic relief maps provided with each APD. Stormwater Pollution Prevention Plans (SWPPPs) would be prepared by each Operator for all wells, access roads, and other disturbances of more than 1 acre, in compliance with the WDEQ-Water Quality Division requirements.

2.1.3 Well Construction and Operation

Approximately 20.4 acres will be disturbed during construction of the five new wells. After construction, approximately 16.6 acres will remain disturbed for well operation and access. The remaining acreage will be expected to be reseeded and mulched within 6 months or as soon as environmental conditions are appropriate. Although requests have been considered to provide more interim reclamation of these sites, Denbury feels that the sites need to stay in open, active status due to possible subsequent completion, reboring, maintenance and safety considerations. Therefore, the disturbance acres for the wells will remain as initially projected.

Table 2-2 summarizes the disturbance for pad construction for the new wells.

Table 2-2 Pad Construction Disturbance Summary – Surface Ownership

	Federal	State	Private	Total
Acres	11.9	4.6	4.1	20.4

2.1.3.1 Drilling Operations

The following is a generalized description of the drilling of deep wells at Riley Ridge. Specific and detailed descriptions of proposed casing, cementing, and drilling fluids programs will be submitted with individual APDs. Additionally, hole conditions encountered during drilling may necessitate changes in plans for which sundry notices will be submitted to the appropriate authorizing agency for approval. New wells would be drilled into the Madison or Big Horn formations to approximate depths of 16,000 to 17,000 feet. A nominal 16-inch surface casing would be set at approximately 2,000 to 3,000 feet and cemented to surface as required by groundwater protection rules. Actual surface casing depths will vary with location and authorizing agency determination of adequate groundwater protection depth. Because of the depth of the wells and the severe conditions that are expected based on the experience of drilling deep wells on the LaBarge Platform, a nominal 10.75-inch intermediate casing string would be run to a depth of approximately 9,000 to 11,000 feet true vertical depth. Production casing would be placed in two sizes utilizing a crossover to link the two sizes. A 7.625-inch size extra-strength casing would be run through a problematic salt zone (Thaynes Formation) that is present between approximately 12,000 to 13,000 feet true vertical depth. Below the salt zone, 7.0-inch casing would then be used across the Madison/Big Horn section.

Because of the conditions posed by the Thaynes evaporite section, the drilling fluid would have to be changed during the drilling of the well. Freshwater drilling fluid would be used to the intermediate casing point, with increasing addition of materials for solids control past a depth of 6,000 feet. At the intermediate casing point, the freshwater drilling fluid will be changed out for drilling fluid composed of either oil-based or brine mud to maintain hole stability through the Thaynes Formation.

The production casing will be cemented to achieve competent cement according to agency-specified distance above the top of the production/injection zone. A cement bond log will be run to confirm sufficiency of cement in all casing strings. If the bond log or conditions encountered during the cementing process or required pressure testing indicate less than adequate bond in the opinion of the agency, then remedial cementing will be conducted in accordance with agency direction and approval. Cement must

be appropriate for subsurface conditions that would be encountered and in consideration of the corrosive properties of H₂S and CO₂. Once competent cement is demonstrated, the casing would then be perforated in the target zone.

All drilling operations and other well site activities on federal land would be conducted in compliance with applicable BLM, WOGCC, WDEQ, and other federal, state, and county rules and regulations. Including rig-up and rig-down activities, drilling each well would take an average of approximately 180 days. Drilling for each well would commence when the wildlife stipulation drilling window opens on July 15 and would either terminate for the year when the drilling window closes on November 15, or an exception will be applied for, if conditions are conducive.

Drilling operations would utilize either a water-based or oil based mud system or both, with additives to minimize downhole problems. The quantity of water used in drilling and completion varies between drilling operations because of mud type, and the re-use of partially treated produced water in drill-out and fracturing. It is estimated that approximately 20,000 barrels of water will be needed for each well installation. Water for drilling operations will come from the City of Big Piney. Water would be used for drilling operations, hydrostatic testing of flowlines, and dust abatement. Water will be trucked to well pads from water wells, water sources and/or treatment facilities depending on site-specific conditions, disturbance requirements, and time of year. See the Groundwater Section (Section 3.4.1) for more details regarding water sources and quantity of water used.

Operators would utilize closed drilling systems (no reserve pits) for all well locations in both the RRU and the MDU, due to air quality non-attainment issues in Sublette County. Tier II or better rated drilling rigs would be used to minimize diesel fume emissions. All fluids and cuttings would be recovered in tanks, and would be hauled off-site to a licensed disposal facility in LaBarge, Wyoming. Off-lease disposal of fluids or drill solids would be in strict accordance with all applicable rules and regulations regarding transport and disposal of exploration and production waste.

2.1.3.2 Completion Operations

Once the well has been drilled and cased, completion operations would begin to clean the wellbore, to conduct pressure testing, and to perforate potentially productive zones. A bond log would be run (a bond log evaluates the integrity of the cement bond between the casing and the borehole), casing would be perforated in potentially productive zones, and production tubing would be run.

All fluids utilized in the completion procedure would be contained on the well pad in tanks and disposed of in compliance with state and federal rules and regulations. In the past, gases and condensate produced in association with completion and testing were flared, but this project will employ "green completions" as required by WDEQ-Air Quality Division. Interim reclamation of disturbed areas not needed for production would occur as specified in the APDs. After well completion, production equipment would be set, gathering pipelines installed, and the well placed on line, with production continuing as long as the well is capable of commercial production and a demand for the gas exists. Production equipment typically would only include a well head or "Christmas tree" (a series of valves designed to control pressures and regulate flows from the well). Recognizing that the RRU and MDU are Visual Resource Management (VRM) Class II areas for federal lands, Denbury will work with the BLM on design features to minimize contrast and meet Class II standards. Detailed VRM Plans will be developed and submitted. All aboveground production facilities would be painted a standard environmental color that blends with the surrounding landscape, except for structures that require safety coloration to comply with Occupational Safety and Health Administration (OSHA) regulations.

2.1.4 Agreements

Denbury has obtained surface access rights from all private parties directly affected by the Project. This includes ROWs for pipelines, injection lines, facility locations, and well sites.

2.1.5 Infrastructure

Existing roads will be used, where possible, as common corridors for injection, production, fiber optic and/or electrical transmission lines. **Figure 1-2** shows the existing and proposed wells, access roads, injection lines, production lines, and the MHRF.

2.1.5.1 Access Roads

The Project is located in an active oil and gas field; therefore, existing infrastructure will be used to the greatest extent possible. Vehicles will access the well sites and facilities using 44.1 miles of existing roads. Road improvements will be needed on 2.2 miles of existing roads (to the Miami Ditch 31-34 site, and a short distance of new road construction will be required to access well sites and facilities - 0.1 mile to the 16-24 well on state land). An approximate 30-foot-wide corridor of disturbance will be expected along the roads that require new disturbance. Specifically, this entails upgrading the existing two track road to the Miami Ditch 31-34 for 2.2 miles to the wellpad location. Road construction to all wellsites will entail utilizing a total of 57 miles of existing roads with 2.2 miles of new disturbance (improvements) to BLM surface. Finally, a short 1/10 mile new road would be built to access the 16-24 well on state land and would involve 0.6 acre of disturbance.

Roads would be designed by a licensed professional engineer if deemed necessary by the BLM (i.e., in problem areas such as steep slopes, unsuitable soils, etc.), and all roads would be built in accordance with guidelines established for oil and gas exploration and development activities in *BLM Manual* Section 9113. On completion of construction activities, the engineer would certify that the road was constructed in accordance with the approved road construction design, if deemed necessary by the BLM. Any deficiencies would be corrected to ensure compliance with both the approved Road Construction Plan and the APD. Once resource road construction is complete, all but 35 feet of the ROW (road surface area and portions of borrow ditch) would be reclaimed and revegetated.

Aggregates used for road and well location construction would be acquired from commercial sources in and adjacent to the project location. Prior to aggregate extraction, appropriate permits would be obtained from the BLM and/or WDEQ-Land Quality Division and WDEQ-Air Quality Division, as appropriate. Aggregates would be free of noxious weeds.

2.1.5.2 Pipelines and Injection Lines

Pipelines and injection lines will utilize a 50-foot-wide corridor, but will overlap with the access road corridor when paralleling; therefore minimizing surface disturbance and reducing visual impacts. The ROW will be cleared and topsoil will be placed alongside the ROW. Trenches will be cut to an average depth of 5 to 6 feet. Once the line is installed, the trench will be backfilled and topsoil replaced. The flowlines between the wells and the MHRF will be formed from steel pipe with both external and internal coating for corrosion resistance; produced water lines for injection will be formed from fiberglass pipe. The flowlines will tie into each other as they intersect and continue toward the MHRF, with pipe diameters increasing as additional flowlines connect. Equipment for construction of the flow and injection lines will include one road scraper (blade), one bulldozer, two track hoes, one side boom, and three to four pickup trucks.

The road corridors will be maintained; however, the remaining corridors (flowlines, fiber optic, and electrical) disturbed by construction activities will be expected to be reclaimed within 6 months or as soon as environmental conditions are appropriate after a specific activity has been completed.

Approximately 7.73 miles of pipelines will be installed across the project area. **Table 2-3** summarizes the acres and miles of pipelines, and breaks these figures down by surface ownership. Common corridors will be used for lines whenever possible, thereby reducing the impacted acreage significantly. A 50-foot-wide corridor of disturbance is expected along the road, injection line and production line routes. These corridors will be disturbed by construction activities, and will be expected to be reclaimed within 6 months

or as soon as environmental conditions are appropriate after a specific activity has been completed. Final reclamation will occur within 6 months or as soon as environmental conditions are appropriate following the end of the construction of the Project.

Table 2-3 Pipeline Summary – Surface Ownership

		Federal	State	Private	Total
Production/injection lines 50-foot ROW	Acres	38.20	7.14	0.0	45.34
	Miles	6.55	1.18	0.0	7.73

Table 2-4 summarizes the distance for the flowlines to the MHRF for the new wells.

Table 2-4 Individual Well Flowlines

Well #	Distance to MHRF (miles)	Comments
18-44	2.20	From proposed pad to MHRF
17-13	0.01	To the 18-44 flowline
20-14	0.02	Short run on existing pad
17-34	0.02	Short run on existing pad
Miami Ditch 31-34	4.17	To the flowlines at the 18-44/17-13 pad
12-43	0.24	To the MD 31-34 flowline
8-24	1.00	To the flowlines at the 20-14/17-34 pad

2.1.5.3 Electrical Distribution Lines

Electrical power will be added as needed. Underground electrical distribution lines would provide power to each well site. Power lines would utilize the same trench as the pipelines and other utilities. Electrical junction boxes will be installed where needed and will be painted to blend with the surrounding environment. Buried electrical lines will tie into the overhead power lines at a service tap or drop that typically would serve the well sites.

2.1.5.4 Produced Water and Waste Gas Management

Produced water in the RRU originates from production wells completed in the Madison/Big Horn formations. When the unit goes into production, it is expected that the produced water, after separation of the gases, would be piped directly to injection wells for disposal and no holding ponds or tanks would be used. The water disposal well, the RRU 24-16, would inject produced water into the Nugget Formation.

Initially, CO₂ and H₂S would be removed from the gas stream and injected in acid gas disposal wells RRU 20-14 (currently SI), RRU 16-31 (currently being drilled; completion summer 2013), and the RRU 10-14R (APD submitted). The Decision Record for the Rands Butte EA had approved one acid gas well, but in order to provide required helium volumes, more gas disposal wells have to be used.

3.0 Resource Values and Environmental Concerns

3.1 Special Status Species

BLM sensitive wildlife and rare plant species that could potentially occur within the project area will be identified via consultation with the BLM and habitat modeling. Historic occurrence data also will be used to identify which species could require further surveys/mitigation. The Project area will be evaluated for the potential occurrence of special status species based on range, known distribution, and the presence of suitable habitat in the Project area.

3.2 Wildlife

The BLM, Wyoming Game and Fish Department (WGFD), and USFWS cooperatively manage wildlife resources over the Project area with the goal to avoid or minimize impacts to wildlife from Project development. In addition, wildlife protection is implemented within the Project area in cooperation with state agencies, federal agencies, Denbury, and landowners. Key species of concern in this area include Canada lynx, elk, mule deer, pronghorn antelope, and moose.

Denbury will acquire necessary baseline wildlife information, monitor wildlife populations, and assess the effectiveness of development stipulations for the Project. That information will be used to facilitate the BLM's ability to identify concerns, provide guidance for the design of Project plans that encourage preservation, monitor the effectiveness of decisions, and make recommendations to adjust management to address specific situations.

Wildlife protection and conservation measures, as described in the Rands Butte EA Decision Record, will be implemented for the Project area and are listed in **Appendices A** and **B**. Additional measures also may be included in lease stipulations, Conditions of Approval, BMPs, and recommendations from consultation with the BLM, USFWS, and WGFD for each individual APD. Consultation with the BLM and WGFD will indicate where surveys are needed to identify areas where impacts may occur to species present within the Project area.

3.3 Cultural and Paleontological Resources

Class III cultural surveys will be conducted on new disturbances on all federal lands. A paleontological field survey will be conducted in the Project area.

Paleontological surveys were conducted for the Rands Butte EA Project area. From the surveys, it was determined that small portions of that project area were underlain by formations that have a Potential Fossil Yield Classification (PFYC) System ranking of Class 5, indicating a high potential for those formations to contain scientifically valuable fossils (BLM 2010). The Class 5 formations consist of the LaBarge, Chappo, and New Fork Tongue members of the Wasatch Formation and the Undifferentiated Fontenelle Member of the Green River Formation. Since there is a high probability for impacting fossil resources on Class 5 units, on-the-ground surveys are commonly required before authorization of surface-disturbing activities. If ground disturbing activities in areas of the Project occur on these high potential units, site specific site mitigation, avoidance, or monitoring may be necessary before or during construction activities (BLM 2008, 2007).

Most of the Rands Butte project area is underlain by PFYC Class 3 formations. At the western edge of the area are the Nugget Sandstone Twin Creek Limestone, Preuss Sandstone, and Stump Formation Gannett Group Aspen Shale. Most of the Riley Ridge geographic feature is underlain by diamictite and sandstone facies of the Wasatch formation. Fossils in PFYC Class 3 units vary in significance, abundance, and predictable occurrence or the potential for fossil resources in those units is not known. Due to the variability in potential fossil resources, management of Class 3 units can include a range of

options including pre-disturbance surveys, monitoring, or avoidance. Areas where surface-disturbing activities would take place on Class 3 units require sufficient assessment to determine whether scientifically valuable paleontological resources occur in the area and whether the activities could impact the paleontological resources (BLM 2008, 2007).

3.4 Wetlands and Waterbodies

Standard wetland and waterbody construction mitigation measures, BMPs, and reclamation will be followed. If rutting is anticipated, essential equipment will need to be stabilized with prefabricated mats or terra mats. Reasonable efforts will be employed to limit any sediment movement. Following completion of well field development, it is anticipated that there will be no additional impacts on surface wetlands or water quality. With the exception of South Piney Creek and some minor unnamed streams, no perennial streams or water sources are proposed to be crossed with activities contained in this POD. All perennial streams will be bored with a horizontal drilling process. Ephemeral streams will be avoided but if necessary would be trenched and use of trench plugs would be employed on all flowlines. Ephemeral drainages would be crossed at a 90 degree angle to minimize disturbance to the drainage. Permanent impacts are not anticipated.

Appendix D contains the Storm Water Pollution Prevention Plan (SWPPP) for construction of the project. The Best Management Practices (BMPs) will be implemented, where appropriate, to minimize the potential for storm water and surface water contamination.

3.4.1 Groundwater

Water for drilling operations would come from the Big Piney Municipal well system and would total approximately 840,000 gallons per new well drilled for a total of 5,040,000 gallons for the six new wells to be drilled. Miscellaneous other needs such as dust control, etc may require additional pumping but in minor volumes. Produced water, H₂S and CO₂ (temporarily) will be injected into deep geologic formations far below domestic consumption aquifers and should have no or negligible effect on groundwater.

3.5 Soil

Erosion and sediment control BMPs will be used during construction, operation, and maintenance to protect topsoil and minimize soil erosion as outlined in **Appendices A and B** and Chapter 4.0, Reclamation. In addition, Denbury will prepare a construction SWPPP that complies with state regulations and reporting requirements, and will submit it for approval to the agencies prior to the first construction season. Potential hazards for the soil may be wind and water erosion but since the disturbance will occur in phases, erosion potential will be minimized. Soils will be susceptible to contamination from spills or leaks of liquids used during construction. Spill prevention and control and BMPs outlined in **Appendices A and B** will be used to reduce this potential. Any contaminated soils will be excavated and removed from the Project area. In addition, BMPs will be used to limit the mixing of topsoil and subsoil, the potential loss of topsoil due to wind and/or water erosion, and compaction/rutting.

3.6 Vegetation

Vegetation clearing will be restricted and limited to the Project area. During clearing activities, sediment barriers will be installed and maintained as necessary to minimize the potential for sediment runoff. Minimal impacts are expected to occur to native plant communities. Some permanent vegetative impacts from construction are anticipated at the new well sites. Reclaimed areas of temporary disturbance will be seeded with native seed mixes per the Natural Resources Conservation Service (NRCS) and BLM recommendations. Denbury will utilize the BMPs and protective measures described in **Appendices A and B**, where applicable, to identify efficient restoration and mitigation following construction.

3.7 Geology

Construction and operation of the proposed work in RRU will not materially alter the geologic conditions of the Project area. Effects from construction could include disturbances to the natural topography but will be limited to the defined Project area and disturbed areas will be re-contoured to as close to pre-existing topography as possible.

The existing landscape of these lands would be slightly modified by additional lines, colors, forms, and textures from proposed new Project structures, such as new well pads, facilities, roads, and pipelines.

3.8 Visual

Impacts to visual resources will be minimized during construction by developing and applying Applicant-committed Measures. All BLM surface in the Riley Ridge and Miami Ditch units is designated as Class II VRM categories. Denbury will work with BLM and USFS specialists on design features to minimize contrast to these landscapes. Surface disturbance will be minimized and vegetation will be preserved to the extent practicable. Following construction, temporary surface disturbance will be restored to its original contour and vegetation cover.

Aboveground facilities will be painted a neutral color, as designated by the BLM, to blend with the surrounding landscape. The neutral color scheme would reduce the contrast between the natural topography and existing man-made development in the area and would not dominate the view of the casual observer. Project development would continue the basic elements of form, line, color, and texture of landform, vegetation, structures, and sky that currently exist in the Project area landscape. A VRM plan for each new BLM well pad will be developed and submitted for review.

3.9 Air Quality

The proposed Project construction operations would generate fugitive dust emissions from wind erosion of disturbed acreage. Pollutant emissions would occur from construction and drilling activities. These emissions would potentially impact air quality in the Project area.

The average daily fugitive dust emissions for a typical construction project are estimated to be 1.2 tons particulate matter with an aerodynamic diameter of 10 microns or less per acre per month for construction activities (USEPA 1985). These emissions will result in minor short-term impacts on local air quality. These impacts will be restricted to the construction period. The construction impacts will diminish once construction activities end and after disturbed areas are reclaimed. BMPs, such as water application, will be used to minimize construction impacts. Vehicular exhaust and crank case emissions from gasoline and diesel vehicles will comply with applicable USEPA mobile emission regulations (40 CFR 85).

Air quality impacts during operations will be minimal. Minor transient emissions will occur from maintenance activities along the Project roads. Emissions will include exhaust from maintenance vehicles and equipment, as well as fugitive dust from maintenance activities, wind erosion, or vehicular traffic. Emissions during operations will be more infrequent and short-term.

This area of Sublette County is non-attainment for ozone; Denbury will comply with all emission analyses and controls that may be required for the operation. Denbury will utilize Tier II or better drilling rigs, and will employ closed loop systems and green completion technology.

3.10 Grazing

The Project area occupies portions of T29N, R113W; T29N, R114W; T30N, R113W; and T30N, R114W in Sublette County, Wyoming. The Project is overlapped by two grazing allotments: Fish Creek Industrial and North LaBarge Common. **Table 3-1** describes the individual grazing allotments.

Table 3-1 Allotment Data in the Riley Ridge Unit Development Project Area

Allotment Name/Number	Fish Creek Industrial – 02033	North LaBarge Common – 02077
Land Ownership (acres)	Federal – 1,748	Federal – 120,975
	State – 0	State – 5,856
	Private – 0	Private – 9,097
Authorizing Office	Pinedale Field Office	Pinedale Field Office
Number of Pastures	1	8
Actual Active Animal Unit Months (AUMs)	151	24,544
Livestock Type and Number	Cattle – 100	Cattle – Varies
Season of Use	7/1-8/15	5/15-10/31

Impacts from well pad construction would involve the Fish Creek Industrial and the North LaBarge Common allotments and would equate to 5.5 and 6.4 acres, respectively. The operational impacts to the associated allotments are shown in **Table 3-2**.

Table 3-2 Facility Impacts per Allotment

Allotment	Facility Type		
	Access Roads (miles)	Flow Lines (miles)	Well Pads (acres)
Fish Creek Industrial	0.91	0.92	3.70
North LaBarge Common	0.52	4.4	5.30

The following mitigation measures have been designed to eliminate, reduce, or compensate for the effect of Project impacts to livestock and ranch operators.

- Supplemental water sources will be provided for livestock in the event that Project activities restrict access to existing water sources.
- AUMs lost to Project activities will be compensated for by the provision of supplemental forage for livestock or by encouraging increased forage production through vegetation treatments (fertilizer application, prescribed burns, mechanical treatments, etc.).
- Vehicle speed limits will be set at 35 miles per hour to avoid livestock/vehicle collisions and to reduce the generation of fugitive dust deposition.
- Fencing will be used to secure hazardous areas. This would include, but not be limited to, excavated locations, staging areas, materials, and equipment that could pose a hazard to livestock health. Fencing type will be decided on a site specific basis, but will commonly be either 4-foot-high temporary (typically orange) snow fencing, or 6- to 8-foot-high chain link security fencing and would be removed once the hazard is no longer present.
- Where necessary, cattle guards will be installed along new access roads to prevent cattle from wandering from their respective pastures.

- Denbury will arrange for preconstruction consultation with the BLM and grazing permit holders to discuss dates of construction, points of access, current grazing practices, and any additional site specific mitigation that may be deemed necessary.
- Denbury will discuss any changes of Project plans that will affect grazing operations with the BLM and the applicable grazing permit holders.
- Rangeland improvements will be documented prior to construction activities and any damaged improvements will be repaired to previous condition or current BLM standards as soon as construction activities in the immediate area are complete.
- Denbury will compensate ranch operators at fair market value for livestock that are injured as a result of Project activities.

3.11 Noxious Weeds

Noxious weeds and other invasive plants are non-native, undesirable native, or introduced species that are able to outcompete desired native species and thereby decrease overall species diversity. Noxious weeds often invade and persist in areas after disturbance. They are most prevalent in areas of prior surface disturbances, such as agricultural areas, roadsides, existing utility ROWs, and wildlife concentration areas.

Appendix C contains the Noxious Weed Management Plan that will guide Denbury's management of noxious weeds during development of the Project.

3.12 Health and Safety

All work will be conducted in accordance with Denbury's Health, Safety, and Environmental (HSE) Policy and procedures outlined in Denbury's HSE Handbook Rev 0 (7/23/13). The HSE Policy sets forth Denbury's commitment to maintaining a safe work place and protection of the environment. The HSE Manual provides safety procedures and guidelines that cover the operations that Denbury and its contractors are likely to conduct on a routine basis. In addition, Denbury has HSE Guidelines for Contractors that not only provides specific health and safety guidelines for contractors, but also lists health and safety responsibilities of contractors.

In addition to adherence to the standards and guidance as described above, there are Applicant-committed BMPs listed in **Appendices A and B**.

3.13 Hazardous Materials and Solid Waste

3.13.1 Hazardous Materials

Hazardous materials, which are defined in various ways under a number of regulatory programs, can represent potential risks to both human health and the environment when not managed properly.

A Hazard Communication Program as defined by OSHA under 29 CFR 1910.1200 will be implemented and copies of the program will be kept in the field office. Also as required by OSHA, Denbury will maintain a file containing current Material Safety Data Sheets for all chemicals, compounds, and/or substances that are used during construction, drilling, and completion operations in the Project area.

Hazardous materials, as defined by U.S. Department of Transportation (USDOT), would include fuels and other chemical products. These materials would be transported to work sites in accordance with applicable USDOT rules and regulations. Gasoline and diesel would be required for construction and drilling equipment and vehicles. During drilling and completion operations, fuels would be stored in small (500- to 1,000-gallon) tanks at the well sites.

In addition, the SPCC Plan and SWPPP will provide for measures to prevent releases and procedures to follow in case of spills. Handling and use of hazardous materials also will be conducted in accordance with Denbury's HSE Policy and HSE Manual.

3.13.2 Solid Waste

Resource Conservation and Recovery Act (RCRA) regulations govern the handling and disposal of solid wastes. Solid wastes comprise a broad range of materials that include garbage, refuse, sludge, non-hazardous industrial waste, municipal wastes, and hazardous waste. Solid waste as defined includes solids, liquids, and contained gaseous materials. Hazardous wastes are those materials that exhibit certain characteristics (as defined by laboratory analysis), are generated from specific industrial processes, or chemical compounds, that if abandoned could pose a threat to human health and the environment. Significant quantities of hazardous wastes are not expected to be generated by the proposed Project.

4.0 Reclamation

Reclamation is the process of returning the land to pre-disturbance conditions as specified by the land-managing agencies and the landowner. Project areas that will require reclamation for the Project following construction include: well locations, access roads, pipelines/flowlines, ROWs, utility corridors, and other Project facilities.

4.1 Interim Reclamation

During Project construction, reclamation will be conducted to stabilize disturbed areas and to protect adjacent areas from degradation. Soil erosion controls will be put in place to reduce the amount of soil carried off-site and to minimize disturbance to top soil. All topsoil will be side cast for replacement later in the reclamation process. Salvaged topsoil will be applied as soon as possible to the reclaimed area.

Following construction, ROW and flowline corridors will be backfilled and revegetated. After drilling is completed, all tanks will be removed and contents disposed of in an approved disposal site. If fluids would be disposed by any method other hauling to an approved disposal pit, prior approval from the authorizing agency would be obtained. If disposal requires a discharge or transport, approval would be obtained from the WDEQ. Denbury anticipates minor interim reclamation may occur for areas around the well sites not used during operations which will be revegetated, but the overall facilities such as well pads, access roads, etc., will be needed in the future and will be left in use. Access roads may be reduced in width, and excess width will reseeded/reclaimed.

4.2 Final Reclamation

At the end of the Project, the underground pipelines will be flushed, disconnected, and abandoned in place to avoid additional disturbance. Surface disturbances will be reclaimed according to the surface use agreements, BLM requirements, and WDEQ storm water construction permits and SWPPPs. Reclamation will occur in areas where surface disturbing activities have been completed or concurrent with other operations in the Project area. Typically, disturbed areas not needed for production operations or during final reclamation will include: removal of facilities, abandonment of pipe and power lines, re-contouring to resemble the surrounding terrain, installing necessary erosion control measures, and seeding disturbed areas with certified weed-seed free mix agreed upon by the BLM and completed within 6 months or as soon as environmental conditions are appropriate after a specific activity has been completed. Seeding will occur in accordance with the Project Reclamation Plan. Seeding will take place in the fall of each year, after October 1 or as specified in the Reclamation Plan. If seeding occurs in the spring, it will be completed by May 15.

Wells that are no longer required will be plugged and abandoned in accordance with Wyoming Oil and Gas Conservation regulations. The producing zone will be isolated and the production casing will be cut off at least 4 feet below ground surface. A metal plate will be affixed to the top providing the operator's name, well number, location, and federal lease number. Final reclamation will occur within 6 months or as soon as environmental conditions are appropriate following the end of the life of the Project. Reclamation activities will be conducted in accordance with the surface owner agreements, the BLM specifications, WDEQ storm water construction permits, and SWPPPs.

4.3 Monitoring and Maintenance

The overall goal of Denbury's monitoring program is to assess and ensure reclamation performance and will be conducted in accordance with the BLM methodology and other regulatory requirements. Monitoring will continue until at least 70 percent or greater of vegetation, as compared to the surrounding undisturbed areas, has been established. If after two growing seasons, vegetation has not progressed, further site evaluation may be required. The weed control program is to treat all weeds deemed noxious

by federal, state, and/or county weed control agencies to the extent that they do not present a significant hindrance to reclamation efforts.

Once construction and installation are complete, Denbury will monitor for and treat noxious weed infestations within the Project area. Noxious weed monitoring will be conducted concurrently with the site-specific Reclamation Plan monitoring.

Implementation of the Reclamation Plan will minimize construction-related impacts to vegetation.

4.4 Seeding Requirements

Denbury will apply seed to all disturbed areas between October and May of each year. Denbury will apply mulch to all areas that have been seeded, and the mulch will be crimped whenever conditions/slopes allow. Denbury remains responsible for achieving acceptable reclamation after construction. Additional reclamation efforts entail the following:

- Disturbed areas will be seeded in accordance with written recommendations for seed mixes, rates, and dates obtained from the NCRS for Sublette County, or at the request of the landowner or BLM. Seeding is not required in actively cultivated croplands unless requested by the landowner.
- Broadcast or hydroseeding may be used in lieu of drilling at double the recommended seeding rates. However, drill seeding is the preferred method for all disturbed areas. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be appropriate (e.g., use of a chain drag) to lightly cover seed after application, as approved by the Environmental Inspector.
- The primary mulch will be certified weed-free straw. This will be applied directly after seeding. In accessible areas, weed-free straw will be applied with a straw sprayer and then crimped with a tractor pulled implement. On steep slopes where a straw sprayer cannot reach, the straw will be spread out and crimped by hand.

Seed availability, especially for forbs, and new information learned about reclamation species may require adjustments at the time of actual seeding. Additionally, reclamation success will be monitored, with adjustments made to the seed mix if necessary to improve re-establishment success. Any proposed changes to the seed mix will require approval by the BLM (via Sundry Notice or similar) prior to implementation.

4.5 Cleanup

Denbury will commence cleanup operations immediately following backfill operations. Final grading, topsoil replacement, and installation of permanent erosion control structures will take place within 20 days after completion of construction activities. If seasonal or other weather conditions prevent compliance with these time frames, temporary erosion controls (temporary slope breakers and sediment barriers) will be maintained until conditions allow completion of cleanup. Additional cleanup will include the following:

- Rock excavated from pipeline trenches may be used to backfill trenches only to the top of the existing bedrock profile. Rock that is not returned to the trenches is considered to be construction debris, unless approved for some other use on the construction work areas by the landowner or BLM.
- Excess rock will be removed from at least the top 12 inches of soil in all actively cultivated or rotated cropland and pastures, hayfields, and residential areas, as well as other areas at the landowner's or BLM's request. The size, density, and distribution of rock on the construction

work area should be similar to adjacent areas not disturbed by construction. The landowner or BLM may approve other provisions in writing.

- The construction ROW will be graded to restore pre-construction contours and soil will be left in the proper condition for planting.
- Construction debris will be removed from all construction work areas unless the landowner or BLM approves otherwise.
- Temporary sediment barriers will be removed when replaced by permanent erosion control measures or when revegetation is successful.

5.0 Fire Prevention and Suppression

Contractors will develop and submit a Fire Control Plan to Denbury that details fire control procedures, roles and responsibilities, and staffing. The Fire Control Plan will be submitted along with construction bid documents and will meet the minimum requirements outlined by Denbury.

To prevent wildfires within the Project area from construction machinery or personnel, the plan will include immediate implementation and aggressive action. There will be an increased commitment of fire protection equipment, fire watch/monitoring efforts, and personnel from Denbury during high fire risk periods. The following precautionary measures will be taken to prevent wildland fires:

- All vehicles will carry fire extinguishers.
- Adequate firefighting equipment (i.e., shovel, Pulaski, extinguisher[s], and /or an ample water supply) will be kept near well sites.
- Vehicle catalytic converters will be inspected often and cleaned of all brush and grass debris.
- Welding operations will be conducted in an area free from or mostly free from vegetation. An ample water supply and shovel will be on hand to extinguish any fires created from sparks. Extra personnel will be at the welding site to watch out for fires created by welding sparks.
- Wildland fires will be reported immediately to the BLM Rawlins Interagency Dispatch Center at **1-800-295-9953** or **307-328-4393**.
- When conducting operations during the months of May through September, the operator will contact BLM to find out about any fire restrictions in place for the area of operation and to advise the office of beginning and ending dates of the activities.
- A 37.5-foot defensible space will be established and maintained around each well pad during construction.

6.0 Fugitive Dust Control

Site preparation generally will involve two phases. The first phase is the removal of brush by a brush hog or other similar equipment. Following topsoil removal, the remainder of the site will be mechanically graded to a working surface by equipment using blading machines, scrapers, and other heavy machinery. When preparation of the site is complete, backhoes and hand excavation will be used to prepare the area for construction activities. Backhoes, along with hydrovac machines, will be used for most of the excavation for pipelines or hand excavation will be used where utilities (such as existing pipelines and telephone lines) must be undercut. In cases where existing roadways and other restrictive man-made or natural topographic features occur, boring machinery and directional drilling equipment may be used in place of surface cutting equipment.

6.1 Best Practical Methods of Fugitive Dust Control

Existing roads will be used for access to construction areas. Paved access roads will be kept free of mud and soil that may track onto the road surface from the construction sites. If soil is transported onto a public road surface or other paved area by construction equipment and vehicles, the material will be removed as soon as practical from the road by shoveling or sweeping, and will be transported back to a designated sediment control disposal area. Road washing only will be allowed after the soil has been removed from the road surface.

Other best practical methods that may be used to control fugitive dust during construction, when necessary or during periods of dry conditions, include the following:

- Water and/or a non-toxic chemical dust suppressant, alone or in combination with mulches, will be applied to areas of disturbance to minimize fugitive dust emissions. *Note: Chemical dust suppressants will not be utilized on BLM-managed lands.*
- Wind fences, berms, or covering material, such as gravel or textiles, will be used in areas of disturbance to minimize fugitive dust emissions.
- Unpaved roads in the construction area that pass within 0.25 mile of inhabited dwellings will either be watered or treated with non-toxic chemical suppressant.
- Wheel compaction will be performed with a motor grader or similar equipment.

Water for fugitive dust control purposes will be obtained, prior to construction, through permits or purchase contracts with owners of valid existing water rights as necessary. Federal, state, and local air quality standards will be met during construction, and construction equipment will be properly operated to minimize emissions. Site revegetation will be conducted in accordance with Denbury's Reclamation procedures utilizing seed mix recommendations from the NRCS and the BLM.

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Appendix A

Applicant-committed Measures and Best Management Practices

Table A-1 Potential Applicant-committed Measures

Environmental Resource	Potential Applicant-committed Measure
Endangered Species Act (ESA), sensitive species, and other wildlife and fish species	Site-specific surveys and/or monitoring for ESA threatened and endangered species, BLM sensitive species, and other wildlife and fish species will be completed per guidance from the agencies. Survey and monitoring approaches will be developed in coordination with USFWS, BLM, and WGFD.
Wildlife Stipulations	Denbury will adhere to the timing and spatial stipulations and exception processes as they are described in the Project Decision Record.
Sensitive Plant Species	Site-specific surveys for sensitive plant species will be completed prior to surface disturbing activities in suitable habitat (as determined by the BLM).
Revegetation and Reclamation	Denbury will complete reclamation of disturbed areas as described in the POD. Reclamation procedures will consider site-specific conditions and design considerations to maximize reclamation success.
Wetland and Waterbody Resources	Facilities will be sited to avoid and/or minimize impacts to wetlands and waterbodies. Where possible, pipeline crossing will approach stream features at a right angle, to minimize disturbances and erosion potential within the drainage course
Wetland Resources	Any construction that occurs in or adjacent to wetlands and streams will use BMPs to protect surface water quality and minimize impacts to those resources.
Paleontological Resources	Denbury will have paleontological monitors present during construction at predetermined sites (as determined by the BLM).
Cultural Resources	Class III inventories will be conducted prior to construction on federal lands in proposed disturbance areas. The Class III Inventory Report will be submitted to the BLM/SHPO for review and concurrence.

Table A-2 Potential Applicant-committed Best Management Practices

Resource Concern	Measure
Air – Dust Control	Water would be applied as deemed necessary to all disturbed surfaces (i.e., exposed, dry, and unfrozen) during construction when dust is created by equipment.
Air – Dust Control	Magnesium chloride or some other non-toxic chemical dust suppressant may be applied, if necessary, for adequate dust suppression. These treatments would occur on an as-needed basis, depending on weather conditions and the amount of traffic on the road.
Air – Dust Control	Speed limits would be enforced along all access roads during construction and maintenance activities to reduce airborne fugitive dust.
Air – Air and Vehicle Emissions	All construction equipment would be maintained in good working condition and would contain appropriate pollution control devices to minimize trace gas emissions. Tier II or better drilling rigs will be used for well drilling.
Cultural and Paleontological Resources	Unexpected discovery of cultural or paleontological resources during construction would be brought to the attention of the responsible BLM authorized officer immediately. Work would be halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated.
General – Avoidance of sensitive areas	Denbury would work with the BLM to mitigate and minimize disruption of environmentally sensitive areas. Marshy soils, drainage bottoms, and riparian areas would be avoided to the extent practical.
General – Maintenance	Once reclamation is complete and vegetation is stable, noxious weed surveys of the Project area would be conducted on a regular basis. Inspection of the Project access roads and internal resource roads would include weed monitoring and treatment, as outlined in the Weed Management Plan.
General – Mitigation Measures	All control and mitigation measures established for the Project in the POD and the management plans that are part of the POD would be maintained and implemented throughout the operational phase, as appropriate. These control and mitigation measures would be reviewed and revised, as needed, based on the mutual agreement of Denbury and BLM, to address changing conditions or requirements within the Project area, throughout the operational phase.
Lands and Realty – Foreign Lines, Monuments, and Markers	All foreign lines would be marked. Monuments and markers (i.e., General Land Surveys and BLM Cadastral Survey Corners, reference corners, U.S. Coastal and Geodetic benchmarks) would be protected during the construction and operational phases of the Project. In the event that a monument or marker is disturbed, the employee would report the incident in writing to the Authorized Officer. Denbury, in consultation with the BLM or other appropriate agency, would be responsible for re-surveying and replacing any markers that are disturbed.
Noise – Construction Equipment	All equipment would have sound-control devices no less effective than those provided on the original equipment. All construction equipment used would be adequately muffled and maintained.
Noise – Road Use	Road use specifications designed to keep traffic to a minimum would be implemented to the maximum extent practical.

Table A-2 Potential Applicant-committed Best Management Practices

Resource Concern	Measure
Reclamation	All areas of disturbed soil would be reclaimed using seed mixes that are weed-free native grasses, forbs, and shrubs (as approved by the agencies and/or private landowners). Reclamation activities would be undertaken as early as possible on disturbed areas not required for operation.
Reclamation – Roadways	The edges of access roads (outside travel lane) would be reseeded as appropriate. Any roadway damage due to the transport of heavy equipment would be repaired on the public roadways upon the completion of Project construction.
Reclamation – Topsoil	Topsoil from all activities would be salvaged and reapplied during final reclamation.
Reclamation – Vegetation	The vegetation cover, composition, and diversity would be restored to values commensurate with the ecological setting. Reclamation is considered successful when the vegetation is 70% cover (as compared to existing, adjacent undisturbed areas).
Recreation – Public Access	Temporary fencing would be installed around construction areas to limit public access, as needed. Public access to open excavations would be limited by either installation of locked gates at public access points or utilization of other approved means of limiting public access.
Roads – General Design	Excessive grades on roads, road embankments, ditches, and drainages would be avoided when possible, especially in areas with erodible soils. Special construction techniques would be used, where applicable.
Roads – General Design	Access roads would be located to follow natural contours where possible and minimize side hill cuts.
Roads – General Design	Existing roads would be used, but only if in safe and environmentally sound locations. If new roads are necessary, they would be designed and constructed to the appropriate BLM road design standards where practical and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles).
Roads – General Design	During the course of construction, if excessive wear and tear to the existing roadway surface is evident, these road surfaces would be restored to their original condition upon the completion of construction.
Roads – General Use	Traffic would be restricted to the roads developed for the Project. Signs would be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information.
Roads – Maintenance	All roads would be maintained in a safe and environmentally responsible manner.
Roads – Reclamation	Abandoned roads would be reseeded upon completion of construction (per discussions with the BLM and/or private landowner).
Soils – Erosion Control	Erosion control measures would be employed as described in the POD under Reclamation.

Table A-2 Potential Applicant-committed Best Management Practices

Resource Concern	Measure
Soils – Erosion Control	Permanent erosion control devices would be installed after construction and may include, but are not limited to, waterbars, roadside ditches with subsurface culverts, berms, energy-dissipating structures, mulches, and establishment of vegetation. Erosion controls that comply with county, state, and federal standards would be applied. Practices such as jute netting, silt fences, wattles, and check dams would be applied near disturbed areas. The Environmental Inspector would monitor construction to ensure that erosion control devices are functioning properly.
Soils – Topsoil Handling	Topsoil from all excavations and construction activities would be salvaged and reapplied during reclamation.
Soils – Topsoil Handling	Topsoil material suitable for site reclamation would be removed in conjunction with clearing and grading and reserved in local stockpiles. Topsoil storage areas would generally be located within staging areas and alongside roadways during construction.
Soils – Wet Soils During Construction	Construction activities would be suspended when soils are saturated. Construction would resume when soils become dry enough to support construction equipment. The Environmental Inspector would determine when conditions are too wet to continue.
Vegetation – Noxious Weed	Noxious weed surveys would be conducted to evaluate the presence and extent of noxious weed and invasive species populations within the Project area. Preventative management measures would be applied as warranted pursuant to the Project's Weed Management Plan.
Visual Resources	Operators would reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving vegetation to the greatest extent possible; stripping, salvaging and replacing topsoil; contoured grading; controlling erosion; using dust suppression techniques as required; and restoring exposed soils as closely as possible to their original contour and vegetation.
Waste Management – Disposal	Wastes would be properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.
Waste Management – Wastewater	Any wastewater generated in association with temporary, portable sanitary facilities would be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility or otherwise disposed of in accordance with applicable state and local laws and regulations. Temporary, portable sanitary facilities provided for construction crews would be adequate to support expected on-site personnel and would be removed at completion of construction activities.

Table A-2 Potential Applicant-committed Best Management Practices

Resource Concern	Measure
Water – SWPPP	A SWPPP would be developed, submitted for approval and followed pre/during/post construction. The SWPPP will describe site-specific erosion control and stream crossing measures that would be implemented during the construction and operation phases of the Project. The Project's SWPPP would be implemented in accordance with the Wyoming Department of Environmental Quality requirements to obtain National Pollutant Discharge Elimination System compliance under Wyoming's General Permit for Stormwater Discharges Associated With Construction Activity. The Environmental Inspector would direct activities to ensure compliance with the SWPPP.
Water – Road Drainage	Whenever possible, existing drainage systems would not be altered, especially in sensitive areas such as erodible soils or steep slopes. Potential soil erosion would be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.
Water – Waterbodies and Wetlands	Waters of the U.S., including wetlands, would be avoided to the maximum extent practical. Where these features cannot be completely avoided, impacts would be minimized through design modification, as necessary. Facilities (e.g., well pads, flowlines, staging areas) would be sited to avoid and/or minimize impacts; however, where impacts are anticipated, minimization measures would be employed to minimize impacts (e.g., use of culverts to maintain downstream flow/drainage).
Water – Waterbodies and Wetlands	Any construction that occurs in or adjacent to wetlands and streams would use Applicant-committed BMPs listed to protect surface water quality and to minimize impacts to those resources.
Wildlife – Disturbance and Harassment	All employees, contractors, and site visitors would be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. During construction, pets would not be permitted on site; during operation, pets would be controlled to avoid harassment and disturbance to wildlife.
Wildlife – Vehicle Collisions	Project personnel and contractors would be instructed and required to adhere to speed limits in the project area to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and airborne dust.

Appendix B

BLM Required Mitigation and Monitoring from Rands Butte EA Decision Record – June 2, 2010

BLM-REQUIRED MITIGATION

BLM-required mitigation measures apply to only BLM-approved actions, as evaluated in the Rands Butte Final Environmental Assessment. The BLM approved Operator/grant holders, including Cimarex Energy, Inc, Williams Pipeline, and Rocky Mountain Power, and their representatives, partners, contractors, and subcontractors, are required to implement the following mitigation measures during construction and operation of the federally approved Project.

Mitigation Relative to April 2010 Findings of Greater Sage-grouse

No Surface Occupancy is allowed within the 0.25-mile radius around the perimeter of an occupied Greater sage-grouse lek.

Natural gas and helium pipelines shall be re-located outside of the 0.25-mile radius around the perimeter of an occupied Greater sage-grouse lek.

Power poles within the 0.5-mile visual buffer around the lek near the center of the southwest quarter of Section 13, T29N, R114W, shall not extend higher than 80 feet above natural ground level.

The power line shall be relocated from the ridgeline in the north half of Section 14, T29N, R114W south approximately 900 feet to the north side of the of the road/two-track traverse the Spring Creek drainage.

Best Management Practices

The Storm Water Pollution Prevention Plan (SWPPP) will be prepared and implemented in accordance with WDEQ Permit WYR10-0000, General Permit to Discharge Storm Water Associated with Large Construction Activity Under the Wyoming Pollutant Discharge Elimination System.

BMPs will be applied to minimize surface disturbance and erosion, control any mobilized pollutants, and expedite revegetation efforts.

The SPCC Plan shall be in place at all times. The SPCC Plan applies BMPs intended to prevent spills of fuels, chemicals, or other hazardous materials, and establish procedures to follow in case any spills occur. These procedures should prevent spilled pollutants from reaching waters of the state. This plan will outline all emergency responses to hazardous releases of substances into the environment, limit exposure of the substance to the organisms present in the environment, and provide details for rapid cleanup of the environment.

The Operator/grant holder shall conduct operations and implement control measures to prevent sediment discharge from Project components occurring on federal land.

Do not remove vegetation from areas with slopes of 25 percent or greater.

Take immediate steps to correct any detected erosion or slope movements.

Design ROWs such that they follow slope contours and have adequate drainage plans.

Reclamation

An Erosion, Revegetation, and Restoration Plan shall be prepared to address all Project-related surface disturbance on BLM-administered land.

The Operator will re-contour and reclaim areas immediately following construction if not needed for production or other long-term operations.

Soil retention measures, such as silt fencing, contour furrows, or hydromulching, will be implemented at the time of disturbance.

Topsoil depth will be determined by the BLM Authorized Officer and all surface soil materials salvaged and re-spread during interim reclamation. During pipeline and fiber optic line construction, topsoil will be kept intact through scalping.

Interim reclamation of disturbed areas will be initiated within one growing season to minimize long-term exposure to wind and water erosion, achieve natural erosion rates and soil productivity to the extent practicable, and control for invasive noxious weeds and/or undesirable plant species.

The Operator shall use adapted species and BLM-approved seed mixtures, and the application of biodegradable mulch, netting, or soil stabilizers.

The Operator shall develop, submit, and implement a SWPPP prior to initiating construction operations on BLM-administered lands.

Water Resource Mitigation

Implementation of Project components shall adhere to all requirements and standards of the Clean Water Act, as well as WDEQ regulations, and applicable requirements in Appendix 3 of the BLM Pinedale RMP ROD.

Water withdrawals from perennial streams on BLM-administered lands shall be conducted in accordance with the WSEO permit requirements.

Culvert installations shall be designed and installed to minimize sediment discharge and shall adhere to Gold Book standards and applicable BMPs from Appendix C of the Pinedale RMP ROD.

In order to protect the existing water quality of the shallow aquifers within the RBPA well drilling and completion of the production and injection wells associated with the Project will use the best available technology in their development.

All known existing aquifers and aquitards will be geophysically logged during drilling, and the well will be completed to eliminate the possibility of cross-contamination between aquifers.

If any construction requires the use of dewatering activities, the wastewater will be disposed of in accordance with WDEQ WYPDES permits. Under no circumstances can the extracted waters be disposed of in an unregulated and unapproved method.

Water applied to roads for dust control purposes must be applied at a rate that will not cause excess water to runoff to surface drainages.

Water used for hydrostatic testing of the natural gas and helium pipelines will be discharged in compliance with WDEQ's General Permit for Temporary Discharge (Authorization for Temporary Discharges Under the Wyoming Pollutant Discharge Elimination System).

If reserve pit fluids are removed, they shall be disposed of in a DEQ approved facility.

Vegetation and Noxious Weed Mitigation

For all locations and access roads, the Operator shall promptly revegetate all disturbed areas not necessary for production with a BLM PFO-approved seed mixture. Revegetation will commence immediately after construction.

The Operator shall minimize airborne dust on access roads using water and/or a dust suppressant acceptable to BLM to reduce damage to roadside vegetation communities. The Operator will develop and maintain a weed management plan with the BLM PFO. Control of noxious or invasive weeds through chemical or biological means will be accomplished by certified applicators.

The Operator shall conduct all surface activities in accordance with the BLM PFO FEIS RMP and ROD (BLM 2008).

Construction equipment, materials, and vehicles will be stored at construction sites or at specified construction yards.

Construction vehicles and equipment will be cleaned, power-washed, and free of soil and vegetation debris prior to entering Sublette County and when leaving areas within the RBPA with known concentrations of invasive or noxious weeds entry and use of access roads to prevent transporting weed seeds.

All personal vehicles, sanitary facilities, and staging areas will be confined to a limited number of specified locations to decrease chances of incidental disturbance and spread of weeds.

Prompt re-establishment of the desired vegetation in disturbed areas is required. Seeding will occur during the frost-free periods after construction. Certified "noxious weed-free" seed will be used on all areas to be seeded.

Seeding will be completed with seed mixtures of plant species indigenous to the area and approved by the BLM PFO or applicable Conservation District.

Pre-construction surveys will be conducted for weed infestations within the site boundaries and along access roads.

The Sublette County and Lincoln County Weeds and Pest Departments will be consulted to determine treatment for noxious weeds, if identified.

Revegetated areas will be monitored following seeding to evaluate the need for supplemental seeding and noxious weed control.

Water Resource Mitigation

The Operator shall develop and implement a comprehensive reclamation and weed monitoring and management plan. The plan shall be completed for BLM approval within 6 months of the issuance of the Decision Record.

The Operator will follow BLM stipulations by avoiding surface disturbances within 500 feet of surface water, riparian areas, wetlands, and 100-year floodplains unless it is determined through site-specific analysis, approved in writing by the BLM, that no practicable alternative to the Proposed Action exists.

All stream crossings will be analyzed on a Project-specific basis during the construction planning process and through CWA authorization and Section 404 permitting as necessary.

Site-specific BMPs and construction techniques will be implemented to minimize the potential for indirect impacts.

The need for permanent structures in surface water features will be avoided to the maximum extent possible and, when unavoidable, their footprints and overall impact will be minimized through design modifications and seasonal construction restrictions.

After construction, all pipeline and transmission line ROWs will be restored to their preconstruction grades and functionality. Reclamation and seeding would be implemented pursuant to the BLM-approved reclamation plan.

Wetland mitigation would be implemented, as required, to comply with the CWA and 'no net loss' policies and directives.

Channel crossings of ephemeral, intermittent, and perennial streams for pipelines will be located and designed in accordance to USACE Section 404 permits to protect channel stability and fish spawning habitat and to prevent increases in water velocity, which could lead to increased erosion and channel instability. Construction generally will be restricted until after spring runoff, when normal or low flows are established. The pipe will be buried at a depth sufficient to ensure the pipeline does not become exposed.

Special Status Species and Fish and Wildlife Resource Mitigation

Any new mitigation measures determined in consultation between BLM and the USFWS shall be implemented by the Operator, in accordance with the Endangered Species Act.

To protect avian species, including western yellow-billed cuckoo, the transmission line design for river crossings, plus three spans on either side, will include bird flight diverters installed on the high neutral line.

Transmission lines shall be constructed with avian-safe design standards and perch discouragers used on every pole to deter avian nesting and reduce the risk of electrocutions and collisions that could occur.

Water quality will be protected through the adherence to permit requirements and BMPs as described in the Section 4.4.

If populations of Ute ladies'-tresses are located, Project activities will not be authorized closer than 0.25 mile without concurrence of the USFWS and the BLM authorized officer.

All disturbance occurring within the high bank plus 50 feet is required to be reclaimed to meet the PFC standards.

Standard no surface occupancy stipulations will be applied within a 500-foot buffer of a riparian area, wetland, or stream channel, and 100-year floodplains unless otherwise determined through site-specific analysis, approved in writing by BLM Authorized Officer.

For the protection of aquatic resources and Ute ladies'-tresses and its potential habitat, surface-disturbing activities listed above should be avoided in the following areas: a) identified 100-year floodplains; b) areas within 500 feet from perennial waters, springs, water wells, and wetlands; and c) areas within 100 feet from the inner gorge of ephemeral channels.

USFWS and WGFD consultation and coordination will be conducted for all mitigation activities relating to raptors and threatened and endangered species and their habitats, and all permits required for movement, removal, and/or establishment of raptor nests will be pursued if they meet the requirements of the USFWS Migratory Bird Treaty Act.

Permanent structures requiring repeated human presence will not be constructed within 1,000 feet (1,400 feet for ferruginous hawks; 2,600 feet for bald eagles) of active raptor nests.

BLM-approved Perch discouragers will be placed on every power pole.

In river crossings or wetland areas, three spans on either side will include bird flight diverters (design to be discussed) installed on the high neutral.

If while conducting operations, substantial unanticipated environmental effects to listed, proposed, or candidate species are observed (whether effects are direct or indirect), formal consultation with USFWS will be initiated immediately in addition to cessation of all such operations.

Avoid sensitive biological resources within the ROW. Avoidance areas will be clearly marked with wooden stakes 3 to 4 feet in height, which will be spray painted to indicate avoidance.

Mechanically graded areas will be seeded with a predetermined seed mixture identified by the BLM to restore the grass and forbs in the disturbed big sagebrush habitat;

Weed control measures will be implemented to reduce the spread of non-native/invasive plant species that may diminish big game foraging habitat in areas disturbed by construction.

To reduce the potential for wildlife/vehicle collisions, a speed limit of 35 miles per hour (mph) or lower will be established for BLM controlled roads. Posted speed limits will be based on the engineering design speed for the road, but in no case will exceed 35 mph.

Carpool or bus will be implemented for work crew transport during shift changes to reduce vehicle disturbance to wildlife.

Vehicle turnouts will be bladed on both the uphill and downhill sides of the road at 0.5- to 1.0-mile intervals and at known game crossings during winter road maintenance to allow wildlife escape routes.

Avoid routine maintenance flaring operations between November 15 and April 30 to reduce disturbance to wintering elk.

Limit motorized access to established roads when accessing the RRU 17-34 well site.

Limit snow plowing operations to only the main road to the plant site and RRU 17-34 well.

Avoid travel between dawn hours (6–8 a.m.) and dusk hours (4–6 p.m.) between November 15 and April 30.

Livestock Grazing Mitigation

All fences damaged by or removed for construction shall be repaired immediately if livestock are present in that or adjoining allotments, or before the beginning of the next grazing season if livestock are not present at the time the fence is damaged or removed. Alternate fencing may be implemented around facility construction sites on a case-by case basis.

Project components shall be sited to avoid range improvements such as stock ponds, guzzlers, and other watering amenities, as well as any range condition monitoring sites/trend plots.

Fugitive dust dispersion from roads to adjacent vegetation shall be controlled by enforcing a 35 mph or lower speed limit on BLM-controlled roads, by watering, and/or by the use of other BLM-approved dust suppressants.

Interim reclamation for well pads and final reclamation for the Project-related ROWs will be implemented no later than the first growing season following the completion of individual Project components. Seed mixtures will be designed to re-establish pre-disturbance vegetation composition.

To reduce the potential for animal/vehicle collisions a speed limit of 35 mph or lower will be established for BLM-controlled roads. Posted speed limits will be based on the engineering design speed for the road, but in no case will exceed 35 mph.

Health and Safety Mitigation

The Operator shall conduct all drilling and operations of sour gas facilities in accordance with BLM Onshore Order 6.

Access to well heads will be strictly limited to authorized personnel equipped with emergency equipment.

All federal and state laws pertaining to the handling, storage, generation, or disposal of any hazardous substance or waste will be applied. BLM required mitigation measures include the following:

The Operator will coordinate emergency response planning with Sublette County and provide documentation regarding compliance with federal hazardous material regulations. Developed standards of operation will ensure that minimum standards, specifications, and regulations are implemented during Project design and construction, as well as during process operations.

Current MSDSs for all hazardous substances will be maintained and readily available on site. SARA Title III, also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), requires that all chemicals present at the facility greater than the Threshold Planning Quantity (TPQ) be included on a list supplied to local response agencies or that all MSDSs be submitted to the emergency response agencies.

An SPCC Plan will be developed to handle all oils within the RBPA in a safe manner by trained employees and contractors. The SPCC Plan also will outline all methods necessary to retain and cleanup any oils when a release occurs.

Transportation Mitigation

The Operator will jointly develop and submit for BLM approval road maintenance and use agreements designating road development, maintenance, and use requirements. These agreements could identify responsibilities for necessary preventative and corrective road maintenance throughout the LOP. Maintenance responsibilities could include, but not be limited to, blading, gravelling or aggregate-surfacing, cleaning ditches and drainage facilities, dust abatement, noxious weed control, culvert maintenance and repair, or other requirements.

The Operator will implement the resource, mitigation, and monitoring measures found in the Transportation Plan.

All development activities along approved ROWs will be restricted to areas authorized in the approved ROW; however, ROW widths could be minimized where feasible.

The Operator will implement fugitive dust control measures on primary access roads and heavily used resource roads.

The Operator will deliver and store equipment and bulk supplies on well pads prior to seasonal stipulation periods to the extent feasible to reduce traffic.

Where feasible, the Operator will develop a computer-assisted field automation of well sites to reduce traffic to each site.

Any two-track roads or ATV trails created in conjunction with the development/construction of Project components will be closed and reclaimed immediately upon completion of that Project component. Seeding will be completed in the next seeding season.

The Project proponent will implement procedures to preclude future use on the closed and reclaimed roads and trails.

In consultation with BLM and WGFD, the Operator will install gates as appropriate and supply other needed material in crucial winter range and sage-grouse concentration areas to encourage compliance with traffic restrictions. After construction, the BLM will maintain the gates. Gate keys will be managed by the BLM. Gate closures will be consistent with traffic restrictions. Proponents will assist BLM with signage on or near the gate explaining the traffic restrictions.

The Operator will restrict OHV activity by employees and contract workers to the immediate area of authorized activity or existing roads and trails.

Visual Quality, Noise, and Light Mitigation

To reduce visual impacts, the Operator shall implement the following measures:

BLM-accepted environmental color will be used that blends with the surrounding landscape on any above ground structures, if located on BLM land and not requiring safety coloration.

The Operator will bury proposed infrastructure when appropriate and locate pipeline ROWs within existing ROWs whenever possible.

The Operator shall initiate revegetation as soon as possible after disturbance to reduce color and line contrasts from exposed soils and retain rocks, trees, drainage, and other natural features as best as practically possible.

The Operator shall shape cut and fill areas to appear as natural forms.

Existing roads will be used.

All topsoil shall be stockpiled and reused, and topographic screening and vegetation manipulation will be used to screen structures.

The Operator shall use project scheduling, and traffic control procedures and use low-profile tanks or structures wherever visual sensitivity is an issue and/or deemed appropriate by BLM.

All equipment will include reflector shields to deflect light towards the area where it will be needed, and aim lights as much as possible below the horizon.

The Operator shall use the minimum number of lights and locations to accomplish the job safely.

The Operator will be required to adhere to noise provisions in the WGFD MOA.

Air Quality Mitigation

PM₁₀ Mitigation 1. The BLM shall require preparation and implementation of a construction Dust Control Plan. This plan shall include measures adequate to achieve 80 percent control efficiency for material entrained into the atmosphere from unpaved roads and disturbed soils. WDEQ can provide technical guidance on the adequacy of an applicant prepared dust plan.

PM₁₀ Mitigation 2. Heavy equipment exhaust opacity shall not exceed an average of 20 percent on the Ringleman scale for any three minutes during a one hour period.

Project operations will not exceed applicable state and federal AAQS.

All drilling and construction equipment engines (if applicable) shall meet EPA Tier2 emission limits or better.

Cultural and Paleontological Resource Mitigation

Should a new cultural resource site be encountered during construction or operations, the Operator will immediately discontinue operations and notify the BLM. The Operator will be responsible for the cost of evaluating and mitigating the site.

Where avoidance re-routes are not feasible, additional subsurface testing or other appropriate assessment of cultural resource sites for potential for Project impacts will be required.

A mitigation plan should be developed for prehistoric archaeological sites 48SU807 and 48SU2311 located in the direct APE of the Williams pipeline. Such a plan could include an archaeological monitor and/or avoidance fencing in the areas integral to the significance of the cultural properties.

An avoidance plan should be developed for the prehistoric archaeological site 48SU5130 in the APE of the 230-kV transmission line under Alternative 3. The plan could require an archaeological monitor and/or avoidance fencing in the areas integral to the significance of the cultural property.

In relation to crossing areas of substantial alluvial deposition in the Beaver Creek area, a subsurface testing plan (approximately 10 to 15 shovel tests along the centerline of any proposed project trenching) is needed to assess the potential for and to locate buried archaeological materials prior to construction. Archaeological monitoring in the form of trench inspection is further stipulated for this creek valley crossing during any permitted project pipeline installation.

Should any subsurface bones or other potential fossils be discovered by construction personnel on BLM-administered land anywhere within the RBPA, the BLM must be notified immediately, as stated in Appendix 3 of the Pinedale RMP ROD (BLM 2008), and work in the area of the discovery shall cease until the BLM or a qualified and BLM-permitted paleontologist can assess the discovery, determine its significance, and make additional recommendations.

A field survey is required for lands affected by BLM actions, if they are underlain by Class 5 geologic units. All significant surficial fossils should be collected and housed in a BLM-approved repository. Further mitigation recommendations will be made based on the survey results.

BLM has identified information of a previously recorded fossil locality (UW 60018/UCMP V99087, mentioned above in Section 4.3.4) located on BLM-administered land in Section 14, T29N, R113W. Additional information should be obtained to accurately relocate this fossil locality.

If the cultural resource or paleontological resource site is determined to be significant by the BLM, and is within the APE of the Cimarex gas pipeline, appropriate mitigation such as surface collection of significant fossils (with associated construction monitoring) or site avoidance is required prior to and/or during construction activities around the site.

BLM-REQUIRED MONITORING

Monitor slopes and look for signs of erosion, slumping, or slope movement.

Monitor for run-on and runoff during construction and correct drainage issues.

When soil erosion in upland soils is accelerated beyond natural levels, visual observations and surveyed erosion pins will be used to determine annual soil loss while land use operations are active and during annual site surveys.

If the water table shrinks beyond average precipitation fluctuations and soil erosion on stream banks and floodplains is increasing, visual observations and surveyed erosion pins will be used to determine the affected area while land use operations are active and during annual site surveys.

When soil compaction restricts water infiltration and plant growth, visual inspection and use of a penetrometer will be used to determine the depth and exceedance of compaction one to two times annually.

Critical erosion condition areas will be identified in soil surveys during the site-specific project analysis for the purpose of avoidance and special management.

Reinforced steel monopoles will be used on BLM-administered land in Alternatives 1 and 3. Ground disturbance associated with the construction of steel monopoles is expected to occur over a greater area and be deeper than that for the wooden H-frames; therefore, paleontological monitoring is required on BLM-administered lands for construction activities associated with the steel monopole installation where underlain by Class 5 geologic units.

Monitoring is required on BLM-administered lands for the construction of the portions of the Cimarex and Williams pipelines and the helium pipeline/fiber optic line underlain by Class 5 geologic units.

Monitoring is required on BLM-administered lands for in-line pulling and tensioning sites and two-track road areas underlain by the Class 5 geologic unit where subsurface disturbance is anticipated.

The SWPPP has specific requirements for monitoring of all disturbed areas and mitigation efforts that are applied in the form of BMPs. The SWPPP requires strict documentation of all monitoring and maintenance activities. These requirements will be followed throughout all phases of the Project development.

The ROW and other disturbed areas will be monitored for weed infestations, and new or expanding populations will be controlled or eradicated for the duration of the construction, operation, and reclamation phases.

Reclamation success will be monitored on an annual basis. Reclamation achievement will be evaluated using the standards agreed upon with the BLM PFO. Rehabilitation efforts will be repeated if it is concluded that the success rate is below an acceptable level as determined by the BLM PFO.

The Operator will collect reclamation monitoring data in an electronic format and submit the spatial data and all associated attributes to the BLM along with their annual reclamation monitoring report.

Continued monitoring and implementation of approved weed management plan is required.

Environmental inspections and monitoring as appropriate during and after construction.

If construction occurs during migratory bird breeding season, a survey for migratory birds (including western yellow-billed cuckoo and BLM sensitive bird species) shall be made just prior to construction. Activities will avoid impacts to nests and fledglings.

If during pre-construction or construction surveys, or while conducting operations, substantial unanticipated environmental effects to any threatened, endangered, or candidate species are observed (whether effects are direct or indirect), formal consultation with USFWS will be initiated immediately in addition to cessation of all such operations.

Pre-construction surveys to verify locations of occupied leks and to identify the presence of other leks within 0.5 mile of proposed pipeline and transmission line alignments.

Monitoring of perch discouragers, used to deter raptor nesting and reduce the risk of raptor electrocutions and collisions that could occur, and initiate adjustments as necessary to ensure effectiveness of perch discourages. A monitoring plan will be developed by the Operator and approved by the BLM within 6 months of the EA approval.

Pre-construction surveys for sensitive raptors and other species will be conducted in areas of potential habitat by a qualified biologist.

Monitoring of perch discouragers, used to deter raptor nesting and reduce the risk of raptor electrocutions and collisions that could occur, and initiate adjustments as necessary to ensure effectiveness of perch discourages. A monitoring plan will be developed by the Operator and approved by the BLM within 6 months of the EA approval.

The percentage of native winter range elk observed in the Riley Ridge Winter Range Complex will maintain a 5-year running average of 40 percent, which is the 5-year running average between 2003 and 2009 (Emmerich 2009b); a 5-year average was selected due to the range and variability in the percent of native winter range elk observed in the Riley Ridge Winter Range Complex. In order to monitor the 5-year running average, the Operator will be required to continue the current collared elk study for 5 years post-construction. (This is a continuation of the study being conducted under the MOA between WGFD and Cimarex. This requirement will extend the elk monitoring 2 to 3 years beyond the 2013 date in the MOA.)

Monitoring of the implementation of BMPs and the requirements of BLM On Shore Order 6 for sour gas operations, including the regular updating of the Emergency and Contingency Plan will be required to assure the safe handling and storage of all hazardous substances and safeguards.

All roads used to access the wells, pipelines, and other facilities will be maintained in their current condition or better. Continuous inspection will be performed, and preventative maintenance measures will be taken on a biannual basis. These measures may include grading, cleaning drainage structures, ensuring erosion control and slope stabilization, and closing roads during periods of excessive soil moisture.

As part of normal operational winter maintenance, the Operator will plow roads the minimum amount necessary to allow safe navigation. Plows will provide breaks in snow-piled berms along the road margins (knockouts) to allow free movement of wildlife across roads.

Refer to Pinedale Field Office Oil and Gas Development Social and Economic Monitoring Plan developed by Dr. Robert Winthrop. Monitoring reports will be submitted to the BLM and cooperating agencies annually.

Within 9 months of completion of project construction (except for drilling operations), Cimarex will provide to BLM a post-construction visual analysis comparing the simulated visual impact analysis to the actual effects. Study design and methods will be approved by BLM and will use the existing KOPs.

Appendix C

Noxious Weed Management Plan

Appendix D

Storm Water Pollution Prevention Plan Update – 2013