

# APPENDIX 6

## RECLAMATION AND MONITORING

### RECLAMATION GOALS

Reclamation goals are to: stabilize disturbed sites by reducing runoff and erosion; reestablish healthy, vigorous ground cover on these areas to their original condition or better by using native plant species; restore wildlife habitat and livestock forage; and restore visual quality to meet established visual resource management objectives on all areas of surface disturbance, reducing visual contrast and enhancing aesthetic values.

### RECLAMATION OBJECTIVES

In order to achieve the above goals, disturbed sites would be reclaimed with perennial native grasses/forbs/shrub species reflecting the species naturally growing on the site before disturbance occurs. The goal is to achieve 100 percent of pre-disturbance cover of desired species, with bond release occurring when 80 percent of the pre-disturbance cover exists and the site is judged to be on its way toward 100 percent. Objectives may be modified as new information is acquired or if needed to conform with JMHCAP objectives.

### PLANNED ACTIONS AND REQUIREMENTS

Surface disturbing projects would be required to utilize the best management practices described in Appendix 12.

All surface disturbing and reclamation activities that would occur within the Steamboat ACEC, Greater Sand Dunes ACEC, South Pass Historic Landscape ACEC, or the Oregon Buttes ACEC would meet the vegetation and habitat management objectives specific to that ACEC.

Within the ACECs and overlapping crucial elk winter range and parturition areas, revegetation of disturbed areas with big sagebrush and other shrubs would be required to maintain and/or improve big game habitat. Planting of shrubs would be required to the same density that occurred on-site prior to disturbance.

Prior to any on-site activity, an Erosion Control, Revegetation, and Restoration Plan (ERRP) (outlined in the Green River RMP ROD Appendix 5-3) may be required. The operator and the BLM would perform an on-site inventory in critical areas, such as shrub and cushion plant communities, to document plant species composition and cover values. This will establish a baseline standard to use in developing post-disturbance plant composition and cover values, seed mixes, and site information required for the restoration plan. Reseeding would be performed with plant species native to the vegetation communities of the planning area.

### Monitoring

All sites would be monitored by the BLM for reclamation success under the standard BLM guidelines. Inspections would be based upon the standards in Appendix 12.

Monitoring of a reclaimed area is a joint effort between the BLM and the operator. The BLM would inspect the site during the initial seeding and the following growing season for compliance with the reclamation requirements. The operator is responsible for notifying the BLM as soon as the site has met the reclamation objectives identified for the sites. If the BLM agrees that the site's reclamation objectives have been met, the operator is released from any further reclamation responsibilities. If the BLM does not feel the reclamation objectives have been met, further treatment may be prescribed.

Especially sensitive areas, such as basin big sagebrush, mountain mahogany, chokecherry, serviceberry, or bitterbrush communities would be monitored on an annual basis by the BLM and the lessee/operator/permittee until shrubs are reestablished on site. Specific monitoring techniques in critical shrub areas would be developed.

### Revegetation

Standard native plant seed mixes would be developed for each ecological site type in the planning area, however, more specific seed mixes could be designed as needed as part of the ERRP process. In sensitive areas, plantings of containerized native shrub seedlings may be required.

The following revegetation time frames are assumed for reclaimed sites in the respective precipitation zones of the planning area. These time frames represent the minimum amount of time it would likely take to see re-establishment of a native plant community similar in composition to the one existing on-site pre-disturbance. These rates do not assume that the plant community would be re-established to the same height and cover value. In some cases, reestablishment of a healthy, vigorous grass stand may provide better forage values than existed prior to disturbance.

It is expected that basin big sagebrush, chokecherry and serviceberry shrubs removed during site disturbance would not likely be reestablished to pre-disturbance size and cover rates during the life of this plan. Therefore, revegetation of the site would not necessarily replace the wildlife forage/browse values that were found on the site pre-disturbance (e.g., the replacement time of the basin big sagebrush to reach the same height and cover values that existed prior to disturbance may be as long as 70 years or more). However, it is expected that adherence to reclamation requirements would eventually provide for the return of these areas to shrub communities.

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### 7-9" Precipitation Zone

Typical establishment of perennial native grasses/forbs in 3-5 years

Typical establishment of shrub species in 20-30 years

### 10-14" Precipitation Zone

Typical establishment of perennial native grasses/forbs in 2-3 years

Typical establishment of shrub species in 20-30 years.

## Stabilized Dunes

Disturbing stabilized dunes would create blowout areas that would be difficult to reclaim. Plant succession in dunes is a very long process, depending on stabilizing the dune, and establishing appropriate pioneer species which then build up nutrients and organic matter in the sand-soil. Phases of dunal succession last for hundreds of years, until reestablishment to pre-disturbance vegetation occurs. Shrub communities such as basin big sagebrush, mountain mahogany and bitterbrush are documented to require 100 to 150 years to become reestablished on activated sand dunes (Chadwick 1965). It is unknown how successful artificial revegetation may be on the dunes. For that reason, surface disturbing activities on stabilized, vegetated dunes are not recommended. However, if such activities do take place, it is recommended that at the time of permitting, the site ERRP and APD reclamation plans include what extra measures would be taken to ensure site stability. These methods may include erosion control matting, soil stabilizers, and/or snow fences.

## Active Dunes

Surface disturbing activities which would require reclamation in the active dune field are not recommended as the dunes continue to shift and move. Road construction and new access may not be feasible. Even if sand stabilization could be temporarily achieved in the immediate vicinity of the disturbance, the nearby shifting dunes would likely interfere with the activity. In addition, the dunal ponds (flockets) could be affected and these would be extremely difficult to reclaim and revegetate.

## MONITORING OIL AND GAS DEVELOPMENT, ROADS, WILDLIFE, RANGELAND, GROUNDWATER, AND WATERSHED

To meet the objectives of the JMHCAP, and conform with the Green River RMP, monitoring would be accomplished by BLM and/or required of operators (oil and gas, rancher, right-of-way applicants, etc.). Monitoring is a requirement provided for in the Code of Federal Regulations (40 CFR 1505.2(c) and 1503.3). The regulation, in its requirements relative to NEPA and Agency decision making, states "...A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation" (1505.2(c)).

The BLM would conduct extensive monitoring inspections of construction, drilling, and rehabilitation operations, through a compliance officer and/or interdisciplinary team, to ensure acceptable attainment of objectives. The monitoring inspections would be based upon the standards in Appendix 12.

Specific activities and resources to be monitored include oil and gas, wildlife, and forage.

## Oil and Gas

Reclamation: All past, present, and future reclamation would be monitored to ensure the following goals have been met with regards to successful revegetation and restoration.

- Immediate site stabilization to limit wind and water erosion.
- Establishment of vigorous stands of desirable plant species to limit invasion by noxious weeds.
- Implementation of noxious weed control in cooperation with County Weed and Pest Control Agent.
- Establishment of vegetation consistent with wildlife, livestock, and wild horse needs.
- Reduction of visual contrast and enhancement of aesthetic values.
- Compliance with site-specific revegetation requirements.
- Regenerating and self-supporting vegetation.
- Long term shrub and big game habitat establishment

Monitoring of a reclaimed area is a joint effort between the BLM and the operator. The BLM would inspect the site during the initial seeding and the following fall for compliance with the reclamation requirements. The operator is responsible for notifying the BLM as soon as the site has met the reclamation objectives identified for the site. If the BLM agrees that the site's reclamation objectives have been met on wells where final reclamation has been completed, the operator is released from any further reclamation responsibilities. If the BLM does not feel the reclamation objectives have been met, further treatment may be prescribed. The reclamation monitoring goal for revegetation would be to adequately characterize ground cover and vegetation canopy cover, and to determine vegetation species occurrence.

These data would be compared to acceptance criteria as follows: reclamation vegetative cover is 50 percent of pre-disturbance vegetative cover at 2 years, and 80 percent of pre-disturbance vegetative cover at 5 years. Other acceptance criteria may be adopted as a result of a reclamation technical review.

Monitoring would consist of a step-point transect which would record ground and canopy cover in the reclaimed area. These data would be compared against acceptance criterion 2 (BLM Manual, Physical Resource Studies, 4412.14 D2 and 4).

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To use acceptance criterion 1, a second transect would be run in the adjacent undisturbed vegetation recording ground and canopy cover on a minimum of 100 points. These cover data would be compared to the 2-year and 5-year pre-disturbance cover parameters.

During monitoring, species would be identified and recorded in the reclaimed area to determine the composition. These data would be compared with the species that were in the seeding requirements. Evaluations would be made of the effectiveness of the seeding effort and appropriateness of the seed mix.

Erosion condition ratings for the reclaimed sites would also be evaluated at the same time the vegetation is monitored. This would be done by visually assessing the amounts of soil movement, surface rock, pedestaling, flow patterns, and rills (BLM's Erosion Condition Class Rating system).

### Roads

As a continuing monitoring effort, all existing access roads would be continually evaluated to determine if they are: 1) still necessary, 2) safe, and 3) whether they have erosion problems. The roads would be reclaimed or maintained as is appropriate. It would be the responsibility of the authorized users to conduct preventative and corrective road maintenance, throughout the life of their operations, on the roads permitted for their use.

### Wildlife

The scheduling of wildlife monitoring activities is dependent upon the implementation of habitat improvement treatments. Specific monitoring practices would be as follows:

- Big game distribution within the planning area would continue to be monitored annually. Monitoring would occur at a level adequate to obtain estimates of mule deer densities year round and particularly during mid-winter. Big game classification information would be provided by the Wyoming Game and Fish Department (WGFD).
- At least one permanent-line intercept transect with a belt transect and permanent photo points would be established within each treatment area before disturbance and after reclamation treatment implementation. From these permanent transects post-treatment estimates of browse species canopy cover, browse species density by age class, and browse species hedging classes within each treatment area would be obtained. Monitoring intensity would be at least once every 3 years. Coordination with the WGFD would occur.
- Two permanent exclosures (one livestock exclosure and one livestock and big game exclosure, actual size to be determined) would be established within the sagebrush-grassland, sagebrush-salt desert shrub, and mountain shrub-sagebrush types within the planning area. Within these exclosures, all of the vegetative characteristics outlined would be monitored, as appropriate, at

least once every 5 years. The construction and monitoring responsibilities would be coordinated with the WGFD.

- Utilization levels within and adjacent to treated areas (key areas) would be monitored by BLM using currently accepted BLM methods.

An evaluation to assess the fluid mineral exploration and development activity and its effects on elk and their movement patterns, elk use of habitat (potential fragmentation), and effects on other wildlife species and habitats, and other sensitive resources would be conducted over a 3-year period.

The evaluation would incorporate information from the elk study initiated in 1999; application of the standards and guidelines for healthy rangelands; proper functioning condition determinations; and from other activities and uses. At the end of the evaluation (about 3 years) a determination would be made on whether currently unleased areas, and currently leased areas that may become available for future leasing consideration (shown on Map 9), would be offered for fluid mineral leasing. Should these areas be offered for lease, appropriate mitigation would be applied to meet planning area management objectives. If the evaluation concludes that planning area management objectives are not being met, these areas would either not be leased, or would be leased with an NSO stipulation.

### Jack Morrow Hills Elk Study

This is a cooperative effort between the BLM, the Wyoming Game and Fish Department, and the University of Wyoming Cooperative Wildlife Research Unit. The study's purpose is to determine the distribution and habitat use of the Steamboat elk herd, both seasonally and year-round. It is also examining the effects of human and vehicular disturbances on elk behavior. For this study, 40 cow elk were fitted with radio collars and tracked by air bimonthly (weather permitting) and weekly by ground searches during weeks they did not track them aerially.

The study is designed to improve our ability to measure and mitigate the effect of energy development and its associated impacts on the Steamboat elk herd. Without this information it will be difficult or impossible to mitigate the impacts; the viability of the elk herd may be threatened.

### Rangeland

Monitoring in conformance with the application of the standards and guidelines for healthy rangelands would be accomplished. Monitoring plans would be developed as part of AMPs, grazing plans, and permit terms and conditions as appropriate. Monitoring plans would be developed to assess progress toward meeting and in accordance with JMHCAP objectives. All rangeland monitoring activities would use approved BLM methodologies and may include actual use, utilization, climate, trend, and use supervision.

Additional key areas would be identified on a case-by-case basis, and monitoring studies may be changed as needed.

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### Groundwater

Plans for groundwater monitoring in this area would be initiated when necessary.

The BLM currently is requiring surface casing and cement through the Wasatch Formation, or isolation of other zones from the Wasatch, in an effort to protect the water bearing zones in that formation. The Wasatch is the chief source for groundwater in the area.

The monitoring program hopefully would add to our understanding of the area's aquifer systems. The Wasatch aquifer system includes many discrete water-bearing sand lenses separated by relatively impermeable beds. It is unknown if, or to what extent, the permeable beds are interconnected. Less is known about interconnections between porous water-bearing zones in the Paleozoic carbonates. Because the available wells are developed in various sands and carbonate sections in different formations, water quality data may indicate whether mixing of aquifers is occurring.

Mixing of aquifers is of concern due to the large number of wells which penetrate rocks bearing waters of varying quality as well as hydrocarbons. Several fields in the area produce from strata in close stratigraphic proximity to good quality

aquifers (Fort Union "Almy" and Mesaverde near the Wasatch). Artificial pressure variations (e.g., water flooding), as well as natural pressure variations, can lead to aquifer mixing, especially when aquifers are breached by wellbores.

Information may also be gained about groundwater supplies which could be made available for other resource activities such as wildlife and grazing management.

BLM policy is to comply with State requirements regarding the use and protection of groundwater. Federal laws and regulations (including FLPMA and Executive Orders) define BLM's responsibility relative to groundwater. The BLM has authority and responsibility to monitor activities so as to protect and enhance the quality of the environment. Oil and gas leasing and subsequent permitting of development have the potential to result in environmental quality problems such as groundwater contamination.

### Watershed

Plans for watershed monitoring would be initiated in the area when necessary. Watershed monitoring needs would be included in all resource monitoring plans if appropriate.