



Pinedale Anticline Project Area Monitoring for Reclamation Success

In accordance with the Pinedale Anticline Record of Decision signed September 12, 2008, this Reclamation Monitoring Plan was developed to give standardized guidance for monitoring the reclamation success in the Pinedale Anticline Project Area. This plan contains criteria that are required to be measured and reported annually to the Bureau of Land Management and Pinedale Anticline Project Office.

**Bureau of Land Management
Pinedale Field Office
Pinedale Anticline Project Office
Pinedale, Wyoming
Version 2**

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Pinedale Anticline Project Area Monitoring for Reclamation Success

1. Introduction

In accordance with the Record of Decision for the Final Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project dated September 2008 (FSEIS ROD), this Reclamation Monitoring Plan was developed to give standardized guidance for monitoring reclamation success in the Pinedale Anticline Project Area (PAPA). This Plan contains criteria that are required to be measured and reported annually to the Bureau of Land Management (BLM) and Pinedale Anticline Project Office (PAPO). All development will be considered under this monitoring plan including new, existing and future development. Methodologies for monitoring include guidance from the Reclamation Plan identified in the FSEIS ROD (Appendix C). Suggested seed mixes (Appendix A), required forms (Appendix B), Weed Management Plan (Appendix D), and a glossary of terms are included in this document. All parts of this monitoring plan are subject to the adaptive management process as outlined in Appendix E. Adaptive management and site-by-site reclamation applications and modifications may be considered on a case by case basis. It is a recommendation that monitoring be conducted early in the season when plants are growing and forbs are present; generally May 1 to June 30. If a lease is sold or changes ownership, it shall become the responsibility of the new lessee to follow the regulations set forth in this document and in the FSEIS ROD including all other State and Federal regulations associated with leased lands.

2. Responsibilities

2.1. Responsibilities of the Operator

Provide a geospatial data meeting Federal Geographic Data Committee (FGDC) standards hard and digital copies with metadata (location, physical and biological description of sites to be used as reference areas for reclamation success). Operator shall provide an Annual Monitoring Report and assessment as per the FSEIS ROD Appendix C Reclamation Plan, no less than three weeks prior to the Annual Planning Meeting or January 31, whichever comes first, to both the BLM and PAPO for review. Operator shall submit data to the PAPO database as collected in the format provided by the PAPO. (Hard copies shall be submitted of all data to both the BLM and PAPO until the database is functioning). Operator shall report any reclamation issues upon discovery (present or upcoming events that may impair success) to both the BLM and PAPO in writing. All locations will require Wyoming Big Sage *Artemisia tridentata ssp. wyomingensis*, unless otherwise approved by the BLM AO and PAPO.

2.2. Responsibility of the PAPO

Evaluate annual monitoring reports, support or refute findings of reclamation assessments (regarding success and rational) and recommend adaptive management as warranted to achieve successful reclamation. In addition, coordinate with the BLM Authorized Officer (AO) to achieve the goals set forth in the FSEIS ROD. The PAPO will randomly evaluate a minimum of 5 % of the locations within the PAPA each year generally May 1 and June 30. PAPO will maintain the monitoring database and provide Operators with data submission protocols once the database is functioning.

2.3. Responsibility of the BLM

Will accept or refute PAPO recommendations, coordinate with the PAPO to achieve the goals set forth in the FEIS ROD, and prescribe remedial actions to the operators when reclamation success criteria are not met. Remediation in writing from the BLM AO may include one or more actions such as soil amendments, irrigation, seeding, etc.

3. Quantitative Monitoring

3.1. Reference locations

- 3.1.1.** Permanent reference sites will be identified by each Operator and submitted to the BLM and PAPO for approval. Reference sites will be located in areas not planned for future disturbance/development and may lay outside of the infill in order to retain them as long term reference sites year to year.
- 3.1.2.** Reference sites will be recorded by Global Positioning System (GPS) North American Datum (NAD) 83 marked and described in writing identifying the ecological site, vegetation, precipitation zone and any other information deemed relevant to provide year-to-year comparison to the monitored site. A permanent transect and photo point (also marked by GPS) will be taken and marked for year-to-year verification. These photos will be taken from the same point each year and start with north, then east ,south and west to keep them uniform and will include one photo of the soil surface for reference. Every reference site will be verified once per year using the point intercept method. This data will be included in the Annual Monitoring Report. Each reference location will be representative of the ecological site of the location to be monitored as a whole (Appendix C, C.4).

3.2. Well Pads and Rights-of-Way (ROW)

3.2.1. Well Pads

- 3.2.1.1.** There will be a minimum of one 100 meter transect per every 5 acres of well pad. Each well pad will require one set of directional photos north, east, south and west, rather than each transect, unless otherwise required by the PAPO or BLM. Each transect will be paired with a reference location representative of the five acres as a whole.
- 3.2.1.2.** Seed mix method used for seeding, including dates and disturbance history of each pad, will be recorded in the annual reports.

3.2.2. ROW

- 3.2.2.1.** All ROW require a minimum of one 100 meter monitoring location every half mile, including photos down the transect and notation of the direction will be in the comments (north, south, east, west) and one photo of the soil surface (total 2 photos per location). These photos can be downloaded by batch to the database once online.
- 3.2.2.2.** ROW Operators will provide a plan of their reclamation monitoring plan to the BLM and PAPO. This plan will address all goals and requirements listed in the FSEIS ROD, as well as more specific requirements listed in this document

for well pads. In addition, this plan will include a detailed outline stating how each pipeline company will comply with the reclamation monitoring criteria and shared ROW plans of action for short term and long term monitoring. This plan will include location identification, seed mix, seeding dates, deliverables, soil preparation, monitoring dates, etc. All ROW of less than one half mile will require a minimum of 1 monitoring location.

3.3. Monitoring schedule:

- 3.3.1.** Year of reclamation: Operators will submit a Sundry Notice to the BLM and PAPO with updated information on actual site preparation methods, seed mixes used, planting methods, time of planting, and any specific treatments to the pad. ROW will require an updated plan of development/ reclamation plan that include information on actual site preparation methods, seed mixes used, planting methods, time of planting, and any specific treatments. In addition, ROW will submit a plan of action detailing how they will deal with shared and overlapping ROW, to the PAPO and BLM.
- 3.3.2.** Starting in the third growing season post seeding, quantitative monitoring will be required annually for all well pads and ROWs until the location meets interim reclamation standards as set forth in the FSEIS ROD, Appendix C.
- 3.3.3.** In the fourth season post seeding, a baseline should be formed. If monitoring shows reclamation is not establishing, PAPO will make recommendations for remedial actions.
- 3.3.4.** In the fifth season post seeding, a trend meeting successful reclamation criteria should be seen. If quantitative monitoring shows reclamation is not proceeding, PAPO will make recommendations for remedial actions.
- 3.3.5.** In the eighth season post seeding, reclamation criteria outlined in the FSEIS ROD, Appendix C, should be met. If quantitative monitoring shows reclamation does not meet reclamation criteria, PAPO will make recommendations for course of action.
- 3.3.6.** Quantitative monitoring will be conducted annually on 20% of locations that have met interim reclamation criteria outlined in FSEIS ROD, Appendix C. These locations will be monitored on an alternating schedule approved by the BLM and PAPO. This schedule should be proposed in the Operator's Annual Monitoring Report.

3.3.7. Quantitative monitoring will continue until final reclamation for bond release has been met unless otherwise approved by the BLM AO and PAPO.

3.4. Data Collection

- 3.4.1.** Permanent photo points will be established for each monitoring site on each pad and half mile of ROW. At each location photos will be taken as close to the same time each year as feasible in order to reduce the differences in plant growth characteristics.
- 3.4.2.** A close-up photo to show the soil surface characteristics and the amount of ground surface covered by vegetation and litter will be required for every transect. For pad locations, photos will be taken from the center mark of transect nearest the center of the pad in a north, east, south and west views. This will allow for consistency in the direction when downloaded to the database. The center point may vary as pad size increases and will be noted in the comments on the monitoring forms for each location. NOTE: each well pad will require one set of directional photos north, east, south and west, rather than each transect, unless otherwise required by the PAPO or BLM.
- 3.4.3.** When possible a representative of the BLM and PAPO will accompany the Operator and or their representative during data collection within the season to verify compliance with the monitoring criteria.
- 3.4.4.** BLM, PAPO, all Operators and their representatives will use the following methods to verify compliance. (See Appendix B for methodology and data forms).
- 3.4.5.** Line-point intercept method will be used to determine bare ground (basal or canopy cover).
- 3.4.6.** Density method as described in “Sampling Vegetation Attributes Interagency Technical Reference” will be used to measure density (Appendix B).
- 3.4.7.** Frequency method as described in “Sampling Vegetation Attributes Interagency Technical Reference” will be used to measure frequency (Appendix B)
- 3.4.8.** Production measurements at final reclamation will be made using the double sampling method (Appendix B).

4. Qualitative Monitoring

4.1. Monitoring Schedule:

- 4.1.1.** Starting the first growing season post seeding, qualitative monitoring shall be conducted annually on all reclamation sites (all pads and ROW) until the locations have met the interim reclamation criteria, usually at the eighth year, set forth in Appendix C, C.4.1.
- 4.1.2.** Once interim reclamation has been met as approved by the BLM and PAPO, a location can be included into a monitoring cycle of 10% of pad locations and 5% of the ROW to be monitored on an alternating schedule. Operator must notify the BLM and PAPO in writing to make this request and submit an alternating schedule to be approved by the BLM and PAPO. Monitoring will continue until final reclamation for bond release has been met unless otherwise approved by the BLM AO and PAPO.
- 4.1.3.** All pads and ROW: locations will be free of all undesirable materials such as trash and construction debris.

4.2. Data Collection

- 4.2.1.** Qualitative monitoring consists of “observations” of the location and should be a brief overview. The Reclamation Monitoring Trend Worksheet will be used to collect this data (Appendix B).
- 4.2.2.** Results from qualitative monitoring may require additional photos if there are areas found by the monitoring team to be of concern (rills, no vegetation, weed infestations, slumping or other such problems). These will be sent to the PAPO and BLM for review with a written plan of action from the operator to address the issue.

5. Weed Monitoring

- 5.1.** All pads and ROW will be free of all noxious weeds listed by the State of Wyoming and Sublette County. All State and Federal regulations associated with noxious weed treatments will be required and enforced.
- 5.2.** Annual nuisance weedy plants such as kochia, halogeton, lambsquarters, etc. will have an allowed threshold of 10% canopy cover on each pad as a whole and 4% canopy cover on each one mile of ROW at which time the Pads and ROW will be considered free of

undesirable species. NOTE: At final reclamation for bond release the threshold will not exceed 1% canopy cover of annual weedy species for any location or ROW.

- 5.3.** A Weed Management Plan will be submitted as per the Pinedale BLM weed management policy to the BLM Weed Management Coordinator by every operator for approval from the BLM AO and BLM Weed Management Coordinator. A record of this plan will be filed with the PAPO. Each BLM Natural Resource Specialist (NRS) will receive a copy of the Weed Management Plan submitted by the operator they are assigned to from the PFO Weed Management Coordinator once it has been approved.
- 5.4.** Noxious and invasive species monitoring will be conducted annually, on each location and ROW. Downy Brome (cheatgrass) and other invasive plants will be reported in writing to the BLM and PAPO upon discovery and the location will be recorded as an “invasive species location” in the database. Treatment will follow as per each company’s BLM-approved Weed Management Plan. A written approval for a cheatgrass treatment will be required from the BLM AO, PAPO, and PFO Weed Management Coordinator. All treatments will be conducted in cooperation with the BLM, PAPO, BLM Weed Management Coordinator, and any operators within the affected areas.
- 5.5.** Annual weeds will only be treated for fire breaks around production equipment and other structures on the location. This will be considered routine maintenance as directed in the Conditions of Approval (COA) and each operator’s Weed Management Plan. If this vegetation requires other treatments such as chemical mowing/burn downs, the operator will contact the BLM, PAPO, and BLM Weed Management Coordinator for an onsite to consider treatment options. The approval of these treatments will be obtained from the Company’s BLM NRS, a representative from the PAPO, and BLM Weed Management Coordinator.
- 5.6.** Noxious weeds will be mapped, treated and reported through the appropriate forms/database to the BLM, PAPO and BLM Weed Management Coordinator. Operators will submit data to the database once on line. (*Hard copies will be submitted of all data to both the BLM and PAPO until the data base is functioning at which time monitoring data will be submitted to the database as it is collected*). It is the responsibility of the operators to report to the BLM, PAPO, and BLM Weed Management Coordinator all noxious weed data (weed mapping data due by January 31 of each year). This is in addition to the required documents for the Annual Planning Meetings.
- 5.7.** Monitoring and reporting for noxious and invasive weeds will be conducted each year on every location, access and ROW.

Note: When invasive species such as cheatgrass are located on a pad or ROW, that monitoring section (half mile) of the ROW and whole pad will be marked as an “invasive species location” and yearly follow up monitoring will be required. Following two consecutive seasons with no detection of cheatgrass on the location, the pad or ROW will follow an every other or every third year schedule for monitoring as approved by the BLM AO in writing, in coordination with the PAPO. If cheatgrass is later found during scheduled monitoring, criteria will revert to an annual schedule.

6. Reporting Format

- 6.1.** Detailed documentation of monitoring will be submitted annually and include location, date of monitoring, qualitative and quantitative data, photos, data summary for vegetation measurements, GIS, reference site that was used for this location and any other relevant information dealing with the location. *(Hard copies will be submitted of all data to both the BLM and PAPO until the data base is functioning at which time monitoring data will be submitted to the database as it is collected).* These monitoring and evaluation reports will be submitted to the BLM, PAPO, and other cooperating agencies by January 31 or a minimum of 3 weeks prior to the annual planning meeting (usually in mid February) whichever comes first(Appendix C, C.3 ROD).
- 6.2.** All required monitoring data will be submitted via PAPO Database. *(Hard copies will be submitted of all data to both the BLM and PAPO until the data base is functioning at which time monitoring data will be submitted to the database as it is collected).*
- 6.3.** Any sensitive species that are found within the PAPA through monitoring will be mapped and reported to the PAPO and BLM.
- 6.4.** Soils form Tech note #346 (Appendix B) will be required on all locations unless otherwise stated in writing from the BLM AO and the PAPO.

APPENDIX A

Suggested Seed Mix ESD

APPENDIX B

Required Monitoring Methodology and Required Data Forms

QUALITATIVE MONITORING SHEET

Well Name/ Number _____

Monitoring Date _____

Company _____

Inspector _____

Well Pad Access Road Pipeline Other _____

Topsoil Storage Stockpile (> 3ft) Stockpile (< 3ft) Direct Haul None

Length of Topsoil Storage (months) _____

Seeding Method Broadcast Drill Other _____

Date Seeded _____ Seed Mix _____

Soil Amendment _____ Date of Amendment Application _____

Item	Monitoring Requirement	Description	Yes	No
1	Is seed germination apparent?	Seeds have germinated, seedlings are emerging.		
2	Is the area free of undesirable materials?	Trash, construction materials, etc.		
3	Is the soil stable with no indications of subsidence, slumping and/or significant erosion?	Rills greater than 2 inches, accelerated erosion is obvious and soils are not being held by plants on site, sheet flow, head cutting in drainages, slopes occurring on or adjacent to reclaimed areas.		
4	Absence of noxious weeds?	Perennial pepperweed, Canada thistle, black henbane, leafy spurge, yellow or Dalmatian toadflax, spotted knapweed, Russian knapweed, etc.		
5	Absence of other undesirable species?	Cheatgrass, Japanese brome, halogeton, Russian thistle, etc.		
6	Is there evidence of good reproductive capability?	Seed production is evident. Amount of tillers, rhizomes, flowers, and/or seed stalks are comparable to the reference site. To answer yes, must have for all three plant types: grass, forb, and shrub.		

Item 7: Year of Reclamation

Years 2 - 3 Years 4 - 5 Years 6 - 7 Years 8+

If any of the items are answered “No” above, please identify the problem, attach explanation and photographs, and contact BLM Reclamation Specialist.

APPENDIX C

September, 2008 ROD Appendix C

Reclamation Plan

All operators are responsible for the satisfactory and timely reclamation of the land surface disturbed by their operations in accordance with federal regulations and the standards, guidelines, and criteria set forth below. These standards will apply to all surface disturbing activities including but not limited to pads, roads, right-of-way, and all industry associated pipelines.

All surface disturbances will be reclaimed to meet Bureau of Land Management (BLM) standards as described in Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development – The Gold Book, and specific criteria identified in this document.

Habitat and livestock grazing reclamation will be initiated to meet criteria standards on all portions of the well pads, access roads, etc not needed for production operations when the last well on the pad is drilled and completed or when no forecasted drilling (based in existing Wyoming Oil and Gas Conservation Commission permitted spacing or depth limitations) or completion activity is expected within two years, but additional well development activity is planned on the pad. Site stabilization including seeding will occur during the first appropriate growing season. BLM will coordinate such requests for expansion and reoccupation with Wyoming Game and Fish Department and/or other appropriate agencies through the Application for Permit to Drill (APD) process. Where practical this coordination would occur through the annual meeting, but could occur on a case-by-case basis throughout the year.

These specific requirements are subject to modification through the adaptive management process.

C.1 Reclamation Objectives

The objective of **interim** reclamation is to achieve healthy, biologically active topsoil; control erosion; and restore habitat, visual, and forage function on those portions of the disturbed area not need for production operations for the life of the well or facilities or until final reclamation is initiated.

Interim reclamation will be considered successful when:

- Disturbed areas not needed for long-term production operations or vehicle travel are recontoured, protected from erosion, and revegetated with a self-sustaining, vigorous, diverse, native (or otherwise approved) plant community sufficient to minimize visual impacts, provide habitat and forage, stabilize soils, and impede the invasion of noxious weeds.

The objective of **final** reclamation is to achieve habitat, forage, and hydrologic function the functions that existed prior to disturbance. Including restoration of the original landform or creating a landform that approximates and blends in with the surrounding landform. Final reclamation involves restoring natural vegetative community, hydrologic systems, visual resources, agricultural values and wildlife habitats.

Final reclamation will be considered successful when:

- The original landform is restored for individual disturbed areas including well pads, production facility areas, roads, pipelines, and utility corridors.
- A self-sustaining, vigorous, diverse, native (or otherwise approved) plant community is established on the site, with a density or frequency sufficient to control erosion and non-native plant invasion and reestablish wildlife habitat and

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forage production. Sites demonstrate productivity approximately equal to or better than pre-disturbance levels.

- Plants are resilient as evidenced by well-developed root systems, flowers, and seed heads. Sites must exhibit sustainability of desired attributes after the removal of external influences for a period of not less than one year.
- Shrubs are well established and in a “young” age class at a minimum (therefore, not comprised of seedlings that may not survive until the following year).
- In agricultural areas, irrigation systems and soil conditions are reestablished in such a way as to ensure successful cultivation and harvesting of crops.
- Erosion control is sufficient so that water naturally infiltrates into the soil and gullyng, headcutting, slumping, and deep or excessive rilling (greater than 3 inches) or excessive sheet erosion is not observed.
- The site is free of federal, state and county-listed noxious weeds, oil field debris, contaminated soil, and equipment.

C.2 Reclamation Plan and Annual Reports

The operators will prepare a detailed Reclamation and Monitoring Plan within 1 year of the signing of this ROD. The Plan will include appropriate quantitative and qualitative reclamation and monitoring standards, as detailed below.

Site-specific reclamation plans will continue to be included with the section 10 of the 13 point Surface Use Plan of Operations for APD-related surface disturbing activity and in the Plan of Development (POD) for right-of-way related actions. The reclamation plan for surface disturbance should reference and be consistent with the overall Reclamation Plan for the SEIS area and should reference the ecological site type when the site type is available, or will reference general vegetation composition if ecological site type data is not available. The plan will address erosion control measures including wind erosion.

Reclamation standards, objectives, and results will be reviewed during the annual planning meetings. Reclaimed sites should be inspected annually (until either interim or final criteria, whichever is applicable for the location, is achieved) and evaluated the first and third growing seasons post seeding to determine if desirable plants are establishing. Operators will provide annual ERRP reports indicating reclamation status of all locations (to include extent of reclamation, vegetative composition, density or frequency, cover, resilience, sustainability,

diversity and noxious weed presence, and surface stability). Surface disturbance reports will include “as built” GIS data in acceptable form for inclusion into BLM database.

C.3 Monitoring and Evaluation

The operators will monitor and evaluate reclamation success and shall prepare an annual monitoring and evaluation report to be submitted to BLM and the cooperating agencies a minimum of 3 weeks prior the annual meeting. Sites will be monitored and evaluated by individuals skilled in rangeland or reclamation monitoring (including knowledge of local ecology and plant identification). An interagency review team will annually review and analyze the annual monitoring results and methods. Annual satellite imagery or other comparable imagery may assist in monitoring and evaluation.

Should the success criteria stated below not be met, the operators will be responsible for implementing additional measures as directed by BLM. Wyoming Game and Fish Department (WGFD), Wyoming Department of Environmental Quality (WDEQ) and/or other appropriate agencies may provide guidance and suggestions to BLM what the additional measures could include, such as: soil amendments, reseeding, inter-seeding, providing precipitation, fencing to isolate plantings from ungulates, and creating snow fences to increase local snow depth.

C.4 Interim or Final Reclamation Criteria

A sample representation of the vegetative population will be used to collect the vegetative data on the reclamation and reference site. The reference site location will represent the ecological characteristics of the well pad prior to disturbance.

Successful reclamation to facilitate restoration of habitat function will be measured in stages as follows:

- Within 1 year of initiation of interim or final reclamation sites will demonstrate the establishment of a viable desirable seedling density or frequency. Desirable seedling density or frequency, compared to reference site, shall consist of a vigorous, diverse, native (or otherwise approved) plant community or ecologically comparable species as approved by BLM Authorizing Officer (AO).

C.4.1 Vegetative Criteria for Interim Reclamation

- 1. Native Forbs:** The average density or frequency of desirable forbs must be a minimum of 75% of the reference site within 5 years. Diversity of forbs on a reclaimed site must be equal to or greater than the reference site within 5 years.
- 2. Native Shrubs:** The average density or frequency of the shrub component must be at least 50 % of the reference site within 5 years. This includes both shrubs and half shrubs (e.g. winterfat, fringed sage, etc.). At least 15% density or frequency of

the shrub component must be by the dominant species from reference site. The diversity of shrubs must be equal to or greater than the reference site.

3. **Native Grasses:** Reclaimed sites must have a minimum of three native perennial grass species present, two of which must be bunch grass species. These are to be planted at rates appropriate to achieve abundance and diversity characteristics similar to those found on the reference site.
4. **Non-Native Weeds:** Sites must be free from all species listed on the Wyoming and federal noxious weed lists. All state and federal laws regarding noxious weeds must be followed. Other highly competitive invasive species such as cheatgrass and other weedy brome will be actively treated if found in the reclaimed areas.
5. **Plant Vigor:** Plants must be resilient as evidenced by well-developed root systems, flowers, and seed heads. All sites must exhibit the sustainability of the above desired attributes after the removal of external influences. A minimum of one growing season without external influences (irrigation, mat pads, fences, etc.) may satisfy this requirement.

C.4.2 Full Site Final Reclamation Criteria

1. Ground Cover & Ecological Function

To ensure soil stability and nutrient cycling, ground cover must be equal to or greater than the reference site and vegetative litter must be decomposing into the soil.

2. Vegetative Criteria

- a. **Native Forbs:** The average density or frequency and total diversity of forbs must be equal to or greater than the reference site within 8 years
- b. **Native Shrubs:** The average density or frequency of the shrub component must be at least 80% of the reference site within 8 years. This includes both shrubs and half shrubs (e.g. winterfat, fringed sage, etc.). At least 25% density or frequency of the shrub component must be the dominant species from the reference site. The diversity of shrub must be equal to or greater than the reference site.
- c. **Native Grasses:** Reclaimed sites must exhibit grass production equal to the reference site. A minimum of 3 native perennial species must be included with at least 2 bunch grass species.
- d. **Non-Native Weeds:** Sites must be free from all species listed on the Wyoming and Federal noxious weed list. All state and federal laws

regarding noxious weeds must be followed. Other highly competitive invasive species such as cheatgrass and other weedy brome grasses are also prohibited.

- e. **Plant Vigor:** Plants must be resilient as evidenced by well-developed root systems and flowers. Shrubs will be well established and in a “young” age class at a minimum (e.g. not comprised of seedlings that may not survive until the following year).

C.4.3 Other Requirements

All seed must be native (or otherwise approved) ecologically suitable species and site-specific. Should available seed mixtures, techniques or other applications be available to enhance the productivity and diversity of the reclaimed area used by wildlife or livestock, these methods should be pursued as approved by the BLM AO.

All topsoil from disturbed sites should be salvaged and stockpiled for later use in reclamation. Stockpiled topsoil will be seeded with native perennial grasses or an appropriate cover crop and soil should be reapplied to a reclaimed area while the topsoil is still viable – usually within 2-5 years.

Any mulch used would be reasonably free from mold, fungi, or noxious weed seeds. Mulch may include native hay, small grain straw, wood fiber, live mulch, cotton, jute, biodegradable netting, and rock or otherwise approved media. Straw mulch should contain fibers long enough to facilitate crimping and provide the greatest cover. The grantee or lessee would be responsible for the control of all noxious weed infestations on surface disturbances.

APPENDIX D

Sample Outline Weed Management Plan

Noxious and Invasive Weed Management Plan for Oil and Gas Development Areas

Introduction Weed Management Plan

Noxious and invasive weeds can occur both directly and indirectly from energy development as well as other development activities that cause disturbance. Weeds and weed seed can be transported and spread with road surfacing and other construction related events including reclamation activities. Weeds and weed seed can be attached to equipment and vehicles thus having the potential to be spread over large areas. Physical disturbance of the soil from pipelines, well locations, road development and other construction, as well as soil moisture and chemical alterations from produced water discharge, and stream flow / storage will also create opportunities for the introduction, infestation and spread of noxious and invasive weeds.

Prevention and control of noxious and invasive weeds should be incorporated into the design, layout and construction of access roads, pipelines, and well locations as well as other facilities. Discharge points for water including reservoirs, off-channel containment structures, drainages for runoff, etc. can harbor weeds and other invasive plants.

Control of noxious and invasive weeds during construction, production and reclamation using an integrated approach is most beneficial. Consideration of landscape, soils, and desirable vegetation, open water, water table locations, and land use must be considered.

The spread of weeds to off location / adjacent areas, and other pertinent factors should be addressed using the most effective combination of any or all of the following methods.

- **Cultural**
 - a. The prompt seeding and revegetation of areas of disturbed soils with certified weed-free seed.
 - b. Encourage the cleaning of equipment and vehicles prior to entering or leaving each management area. (Pressure wash in a designated area)
 - c. Minimize soil disturbance, where possible.
 - d. Use certified weed-free mulch/straw for erosion control.

- **Physical**
 - a. Mowing of weeds in newly revegetated areas during the first season of establishment, prior to seed formation of the weeds in the revegetated area. *Care will be taken to encourage seed formation and growth of new native plants.*
 - b. Hand pull and remove weedy plants in areas that BLM sensitive species are found and newly seeded areas.

- **Biological**
 - a. Use of domestic animals and approved biological agents may be utilized. *NOTE: biological agents are species specific and can take up to five years before any results may be detected. Biological agents also **require prior approval**; see “Policy 1. (c)”.
 - b. Use of domestic livestock include, but is not limited to, livestock species/ breed; targeted weed species and necessary management/care of livestock that is used (i.e. fencing, water, herding, etc.) Use of Livestock **require prior approval**; see “Policy 1. (b)”.

- **Chemical**
 - a. Consider weed species, the site on which the herbicide will be applied, method of application, and desired result when selecting the herbicide for treatment and control of noxious/ invasive weeds.
 - b. Ensure selected herbicides are BLM approved for weed(s) that are to be controlled, and chemical label applications are followed.
 - c. ALL herbicides are required to be applied by a certified commercial applicator(s).

Goals

1. Prevent new infestations of noxious weeds in and around the project area(s), provide inventory, monitoring, and control methods of existing infestations. Including the areas that are affected off pad or (lease).

2. Implement an integrated weed management plan to eradicate/manage noxious weeds populations, including areas that may be affected off pad. ***NOTE** weeds are to be mapped and reported by lease; weeds that are off pad but located on lease will be treated.
3. Maintain weed inventory, herbicide and mapping records by lease.

Policy

1. On BLM administered public lands
 - a. An approved Pesticide Use Permit (PUP) is required to apply chemical herbicide.
 - b. Approval and proper permitting for domestic livestock is required prior to implementing this as a weed control method.
 - c. An approved Biological Release Permit (BRP) is required for the release of biological agents.
 - d. Upon completion of any pesticide application, a Pesticide Application Record (PAR) will be completed within **24 hours**. The PAR will be *kept for 10 years*.
2. **ALL** herbicide applications on BLM administered public lands are required to be applied by a certified commercial applicator(s).
 - a. See current list of herbicide approved for application on Bureau of Land Management administered lands. Contact the BLM, Pinedale Field Office.
 - b. Weed list for Wyoming and Sublette County. www.wyoweed.org, or contact the BLM, Pinedale Field Office.

BLM Wyoming Sensitive/ Threatened & Endangered Species

1. Before a chemical pest control program may be initiated, a survey of the area for Threatened and Endangered Species/ BLM Wyoming Sensitive Species will be made (BLM Manual sec. 6840).
 - a. Contact the Pinedale BLM Field Office for a list of plants that may be located in your Management Area.

Incorporate Weed Prevention and Control Measures

- a. Use only certified weed-free hay, straw and/or any other materials used for erosion control and other reclamation activities (as required by the Jonah ROD).
- b. Use only certified weed-free gravel and earthen materials for road surfacing and maintenance.
- c. Cleaning of equipment and vehicles used in the construction drilling or reclamation activities prior to entering or leaving a management area. (Pressure washing or other means in a designated area).
- d. Reseed all areas immediately following construction, drilling or other restoration activities. (Jonah ROD requires..."The initiation of interim reclamation will commence within 30 days after the last well scheduled on a pad is put into production." A-7 #1.)
- e. Use only certified weed-free seed for the reclamation/restoration of areas disturbed by related development activities.

Initiate a Weed Education Policy

- a. Develop cooperative education and awareness programs within your company in conjunction with State, County and Federal Agencies. (i.e.: Extension

Agents, County Weed and Pest personnel and Local BLM Field Office Representative (s)).

- b. Designate a Company representative, who is responsible for weed management and will be a liaison for the company with State, County and Federal Agencies.
- c. Encourage contractors and employees to report new noxious/ invasive weed infestations to a designated company representative who is responsible for weed management.
- d. Review and make available weed education material at onsite and pre-construction meetings and offices.

Weed Management Plans Will Include

1. **Prevention and Detection:** The most important component to controlling noxious weeds. Early detection and proper identification of a new weed infestation is critical to any successful weed management plan. This management plan will include *how* noxious/invasive weeds will be detected.
2. **Inventory and Mapping:** Maintaining accurate records aids in tracking weed infestations over time and will aid in the overall management decisions made over time in the weed management area. This will also include locations of any BLM Wyoming Sensitive Species. Provide an annual map with identified weed locations and associated control methods. *This map will be included with the annual reclamation reports provided to the BLM and JIO January 31 of each year.*
3. **Reporting:** Maintain a weed inventory, mapping (GPS) and pesticide application data for tracking weeds on public lands and other reporting as necessary, and then reported annually to the BLM, Pinedale Field Office. **Inclusion of an ArcGIS shape file with the report that contains polygons of weed infestations recorded with a GPS unit is required.*

4. **Weed Control:** After weeds have been inventoried and mapped they must be treated with the best available weed control techniques with consideration of any BLM Wyoming sensitive species. Contact the BLM, Pinedale Field Office for assistance.

5. **Long Term Monitoring and Retreatment:** Many weeds have seeds that remain viable in the soil for many years. Thus weed management must be viewed as a long-term process and commitment to the land in order to achieve positive management of the management area. A long term monitoring plan will be submitted as part of a weed management plan.

6. **Spread of Weeds from Pad to undisturbed BLM:** Weeds can and will spread to locations located off of well pads and other construction/development areas to other leases, BLM lands, and other adjacent lands including private lands . A coordination plan between all entities involved, including various operators and agencies will be included as part of any weed monitoring program.

APPENDIX E

Adaptive Management Protocol

PROPOSED ADAPTIVE MANAGEMENT PROCESS
FOR THE PINEDALE ANTICLINE PROJECT AREA ROD

March 2009

Pinedale Field Office

Bureau of Land Management

As formalized in the Pinedale Anticline Record of Decision, Page 18, the BLM will utilize an Adaptive Management approach in analyzing and when needed adapting decisions, policies and process used for delineation, development, managing and monitoring in the Pinedale Anticline Project Area. Although the overall concept for use of Adaptive Management is found in Appendix E of the Record of Decision, it does not provide a detailed *process* on how to adopt Adaptive Management recommendations. Therefore, the following steps will be used when proposing, analyzing and adopting adaptive management changes.

1. When, due to changing conditions, new monitoring results, or ambiguous or poorly written decision documentation, adaptive management changes are proposed to provide clarification to the document, the proposal should be formally written as a memo to the Pinedale Field Manager requesting an adaptive management change, and presented at either the Annual Planning Meeting or a Quarterly Review Meeting.
2. The proposal will be discussed and analyzed by pertinent BLM, WG&F, WDEQ and/or other agency or industry staff as appropriate.
3. After analysis, should the proposal be deemed to have merit by the FM it will be forwarded to and discussed by the Pinedale Anticline Working Group for their advice and consideration and posted to the BLM website. The PAWG will discuss the proposal and issue a resolution, no later than the next PAWG meeting following submittal, recommending change, acceptance and/or denial of the proposed adaptive management change. The PAWG may request Task Group input but must still meet the next meeting requirement for action. Should the PAWG not make a recommendation within this time period, the FM will move forward to accept or deny the proposal.
4. The Pinedale Field Manager will consider the PAWG recommendation and in consultation with BLM staff, formally accept or deny the change.
5. Any clarifications adopted will be documented to the file, released to the public, and formally amended to the Record of Decision. Any proposal adopted must be consistent with the intent of the ROD. Proposals outside these parameters would need to have new NEPA analysis conducted before adoption could occur.

GLOSSARY OF TERMS

<u>Cheatgrass:</u>	Downy Brome <i>Bromus tectorum</i> ; invasive grass species
<u>Ecological Site:</u>	Distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.
<u>ESD:</u>	Natural Resources Conservation Service (NRCS) Ecological Site Description - A site description contains interpretations on the physical, climatic, soil and vegetation conditions. Interpretation of vegetation includes major plant species, production by species, composition, cover and plant community dynamics.
<u>Final Reclamation:</u>	Achieve habitat, forage, and hydrologic function (functions that existed prior to disturbance) including restoration of the original topography or creating topography that approximates and blends in with the surrounding landform. This also involves restoring the natural vegetation community, hydrologic systems, visual resources, agricultural and wildlife habitats.
<u>Forb:</u>	any broad-leaved herbaceous plant that is not a grass, especially one that grows in a prairie or meadow
<u>Grass:</u>	hollow-stemmed green plant: a plant with hollow jointed stems and long narrow, usually green leaves and tiny flowers arranged in spikes.
<u>Interim Reclamation:</u>	Achieve healthy, biologically active topsoil; control erosion; and restore habitat, and forage function on those portions of the disturbed area not needed for production operations for the life of the well or facilities or until final reclamation is initiated.
<u>Litter:</u>	Dead plant material, leaves, sticks, etc.
<u>Noxious Weeds:</u>	Plants that are listed by law to be noxious. Plants such as Musk thistle, Black henbane etc.
<u>Operators:</u>	Oil and Gas Companies/ Lease Holders

<u>Other Weedy species:</u>	Both <i>native</i> and <i>non-native</i> species that heavily colonize a particular habitat.
<u>PAPO:</u>	Pinedale Anticline Project Office
<u>Reference Locations:</u>	An undisturbed location that the Oil and Gas Operators have designated and reported in detail as a comparable site for evaluation of any given well pad /ROW that shares similar vegetation, soils and precipitation zone.
<u>Sensitive Species:</u>	Those species found on public lands, designated by a State Director, which could easily become endangered or extinct in a State. The protection provided for these plants are the same as that provided for candidate species.
<u>Shrub:</u>	woody plant with several stems: a woody plant without a trunk but with several stems growing from the base
<u>Undesirables:</u>	trash that has been used in construction or has been discarded, such as tires, pipe, screws, cans, bottles, paper, etc.

