

Montana Board of Oil and Gas Conservation

Environmental Assessment

For

Pinnacle Gas Resources, Inc.

Deer Creek Fee, Plan of Development

This site-specific analysis tiers to and incorporates by reference the information and analyses contained in the Final Statewide Oil and Gas Environmental Impact Statement-January 2003 (Final CBNG EIS) jointly prepared by the Bureau of Land Management (BLM), Montana Department of Environmental Quality (MDEQ), and the Montana Board of Oil and Gas Conservation (MBOGC) and adopted by the MBOGC on March 26, 2003, and the Programmatic EIS on Oil and Gas Drilling In Montana (Programmatic EIS), prepared under the supervision of the Office of the Governor and adopted by the MBOGC on December 28, 1989. None of the proposed wells in the subject POD occur on state land and as such this EA does not contain any analysis specific to such areas. As well, because none of the proposed subject wells occur on state land, approval by the Trust Land Management Division (TLMD) and Land Board are not required. Authority to conduct operations in federal minerals requires an additional decision by the BLM. However, under the subject POD no requests have been made for wells to be drilled into federal minerals, and therefore; approval by the BLM is not necessary.

Proposed Action- Pinnacle Gas Resources, Inc. (Pinnacle) Deer Creek Fee Project, Plan of Development (POD)

Location of Proposed Action

The proposed POD includes Coal Bed Natural Gas (CBNG) exploration and development drilling for lands in Sections 19, 20, and 21 of Township 9S, Range 42E in the Hanging Woman West Field, Big Horn County, Montana. The surface ownership in the project area includes privately owned (fee) lands. None of the proposed wells are located on land owned by the State of Montana (state). The mineral ownership is limited to fee and federal estates. Pinnacle proposes to drill 33 CBNG wells (33 fee, 0 state, 0 federal) in the POD area and produce water and natural gas typically from the Anderson, Canyon/Cook, and Wall coal seams. The action that is being proposed is the drilling and production of 33 CBNG wells. This Environmental Assessment (EA) analyzes the impacts associated with the proposed fee wells.

Purpose and Need

The proposed action involves the development of CBNG resources known to exist within the current Hanging Woman West Field. The lands involved are fee, all under oil and gas lease. Recovery of natural gas resources is a direct benefit to the mineral owners, both public and private, to state and local governments, and to public schools as recipients of

both tax receipts and royalties from school trust land. Natural gas has become a fuel of choice for environmental reasons, and national demand, as well as the price received for this commodity, has increased substantially over the years. This Environmental Assessment (EA) is the site-specific analysis for Pinnacle's POD to ensure that CBNG development of its leases occurs in an orderly, efficient, economically and environmentally responsible manner that provides measures to protect the environment and surface owner assets.

Description of the Proposed Action

The Deer Creek Fee project was initiated with submission of the Pinnacle Deer Creek Fee POD. This action is a request to develop the Hanging Woman West Field. Of the proposed drilling, all of the 33 new wells will be under the jurisdiction of the MBOGC.

The proposed action includes the use of both existing and new infrastructure and facilities. Access to well sites is to occur on both existing and proposed two-track roads. The project area is currently equipped with approximately 0.84 miles of existing two-track roads. The subject POD proposes the construction of approximately 3.15 miles of two-track roads. Where possible, whether proposed two-track or existing, roads will serve as a common corridor for gas, water, and electric. Construction equipment and routine vehicle travel will be restricted to approved all-weather roads, access corridors, and two-track roads in consultation with the land owner. To meet the needs of the proposed action, additional access routes may be constructed commensurate with usage requirements while being sensitive to the needs and concerns of the surface owner. Electricity will be routed to drop points above ground on poles. Revisions to electric utilities may be required as project development occurs. Electrical junction boxes will be installed where needed by the electric utility company and will be painted to blend with the surrounding area. At power drop points, electricity will be moved to underground cable for burial in trenches dug to well sites. Each drop point is to serve multiple wells via power cable running in its own trench, or if feasible, in gas and/or water flow line/pipeline routes and along well access roads. Typically, power lines will be plowed underground from service taps along the main power system to each well pad.

If the wells are deemed productive, Pinnacle intends to install electric natural gas flow measurement equipment utilizing telecommunications data gathering or chart recorders. Gas measurement may occur at either the central metering buildings or at the individual wellhead. Additional gas/water separation and initial compression of gas will occur at the pod facility. Subsequent to undergoing gas/water separation and compression, CBNG will enter an intermediate pressure pipeline that will carry the gas to a high pressure compressor station and transportation pipeline for delivery to market. Typically, one or two meter houses and up to three compressors will be located at each pod site. New compression facilities will be constructed and operated in accordance with MDEQ air quality permitting requirements. One central gathering facility will be handling the gas for the subject POD. This is an existing facility located in the SENW quarter of Section 6 within Township 9S, Range 42E.

Pinnacle proposes to evaluate and/or utilize three main water management options for the Deer Creek Fee project. These options include evaporation/containment, storage/treatment/managed irrigation, and retrieval/injection. Pinnacle will utilize one or a combination of these options pending the establishment of the quantity and quality of the water produced. Three evaporation/containment ponds are proposed. A stock and wildlife watering tank (tire tank) will be located adjacent to each evaporation/containment pond. If the water treatment option is utilized, a new treatment facility would be installed. The treatment facility would be located in close proximity to the proposed wells and would be of similar design to the water treatment facility currently operated by Pinnacle within the Coal Creek POD project located to the northwest of the Deer Creek Fee project.

Wells will be drilled on shared sites with up to three wells located on a common well site (or pad) to develop the Anderson, Canyon/Cook, and Wall coal seams. Approximately 0.25 acres of surface per well will be disturbed during drilling and completion operations. An estimated total of 2.75 acres may be disturbed during the drilling process on fee lands. Mud pits may be constructed (20'W x 40'L) at each well site to contain drilling fluids and water. Topsoil is stripped and saved during any surface disturbing operations and used for reclamation of the disturbed area.

Well heads, compressors, and other surface facilities will be equipped with appropriate frost boxes painted an unobtrusive color and fenced to protect against damage by cattle. Electronic flow devices or chart recorders will measure natural gas and water production.

Pinnacle has submitted a surface use plan, water management plan, and reclamation plan for the associated POD, in accordance with requirements of the March 26, 2003 MBOGC Record of Decision (ROD) for the EIS. The POD for this project contains several maps and exhibits which are available for public inspection at the MBOGC offices in Helena and Billings.

Hearing Process and Public Involvement

Pinnacle presented its Deer Creek Fee POD to the MBOGC in November of 2006 as Docket No. 455-2006. The Deer Creek Fee POD was approved by the MBOGC in November of 2006, by Order 385-2006. The MBOGC 2003 ROD and MBOGC Order 99-1999 apply to this proposed action. Order 99-1999 was established by the MBOGC to recognize the Montana Department of Natural Resource Conservation (MDNRC) Controlled Ground Water Area for the Powder River Basin and to establish minimum requirements for information to be considered at a public hearing. The order also requires development and implementation of a groundwater monitoring plan, a part of establishing field spacing for CBNG development. Pinnacle's POD complies with the requirements of both the EIS ROD and Order 99-1999.

Public hearings are advertised in the statewide *Helena Independent Record* and the official newspaper of the county in which the proposed operations are to take place. In addition, notice of public hearing is mailed to the MBOGC's mailing list and a notice is

published on its website. The proposed project has fulfilled the necessary public notice requirements.

Other Regulatory Requirements

Table 1-1, Page 1-14, of the Final Statewide Oil & Gas EIS identifies the applicable permits and reviews for CBNG activities and the agencies responsible for each. Table 1-2 of the same document identifies the permitting activities associated with CBNG development. Approval of PODs must be made by the BLM for federal interests and by the MBOGC for state and fee interests under the preferred alternative adopted by both of the agencies, as presented in the Final Statewide Oil & Gas EIS. The project area is located entirely on fee land and minerals; therefore, the 33 proposed wells are exclusively under MBOGC permitting jurisdiction, as the wells are located on only fee minerals. Since none of the proposed wells occur on federal land of minerals, BLM approval is not required. Of the 33 proposed wells, zero (0) are located on state managed lands and, therefore, the TLMD procedures for CBNG development do not require separate approval by the state land board. Produced water discharge permits and storm water discharge permits for state trust lands and fee lands are the responsibility of the MDEQ. In addition, the MDEQ will manage air quality permits for activities in the State of Montana. The BLM will manage permitting activities for wells on federal lands. Again, this EA deals with the assessment of fee wells only, as there are no state wells included in the proposed project.

Alternatives

Alternatives are presented to address the relevant major issues in the proposed action. A “No Action” alternative was considered in the 2003 Montana Statewide EIS. Under this alternative, no proposed wells in the Deer Creek Fee POD would be drilled. However, taking no action on the current proposal would prohibit the lawful recovery of private property (i.e., coal bed natural gas) and would place the state trust mineral resources in jeopardy of drainage by offsetting wells not located on land under jurisdiction of the state. The 2003 Montana Statewide EIS considered other alternatives, including the Preferred Alternative, which is consistent with Pinnacle’s Deer Creek Fee POD.

For this EA, Alternative A is the “No Action” Alternative. In this alternative, no approval would be issued for the POD and no wells would be drilled or produced. This alternative was included to provide the required basis for comparison with Alternative B, the “Proposed Alternative”.

Alternative B is the operator’s proposed action. Under this alternative, Pinnacle’s Deer Creek Fee POD would be approved, including drilling and production of the 33 fee wells, and construction of any additional associated infrastructure. This EA analyzes full implementation of Pinnacle’s proposal, while incorporating measures identified during project review that would avoid or reduce impacts to area resources. Alternative B is the agency’s preferred alternative.

Table1 provides a description summary of the two alternatives.

Alternatives Considered but Eliminated from Detailed Analysis

The alternatives listed below were considered in order to resolve planning questions or issues but were not analyzed in detail because of technical, legal, or other constraints.

Injection of All Produced Water: This alternative was suggested as a means to reduce the amount of produced water requiring management by other means (e.g., treatment or surface discharge). However, the feasibility of injection of produced water is quite variable and site specific. The likelihood of successful injection has not been well established in the Montana portion of the Powder River Basin. In fact, the variable geology, and limited porosity and permeability of the potential receiving units in the Powder River Basin, along with the very limited success of injection in Wyoming's portion of the Powder River Basin, demonstrate that injection is likely not feasible in the project area. While some limited injection may be feasible at selected sites, this alternative cannot be the basis for a comprehensive water management program. Rock units below the level of the nearest perennial or intermittent stream are usually already saturated with water and have very little available porosity in which to store additional water. Confined coal or sandstone units in the Wasatch and Fort Union formations are naturally under hydrostatic pressure, and the total volume of those units capable of storing injected water is very small, often less than 1% by volume. Re-injecting into former producing coal beds may not be possible within several miles of active gas fields, since this would re-pressurize the subject coal, eventually interfering with the production of natural gas in other active fields or in different mineral estates.

Furthermore, the regulatory burden for injection into shallow, drinking water aquifers could require a lead time of one year or more before permit approval. For these reasons, injection of produced water is proposed, at most, as one of multiple produced water management techniques. During the development process, the operator may seek to evaluate potential injection zones for technical and economic feasibility. In the event that injection is proven to be feasible, where appropriate, injection of produced water will be utilized as one of the POD water management options.

Phased Development: Phased development is an alternative that was considered, but not analyzed in detail. As applied specifically to this project area, phased development of CBNG was not considered because of several important legal and regulatory arguments; phased development is implicit in the current permitting process. Discussion of each of these arguments is presented below:

- **Protection of Correlative Rights:** The MBOGC is required to protect correlative rights to minimize drainage of mineral resources by off-lease drilling and production. Drainage can be prevented by minimum setbacks from lease boundaries and mirror-image locations off-setting well location exemptions. Drainage is also prevented given the operator has the express freedom to drill

any legal well locations. Two contiguous tracts must be equally drillable or drainage may occur by the first well to be drilled. If the offsetting well is delayed, such as by a phased development restriction on the number of CBNG wells per year, drainage could occur.

- **Prevention of Waste:** MCA Section 82-11-111(1) provides: “The board shall make such investigations as it considers proper to determine whether waste exists or is imminent or whether other facts exist which justify action by the board under the authority granted by this chapter with respect thereto.” Waste is defined at 82-11-101(16) as follows:

(16) (a) “Waste” means:

(i) physical waste, as that term is generally understood in the oil and gas industry;

(ii) the inefficient, excessive, or improper use of, or the unnecessary dissipation of reservoir energy;

(iii) the location, spacing, drilling, equipping, operating, or producing, of any oil or gas well or wells in a manner which causes or tends to cause reduction in the quantity of oil or gas ultimately recoverable from a pool under prudent and proper operations or which causes or tends to cause unnecessary or excessive surface loss or destruction of oil or gas; and

(iv) the inefficient storing of oil or gas. (The production of oil or gas from any pool or by any well to the full extent that the well or pool can be produced in accordance with methods designed to result in maximum ultimate recovery, as determined by the board, is not waste within the meaning of this definition.)

(b) The loss of gas to the atmosphere during coal mining operations is not waste within the meaning of this definition.

The MBOGC’s primary responsibility, as defined in the statutes quoted above, is to assure efficiency and prevent waste in the production of oil and gas resources, including CBNG. Requiring a particular operator or operators to phase production by deferring development in one or more areas could cause waste. In the case of CBNG development, restricting an operator’s number of wells could reduce the efficiency of the operator’s depressurization of producing coal beds and thereby reduce the ultimate CBNG recovery. The MBOGC does not have the authority to impose such an order since it would violate MBOGC’s fiduciary responsibilities.

- **Implicit Phased Development:** The MBOGC, as well as other state and federal regulatory agencies, have numerous permitting mechanisms in place to address drilling and pit construction, produced water management, air emissions, etc. that must be satisfied before CBNG development can occur. These permitting mechanisms require ongoing analysis to allow development

to continue. The MBOGC's position is that these permitting mechanisms implicitly result in phased development of the resource. This implicit phasing of development, which comprises the Preferred Alternative, also achieves the objective of managing resource conservation and development.

Cumulative Effects

Cumulative effects are the result of impacts from other past, present, or reasonably foreseeable future actions that would overlap in time and locale with the direct effects of the proposed action or alternatives, thus resulting in "cumulative effects" distinctly different (greater or less) than the direct effects. The actions listed below have been considered as potential contributors to cumulative effects:

- **Existing Montana CBNG Development:** According to MBOGC records, as of December 21, 2006, approximately 1,581 CBNG wells have been drilled in Big Horn, Custer, Powder River, and Rosebud counties. The status of these wells includes drilling, shut-in, producing, and plugged. Currently, 716 CBNG wells are considered to be in production. The main development is found in the CX Field near Decker, Montana. The CX Field, which includes the existing, producing Badger Hills, Dry Creek, and Coal Creek project areas, is a CBNG-producing field operated by Fidelity Exploration & Production Company. The field encompasses approximately 56 sections between the Montana/Wyoming state line. The CBNG wells in the CX Field are typically completed in the Dietz 1, Dietz 2, Dietz 3, Monarch, and Carney coal seams. A portion of the produced water from the CX field is discharged to the Tongue River under a valid MPDES permit. The actions proposed in the Deer Creek Fee POD are not likely to have cumulative effects to existing project areas.
- **CX Field (Coal Creek POD (Amended)):** Fidelity has proposed and received approval to amend the Coal Creek POD. The amendment seeks to increase well density within the project area. The POD specifies drilling and producing an additional 236 CBNG wells (43 fee, 20 state, and 173 federal) and constructing and operating associated infrastructure within the CX Field. The project area is located northwest of the Deer Creek Fee project area. The scope and nature of the Coal Creek POD, as well as its proximity to the Deer Creek Fee project area, results in only minor potential for cumulative effects to resources in the project area.
- **CX Field (Deer Creek North POD (Amended)):** Fidelity has proposed and received approval to amend the Deer Creek POD. The amendment seeks to increase well density within the project area. The POD specifies drilling and producing an additional 184 CBNG wells (112 fee, 4 state, and 68 federal) and constructing and operating associated infrastructure within the CX Field. The project area is located west of the Deer Creek Fee project area. The scope and nature of the Deer Creek North POD, as well as its proximity to the Deer

Creek Fee project results in only minor potential for cumulative effects to resources in the project area.

- **CX Field (Badger Hills POD (Amended)):** Fidelity has proposed and received approval to amend the Badger Hills POD. The amendment seeks to increase well density within the project area. The POD specifies drilling and producing an additional 103 CBNG wells (38 fee, 29 state, and 36 federal) and constructing and operating associated infrastructure within the CX Field. The project area is located directly southwest of the Deer Creek Fee project area. The scope and nature of the Badger Hills POD, as well as its proximity to the Deer Creek Fee project results in only minor potential for cumulative effects to resources in the project area.
- **CX Field (Pond Creek POD):** Fidelity has proposed and received approval for the Pond Creek POD. The POD specifies the drilling and producing of 78 CBNG wells and the construction and operation of associated infrastructure within the CX Field. The project area is located directly west of the Deer Creek Fee project area. The scope and nature of the Pond Creek POD, as well as its proximity to the Deer Creek Fee project results in only minor potential for cumulative effects to resources in the proposed project area.
- **Coal Creek Field (Dietz POD):** Pinnacle Gas Resources (Pinnacle) has proposed and received approval for this POD for the drilling and producing of 132 CBNG wells, along with the construction and installation of associated infrastructure in an area of the Coal Creek Field as well as the reclamation of disturbed areas. The project area is within the Coal Creek Field and is northwest of the Deer Creek Fee project area. The 132 wells will be drilled on 42 sites. These CBNG wells will be completed in the four Fort Union coal seams. Due to the proximity of this project to the Deer Creek Fee project area, it is not likely that the Dietz POD could have the potential to affect the resources in the project area.
- **Decker Coal Mine:** The Decker Mine is a surface coal mine operated by Decker Coal Company, a subsidiary of Kiewit. The mining method consists of open pit strip mining. Overburden and interburden are removed via draglines, shovels and trucks, front-end loaders and trucks, or dozers. The permitted mine operations area is approximately 11,400 surface acres. The average annual coal production is 10 million short tons. Both the East Decker and West Decker mines are located west and northwest of the project subject area. Due to the proximity and the scope and nature of the Decker Coal Mine, it is not likely that there is significant potential to affect resources in the project area.
- **Spring Creek Coal Mine:** The Spring Creek Mine is a surface coal mine that is owned and operated by Spring Creek Coal Company. The mine is located northwest of the Pinnacle Deer Creek Fee POD area. The mining method

consists of open pit strip mining. Overburden and interburden are removed via draglines, shovels and trucks, front-end loaders and trucks, or dozers. The permitted mine operations area is approximately 7,000 surface acres. The average annual coal production is 11 million short tons. Due to the proximity and the scope and nature of the Decker Coal Mine, it is not likely that there is significant potential to affect resources in the project area.

- **Existing Wyoming CBNG Development:** According to the Wyoming Oil and Gas Conservation Commission (WOGCC), as of December 22, 2006; a total of 55,684 CBNG wells have been drilled in the state. This includes wells that have been spudded, are producing, or have been abandoned. CBNG development in Wyoming has taken place since the early 1990's, the majority of which has occurred in the Powder River Basin which is located in the north central/eastern part of the state. The CBNG development is primarily located between the cities of Gillette and Sheridan. As of December 28, 2006, a total of 7,123 wells have been drilled in the upper Tongue River watershed. The scope and nature of the Wyoming CBNG development, as well as its distance from the proposed project area, would not likely create cumulative effects to resources in the Pinnacle project area.
- **Coal Creek Field (Coal Creek POD):** Pinnacle has proposed this POD and received approval to drill and produce 48 CBNG wells as well as to construct and install the necessary associated infrastructure and reclaim the disturbed locations in an area of the Coal Creek Field. The project area is within the Coal Creek Field at a location north and west of the Pinnacle Dietz project and southwest of the Deer Creek Fee east project area. The 48 wells will be drilled on 24 sites. These CBNG wells will be completed in the Wall and Flowers/Goodale coal seams. Due to the distance of this project from the Deer Creek Fee project area, the Coal Creek POD would not likely create cumulative effects to resources in the Pinnacle project area.
- **Gravel/Scoria Quarries:** Some gravel or scoria would be used to surface the proposed roads and would be supplied from permitted mineral material sites. Surface disturbance associated with gravel or scoria quarries would not exceed existing permit limits. The potential for cumulative or connected effects from mineral material excavation is minimal.
- **Absaloka Coal Mine:** The Absaloka Mine, which is owned and operated by Westmoreland Resources, is a surface coal mine located adjacent to the Crow Reservation. The mine is located northwest of the Deer Creek Fee project area. The mining method consists of open pit strip mining of Crow Tribe mineral resources. Due to the Absaloka Coal Mine's distance relative to the Deer Creek Fee project area, it is unlikely that there would be any cumulative effects to project area resources.

- **Castle Rock-Stevens POD:** Powder River Gas has proposed and received approval for the development of 284 CBNG wells in Powder River County, including the construction and operation of necessary associated infrastructure and reclamation of disturbed areas. The project area is located northeast of the Deer Creek Fee project area. The 284 wells will be drilled on 71 sites. These CBNG wells will be completed in the Cook/Otter, Pawnee, Sawyer Knobloch or Terret/Stag coal beds. Due to the distance of this project from the Deer Creek Fee project area, the Caste Rock-Stevens POD would not likely create cumulative effects to resources in the project area.
- **Conventional Oil and Gas Development:** A total of 1,991 conventional oil and gas wells have been drilled in Big Horn and Rosebud counties, approximately 22% of which are either federal or Indian wells. Cumulative effects from conventional oil and gas development are not likely.
- **Wolf Mountain Coal:** Wolf Mountain Coal, Inc. proposes to build a coal processing plant on private land for retail sales of coal in Lot 1, Section 18, Township 8S, Range 40E. BLM has issued a right-of-way (MTM93074) for a power line across federal surface in the NE1/4SE1/4 of Section 13, Township 8S, Range 39E in order to provide power to the proposed project site. Due to the distance of the Wolf Mountain plant from the Deer Creek Fee project area; it is not be likely that cumulative effects to resources in the Deer Creek Fee project area would occur from activities at the processing plant.
- **Tongue River Railroad (TRR):** The Surface Transportation Board has published a Draft Supplemental Environmental Impact Statement for the Tongue River Railroad Company's (TRRC) proposed rail line construction in Rosebud and big Horn counties in Montana. The document analyzes the proposed 17.3 mile 'Western Alignment Route', which had been preceded by two related applications that were considered and approved by the Board in 1986 and 1996, respectively. The proposed Western Alignment is an alternative route for the southernmost portion of the 41-mile Ashland to Decker Alignment, known as the Four Mile Creek Alignment. The proposed Western Alignment would bypass the Four Mile Creek Alignment, which is located from the Birney Road (Hwy 566) and Tongue River Canyon junction and runs westward to Hwy 314 and southward to the Decker Mine. The Western Alignment would continue southward along the Tongue River, paralleling the river and ending near the Spring Creek Mine area. The activities relative to the proposed TRR and Deer Creek Fee projects will not occur in the same location and, as such, no cumulative impacts are anticipated to occur with to the resources in the Deer Creek Fee project on behalf of the proposed TRR activities.

Affected Environment and Environmental Consequences

Pinnacle's Deer Creek Fee POD encompasses approximately 720 acres in Big Horn County, Montana. The area is located in the northern portion of the Powder River Basin within the upper Tongue Drainage Basin. The project is located approximately 10 miles southeast of the southernmost element of the Tongue River Reservoir.

Air Quality

Ambient air quality in the project area is good. Coal mining operations in the vicinity of the project location could potentially cause localized elevation in suspended particulates or sulfur dioxide. The East Decker, West Decker, and Spring Creek mines are located south and west of the proposed project area.

Air pollution is regulated under the Federal Clean Air Act (CAA) as well as under Montana statutes and regulations that are implemented by the MDEQ. The southern boundary of the Northern Cheyenne Reservation is located more than 20 miles north of the proposed Deer Creek Fee project area and is the nearest PSD (Prevention of Significant Deterioration) Class I area; the project area is in a PSD Class II area, which allows for moderate, controlled air quality impacts.

Air quality could potentially be impacted by suspended particulate matter generated during drilling and production caused primarily by dust associated with travel on unimproved roads; emissions from drilling rig engines, field and main compressor facilities, and venting of natural gas during testing of wells prior to hookup. The produced natural gas in the Hanging Woman West Field contains no Hydrogen Sulfide (H_2S) and is very nearly pure Methane (CH_4).

Air quality regulations require certain new or existing modified air pollution emission sources (including CBNG compression facilities) to undergo a permitting review prior to commencement of construction activities. The MDEQ has the primary authority to review and require permits and/or control devices prior to construction. A source emitting less than 25 tons of any regulated pollutant, excluding hazardous air pollutants (HAPs), without controls, does not require a permit. Proposed compression facilities will be constructed and operated in accordance with MDEQ air quality permitting requirements. At the level of compression that is anticipated for the subject project it does not appear that a Montana Air Quality permit (MAQP) would be required. However, if additional compressors are needed, the operator may need to obtain a MAQP for applicable emissions.

Mitigation proposed by the operator includes the implementation of speed limits on unpaved roads to reduce dust emissions, the installation of telemetry equipment at wellheads to monitor well performance (subsequently minimizing travel to individual well sites), and the uses of natural gas to fuel field and sales compressor engines. Gas venting is minimized by a MBOGC regulatory requirement that prohibits venting of commercial quantities of gas.

The drilling of CBNG wells, although a temporarily intense activity is of relatively minor concern for air quality impacts since drilling actually occurs only for a limited time during the life of the project. The water well rigs employed are smaller than those commonly used to drill conventional oil and gas wells in the state and do not have engines with high horsepower. Typically, no more than one to two days are required to drill a well to the proposed depths. Air quality impacts are not expected to be significant and the operator's proposed mitigation measures are adequate. MDEQ permitting requirements mitigate longer-term impacts from point sources such as field and sales compressor engines.

Water Quality and Quantity

The Deer Creek Fee project is located within the upper Tongue River watershed in an area that receives an average of 12-14 inches of annual precipitation. The project area is approximately eight (8) miles southeast of the Tongue River Reservoir. As required in the EIS ROD, a water management plan has been prepared for the proposed project by Western Land Services, Inc. and is incorporated into this EA by reference.

Pinnacle expects that the initial water production from the proposed wells will be approximately 25 gallons per minute (gpm), declining by approximately 40% per year, based on the production of existing wells in the area. The proposed 33 fee wells will initially produce 825 gpm of water. Pinnacle proposes the following water management options for the Deer Creek Fee project: evaporation/containment, storage/treatment/managed irrigation, and storage retrieval/injection. Pinnacle will utilize one or a combination of these options after water quality and quantity values have been established. Each option will be implemented in compliance with local, state, and federal regulatory guidelines, rules, and regulations. New storage impoundments will be located in upland locations and sited in "off-channel" areas to avoid interfering with natural runoff and to avoid capture of water that would otherwise travel to downstream water rights holders. A stock and wildlife watering tank (tire tank) will be located adjacent to each evaporation/containment pond. Each tank is to be fitted with an overflow pipe that will divert excessive flows to the adjacent containment pond. In addition to the overflow pipe, each stock tank will have a frost-free hydrant, which will have the ability to divert flows from the pipeline that delivers produced effluent from the wells to the tank. Each tank will also be installed with an emergency wildlife ramp. Treatment of water would involve the construction of a facility located within close proximity to the wells. Any discharge of untreated and treated water will be in accordance with a Montana Pollutant Discharge Elimination System (MPDES) permit.

Two searches were performed using the MDNRC Water Rights Database and the Montana Bureau of Mines and Geology (MBMG) Groundwater Information Center (GWIC) database in order to determine groundwater rights and features for the area within and adjacent to (within one (1) mile) to the Deer Creek Fee project boundary. The searches revealed a total of two (2) permitted groundwater rights (water wells) as well as two (2) springs and two (2) wells. A list of wells is available in the POD

submittal. Water well mitigation agreements have been offered to all owners of registered wells/springs within one mile of the project boundary.

The Hydrology and Groundwater section of the Final Statewide Oil & Gas EIS discusses the Powder River Basin groundwater, surface water, and stratigraphy in detail. The stratigraphic section in the project area includes alluvial aquifers both under and near stream channels, the coalbed aquifers, as well as the impermeable aquitards that impede or prevent vertical movement of water between coalbeds. Monitoring reports document the effect of CBNG water withdrawal as well as the compartmentalized nature of the coalbed aquifers due to faulting in the Powder River Basin of Montana. Many faults are visible at the surface and have been mapped by geological researchers. These down-to-the-basin faults have been shown to retard or prevent the movement of water and gas across the fault boundary, resulting in uniform drawdowns of water pressure within the coalbed aquifers. Local groundwater is described in the referenced water management plan. Regional groundwater quality is characterized in the Final statewide Oil & Gas EIS.

The proposed water management plan relies on accepted methods of water management. The potential impacts of each are described in the Final Statewide Oil & Gas EIS. Water well mitigation agreements effectively guarantee replacement of water if a legitimate well owner/water user is adversely impacted. The hydrogeology of the coalbed aquifers in the project area minimizes any potential impacts that water withdrawn from coal seams would have on users of shallow alluvial aquifers.

Produced water discharge is authorized by MDEQ, in compliance with the water quality standards in place at the time the permit is issued, MBOGC's authorization of the Pinnacle Deer Creek Fee project does not constitute approval to either discharge produced waters to waters of the state or to discharge produced water in excess of the amount authorized by the MDEQ. Overall impacts to water quality due to discharge of CBNG water to the Tongue River were thoroughly discussed in the Final Statewide Oil & Gas EIS. The Montana Board of Environmental Review (BER) has adopted numerical water quality standards for electrical conductivity (EC) and sodium adsorption (SAR). The Final Statewide Oil & Gas EIS analyzed a number of discharge scenarios incorporating current EC and SAR standards. Any future discharge permits would be required to meet the EC and SAR standards. Approval of the proposed action is anticipated to have minimal effect on surface water quality on the Tongue River.

Soils, Vegetation, Land Use

Fort Union and Wasatch formations are at the surface in the Deer Creek fee project area. The lithology of the project area consists of thick beds of yellow sandstone interbedded with grey, maroon, or black shale. In many areas the near-surface coals have burned, baking the surrounding rock, producing red, hard porcellanite commonly referred to as clinker or scoria. Differences in lithology have produced the topographic and geomorphic variations seen in the area. Higher ridges and hills are often protected by an erosion-resistant cap of clinker or sandstone.

Soils in the project area are described generally in the Soils Appendix of the Final Statewide Oil & Gas EIS and in more detail in the POD. Soils consist of shallow to very deep, well-drained soils formed in-situ of materials weathered from silty clay and silty shale bedrock. Due to the variability of topography and bedrock, soil groups vary throughout the project area. Soil K-factors in the project area indicate medium to high runoff as well as moderate to severe erosion potential for disturbed soils. Two vegetative habitat types were identified within the project area. These are Grassland (60%) and Shrubland (40%). Pinnacle proposes the possibility of utilizing managed irrigation as part of its water management plan.

The proposed CBNG development activity includes surface/shallow soil disturbances required to construct gas and water handling infrastructure, drill wells, and to construct access roads. Approximately 3.15 miles of new two-track road will be constructed. The operator has located proposed construction activities to avoid steep slopes in such a manner as to avoid steep slopes and surface disturbance that would require the removal of trees. The operator is responsible for construction of erosion/sedimentation controls during construction and production operations. Specific road locations, surfacing requirements and interim and final reclamation of disturbed areas and roads on private surface is subject to consultation between Pinnacle and the landowner. However, MBOGC rules require stockpiling of topsoil as well as prompt re-vegetation of disturbed areas. Reseeding of disturbed areas will be done with a seed mix acceptable to the surface owner. Without specific instructions from the surface owner, BLM or National Resource Conservation Service (NRCS)-recommended seed mixtures will be utilized. No significant cumulative or irreversible effects to existing land use or to soils are expected from the proposed action.

Health Hazards/Noise

CBNG produced in this area of Montana apparently does not contain H₂S or other contaminants that could affect public safety and health. The near pure methane produced from Powder River basin CBNG wells is lighter than air and does not accumulate in low areas; therefore, little or no exposure hazard exists for the general public. Closed buildings and frost-boxes around well-heads may allow accumulations of CBNG, however, these facilities are typically off-limits to the general public. CBNG operators have established strictly enforced no-smoking policies and other operating procedures to avoid fire or explosion hazards to their employees and authorized visitors. Tank batteries and compressor buildings are equipped with combustible gas detectors.

Exposure to noise from drilling CBNG wells is generally short-term in nature and consists of relatively low levels since the water-well drilling rigs that are used are smaller in overall size and have smaller engines than conventional oil or gas drilling rigs. The 1989 Programmatic EIS describes typical drilling rigs used in Montana. CBNG drilling rigs commonly operate only during daylight hours. CBNG wells in the Montana portion of the Powder River Basin typically take only one to two days to drill. Field compressors

are another source of noise, operating on a nearly continuous basis (i.e., except during occasional maintenance and repair/replacement).

In addition to human residents, noise could affect wildlife. The Final Statewide Oil & Gas EIS and the Biological Opinion Appendix discuss potential effects to Threatened and Endangered Species from noise disturbance. The relatively short duration of drilling operations and construction activities may result in noise levels that could impact noise-sensitive populations; however, ongoing CBNG production and associated maintenance activities will likely have little noise impact. The operator also agrees to avoid construction or drilling activities within a quarter-mile of sage grouse or sharp tail grouse leks during the nesting season to protect these species from noise disturbance during the critical period.

Wildlife/Recreation

Western Land Services, Inc. prepared the wildlife and habitat review. The review suggests that a variety of wildlife species utilize the region, including the POD area. Due to habitat fragmentation/disturbance and CBNG infrastructure development, there is a potential that the POD may impact habitat and species utilizing those habitats, however, it is not likely that the POD will cause a trend to federal listing or loss of viability of those species. Sage grouse, sharp-tailed grouse, and raptor habitat have been recorded within the POD boundary. Neither bald eagle nor mountain plover habitats were identified within the POD boundary. Further wildlife studies will be conducted if so recommended by the state of Montana. The MBOGC does not have the authority to implement any special wildlife stipulations, acquiesce to third party surveys, or to provide habitat for wildlife on private surface. However, the operator has completed a baseline survey that includes the entire Deer Creek Fee project area, as stated above. Wells, roads, and batteries will be located to avoid disturbing sage grouse and sharp-tailed grouse nesting sites within the project area.

The Tongue River Reservoir, a state-managed recreational area, lies near the POD area. Dispersed recreation may occur in parts of the POD area during hunting season. Surface owners control access to the entire project area. Any recreational opportunities that exist are not anticipated to be affected by this action.

Historical/Cultural/Paleontological Resources

Since the underlying MBOGC regulations generally do not apply to private property, the MBOGC cannot require archeological/cultural surveys on fee surface property. The Deer Creek Fee project area includes approximately 720 acres of fee lands. Western Land Services, Inc. conducted a Class I Cultural Resource Inventory of the proposed Deer Creek Fee POD for Pinnacle. In doing so, Western Land Service, Inc. performed a background search which involved consulting the following sources: Montana SHPO, Montana BLM State office. The Montana SHPO files identified seven (7) sites within Sections 19 and 20 of Township 9S, Range 42E. These sites are associated with three projects and three other unspecified investigations. These sites include prehistoric lithic

scatters, tipi rings, and a historic herder's camp. Two of these sites are located within the Deer Creek Fee POD. Both sites are prehistoric lithic scatters tentatively recommended as not eligible for nomination to the NRHP. No sites or cultural resource investigations are associated with Section 21 of Township 9S, Range 42E.

The 1919 plat map of T9S, R42e indicates the potential for a historic county road course to be present adjacent to the modern two-track road. Additionally, GLO Land Patent records and the historical indices from the Montana BLM State Office indicate a number of historic homesteading efforts, including two successful efforts, are associated with the Deer Creek fee Class I study area. These findings suggest a high potential for historic and prehistoric cultural materials to be present within the study area. Due to the lack of cultural resource investigations occurring in Section 21 and the high potential for historic and prehistoric cultural materials to be present within the study area, Western Land Services, Inc. has recommended that a Class III Cultural Resource Inventory be performed within section 21 of the Deer Creek Fee POD prior to the commencement of any ground disturbing activities.

The Ethnographic Overview of Southeast Montana prepared by Peterson and Deaver (2002) for the Final Statewide oil & gas EIS provides a current inventory of historical and cultural sites of the project region obtained from the Montana State Historical Preservation Office (SHPO) database. The area has seen limited archeological reconnaissance; three investigations were undertaken between 1973-1981, prior to CBNG development. Direct impacts to cultural sites can be avoided by carefully locating roads and other infrastructure facilities. For this POD, if cultural sites cannot be avoided, then suggestions for mitigation should be discussed with landowners.

Social/Economic

Social and economic effects of CBNG development are discussed in the 2003 Statewide Oil & gas EIS and in the Socioeconomic Appendix of the EIS. Additional demands on governmental services, impacts on county facilities, and significant relocation or population increases are not expected to result from the implementation of the proposed action. An increase in natural gas production from the project area is likely, resulting in a significant increase in both state and county tax income. Royalty owners will also benefit from natural gas production. Natural gas is expected to increase in value due to potential market shortfalls and increasing demand for gas as both a space heating fuel and as a fuel for the generation of electricity. Approval of the proposed action will increase gas reserves and production in Big Horn County.

On February 25, 2005, United States Magistrate Judge Richard Anderson issued a ruling that declared a portion of the analysis contained in the Montana Statewide FEIS to be deficient, due to its failure to consider a reasonable range of alternatives. *NPRC v. BLM*, CV 03-69-BLG-RWA, consolidated with *Northern Cheyenne Tribe v. Norton*, CV 03-78-BLG-RWA. The case was brought under federal law and pertains to federal lands in the project area, and has no bearing on this EA, which is limited in scope to state and fee minerals.

Remarks/Special Concerns

The proposed action includes the drilling of 33 wells and the construction of infrastructure needed to produce the wells within the Deer Creek Fee project area.

Measurement of gas production and produced water, and reporting of gas and water production is required as part of the MBOGC’s regulatory program. Wells in the Deer Creek Fee Pod area will be added to the monitoring requirements established for the Deitz South Field. The project area will be included in the groundwater monitoring program. Data will be collected from the new wells and compiled with existing information. The Technical Advisory Committee (TAC), established by DNRC’s Controlled Groundwater Area for the Powder River Basin, reviews operators’ groundwater plans and annual report(s).

Section 82-11-172, through 82-11-174, MCA, known as the “Coal Bed Methane Production Offset Act”, requires the MBOGC to issue drilling permits to protect mineral resources under its jurisdiction from drainage by wells permitted by other agencies not under its jurisdiction (BLM maintains jurisdiction over federal mineral resources). Production from adjacent/offsetting wells, not under the jurisdiction of the MBOGC may drain gas from Montana State Trusts Leases and fee leases unless additional wells within the Deer Creek Fee project area are promptly permitted, drilled and produced.

Summary: Evaluation of Impacts and Cumulative Effects

The 2003 Statewide Oil & Gas EIS identified and analyzed the cumulative effects of CBNG development in the Powder River Basin. The CX Field and its environs formed the analogue for the analysis used in the EIS, as it was the only source of CBNG project level data available in Montana. The EIS is directly applicable to the proposed action and accurately identifies impacts and mitigation appropriate to this EA. The following table summarizes impacts and mitigation applicable to the Deer Creek Fee project.

Resource	Summary of Impacts and Mitigation	
	Alternative A - No Action	Alternative B - Proposed Action
Air Quality	No change from existing conditions	Drilling operations, due to short duration, are anticipated to have minimal impact air quality within the project area. Air permit requirements mitigate impacts from significant point sources. Impacts to air quality from fugitive dust will be mitigated by minimizing traffic to individual wells and by voluntarily implementing a speed limit of 25 mph. This proposed action does not

Resource	Summary of Impacts and Mitigation	
	Alternative A - No Action	Alternative B - Proposed Action
		significantly impact air quality in the project area.
Water Quality and Quantity	No change from existing conditions	Surface discharge of produced water will not supersede presently permitted discharge rates. MDEQ has adopted numeric standards for discharge to protect downstream agricultural uses should any additional discharge be proposed in the future. Three new off-channel containment impoundments will be constructed. Enlargement of these impoundments may be required in the future. MBOGC inspectors will periodically monitor the sites. Cumulative effects on groundwater quantity are limited to the coal zones that are being produced. Water well mitigation agreements protect groundwater appropriators. DNRC Controlled Groundwater Area order outlines jurisdiction and procedures. Overall impacts to water quantity and quality are mitigated below the level of significance for the proposed action.
Soils, Vegetation, Land Use	No change from existing conditions	Short-term damage to vegetation and some disruption of exiting land use is expected. The operator has proposed 3.15 miles of two-track roads. MBOGC requirements for prompt re-vegetation of disturbed areas minimize overall and cumulative effects. The operator has negotiated surface use agreements with the surface owner that protect land uses in the project area. No significant impact to these resources is expected.
Health Hazards/Noise	No change from existing conditions	Minimal long-term impacts are expected as a result of the operator's careful selection of sites to minimize potential effects. Short-term impacts related to noise levels during drilling and construction activities are less than those described in the 1989 Programmatic EIS.

Resource	Summary of Impacts and Mitigation	
	Alternative A - No Action	Alternative B - Proposed Action
		Operator has substantive programs intended to protect safety of workers and public.
Wildlife/ Recreation	No change from existing conditions	The operator has located proposed well sites and infrastructure to avoid wildlife nesting/mating grounds. The operator will install devices to discourage raptor roosting on power poles within ¼ mile of active leks and will use raptor protective power line structure where underground utilities are not practical. Voluntary vehicle speed limits are also protective of wildlife. With the voluntary mitigation, potential effects to wildlife due to approval of the proposed action are not considered significant or long term.
Historical/Cultural/ Paleontological Resources	No change from existing conditions	Cultural and historical resources surveys have been conducted on nearby lands as part of the 2003 Montana Statewide Oil & Gas EIS. Although antiquities laws generally do not apply to private landowners, the operator has voluntarily agreed to consult with the surface owner and halt construction if resources are discovered on private land. If cultural resource sites are identified in the area; then through voluntary mitigation efforts no significant impact on these resources is expected from the proposed action.
Social/Economic	No change from existing conditions	Some short-term impacts to private landowner/residents of the area are expected. Relocation or population increases are not expected. However, increases in state and county taxes are likely. Royalty owners will benefit from the proposed action. Most adverse impacts will occur during drilling and the construction of infrastructure. Both activities are considered to be short in duration. Neither significant increases in demand for local government services nor long-term adverse impacts are likely to

Resource	Summary of Impacts and Mitigation	
	Alternative A - No Action	Alternative B - Proposed Action
		result from this project.
Remarks/ Special Concerns	No change from existing conditions	Key wells in the Deer Creek Fee POD area will be added to the groundwater monitoring program established for the Hanging Woman West Field. Data from the project area will be included in future annual groundwater monitoring reports. The operator has offered surface use agreements and water well mitigation agreements to surface owners and water users in the project area. Production from wells on offsetting/nearby minerals that are not under MBOGC's jurisdiction, for example federal wells, may cause drainage from state and fee minerals unless offsetting "protective" wells are promptly permitted.

Pinnacle has proposed voluntary mitigation efforts that are intended to reduce overall impacts of the proposed project. This voluntary mitigation accompanied by the regulatory programs enforced by state and federal agencies reduce the long term, cumulative effects of the proposed action below the level of significance; therefore, I conclude that the approval of the Deer Creek Fee Plan of Development does **not** constitute a major action of state government significantly affecting the quality of the human environment, and does **not** require the preparation of an environmental impact statement.

Approved by (MBOGC):

Original signed by

_____ Date: _____
Thomas P. Richmond, Administrator

Contacts and References:

- Final Statewide Oil & Gas EIS, adopted March 2003 (MBOGC, MDEQ, BLM)
- Final Programmatic EIS, Adopted December 1989 (MBOGC)
- Montana 2002 and 2003 Baseline Wildlife Inventory (Hayden-Wing Associates)
- Plan of Development Deer Creek Fee Plan of Development

Table 1. Pinnacle Deer Creek Fee POD- Comparison of Alternatives

Project Component	Alternative A- No Action	Alternative B- Proposed Action with Additional Mitigation (preferred alternative)
Number and type of wells and drill sites	0 new State wells, 0 new Fee wells	33 new wells, 33 Fee and 0 State (proposed)
Drill site construction	No drill site construction	Well pad construction would be as described in the Deer Creek Fee POD.
Drilling operations	No drilling operations	The 33 new fee wells would be drilled in the same manner as described in the drilling plan section of the Deer Creek Fee POD.
Disposal of drilling and water treatment wastes	No waste would be generated	<p>15 feet X 15 feet X 6 feet reserve pits would be constructed on an as needed basis at each well site for the disposal of drilling waste. Up to three (3) wells will be drilled per site.</p> <p>Reserve pit closure occurs within 90 days of well completion. After evaporation of fluids, the pit is backfilled with soil and topsoil and compacted to prevent settling, as described in the Deer Creek Fee POD.</p> <p>Garbage would be stored in containers at the well site and taken off site to an approved facility for disposal. Sewage is handled with portable toilets, as described in the Deer Creek Fee POD.</p> <p>Any excess brine or reject water that is not recycled to other beneficial uses would be transported and injected into a licensed Class I deep disposal well.</p>
Gas & water pipelines & electrical lines	None constructed	<p>Utility corridor will be built along two-track roads.</p> <p>Buried high density polyethylene flow-line to carry gas from the proposed wells to the central collection point.</p> <p>Produced water would be transported through buried, high density polyethylene flow-lines from each well site to the chosen</p>

		<p>water management option. If the treatment and discharge option is utilized, the water would be transported through buried, high density polyethylene and steel central pipeline to the treatment facility and to an existing discharge point adjacent to the Tongue River.</p> <p>Electricity would be brought to the new wells and facilities from existing major power lines in the Deer Creek Fee project area. Electricity would be routed to drop points above ground on poles. At power drop points, electricity will be routed to buried underground cable placed in trenches dug to well sites. Multiple wells will be serviced from each power drop point.</p>
Road maintenance and use	Road maintenance and use would remain in the current condition	<p>Access would be primarily by way of 0.84 miles of existing two-track roads and 3.14 miles of proposed two-track roads.</p> <p>Earthen materials would come from adjacent locations owned by local ranchers. Gravel/scoria from permitted pits would be used when necessary for surfacing materials.</p> <p>Vehicle access will be negotiated with surface owners via a surface use agreement.</p>
Discharge of produced water	No water would be produced or discharged	<p>Water produced from the proposed fee wells will be stored for evaporation, treatment, managed irrigation, and injection. Treated water will be discharged to surface waters of the state and/or utilized for managed irrigation. These activities would occur in accordance with the requirements established in the Montana Discharge Elimination System (MPDES) permit.</p>
Reclamation measures	No reclamation needed	<p>The disturbed surfaces will be reclaimed in accordance with the agreements made with surface owners. The disturbed areas would be seeded with a certified seed mix agreed to by the NRCS and surface owner.</p>

Reclamation timeframes	No reclamation needed	Reclamation would take as place as defined in the Deer Creek Fee POD.
Air quality monitoring	No effects	Per MDEQ permit requirements
Soils monitoring	None required	Sites would be monitored by onsite visits during various stages of development and reclamation to ensure accelerated erosion is not occurring.
Water quality monitoring	None required	Per MPDES requirements.
Wildlife monitoring	None required	Monitoring of specific wildlife species is not required on fee surface. The disturbed areas will be located in such a manner as to avoid disturbing sage grouse and sharp-tailed grouse nesting sites. Drilling activities will be avoided during bald eagle season.