

Appendix I

Best Management Practices (BMPs)
and Standard Reclamation Practices

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BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are innovative, dynamic, and economically feasible mitigation practices that are applied on a site-by-site basis to reduce, prevent, or avoid adverse environmental or social impacts of development activities (BLM 2004). A number of BLM BMPs for oil and gas development are incorporated into the general oil and gas development requirements in the Proposed Plan. These include minimizing the number of pads by utilizing multiple well designs and directional drilling, minimizing road footprints, centralized support facilities such as tank batteries, collocating utilities and pipelines in common corridors and aligning them along roadways, and implementing interim reclamation practices. The BMPs identified in this Appendix represent the kinds of activities which may be required; actual BMPs required during the permitting process to mitigate impacts may vary. BMPs and specific methodologies associated with them are expected to change over time to reflect the results of monitoring and ongoing adaptive management efforts. Additional practices may be required, practices may be withdrawn, or practices may be modified during activity, implementation, or project level planning; this may be done without future land use plan (RMP) decisions or amendments, but would likely be analyzed as part of the NEPA analysis associated the permitting process. Monitoring and adaptive management practices will be used to refine and clarify needed practices consistent with the goals and objectives of this plan.

The following or similar BMPs will be applied to all long-term ground-disturbing activities, as appropriate to each site and activity. This list is not all inclusive, but is presented to aid the reader in understanding BMPs.

Physical Site Protection/Water Quality Controls

- Employ dust suppression to minimize impacts to air, water, vegetation, and wildlife
- Install silt-fence installation to protect riparian areas, wetlands, open water
- Use closed compressor buildings or mufflers to minimize noise
- Install catalytic converters to minimize emissions

Topsoil Salvage and Storage

- Strip topsoil to a minimum depth of six inches and salvage from potential disturbance sites. Exception to this practice will be in disturbance areas infested with noxious weeds or other undesirable plants species, or with seleniferous or erosive soils. When possible, salvaged topsoil will be direct-hauled to disturbed areas with similar soil characteristics undergoing concurrent revegetation.
- BLM may require stripping be conducted in stages to avoid topsoil compaction, beginning with a leading edge and moving in one consistent direction for subsequent loads.
- Topsoil will be stockpiled where no vehicle traffic will cross topsoil mounds. Stockpiles will be protected from wind and water erosion through the use of suitable weed-free mulch, seeding, and other measures as necessary.
- With the exception of active work areas, all disturbed soils that remain exposed, unprotected, or unreclaimed for longer than one month will be stabilized as approved by BLM. This may be done through the use of native or sterile non-native seed, or application of a covering such as mulch or matting.

Visual Resource Management

- Limit surface disturbance to the minimum area necessary
- Use natural features such as trees, rock formations, or terrain, to conceal disturbed areas. Constructed berms that blend with the terrain may be useful for concealment.

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- Minimize contrast of the structure or activity with the surrounding terrain by using the visual resource management principles of form, line, color, and texture.
- Paint structures a color that blends with the surrounding vegetation.
- Remove unnecessary equipment, structures, and debris from the site that are not necessary for daily operation.

Wildlife Protection Controls

- Incorporate wildlife habitat needs in relationship to planned activities.
- Minimize wildlife habitat loss and fragmentation by carefully planning and considering the location, size, and number of such things as roads, utilities, fencing, ponds, and well pads. Bury pipelines and power lines along roadways.
- If appropriate employ habitat enhancement in appropriate areas to offset habitat loss or fragmentation caused by the planned development.
- Accomplish interim rehabilitation and reclamation as soon as practicable after disturbance.
- Group structures and facilities in a common area.
 - Design power lines to minimize raptor attraction.
 - Install perch guards on utility lines to reduce risk of raptor electrocution and discourage raptor perching on utility poles by the use of anti-perching devices.
- Design activities to eliminate general hazards to wildlife.
- Restrict activities during critical periods such as nesting or fawning.
- Minimize noise by using appropriate noise reduction devices.
- Incorporate habitat requirements in interim and final rehabilitation.
- Limit activity to only the area that is necessary.
- Require that dogs be on leash in critical habit areas, or close the area to all dogs (on or off lease).
- Remotely monitor wells and production equipment.
- Monitor wildlife as needed to document impacts of planned development on population dynamics or behavior; and develop and implement mitigation based on the results of monitoring.
- Require all refuse containers employ a bear-proof design and be emptied on a regular basis.
- Net all oil and gas reserve and permanent pits to exclude birds; enclose pits within an 8-foot-high fence to exclude ungulates; enclose pits within a 2-foot solid barrier buried 6 inches into the soil to exclude small mammals and reptiles, and lined to prevent infiltration to groundwater.

Livestock Management

- Implement management tools such as fencing, stock ponds, and salt licks to manage livestock distribution as needed, and discourage grazing in unwanted areas such as riparian vegetation and sensitive wildlife habitat.
- Adjust livestock grazing in heavily used areas to allow native vegetation a period of recovery.
- Restoring temporarily disturbed areas, using native species, planting woody species, or use a biodegradable erosion-control fabric to enhance germination and seedling establishment
- Drill-seed at a rate of Pure Live Seeds per square foot as needed to establish healthy vegetation (rate may be double for broadcast-seeding or hydroseeding) and be preceded by adequate site preparation, including decompaction of soil and control of annual or biennial weeds
- Fence revegetated areas to exclude livestock for at least two full growing seasons
- Use culverts or hardened crossings for use of roads that cross streams
- Use erosion control devices around culverts as needed to reduce erosion and gully formation.
- Construct fences and gates to ensure that livestock do not enter areas being protected for another resource that would be diminished by grazing or trampling

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- Construct alternative water sources to disperse livestock use and reduce dependence on natural streams and riparian corridors

Noxious and Invasive Weed Management

- Rehabilitation disturbed sites as quickly as possible following interim or final rehabilitation guidelines as appropriate.
- Allow on supplementary livestock feed and revegetation mulches that are certified weed free.
- Clean vehicles regularly using water or air spray to reduce the chance of transporting weed seed from affected areas to non-affected areas.

