

## **Appendix D**

# **Standard Conditions of Approval (COAs) for CBM Wells and Site-Specific Conditions of Approval**

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**Appendix D1**  
**Standard Conditions of Approval for CBM Wells**  
**Thunder Basin National Grassland**

**Construction and Operations**

- If snow is on the ground when construction begins, it will be stockpiled separately from the topsoil.
- The top 12-inches of soil material will be removed from all areas to be cut or filled. This soil material will be stockpiled and saved for later distribution over the properly reclaimed site. The cut and fill slopes will be constructed at 3:1 grade.
- Utility corridors will not be bladed. If clearing is necessary, they will be brush hogged with the material left on site. Pipeline trenching will segregate the topsoil sub-soil. The trench will be filled with the sub-soil first and the top soil mounded over the trench. Where the company feels it is necessary to blade the utility corridor to have a travel way smooth enough to operate equipment on, they will make a request. The Forest Service will make a site inspection and if they concur, approval will be granted.
- The drilling fluid pit will have a minimum of one-half the total depth below the original ground surface at the lowest point within the pit and will be designed to prevent the collection of surface runoff.
- The drilling fluid pit will have an escape ramp built into one corner of the pit, i.e., a trench no steeper than 45 degrees and no less than 18-inches wide running from the bottom to the top of the pit.
- The only fluids / waste materials which are authorized to go into the drilling fluid pit are RCRA-exempt oil and gas exploration and production waste. Any evidence of non-exempt wastes being put into the reserve pit may result in the authorized officer requiring specific testing and closure requirements.
- The drilling fluid pit will be closed within 90 calendar days of completion of drilling.
- The drilling fluid pit must be fenced with sheep-tight fencing on three sides during the drilling and the fourth immediately after the rig is removed. Fencing will be braced so that it remains effective.
- Sewage will be confined to a chemically treated portable unit on location and disposed of at a State Approved disposal site upon completion of operations. The portable latrine unit will remain on location until completion of operations.
- All garbage/trash/drilling debris will be put in an enclosed trash cage and hauled to an approved State landfill. Burying trash or trash within reserve pit will not be allowed. Burning of trash on the location will not be allowed. The cage must be on-site throughout all drilling, testing and completion activities. Trash cans with lids or closed trailer may be used in lieu of a trash cage.
- All equipment and vehicles must be confined to the access roads utility corridors and pad. Pre-drilling / construction activities are excluded.
- Drilling company temporary directional signs will be allowed on National Forest System lands during the construction and drilling phase.

- If subsurface cultural materials and/or paleontological resources are found during construction, the District Ranger must be notified immediately. Construction must cease until the impact has been properly mitigated.
- A Forest Service representative will monitor construction of the location. Notify the Forest Service (358-4690) 48 hours in advance of any construction.

## Production

- The wellhead, and facilities must be fenced with sheep-tight fencing around each facility. Commercial Metal portable panels made of metal tubing such as those used in the livestock industry is preferred. The District Ranger may approve other designs. Fencing specifications will be approved by the District Ranger before installation.
- Where cattle guards are installed, they will have at least a 16-foot wide driving surface. They will have a commercial type-swinging gate that closes the driving surface and a livestock passage gate beside them. The livestock passage gate will be at least 12 feet wide.
- All gate closure devices will be user friendly. The design must be approved by the forest service before installation. On wire gates, the closure will not be a loop of barbed wire. Most commercial lever type closure devices or a chain that loops the gatepost and hooks systems will be acceptable.
- All above ground production facilities will be a "Standard Environmental Color" as shown on the Munsell Soil Color Charts of the Wyoming BLM. Approved colors are Sand Beige (5Y6/3) and / or Desert Brown \*10YR 6/3) or Shale Green (5Y 4/2). The company may choose any of these colors. This requirement does not apply where special colors are required by safety regulations. All above ground facilities will be painted within six (6) months of installation.
- There will be no pits used in conjunction with producing wells. Temporary work over rig pits are allowed, but must be promptly closed when the work over rig leaves the well site.
- Invasive plants, which become established soils disturbed by developing and operating the wells will be controlled by the company.
- Dust suppression measures such as magnesium chloride are allowed. Prior approval of the specific chemical / process to be used must be obtained from the District Ranger before project implementation.
- Pesticides may not be used to control undesirable woody and herbaceous vegetation, aquatic plants, insects, rodents, trash fish, etc., without the prior written approval of the Forest Service. A request for approval of planned uses of pesticides will be submitted 4 months prior to proposed starting date. Information essential for review will be provided in the form specified. Exceptions to this 4 month prior notification may be allowed, subject to emergency request and approval, only when unexpected outbreaks of pests require control measures which were not anticipated at the time a request was submitted. Only those materials registered by the U.S. Environmental Protection Agency for the specific purpose planned will be considered for use on National Forest System lands. Label instructions will be strictly followed in the application of pesticides and disposal of excess materials and containers.

- Surfacing (gravel or scoria no less than 6-inch deep) is required on Forest Service administered roads that are used for all weather access.
- On roads used for fair-weather access roads will be maintained as two track trails. Excessive rutting, “drive a-rounds”, or “web or roads effect” will require remedy. The individual tire paths may be graveled at the company’s option. The Forest Service may require drainage and / or harding of the driving surface if graveling of the individual track is not effective.

## Abandonment and Reclamation

- A permanent abandonment marker, permanently inscribed with operator, well number, lease number, and location (1/4 section 1/4 section, township, range, county, and state), is required. This monument must consist of a piece of pipe of not less than four (4) inches in diameter and ten (10) feet in length, of which four (4) feet shall be above ground level and the remainder being embedded in cement. The top of the pipe must be closed by a welded or screw cap, cement, or other approved means.
- All disturbed areas, which have been compacted, will be scarified. The cut and fill slopes will be graded and shaped to approximate original contours. Disturbed areas over ¼ acre in size will landscaped to approximate original contours, seeded and fenced with a fence design Forest Service approved by the District Ranger to exclude livestock. Fencing does not apply to linear disturbances, i.e., utility corridors. The fencing will be maintained until removal. It will be removed prior to approval of final abandonment.
- Utility corridors’ reclamation will include water bars. A Forest Service Representative will stake water bars on the ground. Forest Service handbooks (“Gold Book”) will be used as guidance. They will be constructed on the contour at intervals beginning at the top of the disturbed slopes. They should be at least one (1) foot deep, with approximately two (2) feet of drop per one hundred (100) feet of length, and with the berm on the downhill side.
- The Forest Service must approve the seed mix used for reclamation. The following seed mixture and fertilization is recommended. Only certified weed free seed may be used.

Species	Lbs./Acre P.L.S.	Fertilizer
western wheatgrass	5.0	90 lbs. 33-0-0
sender wheatgrass	3.0	30 lbs. 0-45-0
thickspike wheatgrass	2.0	
green needle grass	2.0	
Canada or Cice milk vetch	7.0	
prairie clover (native)	2.0	

- Drill seed on the contour at a depth of 1/2 inch.
- It is recommended that fall seeding take place after September 1 and prior to ground frost. To be effective, complete spring seeding after the frost has left the ground and prior to May 15. To maintain purity and quality certified seed would give the best results.

- All disturbed areas over ¼ acre in size must be mulched at the rate of two tons/acre with certified weed free mulch. Acceptable materials to use as mulch consists of hay, straw, wood chips, etc. The mulch must be crimped into the surface with a disk. This does not apply to utility corridors and two track roads that have established vegetation growing.
- Upon receipt of "Subsequent Report to Abandon" via the BLM, the reclamation will be inspected (usually after the second growing season) by the Forest Service. Reclamation will be approved when the established vegetative cover is free of invasive weeds and equal to 70% of that of adjacent areas.
- Where roads are to be abandoned at the end of production they will be ripped to a depth of eighteen (18) inches before they are disked, seeded, mulched and fenced. On two track roads only the individual tracks are to be ripped. This ripping is to break up the soil compaction to get better re-vegetation in these areas.
- Non-linear areas, which have been subject to compaction, of over ¼ acre in size will be ripped to a depth of eighteen (18) inches before they are disked, seeded, mulched and fenced. This ripping is to break up the soil compaction to get better re-vegetation in these areas.

## General Stipulations

- During all road building, pad construction, drilling, well completion, producing and abandonment activities, all gasoline, diesel powered equipment used must be equipped with approved spark arresters or mufflers. Notify the Forest Service (358-4690) in the event of any fire occurrence.
- Field service men (pumper vehicles) will at a minimum have a shovel and fire extinguisher with them at all times.
- Mowing at well locations up to ½ acre and at other facilities up to 50 feet outside of fences for fire prevention, and worker safety is allowed.
- All storage tanks, barrels and containers will be clearly labeled as to contents and have spill prevention protection with a capacity of 150% of the facility. They will also have Forest Service approved fencing or panels to prevent livestock from touching them.
- All buildings will be signed to the same standard as “well location signs” as required by CFR’s.
- All permanent road signing will be approved by the Forest Service before installation: location, size, colors, wording and material.
- National Forest System lands will not be used for the storage of equipment, supplies or materials that are not necessary and being used for operation of the wells.

**Appendix D2**  
**Site-Specific Conditions of Approval**  
**Thunder Head Plan of Development**  
**Thunderhead PODS 1, 2 AND 3**

Onsites were performed July 18, 19 and 20, 2001 by USFS IDT, representatives of the Proponent Company, its contractors, and the third-party consultants. The following Conditions of Approval (COAs) were agreed to by the Company and the USFS and were incorporated into the Proposed Action. This document will be used to monitor implementation of these conditions through the life of the project.

The following COAs apply to all wells, unless superceded by a site specific COA. Well-specific COAs follow the project COAs.

Drilling, Construction and Production Operations:

1. Off road motor vehicle traffic will be kept to a minimum. Driving on sagebrush is prohibited except (1) for development planning traffic and (2) areas within proposed pipeline/utility/fenceline corridor rights-of-way (ROWs). Once pipeline routes are brushhogged, traffic will be limited to these routes, except where specifically noted in a site specific COA or the Transportation Plan. (Basis for COA: sage grouse habitat protection and prevention of “user created roads.”)
2. Site preparation for pipeline installation in sagebrush areas will be limited to brushhogging of a path no wider than 25 feet. No blading of travel ways is to occur unless noted in a site specific COA. Traffic will be limited to 20 feet either side of the ROW centerline. This allows use outside of the brushhogged ROW to turn around, and similar minor uses. (Basis for COA sage grouse habitat protection.)
3. The top six (6) inches of soil material will be removed from building or facilities sites of over 400 square feet in size. This soil will be stockpiled for use in reclamation. (Basis for COA: utilize seed bank in soil, soil bacterial and soil fertility to shorten reclamation time and protect productive of land.)
4. Each motor vehicle will be equipped with fire suppression equipment including, at a minimum, one shovel and one fire extinguisher. (Basis for COA: fire prevention.)
5. At drill sites, sewage will be confined to a chemically – treated portable unit on location and disposed at a State approved disposal site upon completion of operations. Burying of sewage is not allowed. (Basis for COA: public health)
6. All trash will be contained and removed from the site. Use of trashcans or a trash cage is acceptable. Trash will be disposed of at a State approved disposal site upon completion of operations. (Basis for COA: protection of public land values)

7. Woven wire fencing will be erected at all drilling fluid pits to exclude wildlife and livestock. Unattended pits will be fenced on all sides. An escape ramp will be in at least one corner of the pit, i.e., a 45-degree or less ramp that is at least 18 inches wide from the bottom of the pit to the surface. The Forest Service, before installation, must approve the fencing specifications. (Basis for COA: prevention of big game and livestock mortality.)
8. Neither changing motor oil in vehicles or construction equipment nor discarding of motor oil will occur on National Forest System lands with out specific Forest Service approval. (Basis for COA: to prevent spills of motor oil and possible contamination of soil and water.)
9. Motorized production equipment will have containment devises adequate to prevent drips or spills from contaminating soils. (Basis for COA: to prevent spills of motor oil contaminating soil and water.)
10. All fuel tanks on federal land will have an approved spill prevention containment devise. At a minimum, liners under the tank and berm to contain spills. (Basis for COA: to prevent spills of motor oil contaminating soil and water.)
11. All drilling fluid pits will be dry before being covered with at least 2 feet of native soil material within 3 months of completion of drilling. Provisions to prevent the taking of migratory birds will be provided. (Basis for COA: timely reclamation & prevention of “takings” of migratory birds.)
12. All facilities, except those requiring safety code colors, will be of a lusterless color as shown on the agency Standard Environmental Color Sheet. Facilities requiring painting will be painted within 6 months of start of production. (Basis for COA: to protect visual quality of the National Forest System lands in the mid and back ground views.)
13. Water for drilling may be obtained from Little Thunder Reservoir, provided state provisions for water rights are met. (Basis for COA: to coordinate water use and meet requirement of state laws.)
14. All weather access roads will be constructed to have a 14-foot wide driving surface. Ditches and shoulders will be within a 66-foot ROW. The driving surface will be hardened with gravel or scoria, where all weather access is provided for 4X2 vehicle. (Basis for COA: to protect productivity of land from traffic compaction, and to protect soil and water resources.)
15. Driving off the road to avoid snowdrift is prohibited. Snow plowing may be implemented at the operating company’s pleasure, but is not required. (Basis for COA: to protect productivity of land from traffic compaction, and protect soil and water resources.)

16. A water well agreement will be executed for all Forest Service water wells within the “circles of influence” by the proposed well. (Basis for the COA: to protect the federal investment made in water developments.)

#### Production Operations:

1. Motor vehicle traffic will be confined to established roads and pipeline routes. (Basis for COA: protection of soil and water resources, prevention of user created roads, and protection of wildlife, primarily sage grouse habitat.)
2. Roads will be maintained in useable condition where “mud holes and ruts” do not incline drivers to make a web of roads. Gravel replacement on all weather roads will occur when rutting becomes a difficulty in providing all weather access for 4X2 vehicles. On two track roads, conditions that are causative to “drive arounds – web of roads” will be remedied, typically with graveling of the two tracks or spot graveling of the difficult area. (Basis for COA: to protect productivity of land from traffic compaction, and protect soil and water resources.)
3. Wells and electric panels will be “fenced” to preclude damage from livestock. At the Company’s option other production facilities, such as central collection facilities (CCF) may be fenced or paneled to preclude damage from livestock. The Forest Service approval of the plans and specifications must occur before installation. (Basis for COA: prevention of conflicts with grazing use.)
4. Disturbed areas larger than 400 square feet that are not needed for production will be reclaimed. Stockpiled topsoil will be uniformly spread and native vegetation established. A plan for reclaiming these sites will be submitted for Forest Service approval. Forest Service approval is required before reclamation may begin. At a minimum, the plan must include ripping of compacted soils, shaping to approximate pre-disturbance contours, water bars and drainage adequate to prevent soil erosion, mulching to prevent wind erosion, seed mix and reclamation acceptance standards. Reclamation seeding will be implemented within one year of well abandonment. (Basis for COA: timely reclamation to preserve land productivity.)
5. No pits will be allowed in connection with production. (Basis for COA: protection of wildlife, water and soil resources.)
6. Control of invasive and or legally declared noxious weeds that invade areas disturbed by the CBNG development will be required. A request for Forest Service approval of planned uses of pesticides/herbicides will be submitted 4 months prior to the proposed starting date. All pesticide/herbicide use must be in accordance with a Forest Service approved use plan. Multiple use year plans are encouraged. (Basis for COA: protection of vegetative resource and sustainability of ecosystem.)

7. A location sign displaying the operator and legal location of the facility (meeting 43 CFR requirements) will be posted at each well location and CCF. (Basis for COA: to facilitate cost effective monitoring and administration of permitted uses.)

#### Abandoned Well / Reclamation.

1. All pipelines will be removed unless Forest Service approval to leave them in place is obtained. Forest Service approval to leave the pipelines in place would require that the lines be flushed with water post-production and prior to abandonment. (Basis of COA: to prevent contamination of soils)
2. An above ground permanent abandonment marker, meeting the requirements of 43CFR, will be installed. (Basis for COA: to facilitate cost effective monitoring and administration of permitted uses.)
3. All roads will be obliterated and the area restored with native vegetation, except for those identified in a site specific COA for leaving in place. (Basis for COA: to eliminate unnecessary roads returning maximum amount of land to vegetative production.)
4. Upon plugging and abandonment of the CBNG wells, a travel management plan will be developed by the Forest Service to determine which roads will become permanent system roads and which will be closed, scarified and seeded. (Basis for COA: to eliminate unnecessary roads, returning maximum amount of land to vegetative production.)
5. A plan for reclaiming sites will be submitted for Forest Service approval. Forest Service approval is required before reclamation may begin. All concentrated use areas such as well sites, CCF and any others will be restored to native vegetation. At a minimum, the plan must include remediation of compacted soils, shaping to approximate pre-disturbance contours, water bars and drainage adequate to prevent soil erosion, mulching to prevent wind erosion, seed mix and reclamation acceptance standards. Reclamation seeding will be implemented within one year of well abandonment. (Basis for COA: to provide timely reclamation meeting post gas extraction land uses.)

## Site-Specific Conditions of Approval Thunderhead Plan of Development # 1

Relocation of the well location, access corridor for two-track road, water, gas and buried electric line was considered for all wells.

### Well: **12-8-4371**

Two track road, gas line, water line, and electric line will be in a straight-line route from 12-8-4371 to the 21-8-4371. This will be the access for drilling as well as production.

### Well: **14-8-4371**

The gas line, water line, and electric line will be in a straight-line route from 12-14-4371 to the CCF in the southeast corner of Section 7, T43N/ R71W on private land unless documentation is provided of private landowner's refusal or the CCF does not have capacity for the gas. In the event that there is not sufficient capacity at the CCF, piping will go from the 14-8-4371 to the 23-8-4371.

A playa near the well has been recorded as the site of a sage grouse lek. If the lek is found to be active, a No Surface Occupancy restriction would be applied to wells within the mitigation buffer of the lek. If the playa is designated as a feature to be buffered, the ¼-mile restriction on permanent occupancy would eliminate the 23-8-4371. A ¼-mile no-permanent occupancy buffer on this location would result in the elimination of both proposed well locations and the travel corridor. Moving the wells outside the buffer would require application for exception locations. Alternate travel corridors are possible to these exception locations.

The two-track road will be on a straight-line route down the utility corridor to the CCF in the southeast corner of Section 7, T43N/ R71W on private land to the fence between the private land in Section 7 and the National Forest System land in Section 8, thence south parallel to the fence line to the cattle guard entering private land. Due to roughness of land surface on this route, it will be necessary to blade smooth a 25-foot wide ROW driving surface.

If Private land owner refusal is provided or pipeline capacity does not exist at CCF on private land Section 7, T43W/R71N the a two track road, gas pipe line, water pipe line and electric line will bend from a straight line around the east side of the playa on the ridge adjacent to the playa, a straight line between the 14-8-4371 and 23-8-4371 skirting around the playa on the east side to avoid it. If it is necessary to use this route due to roughness of land surface, it will be necessary to blade smooth a 25 foot wide ROW driving surface.

The alternative, using the shorter route to the private land, is some what better than a straight line between the 14-8-4371 and 23-8-4371 except for skirting around the playa on the east side, but both are acceptable. Both require blading of the surface to install the pipelines and electric line and for water truck and drill rig access.

Well: **21-8-4371**

The two track road, gas line, water line, and electric line will be in a straight-line route from 21-8-4371 to the 32-8-4371. This will be the access for drilling as well as production.

Well: **23-8-4371**

The two track road, gas line, water line, and electric line will be in a straight-line route from 23-8-4371 to the 32-8-4371. This will be the access for drilling as well as production. Minor amounts of blading will be required, i.e., short reaches of less than 100 feet, with a total blading of less than 500 feet.

Note: See conditions detailed for 14-8-4371.

Well: **32-8-4371**

Note: There is a CCF at this well location. There will be hardening (gravel or scoria) of the parking area, and turn around areas. The CCF poses no hazards to livestock or wildlife, thus fencing or panels to protect animals are not required. Via a sundry notice the company may, at its option, at a later date request approval to fence or panel the CCF.

The two track road, gas line, water line, and electric line will be in a straight-line route from 23-8-4371 to the 32-8-4371. This will be the access for drilling as well as production. Minor amounts of blading will be required, i.e., short reaches of less than 100 feet, with a total blading of less than 500 feet.

A two track road and trenched utility line will be in a straight-line route from 32-8-4371 to the 41-8-4371 on private land. This will be the access for drilling as well as production. Minor amounts of blading will be required, i.e., short reaches of less than 100 feet, with a total blading of less than 500 feet.

A two track road, gas line, water line, and electric line will be an approximate straight-line route staying on the ridge top from 32-8-4371 to the 43-8-4371 on private land. This will be the access for drilling as well as production. Minor amounts of leveling and blading will be required to cross the existing pipeline, i.e., less than 100 feet either side of the existing pipeline.

A two track road, gas line, water line, and electric line will be a straight-line route from 32-8-4371 to the 21-8-4371. This will be the access for drilling as well as production.

Well: **43-8-4371**

There has been a ferruginous hawk nest recorded within ½ mile of this location. If the nest is found to be considered active, no construction activities will be allowed during the time period of March 1 through July 31 of each year.

The water management plan discharge point that was planned for Thunderhead 1 was here. Because there is no ephemeral drain into which to discharge, and it must be relocated.

Subsequent resolution: The water discharge point has been moved to a viable location in the SENE of Section 9. The lessee has requested water at a reservoir in the SWSWNW Section 9 for livestock. This pond is on a tributary to Rochelle Lake, a playa. To meet lessee's request will be a closed-system stock tank with pressure flow and shutoff is proposed.

Underground electric will come from an overhead drop point south of the 34-8-4371, then in the trench from the 34-8-4371 to the 23-8-4371 to the header at the 32-8-4371 location. The gas line will follow the route described above. The existing drop point about 1500 feet west of the proposed drop point for this section services Section 17 and will not accommodate Section 8 as well. The lessee requested a tire tank at the 23-8-4371. The tank would be a closed-system stock tank with pressure flow and shutoff.

Ferruginous hawk nest territories in Sections 9 and 10 will not be impacted by the project, as they lie outside the distance designated for no-surface occupancy. Timing restrictions on construction activities will adequately protect the nest territories.

A two track road, gas line, water line, and electric line will be an approximate straight-line route staying on the ridge top from 32-8-4371 to the 43-8-4371 on private land. This will be the access for drilling as well as production. Minor amounts of leveling and blading will be required to cross the existing pipeline, i.e., less than 100 feet either side of the existing pipeline.

Well: **34-8-4371**

The 12-inch sales pipeline “stub out” is on private land directly south of this location. Access to the CCF for this pipeline and electric service will come over from the “stub out” to the existing pipeline. These parallel the existing pipeline and go past the 43-8-4371 location to the CCF at the 32-8-4371 location. This will be a 12-inch pipeline and under ground electric line that serves the POD. Minor blading will be required at drainage crossings and crossings of the existing pipeline.

The two track road, gas line, water line, and electric line from the 34-8-4371 location to the CCF at location 32-8-4371 will be on the same route as the 12-inch sales line, i.e., parallel to the existing pipeline.

Access for drilling, i.e., water truck and drill rig, may either come from the CCF at the 32-8-4371 location or may come from private land following the 12-inch pipeline route.

Note: There is an existing segment of two-track road from about the 34-8-4371 location going west that may be desirable to eliminate.

## Site-Specific Conditions of Approval Thunderhead Plan of Development # 2

Relocation of the well location, access corridor for two-track road, water, gas and buried electric line was considered for all wells.

### Well: **32-10-4371**

This location, 32-10-4371, will have a CCF. A 12-inch sales pipeline, water disposal line and electric service come to the site from the private land to the west. No issues, other than having a cattle guard with gate beside it for trailing of livestock, at the fence were identified. A review of this route did not disclose any issues or concerns; no violations of T&E laws, nor any proposed surface uses that are not congruent with best management practices or the Gold book practices.

Primary access to this well group now comes through an existing hinged pole gate at the northeast corner of the pasture where Hilight Road takes off from Highway 450. A cattle guard will be installed beside this gate.

An all weather road, gas line, water line, and electric line will be on a straight-line route from 32-10-4371 to the 41-10-4371 and these will connect with the all weather road to the existing gate on the Hilight Road. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be on a straight-line route from 32-10-4371 to the 43-10-4371. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be on a straight-line route from 32-10-4371 to the 23-10-4371, which is located on private land. This will be the access for drilling as well as production.

There is a potential to bring access into the site from the private land to the west along the 12-inch sales line. A roads analysis should consider this option.

The grazing user has expressed a desire for stock water from this POD. There is an opportunity to place a tire tank (farm tap) at the fence between the federal surface and the private surface where the sales line, water discharge line and electric line cross that boundary and let any overflow run on to private land.

*A closed-system stock tank (with pressure flow and shutoff) is proposed on the east side of the fence line just northwest of the 34-10-4371. This will be a flow-through system with the water line ending on the west side of the fence on private property. A trench will be dug from that point through the natural swale to an established watercourse in the SWNW of Section 10.*

Well: **34-10-4371**

A two track road, gas line, water line, and electric line will be on a straight-line route from 34-10-4371 to the 43-10-4371. This will be the access for drilling as well as production.

Well: **41-10-4371**

An all weather access road will come from the current gate location on the Hilight Road, i.e., north edge of the NENENE of Section 10 run to the 41-10-4371, thence straight line to the CCF at the 32-10-4371. The gas, water and buried electric lines will also be on this route.

The grazing user has expressed a desire to have CBM supply stock water in this pasture. A possible location would be where the 12-inch sales line running to the west from the 32-10-4371 enters private land. See note on the 32-10-4371 location

Well: **43-10-4371**

The potential to have access to the Hilight Road from this site exists, just as it does from the 41-10-4371 location.

A two track road, gas line, water line, and electric line will be on a straight-line route from 43-10-4371 to the 32-10-4371. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be on a straight-line route from 43-10-4371 to the 34-10-4371. This will be the access for drilling as well as production.

Well: **12-11-4371**

The access corridor from this 12-11-4371 location to the 21-11-4371 has raptor concerns. The project wildlife biologist needs to resolve these concerns.

The utility/travel corridor from the 12-11-4371 to the 21-11-4371 should be routed to follow a grass/sage interface to avoid fragmenting sagebrush.

A two track road, gas line, water line, and electric line will be a straight-line route from 12-11-4371 to the 23-11-4371. This will be the access for drilling as well as production.

Well: **21-11-4371**

Note: Relocation of the well location, access corridor for two-track road, water, gas and buried electric line was considered. No alternatives better than the proposed were identified unless specifically noted in the following.

The access corridor from the 12-11-4371 to the 21-11-4371 has raptor concerns. USFS project wildlife biologist needs to resolve these concerns.

There will be a timing limitation for any active raptor use at this location. The USFS project biologist will resolve and determine any specific COAs and will follow-up on any need to move well location, pipeline location for gas, water and electric line or road access location.

Well: **14-11-4371**

Note: The all weather road, to the CCF on private land in Section 14 will cross the SE corner of the W ½ of Section 11, i.e., cross at almost the common corner of the W ½ of Section 11 and E ½ of Section 14. The CCF is in the NE ¼ of the NW ¼ of Section 14 on private land.

A two track road, gas line, water line, and electric line will be on a straight-line route from 14-11-4371 to the 23-11-4371. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be on a straight-line route from 14-11-4371 to the 21-14-4371 located on private land adjacent to the CCF. This will be the access for drilling as well as production.

Well: 23-11-4371

Note: Relocation of the well location, access corridor for two-track road, water, gas and buried electric line was considered. No alternatives better than the proposed were identified unless specifically noted in the following. Note: this location is in a crested wheat grass field with smooth ground.

Note: The all weather road, to the CCF on private land in Section 14 will come across the SE corner of the W ½ of Section 11, i.e., cross at almost the common corner of the W ½ of Section 11 and E ½ of Section 14. The CCF is in the NE ¼ of the NW ¼ of Section 14 on private land.

A two track road, gas line, water line, and electric line will be on a straight-line route from 23-11-4371 to the 14-11-4371. This will be the access for drilling as well as production. Note: This route is through a crested wheat grass field with no sage grouse or Mountain plover issues.

Two track road, gas line, water line, and electric line will be a straight-line route from 23-11-4371 to the 12-11-4371 location. This will be the access for drilling as well as production.

Well: **32-14-4371**

A two track road, gas line, water line, and electric line from the 32-14-4371 to the 34-14-4371 will be a “meander line” deviating from the straight-line route. It will be flagged on the ground by the Forest Service avoiding dense sagebrush. From the 34-14-4371 l it will go west to an existing two-track thence north through grassy openings to the 34-14-4371 location. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be a straight-line route from 32-14-4371 to the 21-14-4371 location. The 21-14-4371 location is on private land adjacent to the CCF. This will be the access for drilling as well as production.

Well: **34-14-4371**

The well site location is good, with no need to move or relocate the proposed 34-14-4371.

A two track road, gas line, water line, and electric line from the 34-14-4371 to the 32-14-4371 will be a “meander line” deviating from the straight-line route. It will be flagged on the ground by the Forest Service before construction. The purpose of this is to avoid dense sagebrush, i.e., excellent sage grouse habitat. From the 34-14-4371 location the access corridor will go west to an existing two track, thence north through grassy openings to the 34-14-4371 location. This will be the access for drilling as well as production.

### Site-Specific Conditions of Approval Thunderhead Plan of Development # 3

#### Thunderhead #3: **Section 18 POD; Access from the Section 18 to Section 19**

Access connecting these sections will be on a route paralleling the existing pipeline and the two track road that is about 75 feet south of both the 14-18-4371 location and 21-19-4371 location, i.e., the two track road due south from the well to the pipeline then along the pipeline to the other well.

Primary access to the header serving Section 18 will come from Highway 450 south along the section line between Section 7 T43R71 and Section 12 T43R72, then south to the header at 43-13-4372. Power will come from an overhead line running east/west along section line between Sections 7 and 18 of T43R71. Buried line to the POD will follow the header/POD access/utility corridor.

The adjacent private landowner strongly opposes a road going through the fence between the north half of Section 18 and the south half of Section 18. He will not allow north-south traffic through the section.

As the neighboring surface owner does not want gates between the north and south halves of Section 18, wells in the south half of Section 18 will be accessed by an existing two track running near or on the boundary of Sections 13/18. This access is different from that proposed in the Scoping Statement project description.

The water discharge point for this POD has been moved to a location above a small reservoir just southwest of the 12-18-4371. A closed-system stock tank with pressure flow and shutoff is proposed near the discharge point to provide livestock water.

**Well: 14-18-4371**

There are no sage grouse issues at this location, which is “tuffy” cactus with less than 5% sagebrush. It is a good flat location for a well. Existing constructed features include a pipeline, corrals, and wind break on private land. The pipeline ROW easily has twice the amount of forage as undisturbed adjacent land.

Power is to come from the existing Barrett Resources Corporation (Williams) overhead power line on private land paralleling the west edge of Section 18. A buried line would either come directly east from the existing overhead line to the 14-18-4371 location or parallel to the existing power line. Neither route is clearly better than the other, and both are acceptable.

The two track road, will be a straight-line route from 14-18-4371 to the 23-18-4371. The gas, water and electric lines will be a straight-line route from the 14-18-4371 to the existing header in the NESE Section 13 43/72. The two-track road will follow this route to the section line, then meet an existing two-track and follow the fenceline north. This will be the access for drilling as well as production. Blading of the route will be necessary.

**Well: 23-18-4371**

The two track road, will be a straight-line route from 14-18-4371 to the 23-18-4371 location. This will be the access for drilling as well as production. Blading of the route will be necessary. It will be necessary to install a culvert “sized” for this drainage crossed and to harden with gravel or scoria the surface of the crossing.

The gas line, water line, and electric line will be a straight-line route from the 23-18-4371 to the 12-18-4371, which is located on private land. About 100 yards of this route is on National Forest System.

Access from the 23-18-4371 to the 43-18-4371 will be northeast from the 23-18-4371 to the fence, thence east along the fence thence southeast to the 43-18-4371. More specifically to the fence between the private land (north half of Section 18) and National Forest System (south half of Section 18) on a straight line between the 23-18-4371 and the 32-18-4371 on private land, thence east down the fence to the straight line between location 32-18-4371 and 43-18-4371, thence southward on this straight line to the 43-18-4371 location. This route will be bladed to smooth the travel way and hardened with gravel or scoria. The soils are prone to becoming muddy, and this will prevent drive-a-rounds and off-road impacts.

A two track road, gas line, water line, and electric line will be an approximately straight-line route from 23-18-4371 to the 34-18-4371. This access will have to be bladed. It will be on a line bending west from the straight line between the 23-18-4371 the 34-18-4371 location staying in cactus and sparse sage brush with a “bending” of 200 yards to avoid dense sage brush sage

grouse habitat. The route will be pin flagged by the Forest Service before construction. The road may be hardened with gravel or scoria at the company's pleasure. This would not be an all weather road, just gravel spread on the smoothed driving surface.

This will be the access for drilling as well as production. Blading of the route will be necessary. It will be necessary to install a culvert "sized" for this drainage where the drainage is crossed and to harden the surface of the crossing with gravel or scoria.

The adjacent private landowner strongly opposes a road going through the fence between the north ½ of Section 18 and the south ½ of Section 18. He will not allow north-south traffic through the section.

The water discharge for this POD will be at the drainage on the straight line between the 12-18-4371 location and the header location in the NESE Section 13, T43N/R72W.

Well: **34-18-4371**

The 34-18-4371 will be moved to the pin flagged location which is approximately 150 feet northward on a straight line between the staked 34-18-4371 and the 23-18-4371. This moves the well upon a bench out of the area prone to flooding.

A two track road, gas line, water line, and electric line will be an approximately straight-line route from 23-18-4371 to the 34-18-4371. The access will have to be bladed. It will be on a line bending west from the straight line between the 23-18-4371 the 34-18-4371 location staying in cactus and sparse sage brush with a "bending" of 200 yards to avoid dense sage brush sage grouse habitat. The route will be pin flagged by the Forest Service before construction. The road may be hardened with gravel or scoria at the company's pleasure. This would not be an all weather road, just gravel spread on the smoothed driving surface.

A straight line between the 34-18-4371 and the 23-18-4371 would go through the only good sage grouse habitat in Section 18, thus the access was relocated.

Well: **43-18-4371**

Access from the 23-18-4371 to the 43-18-4371 will be north from the 23-18-4371 to the fence thence along the fence thence south to the 43-18-4371; more specifically, to the fence between the private land (north half of Section 18) and National Forest System (south half of Section 18) on a straight line between the 23-18-4371 and the 32-18-4371 on private land, thence east down the fence to the straight line between location 32-18-4371 and 43-18-4371, thence southward on this straight line to the 43-18-4371 location. This route will be bladed to smooth the travel way and hardened with gravel or scoria. The soils are prone to becoming muddy and this will prevent drive-a-rounds and off-road impacts.

No wildlife issues were noted at this location, 43-18-4371. The soils here are prone to become muddy thus the travel way will be hardened.

### Thunderhead #3: Electric Power to Section 20

In Section 20, electric power will come from the east/west above-ground power line along the south edge of Sections 19 and 20 directly into the 14-20-4371 well.

### Thunderhead #3: 12-inch Gas Line and Primary Access to Section 20

Primary access into the Section is on an existing improved (crowned and ditched) road that serves for access to existing conventional wells in Section 19. This road would have to be extended to access proposed wells in Section 20. Primary access into Section 20 will enter the Section from just south of the 14-20-4371.

The 12-inch gas line servicing Section 20 comes into Section 20 from the southeast quarter of Section 17 straight south to the 41-20-4371, then follows the utility/access corridor southwest to the header location at the 23-20-4371 well location.

#### Well: **23-20-4371**

The CCF will be at this 23-20-4371 location. There is less than 5% sagebrush cover at this location.

Crowned and ditched road, gas line, water line, and electric line will be a straight-line route from 23-20-4371 location to the 14-20-4371 location. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be a straight-line route from 23-20-4371 location to the 34-20-4371 location. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be a straight-line route from 23-20-4371 location to the 12-20-4371 location. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be a straight-line route from 23-20-4371 location to the 32-20-4371 location. This will be the access for drilling as well as production.

The 12-inch gas line will run in a straight line route from the section line north of the 41-20-4371 to the 41-20-4371 then in a straight to the 23-20-4371, the location of the header.

#### Well: **14-20-4371**

No wildlife issues were noted for this location.

The crowned and ditched road, gas line, water line, and electric line will be a straight-line route from 23-20-4371 to the 14-20-4371. This will be the access for drilling as well as production.

**Well: 34-20-4371**

Note: This site has sagebrush and is secure sage grouse habitat. Moving the location was evaluated and it was found moving the location  $\pm$  200 meters would not help mitigate the impacts. No other apparent adverse impacts to wildlife or other resources were identified.

A two track road, gas line, water line, and electric line will be a straight-line route from 23-20-4371 location to the 34-20-4371 location. This will be the access for drilling as well as production

A stock water tank has been requested by the surface lessee at the playa east of the 34-20-4371. This stock tank will be a closed-system stock tank with pressure flow and shutoff. A water line would run from the 34-20-4371 to the stock tank.

**Well: 12-20-4371**

There is marginal sage grouse habitat at this 12-20-4371 location consisting of 5% sagebrush cover with lots of cactus.

A two track road, gas line, water line, and electric line will be a straight-line route from 23-20-4371 location to the 12-20-4371 location. This will be the access for drilling as well as production. This appears to be the best route for wildlife as well as the least soil disturbance.

**Well: 32-20-4371**

There is little sagebrush on the site.

The two track road, gas line, water line, and electric line will be a straight-line route from 32-20-4371 location to the 23-20-4371 location. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be on a straight-line route from the 32-20-4371 to the 43-20-4371. This will be the access for drilling as well as production.

Two track road, gas line, water line, and electric line from the 32-20-4371 location to the 41-20-4371 location will be on a route pin flagged by the USDA Forest Service at the time of construction. This route will be a line “bowed” west of a straight-line from 32-20-4370 to 41-20-4371 to avoid dense sagebrush. The “bowed” will be  $\pm$  300 feet from the straight line. This will be the access for drilling as well as production.

A two track road, gas line, water line, and electric line will be a straight-line route from the 32-20-4371 location to the 21-20-4371 location. This will be the access for drilling as well as production. Note: This access will impact sagebrush/sage grouse habitat, but no better

alternative exist. This appears to be the best route and an acceptable route. Options considered included moving the location, moving the access and combinations of them.

A 12-inch gas line will run in a straight line route from the section line north of the 41-20-4371 to the 41-20-4371, then in a straight to the 23-20-4371, the location of the header.

Well: **43-20-4371**

A two track road, gas line, water line, and electric line will be straight-line route from the 32-20-4371 to the 43-20-4371. This will be the access for drilling as well as production.

Well: **21-20-4371**

A two track road, gas line, water line, and electric line will be straight-line route from the 32-20-4371 to the 21-20-4371. This will be the access for drilling as well as production. Note: This access will impact sagebrush/sage grouse habitat, but no better alternative exist. This appears to be the best route and an acceptable route. Options considered included moving the location, moving the access and combinations of them.

The discharge point for produced water from the wells in this section will be at a location just north of 21-20-4371. A stock water tank has been requested by the surface lessee at the playa east of the 34-20-4371. This stock tank will be a closed-system stock tank with pressure flow and shutoff. Water line will run from the 21-20-4371 location north to the discharge point. The discharge will be directly into the mainstem of Little Thunder Creek.

Well: **41-20-4371**

There is little sagebrush on the well site; however, there is dense sagebrush on the access routes.

Two track road, gas line, water line, and electric line from the 32-20-4371 location to the 41-20-4371 location will be on a route pin flagged by the USDA Forest Service at the time of construction. This route will be a line “bowed” west of a straight-line from 32-20-4370 to 41-20-4371 to avoid dense sagebrush. The “bow” will be  $\pm$  300 feet from the straight line. This will be the access for drilling as well as production.

A 12-inch gas line will run in a straight line route from the section line north of the 41-20-4371 to the 41-20-4371 then in a straight to the 23-20-4371, the location of the header.

### Thunderhead #3: Overview for Section 21

In Section 21, there are wells that have approved APD’s. They are: the 41-21, 32-21, 34-21 23-21. These wells are served by water discharge, all weather access and 12-inch gas sales line and CCF, which is located at the 32-21. The wells considered in this analysis are the three locations: 14-21, 12-21 and 21-21. This section is adjacent to the Little Thunder Reservoir.

Well: **14-21**

A two track road, gas line, water line, and electric line will be from the 14-21 location to the 32-21 location where the CCF will be located. This route passes directly through the 23-21 location, which is on private surface. Note: The 23-21 and 32-21 and CCF are approved in current APD's. This will be the access for drilling as well as production.

A cattle guard with a gate beside it for trailing of livestock will be installed on the fence between the private land and National Forest System land.

Well: **12-21**

A two track road, gas line, water line, and electric line will be straight-line route from the 12-21 location to the 23-21 location, which is on private land. The 23-21 is approved in a current APD. This will be the access for drilling as well as production.

Well: **21-21**

A two-track road, gas line, water line, and electric line will be straight-line route from the 21-21 location to the 32-21 location with a minor deviation at Little Thunder Creek so that only one crossing of the creek is made. At the creek crossing a culvert sized for flood events (minimum 48-inch culvert) will be installed with a surface hardened by gravel or scoria and by pass overflow provision. Minor soil disturbance at the crossing will be necessary. Disturbance outside of a 66-foot right of way is not anticipated. Note: the 32-21 is approved in a current APD. This will be the access for drilling as well as production.

A cattle guard with a gate beside it for the trailing of livestock will be installed where the access crosses the pasture fence.