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Glossary

A-Weighted Decibel (dBA): An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

Abandoned Mine Lands: An abandoned hard rock mine on or affecting public lands administered by the BLM, at which exploration, development, mining, reclamation, maintenance, and inspection of facilities and equipment, and other operations ceased as of January 1, 1981 (the effective date of BLM's Surface Management regulations codified at 43 CFR 3809) with no evidence demonstrating that the miner intends to resume mining. For many abandoned mines, no current claimant of record or viable potentially responsible party exists. Abandoned mines generally include a range of mining impacts, or features that may pose a threat to water quality, public safety, and/or the environment.

Accelerated Erosion: Soil loss above natural levels resulting directly from human activities. Because of the slow rate of soil formation, accelerated erosion can lead to a permanent reduction in plant productivity.

Acquired Lands: Lands in federal ownership that were obtained by the government through purchase, condemnation, gift, or exchange.

Active Preference: That portion of the total grazing preference for which grazing use may be authorized.

Activity Plan: Site-specific plan which precedes actual development. This is the most detailed level of BLM planning, and is also referred to as project level or implementation level planning.

Actual Use: The amount of animal unit months consumed by livestock based on the numbers of livestock and grazing dates submitted by the livestock operator and confirmed by periodic field checks by the BLM.

Additionality: The conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project. (adopted and modified from BLM Manual Section 1794).

Administrative Unit: Field Office, Resource Area, District or State.

Affected Environment: Natural, physical and human-related environment that is sensitive to changes due to proposed actions.

Air Quality: Air quality depends on the quantity and type of pollutants present in the atmosphere and the dispersion potential of an area to dilute those pollutants.

Air Quality Related Value (AQRV): A resource identified by the Federal Land Management (FLM) agency for one or more Federal areas that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by the FLM for a particular area. AQRV impacts may also include sulfur, nitrogen, acid deposition, and lake acidification.

Air Quality Standards: Primary standards are designed to protect human health, including sensitive populations, such as people with asthma and emphysema, children, and senior citizens. Primary standards were designed for the immediate protection of public health, with an adequate margin of safety, regardless of the cost.

Secondary standards are designed to protect public welfare, including soils, water, crops, vegetation, buildings, property, animals, wildlife, weather, visibility, and other economic, aesthetic, and ecological values, as well as personal comfort and well-being. Secondary standards were established to protect the public from known or anticipated effects of air pollution.

Allotment: An area of land where one or more livestock operators graze their livestock. Allotments generally consist of BLM lands but may also include other federally managed, state owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Allotment Categorization: Grazing allotments and rangeland areas used for livestock grazing are assigned to an allotment category during resource management planning. Allotment categorization is used to establish priorities for distributing available funds and personnel during plan implementation to achieve cost-effective improvement of rangeland resources. Categorization is also used to organize allotments into similar groups for purposes of developing multiple use prescriptions, analyzing site-specific and cumulative impacts, and determining trade-offs.

Allotment Management Plan: A written program of livestock grazing management, including supportive measures if required, designed to attain specific management goals in a grazing allotment.

Allowable Sale Quantity (ASQ): The total level of timber that can be sold and harvested during a decade while assuring a continuous supply of timber in perpetuity. Management practices, assumptions, land use plans, and biological capacity are considered in arriving at the ASQ. The ASQ is usually made available on an average annual basis.

Alternative: In an Environmental Impact Statement, one of a number of possible options for responding to the purpose and need for action.

Alluvium: Any sediment deposited by flowing water, as in a river bed, floodplain, or delta.

Amendment: The process for considering or making changes in the terms, conditions, and decisions of approved Resource Management Plans or Management Framework Plans using the prescribed provisions for resource management planning appropriate to the proposed action or circumstances. Usually only one or two issues are considered that involve only a portion of the planning area.

Analysis Area: The geographic area defining the scope of analysis for a particular resource. This area may be larger than the project area when effects have the potential to extend beyond the boundaries of the proposed action.

Analysis of Management Situation: A comprehensive documentation of the present conditions of the resources, current management guidance, and opportunities for change.

Animal Unit Month (AUM): A standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for 1 month; approximately 800 pounds of forage. An AUM is the amount of forage needed to sustain one cow and her calf, one horse, or five sheep or goats for a month.

Appeal: Application for review by a higher court.

Application for Permit to Drill (APD): Before beginning construction or the drilling of a well, the lessee or operator must file an Application for Permit to Drill (APD) with the BLM Great Falls Oil and Gas Field Office. A copy of the application is posted in the Great Falls Oil and Gas Field Office, the appropriate field office within the HiLine District, and if applicable, in the office of the surface management agency for a minimum of 30 days for review by the public. After 30 days, the application can be approved in accordance with (a) lease stipulations, (b) Onshore Oil and Gas Orders, and (c) Onshore Oil and Gas regulations (43 CFR Part 3160) if it is administratively and technically complete.

Appropriate Management Response (AMR): This term became obsolete in February 2009 when new interagency guidance was developed for implementing Federal Wildland Fire Management Policy. The definition was '*any specific action suitable to meet Fire Management Unit (FMU) objectives. Typically, the AMR ranges across a spectrum of tactical options (from monitoring to intensive management actions). The AMR is developed by using Fire Management Unit strategies and objectives identified in the Fire Management Plan.*'

Appropriation: Public lands covered by an entry, settlement, claim, location, withdrawal, or reservation that sets the land apart for some particular use or disposal.

Aquatic: Living or growing in or on the water.

Aquifer: A water-bearing bed or layer of permeable rock, sand, or gravel capable of yielding large amounts of water.

Archaeological Resource/Remains: A term with legal definition and application, meaning any material remains of human life or activities that are at least 100 years of age, and that are of archaeological interest.

Area Designations:

- ***Open:*** An area where all types of vehicle use is permitted at all times, anywhere in the area subject to the operating regulations and vehicle standards set forth in 43 CFR 8341 and 8342.

- ***Limited:*** An area restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type, but can generally be accommodated within the following type of categories: Numbers of vehicles; types of vehicles; time or season of vehicle use; permitted or licensed use only; use on existing roads, primitive roads and trails; use on designated roads and trails; and other restrictions.

- ***Closed:*** An area where motorized vehicle use off road is prohibited. Use of off-road vehicles in closed areas may be allowed for certain reasons; however, such use shall be made only with the approval of the authorized officer.

Area of Critical Environment Concern: Areas within the public lands where special management attention is required to: (1) protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or (2) protect life and safety from natural hazards.

Arid: A condition of a region where precipitation is insufficient to support any but drought-adapted vegetation.

Armoring: Placement of protective material for the primary purpose of reducing sediment into streams or other water bodies.

Aspect: (1) the visual first impression of vegetation at a particular time or seen from a specific point. (2) The predominant direction of the slope of the land.

Assessment: The act of evaluating and interpreting data and information for a defined purpose.

Authorized Officer: The federal employee who has the delegated authority to make a specific decision.

Authorized Use: Uses of public land that may be authorized include agriculture development, residential use (under certain conditions), business, industrial, and commercial uses, advertising; research projects, State National Guard maneuvers, and motion picture filming. Recreational concessions are considered business uses and may be authorized by lease. Timber harvest, livestock grazing, mineral extraction and special recreation events, among other uses, are authorized under other regulations and not under Section 302 of the Federal Land Policy Management Act (FLPMA).

Avoidance Areas: Areas to be avoided but may be available for location of rights-of-way with special stipulations. (BLM Land Use Planning Handbook, Appendix C)

Avoidance Mitigation: Avoiding the impact altogether by not taking a certain action or parts of an action. (40 CFR 1508.20(a)) (e.g., may also include avoiding the impact by moving the proposed action to a different time or location.)

Back Country Byways: Vehicle routes that traverse scenic corridors utilizing secondary or back country road systems. National back country byways are designated by the type of road and vehicle needed to travel the byway.

Badland: Moderately steep to very steep barren land dissected by many intermittent or ephemeral drainage channels. Potential runoff is very high, and erosion is active.

Bankfull Channel: The elevation on the stream-bank where flooding begins. Bankfull discharge normally re-occurs every 1 1/2 years. The bankfull stage corresponds to the discharge at which channel maintenance is effective.

Bankhead-Jones Lands: See LU Lands.

Baseline: The pre-existing condition of a defined area and/or resource that can be quantified by an appropriate metric(s). During environmental reviews, the baseline is considered the affected environment that exists at the time of the review's initiation, and is used to compare predictions of the effects of the proposed action or a reasonable range of alternatives.

Basin: A depressed area having no surface outlet (topographic basin); a physiographic feature or subsurface structure that is capable of collecting, storing, or discharging water by reason of its shape and the characteristics of its confining material (water); a depression in the earth's surface, the lowest part often filled by a lake or pond (lake basin); a part of a river or canal widened (drainage, river, stream basin).

Beneficial of Positive: An effect promoting a favorable result for a specific resource of resource use. Could be used in short-term, long-term, or both short and long-term contexts.

Best Management Practices (BMPs): A suite of techniques that guide, or may be applied to, management actions to aid in achieving desired outcomes. Best management practices are often developed in conjunction with land use plans, but they are not considered a land use plan decision unless the land use plan specifies that they are mandatory. They may be updated or modified without a plan amendment if they are not mandatory.

Big Game: Large species of wildlife that are hunted, such as elk, deer, bighorn sheep, and pronghorn antelope.

Big Game Analysis Unit: Logical locations across the landscape to conduct analysis of big game winter range. These areas were broken out based on a combination of Elk Management Units from Montana's Elk Management Plan (MFWP 2004) and watershed boundaries.

Biodiversity: The diversity of living organisms considered at all levels of organization including genetics, species, and higher taxonomic levels, and the variety of habitats and ecosystems, as well as the processes occurring therein.

Biological Assessment: The gathering and evaluation of information on proposed endangered and threatened species and critical habitat and proposed critical habitat. Required when a management action potentially conflicts with endangered or threatened species, the biological assessment is the way federal agencies enter into formal consultation with the U.S. Fish and Wildlife Service and describe a proposed action and the consequences to the species the action would affect.

Biological Weed Treatment: These are treatments which involve living creatures, such as insects, sheep and goat grazing, plant pathogens, and biopesticides.

Biologically Significant Unit: The summary of all the Priority Habitat Management Areas within a Greater Sage-Grouse population as delineated in the U.S. Fish and Wildlife Service Conservation Objectives Team (COT) Report recommendations for Greater Sage-Grouse.

Biomass: Woody biomass is defined as the trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment, that are the by-products of forest management.

Board Feet: A unit of solid wood one foot square and one inch thick (BF - board foot, MBF - thousand board feet, MMBF - million board feet).

Browse: To browse (verb) is to graze a plant; also, browse (noun) is the tender shoots, twigs and leaves of trees and shrubs often used as food by livestock and wildlife.

Buffer Zone (STRIP): A protective area adjacent to an area of concern requiring special attention or protection. In contrast to riparian zones which are ecological units, buffer strips can be designed to meet varying management concerns.

Bunchgrass: Individual grasses that have the characteristic growth habit of forming a "bunch" as opposed to having stolens or rhizomes or single annual habit.

Burn Plan: A plan required for every fire application ignited by management. Plans are documents prepared by qualified personnel, approved by the agency administrator, and include criteria for the conditions under which the fire will be conducted (a prescription). Same as Prescribed Fire Burn Plan.

Burn Severity: A qualitative assessment of the heat pulse directed toward the ground during a fire. Burn severity relates to soil heating, large fuel and duff consumption, consumption of the litter and organic layer beneath trees and isolated shrubs, and mortality of buried plant parts. ***See also*** Fire Severity.

Candidate Species: Any species included in the Federal Register notice of review that are being considered for listing as threatened or endangered by the U.S. Fish and Wildlife Service.

Canopy: Foliar layer(s) consisting of the crowns of trees or shrubs in a forest or woodland.

Carrying Capacity: The maximum stocking rate possible without damaging vegetation or related resources.

Cenozoic: The most recent era of geologic history (65 million years ago until the present) during which the world's modern landforms, animals, and plants came into being.

Channel: An open conduit either naturally or artificially created which periodically or continuously contains moving water or forms a connecting link between two bodies of water.

Chemical Weed Treatment: These are treatments using additives, such as applying herbicides or changing soil nutrient ratios.

Class III Archaeological Survey: A continuous, intensive survey of an entire target area, aimed at locating and recording all archaeological properties that have surface indications, by walking close-interval parallel transects until the area has been thoroughly examined. Class III methods vary geographically, conforming to the prevailing standards for the region involved.

The survey describes the distribution of properties in an area; determines the number, location and condition of properties; determines the types of properties actually present within the area; permits classification of individual properties; and records the physical extent of specific properties.

Because Class III survey is designed to produce a total inventory of the cultural properties observable within the target area, once it has been completed no further survey work should be needed in the target area as long as the current standards are met. Areas with a high probability of containing buried cultural materials or known cultural materials may require additional work of professional monitoring and/or data recovery excavations. Areas that require additional work are analyzed on a case-by-case basis, depending on the proposed action and the types of cultural resources present in the project area.

Classification: The authority of the Secretary of the Interior to examine land to see whether it is proper for entry, selection, or location.

Classification of Lands: The process of determining whether lands are more valuable or suitable for transfer or use under particular or various public land laws than for retention in federal ownership for management purposes.

Clean Air Act (CAA): Federal legislation governing air pollution.

Climax: The culminating stage in plant succession for a given site where vegetation has reached a highly stable condition.

Climax Vegetation: The ecological vegetation community that represents the culminating stage or highest development of natural vegetative succession. The climax community often can perpetuate itself indefinitely unless disturbed by outside forces.

Close (Segregate): To remove land from operation of some or all of the public land laws for a given period of time.

Closed: Generally denotes that an area is not available for a particular use or uses; refer to specific definitions found in law, regulations, or policy guidance for application to individual programs.

Closed Road: Closed to motorized public access and subject to administrative or permitted uses based on case-specific exceptions (such as for mining claimants with existing claims accessed by existing routes). Routes identified as closed would have a route bed left intact in case they are needed for valid existing rights only, or in the extended future for administrative purposes. Closed routes would be open to non-motorized use.

Code of Federal Regulations (CFR): The official, legal tabulation or regulations directing federal government activities.

Collaboration: A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other lands.

Commercial Forest Land: Forest land which is producing, or has a site capable of producing, at least 20 cubic feet/acre/year of a commercial tree species.

Common Variety Minerals: Stone, gravel, pumice, pumiced, and cinders that, though possibly having value for trade, manufacture, the sciences, or the mechanical or ornamental arts, do not have a distinct, special value for such use beyond normal uses. On the public lands such minerals are considered salable and are disposed of by sales or by special permits to local governments.

Community: An assemblage of plant and animal populations in a common spatial arrangement.

C**ommunity Noise Equivalent Level (CNEL):** The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.

Compensatory Mitigation: Compensating for the (residual) impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Compensatory Mitigation Projects: The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g., chemical vegetation treatments, land acquisitions, conservation easements). (adopted and modified from BLM Manual Section 1794).

Compensatory Mitigation Sites: The durable areas where compensatory mitigation projects will occur. (adopted and modified from BLM Manual Section 1794).

Composition (of Forest Vegetation): The proportion of each tree species in a stand, expressed as a percentage of the total number, basal area, or volume of all tree species in the stand.

Condition Class: A classification of the degree of departure from historical fire regimes, possibly resulting in alternations of key ecosystem components. These classes categorize and describe vegetation composition and structure conditions that currently exist inside the Fire Regime Groups. The risk of loss of key ecosystem components from wildfires increases from Condition Class 1 (lowest risk) to Condition Class 3 (highest risk). Synonymous with Fire Regime Condition Class (FRCC).

Conformance: That a proposed action shall be specifically provided for in the land use plan or, if not specifically mentioned, shall be clearly consistent with the goals, objectives, or standards of the approved land use plan.

Conifer: A tree or shrub of the order Coniferae with cones and needle-shaped or scale-like leaves.

Coniferous: Pertaining to conifers, which bear woody cones containing naked seeds.

Connectivity: The degree to which similar but separated vegetation components of a landscape are connected.

Conservation Agreement: A formal signed agreement between the U.S. Fish and Wildlife Service or National Marine Fisheries Service and other parties that implements specific actions, activities, or programs designed to eliminate or reduce threats or otherwise improve the status of a species. Conservation agreements can be developed at a state, regional, or national level and generally include multiple agencies at both the state and federal level, as well as tribes. Depending on the types of commitments the BLM makes in a conservation agreement and the level of signatory authority, plan revisions or amendments may be required prior to signing the conservation agreement, or subsequently in order to implement the conservation agreement.

Conservation Strategy: A strategy outlining current activities or threats that are contributing to the decline of a species, along with the actions or strategies needed to reverse or eliminate such a decline or threats. Conservation strategies are generally developed for species of plants and animals that are designated as BLM Sensitive species or that have been determined by the Fish and Wildlife Service or National Marine Fisheries Service to be federal candidates under the Endangered Species Act.

Consistency: The proposed land use plan does not conflict with officially approved plans, programs, and policies of tribes, other federal agencies, and state, and local governments to the extent practical within federal law, regulation, and policy.

Contiguous: Lands or legal subdivisions having a common boundary; lands having only a common corner are not contiguous.

Cooperating Agency: Assists the lead federal agency in developing an environmental analysis or environmental impact statement. The Council on Environmental Quality regulations implementing NEPA define a cooperating agency as any other federal agency which has jurisdiction by law or special expertise for proposals covered by NEPA. Any tribe or federal, state, or local government jurisdiction with such qualifications may become a cooperating agency by agreement with the lead agency.

Corridor: A designated right-of-way corridor is a parcel of land with specific boundaries identified by law, Secretarial order, the land-use planning process, or other management decision, as being a preferred location for existing and future rights-of-way and facilities. The corridor may be suitable to accommodate more than one type of right-of-way use or facility or one or more right-of-way uses or facilities which are similar, identical, or compatible. (43 CFR 2801.5(b)(9))

Council of Environmental Quality (CEQ): An Executive Office advisory council established by the National Environmental Policy Act of 1969 for review of federal program effects on the environment. The council conducts environmental studies and advises the President on environmental matters.

Cover: Any form of environmental protection that helps an animal stay alive (mainly shelter from weather and concealment from predators).

Cover Type: The present vegetation composition of an area, described by the dominant plant species.

Critical Habitat: An area occupied by a threatened or endangered species "on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management considerations or protection."

Crucial Winter Range: That part of the winter range where a majority of the wildlife population (primarily mule deer) is located (or 90% of the individuals) when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten.

Cultural Resource / Cultural Property: A definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) or traditional cultural or religious importance to specified social and/or cultural groups. Cultural resources are concrete, material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit.

Cultural Resource Inventory Classes:

- Class I – Existing data inventory: a study of published and unpublished documents, records, files, registers, and other sources, resulting in analysis and synthesis of all reasonably available data. Class I inventories encompass prehistoric, historic, and ethnological/sociological elements, and are in large part chronicles of past land uses. They may have major relevance to current land use decisions.

- Class II – Sampling field inventory: a statistically based sample survey designed to help characterize the probable density, diversity, and distribution of archaeological properties in a large area by interpreting the results of surveying limited and discontinuous portions of the target area.

- Class III – Intensive field inventory: a continuous, intensive survey of an entire target area, aimed at locating and recording all archaeological properties that have surface indications, by walking close-interval parallel transects (generally at 30 m intervals) until the area has been thoroughly examined.

Cultural Weed Treatment: These are treatments which involve human behavior, such as using quarantine, closure, or relocation of a particular activity to reduce weed spread, selective timing and choice of stock for grazing, containing livestock after they have grazed in a weed infested area, revegetation seed mix choices for rehabilitating new soil disturbances, land use choices, and public outreach methods.

Cumulative Impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Day-Night Level (Ldn): The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.

Deciduous: Pertaining to plants that shed all their leaves every year in a certain season.

Decommissioned Road: Route is closed and rehabilitated to eliminate resource impacts (for example, to eliminate erosion or to restore a riparian area if route is located within a riparian area) and is no longer useable for public or administrative uses.

Deep Soils: Soils that are 40 to 60 inches deep to bedrock.

Denning Habitat: Habitat used during parturition and rearing of young until they are mobile. The common component appears to be large amounts of coarse woody debris, either down logs or root wads. Coarse woody debris provides escape and thermal cover for kittens. Denning habitat may be found either in older mature forest of conifer or mixed conifer/deciduous types, or in regenerating stands (>20 years since disturbance). Denning habitat must be located within daily travel distance of foraging habitat (typical maximum daily distance for females is 3-6 miles).

Design Value: A statistic that describes the air quality status of a given location relative to the level of the National Ambient Air Quality Standards (NAAQS). Design values are defined to be consistent with the individual NAAQS in terms of their averaging times and their statistical formats.

Designated Roads and Trails: Specific roads and trails where some type of motorized vehicle use is allowed either seasonally or year long.

Desired Future Condition: Outcomes representing the long-term vision of BLM with regard to the resources managed on BLM land.

Developed Recreation: Recreation that requires facilities and might result in concentrated use of an area; for example, a campground.

Dispersed Recreation: Recreation activities of an unstructured type which are not confined to specific locations such as recreation sites. Example of these activities may be hunting, fishing, off-road vehicle use, hiking, and sightseeing.

Disturbance: Events that alter the structure, composition, or function of terrestrial or aquatic habitats. Natural disturbances include drought, floods, wind, fires, wildlife grazing, and insects and pathogens. Human-caused disturbances include actions such as timber harvest, fire, livestock grazing, road construction, and the introduction of exotic species.

Distribution Line: An electric power line operating at a voltage of less than 69 kilovolts.

Diversity: The relative abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area.

Drainage: The removal of excess water from land by surface or subsurface flow.

Drilling: The operation of boring a hole in the earth, usually for the purpose of finding and removing subsurface formation fluids such as oil and gas.

Durability (protective and ecological): The maintenance of the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations. (adopted and modified from BLM Manual Section 1794).

Easement: A right afforded a person or agency to make limited use of another's real property for access or other purposes.

Ecological Function: The process through which the constituent living and nonliving elements of ecosystems change and interact, including biogeochemical processes and succession.

Economics: The study of allocation of limited resources, goods, and services among competing uses.

Ecosystem: A complete, interacting system of living organisms and the land and water that make up their environment; the home places of all living things, including humans.

Eligibility (for Wild and Scenic Rivers): A river is eligible for inclusion in the National Wild and Scenic River System if it is free flowing and has at least one river-related value that is considered outstandingly remarkable.

Elk Management Unit: Designated by Montana Fish Wildlife and Parks, establishes statewide elk management population objectives and divides Montana's elk habitat into 35 management units, each with its own elk management objectives and elk population targets.

Emergent Vegetation: Aquatic plant species that are rooted in wetlands but extend above the water's surface.

Encroach: Plant succession in the absence of disturbance, in areas the plant type is not desired. Often associated with vegetative type conversion such as conifer colonization of grass or shrub meadows.

Endangered Species: Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range.

Entry: An application to acquire title to public lands.

Environmental Assessment: A concise public document that analyzes the environmental impacts of a proposed federal action and provides sufficient evidence to determine the level of significance of the impacts.

Environmental Impact Statement: A detailed written statement required by the National Environmental Policy Act when an agency proposes a major federal action significantly affecting the quality of the human environment.

Environmental Justice: Refers to the fair treatment and meaningful involvement of people of all races, cultures and incomes with respect to the development, implementation and enforcement of environmental laws, regulations, programs and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal state, local and tribal programs and policies.

Ephemeral Area: Watershed land area that delivers surface water flow during spring runoff, rain and snow storms to intermittent and perennial streams.

Ephemeral Stream: A stream or part of a stream that flows only in direct response to precipitation; it receives little or no water from springs, melting snow, or other sources; its channel is at all times above the water table.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geological agents.

Exceedance: With respect to a national ambient air quality standard means one occurrence of a measured or modeled concentration that exceeds the specified concentration level of such standard for the averaging period (1-hr, 3-hr, 8-hr, 24-hr, or annual) specified by the standard.

Exception (Oil and Gas): A one-time exemption to a lease stipulation. Exceptions are determined on a case-by-case basis.

Exceptional Event: An event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by the EPA Administrator in accordance with 40 CFR 50.14 to be an exceptional event. It does not include stagnation of air masses or meteorological inversions, a meteorological event involving high temperatures or lack of precipitation, or air pollution relating to source noncompliance.

Exchange: A trading of public lands (surface and/or subsurface estates) that usually do not have high public value, for lands in other ownerships that do have value for public use, management, and enjoyment. The exchange may be for the benefit of other federal agencies as well as for BLM.

Exclusion Areas: Areas which are not available for location of rights-of-way under any conditions (BLM Land Use Planning Handbook, Appendix C).

Exploration: The work of investigating a mineral deposit to determine by geological surveys, geophysical surveys, geochemical surveys, boreholes, pits, and underground workings if it is feasible to mine.

Extensive Recreation Management Area (ERMA): An identified area of BLM land managed to provide stewardship of resources and visitor use. Investments are limited to stewardship actions only within ERMAs.

Facultative (FAC): Plant species equally likely to occur in wetlands, riparian areas or non-wetlands (estimated probability 34%-66%).

Facultative Wetland (FACW): Plant species that usually occur in wetlands or riparian areas (estimated probability 67%-99%), but occasionally found in non-wetlands or uplands.

Federal Land Policy and Management Act of 1976: Public Law 94-579, October 21, 1976, often referred to as the BLM' s "Organic Act," which provides the majority of the BLM's legislated authority, direction, policy, and basic management guidance.

Federal Land Transaction Facilitation Act (FLTFA): FLTFA monies accrue from disposal of BLM lands by sale and the monies stay within the state where the disposal parcels are located. The BLM is entitled to 60% of the fund, while the Forest Service, Park Service and Fish and Wildlife Service are each entitled to 10%. The remaining 10% covers administrative costs. A proposal to use the fund for a specific acquisition must be presented to and agreed upon by all four agencies.

Federal Power Project Reservation: A reservation of public lands for use in a project developed under the jurisdiction of the Federal Power Commission.

Federal Register: A daily publication that reports Presidential and federal agency documents.

Fire Frequency: How often fire burns a given area; often expressed in terms of fire return intervals. For example, a site might burn every 5 to 15 years.

Fire Intensity: The rate of energy released per unit length of the fire front; loosely, how hot the fire is burning.

Fire Management Category: A classification for landscape-level fire and fuels management strategies and options based on consideration of fire history, land status, issues, concerns, hazardous fuels, and other resource objectives. There are four categories which range from Category A where wild and prescribed fire are not desired due to reasons other than ecological; to Category D where fire may be desired and there are no constraints associated with the resource condition, or social, economic, or political considerations.

Fire Management Plan: A strategic plan that defines a program to manage wildland fire (***wildfire*** and ***prescribed fire***) and documents the fire management program in the approved land use plan; the plan is supplemented by operational procedures such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Management Unit: A land management area definable by objectives, management constraints, topographic features, access, values to be protected, political boundaries, fuel types, major fire regime groups, etc. that set it apart from the characteristics of an adjacent FMU. The FMU may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.

Fire Management Zone: Administrative unit for wildland fire suppression, for the execution of all logistical, aviation, and support activities within this geographical area.

Fire Preparedness: Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination.

Fire Regimes: Descriptions of the patterns of fire occurrence, frequency, size, and severity in a given area or ecosystem. A fire regime is a generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured, such as fire return interval.

Fire Regime Condition Class: A classification describing the degree of departure from historical fire regimes, possibly resulting in alternations of key ecosystem components. These classes categorize and describe vegetation composition and structure conditions that currently exist inside the Fire Regime Groups. The risk of loss of key ecosystem components from wildfires increases from Condition Class 1 (lowest risk) to Condition Class 3 (highest risk). ***See also*** Condition Class.

Fire Regime Groups: A classification of fire regimes into groups based on frequency and severity. The national classification includes five groups: **I** - frequent (0-35 years), low severity; **II** - frequent (0-35 years), stand replacement severity; **III** - 35-100+ years, mixed severity; **IV** - 35-100+ years, stand replacement severity; and **V** - 200+ years, stand replacement severity.

Fire Severity: The degree to which a site has been altered by fire; a product of fire intensity and residence time. ***See also*** Burn Severity.

Fishery: Habitat that supports the propagation and maintenance of fish.

Flood Plain: The relatively flat area or lowlands adjoining a body of standing or flowing water which has been or might be covered by floodwater.

Fluvial: Pertaining to streams or produced by stream action.

Forage: All browse and herbaceous foods available to grazing animals, which may be grazed or harvested for feeding.

Forb: An herbaceous plant that is not a grass, sedge, or rush.

Forest Health: The perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, vigor, presence, or unusual levels of insects and disease, and resilience to disturbance.

Forest Health Treatments: Treatments that restore forest ecosystems or stands to a condition that sustains their complexity, function and/or productivity while providing for human needs.

Forest Land: Land that is now, or has the potential of being, at least 10% stocked by forest trees (based on crown closure) or 16.7% stocked (based on tree stocking).

Forest Products: Vegetative resources that are not normally measured in board feet, but can be sold or removed from public lands by means of the issuance of a contract or permit.

Formation: A body of rock identified by lithic characteristics and stratigraphic position; it is prevailingly, but not necessarily tabular, and is mappable at the earth's surface or traceable in the subsurface.

Fossil: Mineralized or petrified form from a past geologic age, especially from previously living things.

Fragmentation: The splitting or isolating of patches of similar habitat. Habitat can be fragmented by natural events or development activities.

Free-Flowing River: Existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.

Fuel Loading: Relative to flammable vegetation and natural debris, the amount of fuel present expressed quantitatively in terms of weight of fuel per unit area (ex: tons per acre).

Fuel Management: The act or practice of controlling flammability of vegetation and reducing resistance to control of wildland fires through mechanical, prescribed fire, chemical, or biological means, in support of land management objectives.

Fuel Model: A fuel complex used for mathematical calculations for the prediction of fire rate of spread. Fuel models, fuel moisture, and weather parameters are used to calculate fire behavior and to formulate parameters for prescribed fire projects.

Fuel Treatment: The manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to fire control (e.g., lopping, chipping, crushing, piling and burning).

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Game Species: Any species of wildlife or fish for which seasons and bag limits have been prescribed, and which are normally harvested by hunters, trappers, and fisherman under state or federal laws, codes, and regulations.

General Orders of Withdrawals: Executive Orders No. 6910 of November 26, 1934, and No. 6964 of February 5, 1935, which withdrew for classification all vacant public lands in the 11 western states and certain other public land states.

Geographic Information System (GIS): A system of computer hardware, software, data, people and applications that capture, store, edit, analyze and graphically display a potentially wide array of geospatial information.

Geophysical Exploration: The use of geophysical instruments and methods to determine subsurface conditions by analyzing such properties as specific gravity, electrical conductivity, or magnetic susceptibility.

Goal: A broad statement of a desired outcome. Goals are usually not quantifiable and may not have established time frames for achievement.

Grassland Bird/Greater Sage-Grouse Priority Areas: Areas containing substantial and high quality grasslands that support large populations of a suite of special status grassland bird species. This suite of species includes the following species of concern: Sprague's pipit, chestnut-collared longspur, McCown's longspur, Baird's sparrow, and long-billed curlew. Management actions would emphasize the conservation and enhancement of sustainable grassland bird habitats. Areas are delineated by using survey results, predictive models of species distributions, and land ownership patterns.

These areas also include core area for Greater Sage-Grouse identified by Montana Fish, Wildlife and Parks. Sage-grouse core areas are habitats associated with 1) Montana's highest densities of sage-grouse, based on male counts and/or 2) sage-grouse lek complexes and associated habitat important to sage-grouse distribution.

Grazing Relinquishment: The voluntary and permanent surrender by an existing permittee or lessee, (with concurrence of any base property lienholder(s)), of their priority (preference) to use a livestock forage allocation on public land as well as their permission to use this forage. Relinquishments do not require the consent or approval of the BLM. The BLM's receipt of a relinquishment is not a decision to close areas to livestock grazing. ***See also*** Retirement of Grazing Privileges.

Grazing System: The manipulation of livestock grazing to accomplish a desired result.

Greater Sage-Grouse Habitat: A specific environment, or set of environmental conditions suitable for occupancy by Greater Sage-Grouse often typified by the presence of sagebrush. Sage-grouse habitat may be further defined by the season of use (i.e., winter, breeding, and brood rearing), each with its own set of different environmental conditions. Each planning area may further define seasonal habitat characteristics based on local ecological conditions. ***See also*** Sage-Grouse Habitat – General Habitat Areas; Sage-Grouse Habitat - Protection Priority Areas; and Sage-Grouse Habitat – Restoration Areas.

Greater Sage-Grouse Protection Priority Area: An area with limited impacts containing substantial and high quality greater sage-grouse habitat that supports high density Greater Sage-Grouse populations. Management actions would emphasize the conservation and enhancement of sustainable Greater Sage-Grouse habitat. The area is delineated by using "key," "core" and connectivity data/maps land ownership patterns, and other resource information.

Groundwater: Water contained in pore spaces of consolidated and unconsolidated surface material.

Guidelines: Actions or management practices that may be used to achieve desired outcomes, sometimes expressed as best management practices. Guidelines may be identified during the land use planning process, but they are not considered a land use plan decision unless the plan specifies that they are mandatory.

Habitat: (a) Species specific environment or environmental conditions suitable for occupancy by that species.
(b) a particular land cover type that provides an environment or environmental conditions suitable for occupancy by many species.

Habitat Connectivity: Vegetative cover in sufficient quantity and arrangement to allow for the movement of wildlife.

Habitat Diversity: The variation in types, sizes, and shapes of landscape elements or vegetation types.

Habitat Type: A site classification of all land areas potentially capable of producing similar plant communities at the climax phase of succession.

Hazardous Fuel: Excessive live or dead wildland fuel accumulations that increase the potential for uncharacteristically intense wildland fire and decrease the capability to protect life, property, and natural resources.

Healthy Forest Initiative of 2002: Presidential direction to the Departments of Agriculture and the Interior to improve regulatory processes and management efficiency in reducing the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The initiative is

based on sound science and helps care for forests and rangelands, reduce the risk of catastrophic fire to communities, help save the lives of firefighters and citizens, and protect threatened and endangered species.

Heavy Metal: Any of the metals that react readily with dithizone, including zinc, copper, cobalt, lead, bismuth, gold, cadmium, iron, manganese, nickel, tantalum, tellurium, platinum, and silver.

Herbaceous: Pertaining to or characteristic of an herb (fleshy-stem plant) as distinguished from the woody tissue of shrubs and trees.

Heterogeneous: Composed of differing parts or elements.

High or Major: An effect is severe; there would be a highly noticeable, long-term or permanent measurable change.

Historic: Period wherein nonnative cultural activities took place, based primarily upon European roots, having no origin in the traditional Native American culture(s).

Historic property or Historic Resource: "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register. The term includes, for purposes of these regulations, artifacts, records, and remains that are related to and located within such properties. The term 'eligible for inclusion in the National Register' includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet National Register listing criteria." (quoted from 36 CFR 900.2(e)).

Home Range: The area in which an animal travels in the scope of natural activities.

Horizon (Soil): A layer of soil or soil material roughly parallel to the land surface and differing from adjoining genetically related layers in physical, chemical, and biological properties or characteristics, such as color, structure, and texture.

Hummock: A low, rounded hill, knoll, hillock; a tract of wooded land higher than a nearby swamp or marsh.

Hydrologic Condition: The current state of the processes controlling the yield, timing, and quality of water in a watershed. Each physical and biologic process that regulates or influences stream flow and groundwater character has a range of variability associated with the rate or magnitude of energy and mass exchange. At any point in time, each of these processes can be defined by their current rate or magnitude relative to the range of variability associated with each process. Integration of all processes at one time represents hydrologic condition.

Hydrologic Unit Code (HUC): A coding system developed by the U.S. Geological Survey to map geographic boundaries of watersheds by size.

Hydrophytic: Water-loving; ability to grow in water or saturated soils.

Igneous Rock: Rock, such as granite and basalt, which has solidified from a molten or partially molten state.

Impact: A modification of the existing environment caused by an action (such as construction or operation of facilities).

Impacts (or Effects): Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by the action and occur at the same time and place, or indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or cumulative.

Impact Analysis for Planning (IMPLAN): The IMPLAN Model is the most flexible, detailed and widely used input-output impact model system in the U.S. It provides users with the ability to define industries, economic relationships and projects to be analyzed. It can be customized for any county, region or state, and used to assess "multiplier effects" caused by increasing or decreasing spending in various parts of the economy. This can be used to assess the economic impacts of resource management decisions, facilities, industries, or changes in their level of activity in a given area.

Implementation Decisions: Decisions that take action to implement land use plan decisions. They are generally appealable to Interior Board of Land Appeals.

Implementation Plan: A site-specific plan written to implement decisions made in a land use plan. An implementation plans usually selects and applies best management practices to meet land use plan objectives. Implementation plans include both activity plans and project plans.

Indian Tribe: Any Indian group in the conterminous United States that the Secretary of the Interior recognizes as possessing tribal status.

Indicator (Species): A species of animal or plant whose presence is a fairly certain indication of a particular set of environmental conditions. Indicator species serve to show the effects of development actions on the environment.

Indirect Effects: Secondary effects that occur in locations other that the initial action or later in time.

Infiltration: The downward entry of water into the soil or other material.

Initial Fire (Attack): An aggressive fire suppression action consistent with firefighter and public safety and values to be protected.

Integrated Weed Management (IWM): This is a decision support system involving deliberate selection, integration, and implementation of effective weed management tactics. It utilizes cost/benefit analysis and takes into consideration public interests and social, economic, and ecological impacts in the decisionmaking process.

Interdisciplinary Team: A group of individuals with different training, representing the physical sciences, social sciences, and environmental design arts, assembled to solve a problem or perform a task. The members of the team proceed to a solution with frequent interaction so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions. The number and disciplines of the members preparing the plan vary with circumstances. A member may represent one or more discipline or Bureau program interest.

Interim Management Policy: Policy that guides management of the BLM's Wilderness Study Areas. The policy balances the various uses of Wilderness Study Areas with the requirement to protect the lands wilderness values.

Interior Board of Land Appeals: The Department of the Interior, Office of Hearings and Appeals board that acts for the Secretary of the Interior in responding to appeals of decisions on the use and disposition of public lands and resources. Because the Interior Board of Land Appeals acts for and on behalf of the Secretary of the Interior, its decisions usually represent the Department's final decision but are subject to the courts.

Intermittent Stream: A stream that flows only when it receives water from rainfall runoff or springs, or from some surface source such as melting snow.

Invasive Plants: Plants which are invasive species.

Invasive Species: Organisms that have been introduced into an environment where they did not evolve. Executive Order 13112 focuses on organism whose presence is likely to cause economic harm, environmental harm, or harms to human health.

Inversion: The state of the atmosphere in which a layer of cool air is trapped near the earth's surface by an overlying layer of warm air so that the lower layer cannot rise. Serious air pollution problems may result from air pollutants being emitted into the limited mixing depth below the inversion.

Irreversible Commitment of Resources: Result from the use or destruction of a specific resource that cannot be replaced within a reasonable timeframe.

Irretrievable Commitment of Resources: Result from actions in which resources are considered permanently lost.

Jurisdiction: The legal right to control or regulate use of a transportation facility. Jurisdiction requires authority, but not necessarily ownership.

Land and Water Conservation Fund (LWCF): Most LWCF monies comes from Outer Continental Shelf oil and gas leasing, and are used for the purchase of land, waters and wetlands with an emphasis on special management areas. Congress allocates the money based on competing proposals submitted by various BLM offices.

Land Classification: A process for determining the suitability of public lands for certain types of disposal or lease under the public land laws or for retention under multiple use management.

Land Use Allocation: The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the planning area, based on desired future conditions.

Land Use Plan: A set of decisions that establish management direction for land within an administrative area, as prescribed under the planning provisions of FLPMA; an assimilation of land-use-plan-level decisions developed through the planning process, regardless of the scale at which the decisions were developed.

Leasable Minerals: Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920. They include coal, phosphate, asphalt, sulphur, potassium, and sodium minerals, and oil, gas, and geothermal.

Lease: (1) A legal document that conveys to an operator the right to drill for oil and gas; (2) the tract of land, on which a lease has been obtained, where producing wells and production equipment are located.

Lease (Occupancy): A usually long-term authorization to possess and use public lands for a fixed period of time (43 CFR 2910).

Lease Stipulation (Oil and Gas): Conditions of lease issuance that provide protection for other resource values or land uses by establishing authority for substantial delay or site changes or the denial of operations within the terms of the lease contract. The authorized officer has the authority to relocate, control timing, and impose other mitigation measures under Section 6 of the Standard Lease Form. Lease stipulations clarify the Bureau's intent to protect know resources or resource values.

Lessee: A person or entity holding record title in a lease issued by the United States (see 43 CFR 3160.05).

Lessee (Grazing): Holder of a valid lease that authorizes grazing use of the public lands outside the grazing district.

Lek – Greater Sage-Grouse

- ***Confirmed Greater Sage-Grouse lek:*** Data supports existence of lek. Supporting data defined as: (a) minimum of 2 years with 2 or more males lekking on site (preferred); or (b) 1 year with 2 or more males lekking on site followed with evidence of lekking (vegetation trampling, feathers, and droppings) during subsequent year. One of three subcategories will be assigned a confirmed lek:

    a. Active – default assignment unless criteria are met for "inactive" or "extirpated."
    b. Inactive –10 years with no sign of lek activity - supported by surveys conducted during 3 or more years over the last 10 years.
    c. Extirpated – Habitat changes have caused birds to permanently abandon a lek (e.g., plowing, urban development, overhead power line).

- ***Provisionally confirmed Greater Sage-Grouse lek:*** Only one year of survey data is available but more than 5 males were observed.

- ***Unconfirmed Greater Sage-Grouse lek:*** Single count with no subsequent survey or a reported lek without supporting survey data.

Lek – Sharp-tailed Grouse:

- ***Confirmed sharp-tailed grouse lek:*** Data supports existence of lek. Supporting data defined as: a) minimum of 2 years with 2 or more males lekking on site (preferred); or b) 1 year with 2 or more males lekking on site followed with evidence of lekking (vegetation trampling, feathers, and droppings) during subsequent year. One of three subcategories will be assigned a confirmed lek:

    a. Active – default assignment unless criteria are met for "inactive" or "extirpated."
    b. Inactive –10 years with no sign of lek activity - supported by surveys conducted during 3 or more years over the last 10 years.
    c. Extirpated – Habitat changes have caused birds to permanently abandon a lek (e.g., plowing, urban development, overhead power line).

- ***Unconfirmed sharp-tailed grouse lek:*** Single count with no subsequent survey or a reported lek without supporting survey data.

Lentic: Standing water.

Lentic Riparian: Standing water habitat such as lakes, ponds, seeps, bogs and meadows.

Lentic Riparian-Wetland Resources: Resources whose capabilities and potentials are defined by the interaction of three physical components: 1) vegetation, 2) landform/soils, and 3) hydrology.

Limited Areas or Trails: Designated areas or trails where the use of off-road vehicles is subject to restrictions, such as limiting the number or types or vehicles allowed, dates and times of use (seasonal restrictions), limiting use to existing roads, primitive roads and trails, or limiting use to designated roads and trails. Under the designated roads and trails designation, use would be allowed only on roads and trails that are signed for use. Combinations of restrictions are possible, such as limiting use to certain types of vehicles during certain times of the year.

Linkage: Route that permits movement of individual plants (by dispersal) and animals from a habitat type to another similar habitat type.

Litter: The uppermost layer of organic debris on the soil surface, essentially the freshly fallen or slightly decomposed vegetal material.

Locatable Minerals: Minerals subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. This includes deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

Lode Mining: Mining of a mineral deposit in solid rock.

Long Term: Effects lasting more than 10 years.

Lotic: Moving water.

Lotic Riparian: Running water habitat such as rivers, streams and springs.

Lotic Riparian-Wetland Resources: Resources whose capabilities and potentials are defined by the interaction of three physical components: 1) vegetation, 2) landform/soils, and 3) hydrology.

Low or Minor: An effect is slight but detectable; there would be a small change.

LU Lands *(also referred to as Acquired Lands or Bankhead-Jones Lands):* Under Title III of the Bankhead-Jones Farm Tenant Act of July 22, 1937, the Department of Agriculture was authorized to purchase submarginal farm lands in the Great Plains region for purposes of reclamation, conservation, etc. Approximately two million acres were acquired

and are termed "Bankhead-Jones Lands." These lands are now under the administration of the BLM, are in the class of federal lands called "acquired lands" and are not subject to entry or disposal under the general public land laws.

Lynx Habitat: Lynx occur in mesic coniferous forest that have cold, snowy winters and provide a prey base of snowshoe hare. In the Rocky Mountains primary vegetation that contributes to lynx habitat is lodgepole pine, subalpine fir, and Englemann spruce. Secondary vegetation that, when interspersed within subalpine forests, may also contribute to lynx habitat, includes cool, moist Douglas-fir, grand fir, western larch, and aspen forest. Dry forest types (ponderosa pine, climax lodgepole pine) do not provide lynx habitat. Primary elevations for lynx habitat are between 1500-2000 m. (4,920 – 6,560 ft.) elevation zones in the northern Rockies.

Management Decision: A decision made by the BLM to manage public lands. Management decisions include both land use plan decisions and implementation decisions.

Management Framework Plan (MFP): Planning decision document prepared before the effective date of the regulations implementing the land use planning provisions of the FLPMA, which establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, and objectives to be achieved for each class of land use or protection.

Management Opportunities: A component of the analysis of the management situation; actions or management directions that could be taken to resolve issues or management concerns.

Mechanized Travel: Moving by means of mechanical devices such as a bicycle; not powered by a motor (source: Washington Office Instruction Memorandum No. 2010-056 and Draft Travel and Transportation Management Manual to replace Manual 8342, Release 8-20).

Medium or Moderate: An effect is readily apparent; there would be a measurable change than could result in a small but permanent change.

Mid-Term: Effects lasting 5 to 10 years.

Mill: A plant in which ore is treated for the recovery of valuable minerals or valuable minerals are concentrated into a smaller bulk for shipping to a smelter or other reduction works.

Mine: An opening or excavation in the earth for extracting minerals.

Mineral: Any solid or fluid inorganic substance that can be extracted from the earth for profit.

Mineral Entry: The filing of a claim on public land to obtain the right to any minerals it may contain.

Mineral Estate: The ownership of minerals, including rights necessary for access, exploration, development, mining, ore dressing, and transportation operations.

Mineral Materials: Materials such as common varieties of sand, stone, gravel, pumice, pumicite, and clay, that are not obtainable under the mining or leasing laws but that can be acquired under the Mineral Materials Act of 1947, as amended.

Mineral Withdrawal: A formal order that withholds federal lands and minerals from entry under the Mining Law of 1872 and closes the area to mineral location (staking mining claims) and development.

Minimize: To reduce the adverse impact of an operation to the lowest practical level.

Minimization Mitigation: Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (40 CFR 1508.20 (b))

Mining Claim: A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law and local laws and rules. A single mining claim may contain as many

adjoining locations as the locator may make or buy. The four categories of mining claims are: lode, placer, millsite, and tunnel site.

Mining District: An area, usually designated by name, with described or understood boundaries, where minerals are found and mined under rules prescribed by the miners, consistent with the Mining Law of 1872.

Mitigation Measures: Methods or procedures that reduce or lessen the impacts of an action. Mitigation measures and conservation actions are Best Management Practices (BMPs), operating procedures, or design features that have been developed to avoid, minimize, rectify, reduce, or compensate for potentially significant adverse environmental impacts associated with surface-disturbing or disruptive activities.

Monitoring Plan: The process of tracking the implementation of land use plan decisions and collecting and assessing data/information necessary to evaluate the effectiveness of land use planning decisions.

Modification: A change in a Plan of Operations that requires some level of review by BLM because it exceeds what was described in the approved Plan of Operations.

Modification (Oil and Gas): A change to the provision of a lease stipulation either temporarily or for the term of the lease.

Monitoring Plan: The process of tracking the implementation of land use plan decisions.

Motorized Travel: Moving by means of vehicles that are propelled by motors such as cars, trucks, OHVs, motorcycles, boats and aircraft. (Source: BLM Handbook 8342: Travel and Transportation Management)

Motorized Vehicles: Synonymous with off-highway vehicle (OHV). Examples of this type of vehicle include airplane, all-terrain vehicle (ATV), utility type vehicle (UTV), sport utility vehicle (SUV), motorcycle, and snowmobiles. (Source: BLM Handbook H-8342-1: Travel and Transportation Management)

- ***All-Terrain Vehicle (ATV):*** A wheeled vehicle other than a snowmobile, which is defined as having a wheelbase and chassis of fifty (50) inches in width or less, steered with handlebars, generally having a dry weight of 800 pounds or less, travels on three or more low-pressure tires, and with a seat designed to be straddled by the operator.

- ***Motorcycle:*** Motorized vehicles with two tires and with a seat designed to be straddled by the operator.

- ***Off-Highway Vehicle (OHV):*** OHV is synonymous with Off-Road Vehicles (ORV). ORV is defined in 43 CFR 8340.0-5 (a): Off-road vehicle means any motorized vehicle capable or, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: 1) Any non-amphibious registered motorboat; 2) Any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; 3) Any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; 4) Vehicles in official use; and 5) Any combat or combat support vehicle when used in times of national defense emergencies. OHVs generally include dirt motorcycles, dune buggies, jeeps, 4-wheel drive vehicles, SUVs, over-the-snow vehicles, UTVs and ATVs. Airplanes are also considered OHVs because they are wheeled, motorized vehicles that are capable of travel over land. Helicopters are not considered OHVs because they are not capable of travel over land.

- ***Over-the-Snow Vehicle:*** An over-snow vehicle is defined as a motor vehicle that is designed for use over snow that runs on a track or tracks and/or a ski or skis, while in use over snow. An over-snow vehicle does not include machinery used strictly for the grooming of non-motorized trails.

- ***Sport Utility Vehicle (SUV):*** A street legal, high clearance vehicle used primarily on-highway but designed to be capable of off-highway travel.

- ***Utility Type (or Terrain) Vehicle (UTV):*** Any recreational motor vehicle other than an ATV, motorbike or snowmobile designed for and capable of travel over designated unpaved roads, traveling on four (4) or more

low-pressure tires, maximum width less than seventy-four (74) inches, usually a maximum weight less than two thousand (2,000) pounds, or having a wheelbase of ninety-four (94) inches or less. Utility type vehicle does not include vehicles specially designed to carry a person with disabilities.

Multiple Use: Under the Federal Land Policy and Management Act of 1976, the term "multiple use" means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output." (43 U.S.C. 1702, Sec. 103(c))

National Ambient Air Quality Standards (NAAQS): The allowable concentrations of air pollutants in the ambient (public outdoor) air. National ambient air quality standards are based on the air quality criteria and divided into primary standards (allowing an adequate margin of safety to protect the public health) and secondary standards (allowing an adequate margin of safety to protect the public welfare). Welfare is defined as including (but not limited to) effects on soils, water, crops, vegetation, human-made materials, animals, wildlife, weather, visibility, climate, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.

National Environment Policy Act (NEPA) of 1969: An Act that encourages productive and enjoyable harmony between man and his environment and promotes efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; enriches the understanding or the ecological systems and natural resources important to the Nation, and establishes the Council on Environmental Quality.

National Historic Trail: An extended, long-distance trail designated by Congress that is not necessarily managed as continuous but follows as closely as possible and practicable the original trails or routes of travel of national historic significance. The purpose of a National Historic Trail is the identification and protection of the historic route and the historic remnants and artifacts for public use and enjoyment. A National Historic Trail is managed to recognize the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, including the primary use or uses of the trail. Federal Protection Components associated with the National Historic Trail, including high potential historic sites, high potential route segments, and auto tour routes are identified by the National Trail administering agency through the trailwide Comprehensive Plan. Properties eligible for the National Register of Historic Places, which may also be Federal Protection Components, may be identified along the National Historic Trail, including segments of the National Historic Trail.

National Register of Historical Places: A register of districts, sites, buildings, structures, and objects, significant in American history, architecture, archaeology and culture, established by the "Historic Preservation Act" of 1966 and maintained by the Secretary of the Interior.

National Wild and Scenic Rivers System: A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams: (1) recreation—rivers or sections of rivers that are readily accessible by road or railroad and that may have some development along their shorelines and may have undergone some impoundments or diversion in the past, (2) scenic—rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads, and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

Negligible: An effect at the lower level of detection; there would be no measurable change. Effects may not be readily noticeable.

Net Conservation Gain: The actual benefit or gain above baseline conditions.

Neutral: An effect that is neither beneficial nor adverse to a specific resource or resource use.

No Surface Occupancy: A fluid minerals leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the area.

Noise: Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

North American Industry Classification System (NAICS): The standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. The NAICS was developed under the auspices of the Office of Management and Budget (OMB), and adopted in 1997 to replace the Standard Industrial Classification (SIC) system and to allow for a high level of comparability in business statistics among the North American countries.

Noxious Weeds: A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common to the United States.

Nutrient Cycling: The circulation of chemical elements such as nitrogen, oxygen, carbon, and phosphorus in specific pathways from the abiotic (not involving or produced by organisms) portions of the environment into organic substances in plants and animals and then back into abiotic forms.

Objective: A description of a desired condition for a resource. Objectives can be quantified and measured and, where possible, have established time frames for achievement.

Obligate: Essential, necessary, unable to exist in any other state, mode, or relationship.

Obligate Wetland (OBL): Plant species that occur almost always (estimated probability >99%) under natural conditions in wetlands or riparian zones.

Off-Highway Vehicle (OHV): Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: (1) Any non-amphibious registered motorboat; (2) Any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) Any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) Vehicles in official use; and (5) Any combat or combat support vehicle when used in times of national defense emergencies. OHVs generally include dirt motorcycles, dune buggies, jeeps, four-wheel drive vehicles, snowmobiles, and ATVs.

Old Forest Structure: Physical forest or woodland characteristics that contribute to the structure, composition or function of forested stands for a particular forest type. These characteristics include large and old tree components, accumulations of dead wood components such as standing snags and/or downed logs, occurrence of climax plant species or seral trees with a common decadent attributes such as broken or deformed tops and rotten boles, wide variation in tree age classes and stocking levels, and multiple canopy layers.

Old-Growth: Forested stands in late successional stages of development meeting the main characteristics or old forest structures that are described by the forest type for the East-side Montana Zone in Old-Growth Forest Types of the Northern Region (USFS 1992).

Open: Generally denotes that an area is available for a particular use or uses. Refer to specific program definitions found in law, regulations, or policy guidance for application to individual programs.

Open Road: Open year-round to public and administrative uses.

Open Road with Restrictions: Open to public and administrative uses with seasonal and/or vehicle type limitations.

Opening Order: Returning land to the operation of some or all of the public land laws. Normally done at the same time as revocation, it opens lands to the operation or partial operation of the public land laws. An opening order may be a part of the revocation order and need not be a separate document.

Operator: Any person who has taken formal responsibility for the operations conducted on the leased lands.

Ore: A mineral deposit of high enough quality to be mined at a profit.

Outstandingly Remarkable (River) Values: Values among those listed in Section 1(b) of the Wild and Scenic Rivers Act are "scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values. . . ." Other similar values which may be considered include botanical, hydrological, paleontological, or scientific. Professional judgment is used to determine whether values exist to an outstandingly remarkable degree.

Over-Snow Vehicle: An over-snow vehicle is defined as a motor vehicle that is designed for use over snow that runs on a track or tracks and/or a ski or skis, while in use over snow. An over-snow vehicle does not include machinery used strictly for the grooming of non-motorized trails.

Overstory: The layer of foliage in a forest canopy, often the uppermost layer(s) consisting of the crowns of trees or shrubs.

Paleontological Resources (Fossils): The physical remains of plants and animals preserved in soils and sedimentary rock formations. Paleontological resources are important for understanding past environments, environmental change, and the evolution of life.

Paleontology: A science dealing with the life forms of past geological periods as known from fossil remains.

Parent Mineral (Soil): The unconsolidated more or less chemically weathered mineral or organic matter from which the upper level of the soil profile has developed.

Passport in Time: Passport in Time (PIT) is a volunteer archaeology and historic preservation program. PIT volunteers work with professional archaeologists and historians throughout the U.S. on such diverse activities as archaeological survey and excavation, rock art restoration, survey, archival research, historic structure restoration, oral history gathering, and analysis and curation of artifacts.

Patent: The instrument by which the federal government conveys title to the public lands.

Perennial Stream: A stream that normally has water in its channel at all times.

Permit: A short-term (generally under 3 years), revocable authorization to use public lands for specific purposes. BLM issues permits under 43 CFR 2910. For grazing authorizations issued under 43 CFR 4100, permits are normally issued for 10 years.

Permitted Use: The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease. Expressed in AUMs.

Permittee: Holder of a valid permit that authorizes certain uses of the public lands (e.g., for grazing).

Permittee (Grazing): Holder of a valid permit that authorizes grazing use of the public lands within the grazing district.

Perpetual Exclusive Easement: A perpetual exclusive easement is acquired by the United States to use land of another for a particular purpose. An exclusive road easement grants control to the United States and may allow it to authorize third party use and set road use rules.

When obtaining a road easement, the BLM's preferred option is to gain an exclusive easement in order to obtain the right for the general public to use and access the road.

Petroglyph: A figure, design, or indentation carved, abraded, or pecked into a rock.

Physical Weed Treatment: These are treatments which use manual labor, mechanical equipment, or fire, such as hand-pulling, mowing or tilling, and prescribed burning.

Pictograph: A figure or design painted onto a rock.

Placer: An alluvial deposit of sand and gravel containing valuable minerals such as gold.

Placer Mining: A method of mining in which the overburden is removed to expose gold-bearing gravel deposits beneath. The gravel is then sluiced to separate the gold.

Plan: A document that contains a set of comprehensive, long range decisions concerning the use and management of Bureau administered resources in a specific geographic area.

Planning Area: A geographical area for which land use and resource management plans are developed and maintained. Within the HiLine planning area, the BLM administers approximately 2,437,000 acres of public land surface and 4,240,000 acres of federal mineral estate in Blaine, Chouteau, Glacier, Hill, Liberty, Phillips, Toole, and Valley counties.

Planning Criteria: The standards, rules, and other factors developed by managers and interdisciplinary teams for their use in forming judgments about decision making, analysis, and data collection during planning. Planning criteria streamline and simplify the resource management planning actions.

Planning Decision (Land Use Plan Decision): Establishes desired outcomes and actions needed to achieve them. Decisions are reached using the BLM planning process. When they are presented to the public as proposed decisions, they can be protested to the BLM Director. They are not appealable to Interior Board of Land Appeals.

Population: Within a species, a distinct group of individuals that tend to mate only with members of the group. Because of generations of inbreeding, members of a population tend to have similar genetic characteristics.

Potential Fossil Yield Classification: Occurrences of paleontological resources are closely tied to the geologic units that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

Using the Potential Fossil Yield Classification (PFYC) system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. The five classes range from Class 1 – Very Low to Class 5 – Very High.

Potential Natural Vegetation: The vegetation that would become established if all successional sequences were completed without interferences by man under the present environmental conditions.

Potential to Emit (PTE): The maximum capacity of a facility or emitting unit, within physical and operational design, to emit a pollutant. Any physical or operational limitation on the capacity of the facility or emitting unit to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, is treated as part of its design only if the limitation or the effect it would have on emissions is federally enforceable.

Power Site Classification: A classification made by the Federal Power Commission that is a segregation against the operation of the public land laws for lands that are needed or have potential for power projects and associated transmission lines. Lands classified to benefit transmission lines are open to the operation of the public land laws subject to their use for transmission lines.

Power Site Reserve: A reservation of public lands that have potential value for power development.

Precambrian: Pertaining to the earliest era of geological history, extending from 4.5 billion to 540 million years ago and encompassing 7/8 of the earth's history. Just before the end of the Precambrian, complex multicellular organisms, including animals, evolved.

Precious Metals: A general term for gold, silver, or any of the minerals of the platinum group.

Pre-Commercial Thinning: A thinning that does not yield trees of commercial value, usually designed to reduce stocking in order to concentrate growth on the more desirable trees or to meet desired vegetation and/or fuel loading conditions.

Prehistoric: Refers to the period wherein Native American cultural activities took place which were not yet influenced by contact with historic nonnative culture(s).

Prescribed Fire: The planned ignition of fire in a planned area; implementation must occur under specified conditions to meet specific management objectives.

Prescribed Fire Burn Plan: A plan required for each fire application ignited by management. Plans are documents prepared by qualified personnel, approved by the agency administrator, and include criteria for the conditions under which the fire will be conducted (a prescription).

Prescription Livestock Grazing (Grazing): Grazing use authorized on land designated or not designated for livestock grazing designed to accomplish a specific purpose; for example, authorizing sheep and goats to graze a piece of land as a biological control agent to treat noxious weeds. Prescription grazing would normally be authorized on a temporary nonrenewable basis.

Prevention of Significant Deterioration (PSD): A regulatory program under the Clean Air Act (Public Law 84-159, as amended) to limit air quality and AQRV degradation in areas currently achieving the National Ambient Air Quality Standards. The PSD program established air quality classes in which differing amounts of additional air pollution are allowed above a legally defined baseline level. Small additional air pollution may be considered significant in PSD Class I areas (certain large national parks and wilderness areas in existence on August 7, 1977, and specific Tribal lands redesignated since then). PSD Class II areas allow deterioration associated with moderate, well-controlled growth (most of the country). Area classes are described below.

- ***Class I:*** an area that allows only minimal degradation above "baseline." The Clean Air Act designated existing national parks over 6,000 acres and national wilderness areas over 5,000 acres in existence on August 7, 1977, as mandatory federal Class I Areas. These areas also have special visibility protection. In addition, four tribal governments have redesignated their lands as Class I Areas.

- ***Class II:*** an area that allows moderate degradation above "baseline." Most of the United States is Class II.

- ***Class III:*** any area that allows the maximum amount of degradation above "baseline." Although the U.S. Congress allows air quality regulatory agencies to redesignate Class II lands to Class III, none have been designated.

Prevention of Significant Deterioration (PSD) Increment and Increment Analysis: The allowable PSD increment is the change in pollutant concentration allowed in a Class I, Class II, or Class III area. PSD increment values are provided in EPA regulations. As performed by the BLM for NEPA analysis, PSD increment analysis is a method of comparing predicted (modeled) pollutant concentrations to EPA's allowable PSD increment values for the purpose of public disclosure only. The BLM increment analysis is not a regulatory analysis. State air quality agencies and the USEPA perform regulatory PSD increment analysis.

Prey Base: Populations and types of prey species available to predators.

Primitive and Unconfined Recreation: Non-motorized, non-mechanized and undeveloped types of recreational activities.

Primitive Road: A linear route managed for use by four-wheel drive or high-clearance vehicles. These routes do not customarily meet any BLM road design standards.

Primitive Route: Any transportation linear feature located within a WSA or lands with wilderness characteristics designated for protection by a land use plan and not meeting the wilderness inventory road definition.

Priority Habitats: Priority habitats would include habitat for all special status species as well as riparian areas, dry savannah forest, special habitats including caves, cliffs, snags, and down woody material, sagebrush, bitterbrush communities and mountain mahogany communities.

Priority Species: Priority species are those wildlife, fish or plant species that the BLM has determined to be unique or significant based on at least one of the following factors: density, diversity, population size, public interest, remnant character, or age.

Private Exchange: A land exchange between the federal government and any landowner other than a state.

Probable Sale Quantity (PSQ): The allowable harvest level that can be maintained without decline over the long term if the schedule of harvests and regeneration are followed. PSQ recognizes a level of uncertainty in meeting the determined level; this uncertainty is typically based on other environmental factors that preclude harvesting at a particular time. PSQ is not a commitment to offer for sale a specific level of timber volume every year.

Project Plan: A type of implementation plan. A project plan typically addresses individual projects or several related projects. Examples of project plans include prescribed burn plans, trail plans, and recreation site plans.

Project Area (Minerals): The area of land upon which an operator conducts mining operations, including the area needed for building or maintaining of roads, transmission lines, pipelines, or other means of access.

Project Area (Vegetation): An area of land within some type of management activity would occur and encompasses a region defined by logical boundaries such as: watersheds, ridges, highways, or ownership blocks of BLM lands. The project area can be both the analysis area and a starting point to determine where treatments or activities should occur, and includes the area needed for supporting structures and activities such as roads, transmission lines, or pipelines.

Proper Functioning Condition (PFC): Ecosystems are in PFC when they function within their historic range of variability.

Proposed Action: A project or set of activities that a federal agency intends to implement, as defined in NEPA regulations.

Proposed Planning Scenario: Using comments received during the initial scoping period, the BLM interdisciplinary team developed the "Proposed Planning Scenario," to describe possible management prescriptions and goals for individual programs.

Protest: Application for review by a higher administrative level.

Public Domain Lands: Vacant, unappropriated, and unreserved public lands, or public lands withdrawn by Executive Order 6910 of November 26, 1934, as amended, or Executive Order 6964 of February 5, 1935, as amended, and not otherwise withdrawn or reserved, or public lands within grazing districts established under Section 1 of the Act of June 28, 1934 (45 Stat. 1269), as amended, and not otherwise withdrawn or reserved.

Public Involvement: Any process designed to broaden the information base upon which agency decisions are made by informing the public about BLM activities, plans, and decisions to encourage public understanding about the participation in the planning processes which lead to final decisionmaking.

Public Lands: Under the Federal Land Policy and Management Act of 1976, the term "public lands" means any land and interest in land owned by the United States within the several States and administered by the Secretary of the Interior

through the Bureau of Land Management, without regard to how the United States acquired ownership." (43 U.S.C. 1702, Sec. 103(e))

Public Land Laws: A body of laws that regulates the administration of the public lands and the resources thereon.

Public Land Order (PLO): Creating, continuing, modifying, or revoking a withdrawal or reservation that has been issued by the Secretary of the Interior pursuant to his delegations of authority.

Public Propose: A use in which the public has an interest, affecting its safety, health, morale, and welfare, but not including use for habitation, cultivation, trade, or manufacturing.

Public Value: An asset held by, service performed for, or benefit accruing to the people at large.

Quarry: An open or surface working, usually for the extraction of stone, slate, limestone, etc.

Quarry Site: Place where minerals occur which were a source of raw material for prehistoric/historic industries.

Rangeland: Land used for grazing by livestock and big game animals on which vegetation is dominated by grasses, grass-like plants, forbs, or shrubs.

Raptor: Bird of prey with sharp talons and strongly curved beaks such as hawks, owls, vultures, and eagles.

Reach: A segment of stream.

Reasonably Foreseeable Development Scenario: The prediction of the type and amount of oil and gas activity that would occur in a given area. The prediction is based on geologic factors, past history of drilling, projected demand for oil and gas, and industry interest.

Reclamation: Reclamation is the reconstruction of topographic, soil, and plant conditions after disturbance, which may not be identical to the predisturbance site, but which permits the degraded land mass to function adequately in the ecosystem of which it was and is a part (Munshower 1994).

Reclamation Project: A water development and irrigation project of the Bureau of Reclamation.

Record of Decision: A document signed by a responsible official recording a decision that was preceded by the preparing of an environmental impact statement.

Recreation and Public Purposes (R&PP) Act: Authorizes the sale or lease of BLM lands for recreational or public purposes to State and local governments and to qualified nonprofit organizations. Examples of typical uses under the act are historic monument sites, campgrounds, schools, fire houses, law enforcement facilities, municipal facilities, landfills, hospitals, parks, and fairgrounds.

Department of the Interior regulations for the Recreation and Public Purposes Act are found in Title 43 of the Code of Federal Regulations (43 CFR), Parts 2740 (Sales) and 2912 (Leases).

Recreation Opportunity Spectrum (ROS): A framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences are arranged along a continuum or spectrum divided into six classes-primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural and urban.

Relict: A remnant or fragment of the vegetation of an area that remains from a former period when the vegetation was more widely distributed.

Relinquished Allotment (Grazing): An allotment where an existing permittee or lessee gives up his or her permit or lease causing the allotment to become unleased.

Required Design Feature: Required Design Features (RDFs) are required for certain activities in all Greater Sage-Grouse habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for Greater Sage-Grouse or its habitat;
- A specific RDF will provide no additional protection to Greater Sage-Grouse or its habitat.

Research Natural Area: An area that illustrates or typifies for research or educational purposes, the important forest and range types in each field office, as well as other plant communities that have special or unique characteristics of scientific interest and importance.

Reservation: A “setting aside” or dedication of lands for the federal government for a specific public purpose. "Reserved" land is not necessarily withdrawn. A permanent withdrawal dedicated to a specific public purpose.

Reserve Common Allotment: A unit of public land that will not have term grazing permits issued. Such an allotment would only be grazed on a temporary nonrenewable basis. The use of these allotments would be to provide temporary grazing to rest other areas following wildfire, habitat treatments, or to allow for more rapid attainment of rangeland health. The allotment must be of sufficient size to be managed as a discrete unit. Reserve Common Allotments should be distributed throughout the planning area.

Reserves (Mineral): Known mineral deposits that are recoverable under present conditions but are as yet undeveloped.

Reservoir (Oil and Gas): A naturally occurring, underground container of oil and gas, usually formed by deformation of strata and changes in porosity.

Residual Impacts: Impacts that remain after applying avoidance and minimization mitigation; also referred to as unavoidable impacts.

Resource Advisory Council (RAC): A council established by the Secretary of the Interior to provide advice or recommendations to BLM management.

Resource Management Plan (RMP): A land use plan as prescribed by the Federal Land Policy and Management Act which establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, objectives and actions to be achieved.

Retirement of Grazing Privileges: Ending livestock grazing on a specific area of land. ***See also*** Grazing Relinquishment.

Revision: The process of completely rewriting the land use plan due to changes in the planning area affecting major portions of the plan or the entire plan.

Revocation: The action that cancels a withdrawal but does not necessarily "open" the lands to application or entry.

Right-of-Way: A permit or an easement which authorizes the use of public lands for certain specified purposes, commonly for pipelines, roads, telephone lines, electric lines, reservoirs, etc.; also, the lands covered by such an easement or permit.

Right-of-Way Corridor: A parcel of land that has been identified by law, Secretarial order, through a land use plan or by other management decision as being the preferred location for existing and future right-of-way grants and suitable to accommodate one type of right-of-way or one or more rights-of-way which are similar, identical or compatible.

Rights-of-Way – Major: High voltage transmission lines of 100 kilovolts or greater and pipelines 24 inches or greater in diameter.

Riparian Area: A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral areas or washes that lack vegetation dependent upon free water in the soil.

River Designation: The process whereby rivers are added to the National Wild and Scenic Rivers System by an act of Congress or by administrative action of the Secretary of the Interior with regard to state-designated rivers under Section 2(a)(ii) of the Wild and Scenic Rivers Act.

Road: A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.

Road Density: Number of miles of open road per square mile.

Roadless: Refers to the absence of roads which have been improved and maintained by mechanical means to insure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road.

Rock Art: Petroglyphs or pictographs.

Rock Outcrop: Consists of exposures of bare bedrock other than lava flows and rock-lined pits. Also, areas of highly flocculated, salt affected, clays that support little or no vegetation.

Runoff: The water that flows on the land surface from an area in response to rainfall or snowmelt.

Rural Fire District: An organization established to provide fire protection to a designated geographic area outside of areas under municipal fire protection.

Rural Intermix: Any area wherein residences and other developments are scattered and intermingled with vegetative fuels such as forest, range, farm land, or native vegetation. ***See also*** Wildland Urban Interface.

Sagebrush Focal Area: Areas of BLM-administered land identified by the U.S. Fish and Wildlife Service as "strongholds" for Greater Sage-Grouse and that have been noted and referenced by the conservation community as having the highest densities of Greater Sage-Grouse and other criteria important for the persistence of Greater Sage-Grouse.

Sage-Grouse Habitat - General Habitat Management Area (GHMA): Areas with or without ongoing or imminent impacts containing sage-grouse habitat outside of the priority areas. Management actions would maintain habitat for sustainable sage-grouse populations to promote movement and genetic diversity. Areas are delineated based on sage-grouse habitat.

Sage-Grouse Habitat – Priority Habitat Management Area (PHMA): An area with limited impacts containing substantial and high quality Greater Sage-Grouse habitat that supports high density Greater Sage-Grouse populations. Management actions would emphasize the conservation and enhancement of sustainable Greater Sage-Grouse habitat. The area is delineated by using "key," "core" and connectivity data/maps, land ownership patterns, and other resource information.

Sage-Grouse Habitat - Protection Priority Areas: Areas with limited impacts containing substantial and high quality sage-grouse habitat that support sustainable sage-grouse populations. Management actions would emphasize the

protection and enhancement of sustainable sage-grouse populations. Areas are delineated by using "key," "core" and connectivity data/maps and other resource information.

Sage-Grouse Habitat - Restoration Areas: Areas with ongoing or imminent impacts containing substantial and high quality sage-grouse habitat that historically supported sustainable sage-grouse populations. Management actions would emphasize restoration for the purpose of establishing or restoring sustainable sage-grouse populations. Areas are delineated by using "key," "core" and connectivity data/maps and other resource information.

Salable Minerals: Common variety minerals on the public lands, such as sand and gravel, which are used mainly for construction and are disposed of by sales or special permits to local governments.

Salmonid: Any fish of the Salmonidae family, including salmon and trout.

Salvage Timber: Dead timber, damaged timber, or timber that is dying from insect, disease, fire, or environmental events, which can be economically removed from the forest.

Scale: Refers to the geographic area and data resolution under examination in an assessment or planning effort.

Scenic Quality: The degree of harmony, contrast and variety within a landscape.

Scenic River: A river or section of a river that is free of impoundments and whose shorelines are largely undeveloped but accessible in places by roads.

Scoping: The process of identifying the range of issues, management concerns, preliminary alternatives, and other components of an environmental impact statement or land-use planning document. It involves both internal and public viewpoints.

Seasonal Restriction: A fluid minerals leasing constraint that prohibits surface use during specified time periods to protect identified resource values. The constraint does not apply to the operation and maintenance of production facilities unless analysis demonstrates that such constraints are needed and that less stringent, project- specific constraints would be insufficient.

Section 7 Consultations: The requirement of Section 7 of the Endangered Species Act that all federal agencies consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service if a proposed action might affect a federally listed species or its critical habitat.

Section 106 Compliance: The requirement of Section 106 of the National Historic Preservation Act that any project funded, licensed, permitted, or assisted by the federal government be reviewed for impacts to significant historic properties and that the State Historic Preservation Officer and the Advisory Council on Historic Preservation be allowed to comment on a project.

Security Habitat: refers to the protection inherent in any situation that allows elk to remain in a defined area despite an increase in stress or disturbance associated with hunting or other human activities.

Sediment: Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

Sedimentary Rock: Rock resulting from consolidation of loose sediment that has accumulated in layers.

Sedimentation: The process or action of depositing sediment.

Segregation: Any action such as a withdrawal or allowed application (exchange) that suspends the operation of the general public land laws; removing lands from the operation of part or all the public land mineral laws.

Sensitive Class II Area: A Class II area under the Prevention of Significant Deterioration (PSD) Program for which a Federal Land Management (FLM) agency, state agency, or tribal authority requests Air Quality Related Value (AQRV) analysis comparable to that performed for PSD Class I areas. Agencies with jurisdiction over sensitive Class II areas

sometimes request that the lead agency implement mitigation measures to protect AQRVs at sensitive Class II areas. Sensitive Class II areas are not addressed by the Clean Air Act.

Sensitive Species: Species designated by the State Director, usually in cooperation with the State agency responsible for managing the species and State Natural heritage programs, as sensitive. They are those species that: (1) could become endangered in or extirpated from a State, or within a significant portion of its distribution; (2) are under status review by the USFWS; (3) are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution; (4) are undergoing significant current or predicted downward trends in population or density such that federal listed, proposed, candidate, or State listed status may become necessary; (5) typically have small and widely dispersed populations; (6) inhabit ecological refugia or other specialized or unique habitats; or (7) are State listed but which may be better conserved through application of BLM sensitive species status.

Seral: A temporal and intermediate condition pertaining to the successional stages of biotic communities.

Shaft: A vertical or inclined opening to an underground mine.

Shallow Soils: Soils that are less than 20 inches to bedrock.

Short-Term: Effects lasting less than 5 years.

Shrub: A low, woody plant, usually with several stems, that may provide food and/or cover for animals.

Significant: An effect that is analyzed in the context of the proposed action to determine the degree or magnitude of importance of the effect, either beneficial or adverse. The degree of significance can be related to other actions with individually insignificant but cumulatively significant impacts.

Significant Paleontological Resource (syn. Significant Fossil Resource): Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value. Paleontological resources that may be considered to not have paleontological significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research.

Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities.

Slash: Forest residues such as branches, bark, tops, cull logs, broken or uprooted trees, and/or stumps that can be left on the ground or in piles after logging, vegetative or fuels treatments, or land use activities such as road construction.

Slope: The degree of deviation of a surface from the horizontal.

Soil Compaction: A layer of dense soil caused by repeated impacts on or disturbances of the soil surface. Compaction becomes a problem when it begins to limit plant growth, water infiltration, or nutrient cycling processes.

Soil Productivity: The capacity of a soil to produce a plant or sequence of plants under a system of management.

Solar Insolation: A measure of solar radiation energy received on a given surface area in a given time. It is commonly expressed as average irradiance in watts per square meter (W/m^2) or kilowatt-hours per square meter per day ($kWh/m^2/day$).

Solitude: (1) the state of being alone or remote from others; isolation; (2) a lonely or secluded place.

Sound: A vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

Source Water Protection Plan: A management plan, usually developed by local communities, that addresses public water system concerns based on information contained within Source Water Delineation and Assessment Reports.

S**pecial Recreation Management Area (SRMA):** An identified area of BLM land managed to provide entire recreation products (i.e., services, settings, and activity and outcome opportunities) in response to identifiable significant customer desires. Investments in facilities and/or visitor assistance are authorized within SRMAs.

Special Recreation Permits (SRPs): Authorizations which allow for recreational uses of the public lands and related waters. They are issued as a means to control visitor use, protect recreational and natural resources, and provide for the health and safety of visitors. Organized Groups and Special Area permits are usually issued in high use areas or where recreation use requires special BLM management. Commercial SRPs are also issued as a mechanism to provide a fair return to the United States for the commercial recreational use of public lands.

Special Status Species: Includes proposed species, listed species, and candidate species under the Endangered Species Act; State-listed species; and BLM State Director-designated sensitive species.

Species: A unit of classification of plants and animals consisting of the largest and most inclusive array of sexually reproducing and cross-fertilizing individuals, which share a common gene pool.

Species Diversity: The number, different kinds of, and relative abundances of species present in a given area.

Split Estate: Split estate is a land status term which applies when the surface is patented or deeded into non-federal ownership, while the federal government retains the mineral rights. Reverse split estate applies when the federal government transferred both the surface and mineral estate into non-federal ownership, but the surface estate was subsequently returned while the minerals, or a portion of them, were retained by the private landowner.

Stand: A community of trees or other vegetation uniform in composition, constitution, spatial arrangement, or condition to be distinguishable from adjacent communities.

Stand Composition: The proportion of each tree species in a stand expressed as a percentage of all trees, basal area or volume.

Standard: A description of the physical and biological conditions or degree of function required for healthy, sustainable lands (e.g., land health standards). To be expressed as a desired outcome or goal.

State Exchange: A land exchange between the federal government and a state.

Steep Slopes: Slopes with a gradient between 20 and 60 percent (USDA-SCS 1993).

Stipulations: Requirements that are part of the terms of a mineral lease. Some stipulations are standard on all federal leases. Other stipulations may be applied to the lease at the discretion of the surface management agency to protect valuable surface resources and uses.

Strategic Plan: A plan that establishes the overall direction for the BLM. This plan is guided by the requirements of the Government Performance and Results Act of 1993, covers a 5-year period, and is updated every 3 years. It is consistent with FLPMA and other laws affecting the public lands.

Stream Reach: A specified length of a stream or channel.

Structure (Stream Channel): Any object, usually large, in a stream channel that controls water movement.

Structure (of Forest Vegetation): The horizontal and vertical distribution of plants in a stand, including height, diameter, crown layers, and stems of trees, shrubs, herbaceous understory, snags and coarse woody debris.

Substrate: The mineral or organic material that forms the bed of a stream; the base upon which an organism lives; the surface on which a plant or animal grows or is attached.

Subsequent Well Operations: A proposal for further well operations must be approved by the authorized officer prior to commencing operations to redrill, deepen, perform casing repairs, plug-back, alter casing, perform nonroutine fracturing jobs, recomplete in a different interval, perform water shut off, commingling production between intervals and/or conversion to injection. Unless additional surface disturbance is involved and if the operations conform to the standard of prudent operating practice, prior approval is not required for routine fracturing or acidizing jobs, or recompletion in the same interval. No prior approval or a subsequent report is required for well cleanout work, routine well maintenance, or bottom hole pressure surveys.

Sub-surface Ownership Codes: GIS datasets created for the purpose of spatially displaying subsurface minerals on the 1:100,000 map series for BLM in Montana, North Dakota and South Dakota.

- ***Coal Only:*** The federal government reserved its right to explore and excavate coal according to standards, regulations and statutes. Remaining subsurface has been patented out.

- ***All Minerals:*** The federal government reserved all subsurface mineral rights, including but not limited to oil, gas, and coal. This designation is used only when the federal government has reservations on all subsurface, and is not a category that contains any or all of the other listed categories.

- ***Oil and Gas Only:*** The federal government reserved its right to explore and drill for oil and gas according to standards, regulations and statutes. Remaining subsurface has been patented out.

- ***Oil, Gas, and Coal Only:*** The federal government reserved its right to explore for and remove coal, oil and gas according to the standards and regulations. Remaining subsurface has been patented out.

- ***Other Minerals (Restricted Minerals):*** The federal government has retained a whole or partial interest in a specific mineral or group of minerals that are not listed as a separate category above (e.g., phosphate), or where the federal government has a certain percent interest in one or more minerals. This must be researched to establish the federal interest.

Succession: The replacement in time of one plant community with another. The prior plant community (or successional stage) creates conditions that area favorable for the establishment of the next stage.

Suitability (for Wild and Scenic Rivers): Evaluation of eligible rivers for inclusion into the national Wild and Scenic River System by Determining the best use of the river corridor and the best method to protect the outstandingly remarkable values within the river corridor.

Sundry Notice: A BLM Form 3160-5 that is used by leaseholders/operating rights owners to request approval to perform specific tasks related to a federal oil and gas lease. Sundry notices are also submitted once a task has been completed.

Surface-Disturbing or Disruptive Activities: For the purposes of applying mitigation measures, surface-disturbing and disruptive activities are defined below.

- ***Surface-Disturbing Activities:*** The physical disturbance or removal of land surface and vegetation. Some examples of surface-disturbing activities include, but are not limited to, construction of roads, well pads, pipelines, powerlines, pits/reservoirs, facilities, recreation sites, and mining. Vegetation renovation treatments that involve soil penetration and/or substantial mechanical damage to plants (plowing, chiseling, chopping, etc.) are also surface-disturbing activities.

- ***Disruptive Activities:*** Those resource uses and activities that are likely to alter the behavior of, displace, or cause excessive stress to wildlife populations occurring at a specific location and/or time. In this context, disruptive activity(ies) refers to those actions that alter behavior or cause the displacement of wildlife such that reproductive success is negatively affected, or the physiological ability to cope with environmental stress is compromised. This term does not apply to the physical disturbance of the land surface, vegetation, or features. Examples of disruptive activities may include noise, vehicle traffic, or other human presence regardless of the activity. The term is used in conjunction with protecting wildlife during crucial life stages (e.g., breeding,

nesting, birthing, etc.), although it could apply to any resource value. This definition is not intended to prohibit all activities or authorized uses.

For example, emergency activities (e.g., fire suppression, search and rescue), rangeland monitoring, routine maintenance associated with an approved authorization, dispersed recreational activities (e.g., hunting, hiking) and livestock grazing are not considered surface-disturbing or disruptive activities.

Sustainability: The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

Sustained Yield: Maintenance of an annual or regular periodic output of a renewable resource from public land consistent with the principles of multiple use.

Tailings: The waste matter from ore after the extraction of economically recoverable metals and minerals.

Take: As defined by the Endangered Species Act, "to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or attempt to engage in any such conduct."

Technically/Economically Feasible: Actions that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant. It is the BLM's sole responsibility to determine what actions are technically and economically feasible. The BLM will consider whether implementation of the proposed action is likely given past and current practice and technology; this consideration does not necessarily require a cost-benefit analysis or speculation about an applicant's costs and profit. (Modified from the CEQ's 40 Most Asked Questions and BLM NEPA Handbook, Section 6.6.3)

Terms and Conditions: Measures contained in livestock grazing permits and leases, which are determined by the authorized officer to be appropriate to achieve management and resource condition objectives for the public lands and other lands administered by the BLM, and to ensure conformance with Fundamentals of rangeland health and Standards and guidelines for grazing administration.

Terrestrial Species: Ground-dwelling plants and animals.

Thermal Cover: Vegetation or topography that prevents radiational heat loss, reduces wind chill during cold weather, and intercepts solar radiation during warm weather.

Threatened Species: Any plant or animal species defined under the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range; listings are published in the Federal Register.

Timber: Standing trees, downed trees or logs which are capable of being measured in board feet.

Timeliness: The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives (BLM Manual Section 1794).

Tools: Something that helps to accomplish the stated goal or action for a resource/resource use or program. Tools include: timing, duration of grazing, forage utilization, grazing rotation, deferment of grazing, stubble height, bank alteration, and structural features.

Total Maximum Daily Load: An estimate of the total quantity of pollutants (from all sources: point, nonpoint, and natural) that may be allowed into waters without exceeding applicable water quality criteria.

Traditional Lifeway Values: Values that are important for maintaining a group's traditional system of religious belief, cultural practice, or social interaction. A group's shared traditional lifeway values are abstract, nonmaterial, ascribed ideas that cannot be discovered except through discussions with members of the group. These values may or may not be closely associated with definite locations. Traditional lifeway values sometimes imbue cultural resources with

significance. They can be identified through consultation and considered through public participation during planning and environmental review. The BLM does not manage people's values, beliefs, or social systems.

Trail: Linear routes managed for human-powered, stock, or off-road vehicle forms of transportation, or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Travel Management Areas: Polygons or delineated areas where a rational approach has been taken to classify areas open, closed, or limited, and have identified and/or designated network of roads, trails, ways, and other routes that provide for public access and travel across the planning area. All designed travel routes within travel management areas should have a clearly identified need and purpose as well as clearly defined activity types, modes of travel, and seasons or timeframes for allowable access or other limitations.

Treatment Area: The specific area of land where the actual management activity, such as timber harvest, prescribed burning, construction, or other activity would occur. One or more treatment areas can be included in a project area which usually includes adjacent and/or surrounding areas that are not treated, and multiple activities could occur within a single treatment area, concurrently or over time.

Unauthorized Development: An activity that physically alters the character of BLM land or vegetative resources. Examples include cultivation of the land and road or trail construction/realignment.

Unauthorized Occupancy: Activities which result in full or part-time human occupancy or use. An example would be the construction, placement, occupancy, or assertion of ownership of a facility or structure (cabin, house, natural shelter, trailer, etc.) on BLM land.

Unauthorized Use: Activities that do not appreciably alter the physical character of BLM land or vegetative resources. Some examples of unauthorized use include the abandonment of property or trash, enclosures, and use of existing roads, primitive roads and trails for purposes which require a use fee or right-of-way.

Unavoidable Adverse Effects: Those that remain following the implementation of mitigation measures, and include effects for which there are no mitigation measures.

Understory: Vegetation (e.g., trees or shrubs) growing under the canopy formed by taller trees.

Ungulates: Hoofed animals, including ruminants but also horses, tapirs, elephants, rhinoceroses, and swine.

Unleased Allotments (Grazing): Areas of land designated and managed for livestock grazing which are currently not leased or permitted by a qualified applicant.

Unreserved Public Lands: Public lands not covered by a reservation or a withdrawal except by the federal orders of withdrawal.

Uplands: Lands at higher elevations than alluvial plains or low stream terraces; all lands outside the riparian-wetland and aquatic zones.

Use Authorization: Approval of a proposed use for land or resources on the prescribed form or document designated for such use; a document showing permission to use land or the resources thereon; a formalized grant pursuant to a request to use land or resources.

User Day: Any calendar day, or portion thereof, for each individual accompanied or serviced by an operator or permittee on the public lands or related waters; synonymous with passenger day or participant day.

Utility Type (or Terrain) Vehicle (UTV): Any recreational motor vehicle other than an all-terrain vehicle, motorbike, or snowmobile designed for and capable of travel over unpaved roads, traveling on four or more low-pressure tires, maximum width is less than 74 inches, usually a maximum weight less than 2,000 pounds, or having a wheelbase of 94 inches or less. Utility type vehicles do not include vehicles specially designed to carry a person with disabilities.

Utilization (Rangeland): The proportion of the current year's forage production that is consumed or destroyed by grazing animals. Utilization is usually expressed as a percentage.

Vacant Available Lands (Grazing): Areas of land designated for livestock grazing which are not segregated into allotments. These lands may be formed into allotments if a qualified applicant applies for a lease or permit.

Vacant Public Lands: Public lands that are unappropriated and unreserved and not within a withdrawal; lands that are not reserved except by the general orders of withdrawal.

Valid Existing Rights: Locatable mineral development rights that existed when the Federal Land Policy and Management Act was enacted on October 21, 1976. Some areas are segregated from entry and location under the Mining Law to protect certain values or allow certain uses. Mining claims that existed as of the effective date of the segregation may still be valid if they can meet the test of discovery of a valuable mineral required under the Mining Law. Determining the validity of mining claims located in segregated lands requires BLM to conduct a validity examination and is called a "valid existing rights" determination.

Vegetation Community: An assemblage of plant populations in a common spatial arrangement.

Vegetation Manipulation: Alteration of vegetation by using fire, plowing, cutting, powered mechanical, or other means.

Vegetation Type: A plant community with distinguishable characteristics described by the dominant vegetation present.

Very Deep Soils: Soils that are greater than 60 inches deep to bedrock.

Very Shallow Soils: Soils that are less than 10 inches to bedrock.

Very Steep Slopes: Slopes with a gradient greater than 45 percent (USDA-SCS 1993).

Viable: Capable of sustaining a healthy, productive, and reproducing population over a long period of time.

Visual Resource Management (VRM) Classes: Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective which prescribes the amount of change allowed in the characteristic landscape.

Waiver (Oil and Gas): A permanent exemption to a lease stipulation.

Waste Rock: Barren rock at a mine or material that is too low in grade to be of economic value.

Water Quality: The chemical, physical, and biological characteristics of water with respect to its suitability for a particular use.

Water Quality Restoration Plans: A comprehensive plan developed in conjunction with Montana Department of Environmental Quality, local watershed groups, and numerous agencies and entities to address and establish water quality goals, Total Maximum Daily Loads, restoration strategies, and monitoring.

Water Table: The surface in a groundwater body where the water pressure is atmospheric. It is the level at which water stands in a well that penetrates the water body just far enough to hold standing water.

Watershed: A geomorphic area of land and water within the confines of a drainage divide. The total area above a given point on a stream that contributes flow at that point.

Watershed Approach: A framework to guide watershed management that: (1) uses watershed assessments to determine existing and reference conditions; (2) incorporates assessment results into resource management planning; and (3) fosters collaboration with all landowners in the watershed. The framework considers both ground and surface water flow within a hydrologically defined geographical area.

Watershed Assessment: An analysis and interpretation of the physical and landscape characteristics of a watershed using scientific principles to describe watershed conditions as they affect water quality and aquatic resources.

Weed Management Area: These are distinguishable zones based on similar geography, weed problems, climate, or human-use patterns with agreements between landowners to cooperatively manage noxious weeds.

Wetland Vegetation: The outer extent of the obligate and facultative wetland species that grows on land that is inundated or saturated by surface water or groundwater.

Wetlands: Areas that are inundated or saturated by surface or ground water often and long enough to support and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wild River: Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Wild, Scenic or Recreational River: The three classes of what is traditionally referred to as a "Wild and Scenic River." Designated river segments are classified as wild, scenic and/or recreational, but the segments cannot overlap.

Wild and Scenic River Study: Rivers identified in Section 5 of the Wild and Scenic Rivers Act for study as potential additions to the National Wild and Scenic Rivers System. The rivers shall be studied under the provisions of Section 4 of the Wild and Scenic Rivers Act.

Wildcat (Exploration) Well: A well drilled in the area where there is no oil or gas production.

Wilderness: A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres or is large enough to make practical its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Wilderness Characteristics: Key characteristics of a wilderness listed in section 2(c) of the "Wilderness Act" of 1964 and used by BLM in its wilderness inventory. These characteristics include size, naturalness, outstanding opportunities for solitude, outstanding opportunities for primitive and unconfined type of recreation, and special features.

Wilderness Study Area: A designation made through the land use planning process of a roadless area found to have wilderness characteristics as described in Section 2 (c) of the Wilderness Act of 1964.

Wildfire: An unplanned ignition of a wildland fire (such as a fire caused by lightning, volcanoes, unauthorized and accidental human-caused fires) and escaped prescribed fires..

Wildland Fire: Any non-structure fire that occurs in the wildland. This term was updated in February of 2009 to include two (rather than three) types of wildland fire:

- ***Wildfire*:** An unplanned ignition of a wildland fire (such as a fire caused by lightning, volcanoes, unauthorized and accidental human-caused fires) and escaped prescribed fires.

- ***Prescribed Fire:*** A planned fire; planned ignitions.

Wildland Fire Use: This term became obsolete in February of 2009 when new interagency guidance was developed for implementing Federal Wildland Fire Management Policy. The definition was '*application of the appropriate management response to naturally-ignited wildland fires to accomplish specific resource management objectives in pre-defined designated areas outlined in Fire Management Plans*.' There is no new term to replace this, but the concept remains available as a planned management option. Prior to 2009, this term was the third type of **Wildland Fire**.

Wildland Urban Interface (WUI): The line, area, or zone, where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel. ***See also*** Rural Intermix.

Wildlife Corridor: Landscape elements that connect similar patches of habitat through an area with different characteristics. Wildlife corridors are also segments of land which create a link between critical habitats. For example, streamside vegetation may create a corridor of willows and hardwoods between meadows or through a forest. These linkage zones are where species migrate and intermingle ensuring genetic interchange and consequently long-term survival.

Winter Range: An area where specific wildlife species (primarily deer, antelope and elk) congregate during winter time periods. These areas are often composed of topographic or vegetative features that enhance survival for these species when conditions such as snow accumulation and temperature place increased energetic demands on individual animals.

Withdrawal: Removal or withholding of public lands by statute or secretarial order, from the operation of some or all of the public land laws.

Withdrawal Modification: To make a change to an existing, indefinite withdrawal.

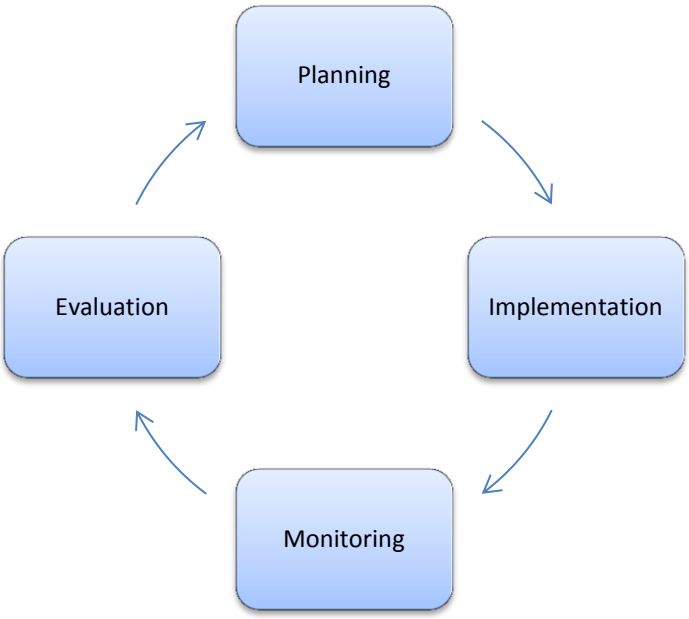
Withdrawal Revocation: The cancellation of a withdrawal.

Woodland: A forest community occupied primarily by noncommercial species such as juniper, mountain mahogany, or quaking aspen groves. All western juniper or limber pine are classified as woodlands, since juniper and limber pine are classified as noncommercial species.

Appendix A
Implementation and Monitoring

Plan implementation is a continuous process occurring over the life of the resource management plan that will consider changing circumstances and new information through monitoring. The goal is to maintain a dynamic resource management plan that is evaluated and amended if necessary on an issue-by-issue basis.

The implementation and monitoring process for the HiLine District involves four major steps: planning, implementation, monitoring, evaluation, and adjustments, as necessary. Planning involves a great amount of time and resources to identify issues and management opportunities to address those issues. During the planning process, the scope of the issue is identified and management goals, objectives and actions are defined to address the issues. Once the planning process is completed, decisions are implemented, monitored, and evaluated over a period of time to determine if goals are being met and if management actions are achieving the desired objective or standard. Results of monitoring are documented and communicated to appropriate parties, and management objectives and actions are modified based on results, if necessary.



Planning

The Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) is approved once the Record of Decision is signed. An Approved Plan will also be available that will include all the approved decisions from the RMP.

The BLM regulation in 43 CFR 1610.5-4 provides that land use plan decisions and supporting components can be maintained to reflect minor changes in data. Maintenance is limited to further refining, documenting, or clarifying a previously approved decision incorporated in the plan. Maintenance must not expand the scope of resource uses or restrictions or change the terms, conditions, and decisions of the Approved Plan.

Land use plan decisions are changed through either a plan amendment or a plan revision. The process for conducting plan amendments is basically the same as the land use planning process used in developing RMPs. The primary

difference is that circumstances may allow for completing a plan amendment through the environmental assessment (EA) process, rather than through an EIS. Plan amendments (43 CFR 1610.5-5) change one or more of the terms, conditions, or decisions of an approved land use plan. Plan amendments are most often prompted by the need to consider a proposal or action that does not conform to the plan; implement new or revised policy that changes land use plan decisions; respond to new, intensified, or changed uses on BLM land; and consider significant new information from resource assessments, monitoring, or scientific studies that change land use plan decisions.

Implementation

Implementation of the resource management plan (RMP) begins once the Record of Decision and Approved Plan for the Proposed RMP/Final EIS is signed.

Decisions made through the RMP planning process are implemented over a period of time. Some of the decisions are immediate and go into effect with the Record of Decision. These include decisions such as the road designations and lands available for disposal through exchange. Some decisions would be implemented after a site-specific environmental review is completed. Examples include range improvements, recreation sites, or approval of an application for permit to drill a natural gas well. Other decisions include guidance that would be applied during site-specific analysis or activity planning.

Any future proposals or management actions will be reviewed against the Approved Plan to determine if the proposal would be in conformance with the RMP. While the Final EIS for the HiLine RMP provides the compliance with NEPA for the broad-scale decisions to be made in the Record of Decision, it does not replace the requirement to comply with NEPA for implementation actions. Proposed actions fall into one of five categories: (1) actions that are exempt from NEPA; (2) actions that are categorically excluded; (3) actions that are covered by an existing NEPA environmental document; (4) actions that require preparation of an environmental assessment (EA) to determine if an environmental impact statement (EIS) is needed; or (5) actions that require preparation of an EIS. The NEPA procedural, documentation, and public involvement requirements are different for each category.

Activity level planning will address any proposed new activities and long-term permitted activities that need to be brought into compliance with plan decisions, subject to valid existing rights. Monitoring of these activities will then determine the effectiveness of applying the land use plan direction. Where land use plan actions or best management practices are not effective, modifications could occur without amendment or revision of the plan as long as assumptions and impacts disclosed in the analysis remain valid and broad-scale goals and objectives are not changed. This approach uses on-the-ground monitoring, review of scientific information, and consideration of practical experience and common sense to adjust management and modify implementation of the plan to reach the desired outcome.

As part of this process, the BLM will review management actions and the plan periodically to determine whether the objectives set forth in this document are being met. Where they are not being met, the BLM will consider adjustments of appropriate scope. Where the BLM considers taking or approving actions which will alter or not conform to overall direction of the plan, the BLM will prepare a plan amendment and environmental analysis of appropriate scope.

In addition, during the life of the Approved Plan, the BLM expects that new information gathered from field inventories and assessments, research, other agency studies, and other sources will update baseline data or support new management techniques, best management practices, and scientific principles. To the extent that such new information or actions address issues covered in the plan, the BLM will integrate the data through plan maintenance.

Monitoring

Monitoring is the repeated measurement of activities and conditions over time. Monitoring data gathered over time is examined and used to draw conclusions on whether management actions are meeting stated objectives, and if not, why. Conclusions are then used to make recommendations on whether to continue current management or what changes need to be made in management practices to meet objectives.

Monitoring determines whether planned activities have been implemented in the manner prescribed by the plan. This monitoring documents the BLM's progress toward full implementation of the land use plan decision. No specific thresholds or indicators are required for this type of monitoring.

Monitoring also is used to determine if the implementation of activities has achieved the desired goals and objectives. This requires knowledge of the objectives established in the RMP as well as indicators that can be measured. Indicators are established by technical specialists in order to address specific questions, and thus avoid collection of unnecessary data. Success is measured against the benchmark of achieving desired future conditions established by the plan.

Monitoring is also used to ascertain whether a cause-and-effect relationship exists among management activities or resources being managed. It confirms whether the predicted results occurred and if assumptions and models used to develop the plan are correct. This type of monitoring is often done by contract with another agency, academic institution, or other entity, and is usually expensive and time-consuming since results are not known for many years.

Regulations at 43 CFR 1610.4-9 require that the proposed plan establish intervals and standards, as appropriate, for monitoring and evaluation of the plan, based on the sensitivity of the resource decisions involved. Progress in meeting the plan objectives and adherence to the management framework established by the plan is reviewed periodically. CEQ regulations implementing NEPA state that agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases (40 CFR 1505.2(c)). To meet these requirements, the BLM will prepare periodic reports on the implementation of the RMP.

Evaluation

Evaluation is a process in which the plan and monitoring data are reviewed to see if management goals and objectives are being met and if management direction is sound.

Land use plan evaluations will be used by BLM to determine if the decisions in the RMP, supported by the accompanying NEPA analysis, are still valid. Evaluation of the RMP will generally be conducted every five years, unless unexpected actions, new information, or significant changes in other plans, legislation, or litigation triggers an evaluation. Land use plan evaluations determine if decisions are being implemented, whether mitigation measures are satisfactory, whether there are significant changes in the related plans of other entities, whether there is new data of significance to the plan, and if decisions should be changed through amendment or revision.

Based on a Record of Decision and Approved Plan released in the winter of 2014, the following evaluation schedule would be followed for the HiLine RMP/EIS:

- December 2019
- December 2024
- December 2029
- December 2034

Evaluations will follow the protocols established by the BLM Land Use Planning Handbook H-1601-1 in effect at the time the evaluation is initiated.

Appendix B
HiLine District Air Resource Management Plan:

Adaptive Management Strategy
for
Oil and Gas Resources

Malta Air Monitoring Station Photo by Amanda Anderson

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Acronyms

APD	Application for Permits to Drill
AQRV	Air quality related value
AQTW	Air Quality Technical Workgroup
ARMP	Air Resource Management Plan
ARTSD	Air Resource Technical Support Document
BACT	Best Available Control Technology
BLM	Bureau of Land Management
CAMx	Comprehensive Air Quality Model with Extensions
CFR	Code of Federal Regulations
CMAQ	EPA Models-3/Community Multiscale Air Quality
CO	Carbon monoxide
EPA	U.S. Environmental Protection Agency
FLIR	Forward looking infrared
FLPMA	Federal Land Policy and Management Act
FS	U.S. Forest Service
FWS	U.S. Fish and Wildlife Service
hp	Horsepower
MAAQS	Montana Ambient Air Quality Standards
MAQP	Montana Air Quality Permits
$\mu g/m^3$	Micrograms per cubic meter
MDEQ	Montana Department of Environmental Quality
MOU	Memorandum of Understanding
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO	Nitric oxide
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NPS	National Park Service
NSR	New Source Review
O_3	Ozone
Pb	Lead
PGM	Photochemical grid modeling
PM_{10}	Particulate matter with a diameter less than or equal to 10 microns
$PM_{2.5}$	Particulate matter with a diameter less than or equal to 2.5 microns
POD	Plan of Development
ppb	Parts per billion
ppm	Parts per million
PSD	Prevention of Significant Deterioration
REC	Reduced emissions completion
ROD	Record of Decision
RMP	Resource Management Plan
SLAMS	State or Local Air Monitoring Station
SO_2	Sulfur dioxide
tpy	Tons Per Year
USDI	U.S. Department of the Interior
VOC	Volatile organic compound
WRAP	Western Regional Air Partnership
WRF	Weather and Research Forecasting

1.0 Introduction

1.1 Purpose of the Air Resource Management Plan

The Bureau of Land Management (BLM) HiLine District (HiLine) Air Resource Management Plan (ARMP) for oil and gas activities describes the air quality adaptive management strategy that would be used to assess future air quality and Air Quality Related Values (AQRVs) and identify mitigation measures to address unacceptable impacts that could potentially be associated with future oil and gas development. The adaptive management strategy focuses on oil and gas activity because aggregated emissions from multiple small sources at well sites can potentially cause significant air quality and AQRV impacts under certain circumstances.

The BLM works collaboratively with the Montana Department of Environmental Quality (MDEQ) to promote air quality monitoring near oil and gas activity areas and will work closely with the Montana MDEQ on any future emission mitigation considered under this ARMP. The oil and gas adaptive management strategy was prepared in collaboration or with the review of the U.S. Environmental Protection Agency (EPA) and three federal land management agencies under the *Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the National Environmental Policy Act [NEPA] Process* (USDI 2011). This Memorandum of Agreement (MOU) is described in more detail in Section 1.4 of this appendix. Although not a signatory to the MOU, the MDEQ participates in the Air Quality Technical Workgroup (AQTW) that was established to implement the MOU process for the Proposed Resource Management Plan (PRMP) and Environmental Impact Statement (EIS).

As described in Chapter 3 of the Proposed RMP/Final EIS, the MDEQ and EPA implement the Clean Air Act within non-tribal portions of the planning area, while EPA implements the Act in tribal areas. State and federal emission control regulations and air quality permitting programs apply to many oil and gas sources. However, some of the smallest oil and gas emission sources are not required to obtain air quality permits. Facilities that have the potential to emit less than 25 tons per year of a regulated air pollutant are generally not required to obtain state or federal air quality permits or register their facilities with MDEQ. At these smallest facilities, certain activities and equipment are subject to state and federal emission control regulations. The ARMP provides a means for the BLM to satisfy its statutory responsibility under NEPA and FLPMA to protect air quality and other natural resources. Under the ARMP, the BLM will take appropriate management action if monitoring data for local areas with BLM-authorized oil and gas activity indicate that additional emission reductions may be needed to maintain good air quality. Due to the fragmentation of surface and mineral estate within the planning area, the BLM and MDEQ would seek a consistent emission control approach throughout an area of concern.

The ARMP includes both near-term actions and long-term actions. In the near-term, the ARMP sets forth initial actions to maintain good air quality until regional modeling can be performed to further assess potential impacts to air quality and AQRVs. In the long-term, the ARMP provides ongoing management strategies to assess and adapt to new air quality and AQRV ambient monitoring and modeling data during the life of this Resource Management Plan (RMP).

The ARMP includes a multifaceted approach involving the following activities:

- Oil and gas activity assessment
- Ambient air quality monitoring support
- Air quality and AQRV assessment
- Future air quality and AQRV modeling
- Mitigation

Pollutant emissions addressed by the ARMP include the criteria air pollutants listed below.

- Carbon monoxide (CO)
- Nitrogen dioxide (NO_2)
- Ozone (O_3)
- Particulate matter with a diameter less than or equal to 10 microns (PM_{10})

- Particulate matter with a diameter less than or equal to 2.5 microns ($PM_{2.5}$)
- Sulfur dioxide (SO_2)

Three criteria air pollutants, CO, lead, and SO_2, are not monitored within the HiLine because high concentrations of these pollutants are unlikely. Elevated concentrations of CO are associated with vehicle traffic in very large urban areas, while high concentrations of lead and SO_2 are typically found near industrial facilities that emit large quantities of these pollutants or in areas with sour gas production. These situations do not occur in the planning area, as described in Chapter 3. CO and SO_2 emissions would be modeled to demonstrate compliance with the NAAQS. Due to the lack of lead emissions from oil and gas activities, lead emissions would not be modeled as part of the air quality analysis.

The ARMP also addresses modeling and mitigation for the following AQRV assessments:

- Deposition of sulfur and nitrogen
- Lake acid neutralizing capacity
- Visibility

The adaptive management strategy for oil and gas resources provides the flexibility to respond to changing conditions that could not be predicted during RMP development. The strategy also allows for the use of new technology and methods that may minimize or reduce impacts.

1.2 Revision of the Air Resource Management Plan

This ARMP may be modified as necessary to comply with law, regulation, and policy and to address new information and changing circumstances. Changes to the goals or objectives set forth in the HiLine RMP/EIS would require maintenance or amendment of the RMP while changes to implementation, including modifying this ARMP, may be made without amending the RMP.

1.3 Current Air Quality

Based on the closest available monitoring data for rural oil and gas activity areas in northern Montana, air quality within the HiLine is believed to be good, as described in Chapter 3. All areas within the HiLine are designated as areas that attain the National Ambient Air Quality Standards (NAAQS). State-based standards, known as the Montana Ambient Air Quality Standards (MAAQS), are also believed to be met in the HiLine based on monitors sited outside the planning area. Recently installed BLM-funded monitors in Malta are providing much-needed ambient concentration data for north-central Montana.

1.4 Background of the AQTW and the MOU Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through the NEPA Process

The AQTW includes representatives from the following agencies: the BLM, EPA, U.S. Forest Service (FS), U.S. Fish and Wildlife Service (FWS), and the National Park Service (NPS). Each of these agencies is a party to the *Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the National Environmental Policy Act Process* (USDI 2011) (herein referred to as the MOU). This agreement is designed to ". . . facilitate the completion of NEPA environmental analyses for Federal land use planning and oil and gas development decisions [USDI 2011]."

The BLM asked the MDEQ to join the AQTW. The MDEQ has primary authority to protect air quality within the state. Although the MDEQ is not a signatory to the national MOU, successful air quality management of BLM-authorized oil and gas activities depends on a close working relationship between the BLM and the MDEQ. The two agencies have worked together to improve air quality monitoring and will continue to cooperate by sharing data, planning modeling efforts, and working together to identify emission reduction measures needed to maintain good air quality in areas with oil and gas activity.

The MOU sets forth collaborative procedures that the AQTW agencies use to analyze potential air quality and AQRV impacts. The agencies also work together to identify potential mitigation measures that may be needed to reduce impacts to air quality and AQRVs. The lead agency (the BLM in this case), in collaboration with the other agencies, has the responsibility to identify reasonable mitigation and control measures to address adverse impacts to air quality. Mitigation measures may also address impacts to AQRVs at Class I areas and at sensitive Class II areas that have been identified by the BLM, FS, FWS, and NPS.

The AQTW provided input to this ARMP and will continue to work collaboratively on future modeling efforts associated with this RMP. Provisions of the MOU continue to apply to future oil and gas activities in the planning area. In some cases, air quality and AQRV modeling performed under this ARMP may be sufficient to address modeling needs for future oil and gas projects that would otherwise require additional modeling under the MOU. However, the ARMP in no way replaces provisions of the MOU. Determinations of existing modeling adequacy for future oil and gas activities that trigger the MOU would be made collaboratively by the AQTW using the procedures included in the MOU.

1.5 MDEQ Air Quality Management and BLM Mitigation Measures

Primary air quality management authority and responsibility for the planning area rest with the MDEQ (for non-tribal areas of the planning area) and the EPA for tribal areas. However, the BLM also plays a role in protecting air resources under the Federal Land Policy and Management Act (FLPMA) and NEPA. Due to the nature of NEPA analyses for land use planning, the BLM's air resource management role is forward-looking because air resource impacts are analyzed for future activities that may or may not occur.

1.5.1 MDEQ Air Quality Programs

The MDEQ has been delegated Federal Clean Air Act authority from EPA to regulate air quality and air emissions requirements within the non-tribal areas of Montana. The MDEQ also implements state ambient air quality standards for additional air pollutants and has established more stringent standards for some criteria air pollutants, as shown in Table B.2. As part of NAAQS implementation, the MDEQ operates air quality monitors throughout Montana.

The MDEQ has State Implementation Plan approved New Source Review (NSR) permitting programs, which include Prevention of Significant Deterioration (PSD), Nonattainment Area (NAA), and minor source programs. The MDEQ's PSD and NAA permitting programs impose controls on major stationary sources in order to control emissions of regulated pollutants. Emission controls are typically required through the application of Best Available Control Technology (BACT) or Lowest Achievable Emission Rate, depending on the applicable NSR permitting program. In addition, the MDEQ implements a minor source NSR permitting program (e.g., minor source Montana Air Quality Permits [MAQP] and registrations). The MDEQ's minor source NSR program requires sources with a potential to emit greater than 25 tons per year (tpy) of any regulated air pollutant to apply for a permit to construct pursuant to the MAQP requirements or register with the MDEQ pursuant to the registration requirements under the Administrative Rules of Montana (ARM). To ensure compliance with the NAAQS, MDEQ's minor NSR program contains regulatory requirements that track activity and require the application of BACT. Additionally, the ARM require reasonable precautions to limit fugitive particulate emissions from all activities in Montana (i.e., permitted, registered, and those facilities that do not require a permit/registration). MDEQ's NSR program not only provides the emission benefits necessary to attain Montana's air quality goals, but also includes many features that provide regulatory certainty while still allowing flexibility in the implementation of Montana's air quality programs.

1.5.2 MDEQ Oil and Gas Emission Control Requirements

The MDEQ minor source permitting and registration program for oil and gas facilities includes a robust set of emission controls. MDEQ rules require oil or gas well facilities to control emissions from the time the well is completed until the source is registered or permitted. Facilities that choose to register must meet the emission control requirements contained in Administrative Rules of Montana (ARM) 17.8.17. If a source cannot meet these requirements it must apply for an MAQP. The MAQP requires a case-by-case BACT analysis. A case-by-case BACT analysis may include design, equipment, work practice, or operational standards in place of or in combination with an emission limitation. Examples of MDEQ emission control requirements for oil and gas facilities (defined as those with a potential to emit more than 25 tpy of any airborne pollutant) include the following measures to limit emissions.

- Each piece of oil or gas well facility equipment containing volatile organic compound (VOC) vapors (as defined in the permitting or registration regulations) with a potential to emit 15 tpy or more must be routed to a gas pipeline or to air pollution control equipment with 95 percent or greater control efficiency (registered facilities). This requirement applies to the following equipment.
    - Oil and gas wellhead production equipment including, but not limited to, wellhead assemblies, amine units, prime mover engines, phase separators, heater treatment units, dehydrator units, storage tanks, and connector tubing
    - Transport vehicle loading operations
- Hydrocarbon liquids must be loaded into transport vehicles using submerged fill technology.
- Stationary internal combustion engines greater than 85 brake horsepower must be equipped with nonselective catalytic reduction (for rich burn engines) or oxidation catalytic reduction (for lean burn engines) or equivalent emission reduction technologies.
- Piping components containing VOCs must be inspected for leaks each month. The first attempt to repair any leaking VOC equipment must occur within 5 days and the repair must be completed no later than 15 days after the leak is initially detected unless facility shutdown is required. Facilities are required to maintain monthly leak inspection and repair records.

Although MDEQ emission control requirements do not mention GHGs, the VOC emission control measures would also reduce methane emissions, while the engine emission controls would reduce nitrous oxide emissions.

The MDEQ oil and gas emission control requirements have successfully protected air quality throughout the planning area, as evidenced by ambient air quality monitoring data that indicate good air quality in oil and gas activity areas.

1.5.3 BLM Air Resource Management and MDEQ Coordination

The BLM's authority to address air resources derives primarily from FLPMA and NEPA. Under FLPMA, the BLM must "provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans" in the development and revision of land use plans (Section 202 (c)(8)). FLPMA also authorizes the BLM to manage public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values" (Section 102 (8)).

Under NEPA, the BLM ensures that information on the potential environmental and human impact of federal actions is available to public officials and citizens before decisions are made and before actions are taken. One of the purposes of the Act is to "promote efforts which will prevent or eliminate damage to the environment and biosphere," and to promote human health and welfare (Section 2). NEPA requires that BLM and other federal agencies prepare a detailed statement on the environmental impact of the proposed action for major federal actions expected to significantly affect the quality of the human environment (Section 102 (C)).

The BLM's authority under the Clean Air Act primarily derives from the requirement that BLM-authorized activities comply with the Clean Air Act. BLM-authorized activities may not violate the Clean Air Act or federal and state regulations and State Implementation Plans issued to implement the Act. When air quality or AQRV modeling performed during NEPA analysis predicts potential violations of the Clean Air Act or unacceptable AQRV impacts, the BLM evaluates the data and determines whether mitigation measures are needed. For example, the initial mitigation measure requiring drill rig engines to meet Tier 4 emission standards reduces NO_2 emissions and was demonstrated via modeling to prevent NAAQS violations from multiple large drill rig engines that may operate on one well pad. The mitigation measure includes an exception that allows use of drill rig engines meeting Tier 1, 2, or 3 emission standards if future modeling or near-field monitoring demonstrates compliance with the NAAQS.

When determining whether mitigation measures are needed, the BLM reviews current and proposed federal, state, and local regulations to determine whether mitigation will occur due to other agency actions. If the BLM determines that additional mitigation is needed while implementing this ARMP, the BLM will work closely with the MDEQ to coordinate future mitigation measures for BLM-authorized activities.

2.0 Oil and Gas Activity Assessment

Each year, the BLM would track the number and locations of new oil and gas wells drilled on federal mineral estate and the number of new and abandoned producing wells on federal mineral estate. These numbers would be compared to the planning area RFD and to the level of oil and gas development identified in the proposed plan.

In addition, the BLM would estimate oil and gas emissions from federal mineral estate every three years for oil and gas wells drilled and producing after the ROD is signed. Emission estimates would be based on well types, well numbers, and knowledge of typical equipment and operations. Emission estimation methods are expected to improve over time as better data become available. The emission estimates would also account for implemented mitigation measures and for new emission control regulations as they become effective. The BLM would collect additional data related to oil and gas equipment and operations to improve emission inventory quality. One area identified for improvement involves acquiring better data on oil and gas equipment used in the planning area. In order to improve fugitive dust emission estimates, the number, type, and length of vehicle trips in high-activity areas would also be assessed.

Each three-year oil and gas emission inventory would be compared to emission estimates for the RFD and the proposed plan. The results of this comparison would inform BLM decisions on NEPA adequacy.

3.0 Ambient Air Quality Monitoring Support

The Air Resources Management Bureau of the MDEQ has primary responsibility for siting and operating ambient air quality monitors within Montana and for reporting monitoring data to EPA and to the public. As described in its annual Air Quality Monitoring Network Plan (MDEQ 2013), the MDEQ identifies monitoring objectives for assessing ambient concentrations of criteria air pollutants and assessing compliance with the NAAQS and MAAQS. Historically, most MDEQ monitors were placed in cities to assess human health impacts in the more densely populated areas of Montana.

The BLM is working cooperatively with the MDEQ to place ambient air quality monitors in less densely populated areas where oil and gas activities are occurring or may occur in the future. The purpose of these monitors is two-fold: 1) to assess compliance with ambient air quality standards, and 2) to provide background ambient air quality concentrations for use in modeling efforts. Using a cooperative agreement, the BLM provided funding to help purchase, install, and operate monitoring equipment near Malta at the location shown in Table B.1.

The recently installed monitoring station near Malta measures ambient concentrations of NO_2, ozone, PM_{10}, and $PM_{2.5}$, as well as meteorological parameters such as temperature, wind speed, and wind direction. The BLM plans to continue to support monitoring at this location by providing operational funding and BLM staffing support to the MDEQ.

Table B.1. HiLine Monitoring Station

Station Name	*Monitored Pollutants*	*Installation Date*	*Station Number*	*County*	*Latitude*	*Longitude*
Malta	NO, NO_2, NO_x, O_3, PM_{10}, $PM_{2.5}$	July 2012	30-071-0010	Phillips	48.3175	-107.8625

4.0 Air Quality and AQRV Assessment

The BLM would assess air quality and AQRVs on an annual basis using quality-assured data from the EPA, MDEQ, FS, FWS, NPS, and other sources. In addition, a preliminary assessment of ozone concentrations would be performed on a weekly basis using data provided by the MDEQ.

4.1 Annual NAAQS and MAAQS Assessment

Based on the monitor listed in Section 3.0, the BLM would assess air quality monitoring data annually and would share the results of the assessment with the MDEQ and AQTW. The purposes of the annual assessment are to compare monitored data to NAAQS and MAAQS and to identify seasonal and long-term trends in air pollutant concentrations. The BLM would complete the annual assessment by May 31 of each year in order to ensure that quality-assured data are available for review.

NAAQS and MAAQS are provided in Table B.2 for pollutants monitored at the Malta monitoring station.

Table B.2. Ambient Air Quality Standards for Pollutants Monitored at the Malta Station

		Federal NAAQS [1]			*MAAQS* [2]
Pollutant	***Averaging Period***	***Concentration***	***Standard Type***	***Form of NAAQS Primary Standard***	***Concentration***
NO_2	1-hour	100 ppb	Primary	3-year average of the 98th percentile concentrations	0.30 ppm
	Annual	53 ppb	Primary, Secondary	Annual mean	0.05 ppm [6]
Ozone	1-hour	---	---	---	0.12 ppm [7]
	8-hour	0.075 ppm	Primary, Secondary	3-year average of the fourth-highest daily maximum 8-hour average	---
$PM_{2.5}$	24-hour	35 µg/m^3	Primary, Secondary [3]	3-year average of the 98th percentile concentrations	---
	Annual	12 µg/m^3	Primary	3-year average of the annual mean	---
	Annual	15.0 µg/m^3	Secondary	3-year average of the annual mean	---
PM_{10}	24-hour	150 µg/m^3	Primary, Secondary	NTBE more than one per year on average over 3 years	---
	Annual	Revoked [5]	---	---	50 µg/m^3 [5]

µg/m^3 micrograms per cubic meter
MAAQS Montana Ambient Air Quality Standards
NAAQS National Ambient Air Quality Standards
NO_2 nitrogen dioxide
NTBE not to be exceeded
$PM_{2.5}$ particulate matter less than or equal to 2.5 microns
PM_{10} particulate matter less than or equal to 10 microns
ppb parts per billion
ppm parts per million

[1] NAAQS are codified in Title 40 of the Code of Federal Regulations (CFR), Part 50.
[2] Montana AAQS are codified in Title 17, Chapter 8, Subchapter 2 of the Ambient Air Quality in the Administrative Rules of Montana and are shown in this column.
[3] EPA proposed a new secondary standard for $PM_{2.5}$ visibility of 28 or 30 deciviews (equivalent to 24 or 19 kilometers [15 or 12 miles] standard visual range).
[4] The annual PM_{10} NAAQS was revoked October 17, 2006.
[5] Based on annual second maximum.
[6] Not to be exceeded in the averaging period specified.
[7] State violation when exceeded more than once during any 12 consecutive months.

Montana standards are shown only if they are more stringent than the NAAQS. As of November 1, 2013, CO, lead, and SO_2 were not monitored within the HiLine. With regard to pollutants regulated exclusively under the MAAQS, hydrogen sulfide and settleable PM are not monitored within the planning area. Hydrogen sulfide is not monitored because ambient concentrations are believed to be very low due to low hydrogen sulfide levels in gas produced in the area. Settleable PM is not monitored in the area because the MDEQ prioritizes monitoring of pollutants subject to NAAQS and settleable PM is a MAAQS.

The BLM would use design values to compare ambient monitoring data to the NAAQS. Design values reflect the form of the NAAQS; they define the statistical metric used to compare monitoring data to federal and state standards. Depending on the pollutant and averaging time being assessed, the NAAQS is typically stated in terms of the maximum or second maximum concentration, average concentration, or a percentile of the standard. The form of a standard also states whether the design value is determined based on one or more years of monitoring data. EPA-calculated design values serve a critically important regulatory purpose; they determine whether areas are designated attainment or nonattainment. As such, EPA's design value determinations may take more than one year to finalize.

In order to review air quality trends more quickly, the BLM would determine "mitigation design values" by May 31 of each year for the previous calendar year(s). The mitigation design value would be a metric calculated by the MDEQ or BLM that uses procedures similar to EPA's regulatory design value calculation methodology, with the advantage that the MDEQ/BLM-calculated mitigation design values can be determined more quickly. The timing allows the MDEQ adequate time to quality assure monitoring data. However, the MDEQ may not yet have EPA concurrence on data that has been flagged by the MDEQ due to exceptional events such as wildfires. Consequently, the MDEQ/BLM-calculated mitigation design values would exclude monitoring data associated with MDEQ-identified exceptional events. Each BLM annual assessment would look back the requisite number of years for each pollutant and include data from the time period prior to ROD issuance for the first several annual BLM assessments. Additional information concerning design value calculations is provided in Section 6.2.3 The BLM will work closely with the MDEQ to ensure that only data certified by the MDEQ and procedures consistent with MDEQ procedures are used in design value calculations.

4.2 Preliminary Ozone Assessment

Because the new Malta monitor began operation in mid-2012, a full calendar year of data is not yet available. The most representative historical ozone concentration data for oil and gas areas in the HiLine comes from the Sidney monitoring station, for which data are provided in Table B.3 The maximum (1st highest) monitored ozone 8-hour concentration is shown in the following table. These numbers are greater than the values provided in Chapters 3 and 4, which are based on the 3-year average of the 4th highest daily maximum 8-hour average for direct comparison to the NAAQS. In its annual network monitoring plan, the MDEQ stated: "The information collected from these sites to-date indicates that O_3 is not currently a pollutant of concern in Montana" [MDEQ 2012]. However, in other states, ozone has become a pollutant of concern in rural areas with oil and gas activity. In order to protect air quality, the BLM developed an adaptive management strategy that would quickly identify any high-ozone events that may occur in the future and gather data that may help explain these events.

Table B.3. Maximum Monitored Ozone Concentrations Near the HiLine

Year	*8-hr Ozone Concentrations (ppb)*
2009	62
2010	65
2011	57

The BLM would perform weekly preliminary ozone concentration reviews to determine if high ozone events occur at the Malta monitor. If a high-ozone event occurs, the BLM would document meteorological and other conditions that may have contributed to the event. Because high-ozone events in other rural parts of the nation are not well understood and contributing factors can be site-specific, the BLM would gather data to develop baseline information relevant to any high-ozone events that may occur within the HiLine. Relevant baseline information includes capturing meteorological data for each event, determining the amount of snow on the ground (if applicable), and identifying any other data that may help describe circumstances associated with the event. For the purposes of this effort, a high-ozone event would be defined as a day for which the maximum 8-hour average ozone concentration is at or above 0.065 ppm.

In order to quickly ascertain relevant circumstances, the preliminary ozone assessments would use non-quality-assured data provided by the MDEQ. As part of the annual NAAQS assessment, quality-assured ozone data would be reviewed to determine if the preliminary ozone monitoring data were valid or if monitored high ozone concentrations were due to monitor malfunctions.

If high-ozone events occur within the HiLine, a summary of events and a discussion of relevant meteorological data and circumstances would be developed as part of the annual NAAQS assessment. These summaries and the underlying data may provide important information that can be used to predict potential occurrences of high-ozone events and to identify mitigation measures and/or proactive measures that could prevent future events.

4.3 Annual AQRV Assessment

Federal land managers track the status, condition, and trends of AQRVs for Class I and sensitive Class II areas under their jurisdictions. Consequently, the BLM would request visibility, sulfur and nitrogen deposition, and lake acid neutralizing capacity data from the FS, FWS, and NPS and would include agency-submitted data in the BLM's annual review of AQRV trends. The annual review would also include AQRV data from any Class I or sensitive Class II areas under BLM jurisdiction.

Based on these reviews, the BLM would maintain an awareness of AQRV trends. However, it should be noted that the reviews would not necessarily link AQRV trends to oil and gas development. AQRV impacts are often associated with pollutants that can be transported long distances from many different types of sources. For example, visibility degradation in eastern Montana primarily results from large stationary sources such as electric generating units and cement kilns, as addressed in the Montana Regional Haze Federal Implementation Plan (EPA 2012).

Photochemical grid modeling (PGM) would be completed after the ROD is signed and would provide additional information concerning the potential impact of oil and gas emissions and cumulative emissions on AQRVs.

5.0 Future Modeling

The BLM committed to perform PGM in order to assess regional air quality and AQRV impacts. Due to insufficient monitoring and regional emissions data available during development of the RMP, PGM will not be completed prior to issuance of the RMP/EIS and the ROD. In order to complete PGM expeditiously, the BLM began data acquisition and initiated steps needed to proceed with PGM. When PGM is completed and the results assessed, the BLM may identify additional emission mitigation measures for oil and gas activity.

5.1 Photochemical Grid Modeling

Comprehensive regional air quality and AQRV regional modeling of emission sources within the HiLine and surrounding areas requires PGM. This type of modeling can predict ozone and regional haze impacts, for which major pollutants and precursors can be transported many hundreds of miles.

5.1.1 Data Acquisition

PGM requires three main types of concurrent data: meteorological data, ambient monitoring data, and comprehensive emission data. The BLM's analysis determined that the latter two types of data need to be augmented and updated prior to performing PGM.

5.1.1.1 Additional Monitoring

Ambient monitoring data throughout the PGM domain is needed in order to validate model performance, which is assessed by modeling a previous year and comparing the model's predicted concentrations to actual monitored concentrations. A new monitor in Malta will provide data to assess model performance in north-central Montana.

5.1.1.2 Updating Emission Inventories

Comprehensive emission inventories are also critically important in predicting cumulative air quality and AQRV impacts. Current oil and gas regional emission inventories for Montana and the Dakotas are known to lack important emission sources, particularly sources of volatile organic compounds (VOCs), which contribute to ozone formation. The

existing oil and gas inventories for the Williston and Central Montana Basins represent the year 2002 and were developed as part of the Western Regional Air Partnership (WRAP) Phase II inventory. Since then, 2006 Phase III emission inventories have been developed for oil and gas basins within Colorado, Utah, Wyoming, and New Mexico, but have not yet been completed for Montana, North Dakota, and South Dakota. The Phase III inventories have more comprehensive emission inventories of VOC sources at oil and gas facilities.

The BLM Montana and Dakotas State Office is providing financial assistance to the WRAP so that Phase III oil and gas emission inventories can be completed in 2013 for the Williston Basin and the Central Montana Basin. These inventories would represent calendar year 2011 emissions. In addition to covering the planning area, the inventories would include comprehensive recent emission estimates for oil and gas activity in North Dakota and South Dakota.

5.1.2 PGM Schedule

In order to use a full 12 months of ambient monitoring data from the new Malta monitor (and a similar monitor near Lewistown), the baseline year for PGM is expected to be 2013 or may be a 12-month period beginning in late 2012 and ending in 2013. PGM planning began in 2012 and development of the PGM modeling protocol was completed in 2013. Modeling activities will begin in 2014 and should be completed in mid-2015. Review and assessment of PGM results would be completed in Fall 2015. Table B.4 provides the data acquisition and PGM schedule.

Table B.4. Data Acquisition and PGM Schedule

Task / Subtask	*Completion Date*
Pre-Modeling Emission Inventory and Protocol Development	
Develop Weather Research Forecasting and PGM Protocol	4/15/2013
"WRAP" Williston and Central Montana Basin Inventory	4/15/2014
Base Year Modeling and Evaluation*	
Weather Research Forecasting Modeling	5/8/2014
Draft WRF Model Evaluation	6/5/2014
WRF Evaluation Review	7/10/2014
Photochemical Grid Modeling of Base Year	8/28/2014
AQTW and MDEQ Emission Modeling Review	10/2/2014 (base year) 1/7/2015 (future year)
Draft Base Year PGM Evaluation	11/25/2014
AQTW and MDEQ PGM Evaluation Review	12/1/2014
Finalize WRF and PGM Evaluations	12/15/2014
Emission Modeling Reports	1/21/2015
Future Year Modeling and Evaluation*	
Draft ARTSD	4/19/2015
AQTW ARTSD Review	6/19/2015
Finalize ARTSD	7/1/2015

AQTW = Air Quality Technical Workgroup
ARTSD = Air Resource Technical Support Document
MDEQ = Montana Department of Environmental Quality
PGM = Photochemical grid modeling
RFP = Request for Proposal
WRF = Weather Research and Forecasting Model
WRAP = Western Regional Air Partnership
* Duration and dates are subject to revision; they are estimated to provide the general timing of future modeling activities.

The Weather Research and Forecasting (WRF) model would be used to model meteorological conditions and the photochemical grid model to be used would be either the EPA Models-3/Community Multiscale Air Quality (CMAQ) modeling system or the Comprehensive Air Quality Model with Extensions (CAMx). In addition, multiple models would be used to develop and process emission inventories for input into the photochemical grid model. When modeling is completed, a PGM Air Resource Technical Support Document (ARTSD) would be developed.

Initial PGM would include future year modeling for a year between 2017 and 2020 using emissions representing full development of BLM oil and gas resources under the selected Alternative. The specific year would be determined by the BLM based on the ability to predict future cumulative regional oil and gas emissions in the Williston and Central Montana Basins.

5.1.3 MDEQ and AQTW Review and Input to PGM

Throughout the PGM data collection and modeling process, the BLM would work collaboratively with the MDEQ and the AQTW that was formed to provide input on this ARMP, and with other agencies or Tribes that request to be involved in the PGM effort. These collaborators would provide technical review and comment on the draft modeling protocol, on WRF and PGM performance evaluations, and on the draft PGM ARTSD. Substantial time has been included in the schedule shown in Table B.4 to allow adequate review and comment periods during the PGM process.

5.1.4 Availability of PGM Results

Future PGM results would be presented in the final ARTSD and in a summary of the results. The ARTSD and summary document would be posted on the Glasgow, Malta, and Havre BLM websites. In addition, the WRF and PGM protocol document would be provided via the websites when the photochemical modeling ARTSD is made available. Outreach information regarding the availability of the results would be made through the AQTW and agencies involved in the PGM process, as well as other interested parties.

5.2 Limited CALPUFF Modeling for AQRVs

Through their participation under the AQ MOU, the FWS and the NPS specifically requested that limited CALPUFF modeling be prepared between the Draft and the Final RMP. This limited modeling effort was performed and assessed direct AQRV impacts from potential future BLM-authorized oil and gas sources in the northern portion of the planning area near the FWS UL Bend Wilderness and Medicine Lake Wilderness.

The CALPUFF modeling was used as a screening tool to assess direct oil and gas impacts to AQRVs at FWS Class I and sensitive Class areas. In addition, potential plume blight impacts were assessed using the VISCREEN model. Results of these efforts are provided in Chapter 4.

Regional far-field impact analysis for this RMP would be based on results from future PGM described above in Section 5.1. Photochemical grid models are recommended for AQRV analysis of large domains in the Appendix to the MOU (USDI 2011).

5.3 Post-PGM Modeling

To the extent that future emission increases are within the levels modeled with PGM or other modeling and are proximate to modeled emission locations, far-field air quality and AQRV impact analysis may incorporate by reference PGM and other modeling results. The BLM and the AQTW would determine whether previous modeling is sufficient to satisfy MOU requirements. This air quality management approach is consistent with the MOU (USDI 2011) and allows for efficient air quality and AQRV impact analysis.

If additional modeling is performed after PGM is complete, an assessment of air quality and AQRV impacts would be made and, if necessary, additional mitigation measures may be identified.

6.0 Mitigation

Air quality and AQRV impact mitigation would involve two types of mitigation: 1) initial mitigation measures that become effective when the ROD is signed, and 2) enhanced mitigation measures that may be identified based on future ambient monitoring data or modeling results.

6.1 Initial Mitigation Measures

The following air quality mitigation measures would be applied upon issuance of the ROD through leasing documents and project-specific NEPA documents. To the extent practical, emission reductions associated with these mitigation measures have been included in the HiLine emission inventory.

1. Design and construct roads and well pads to reduce the amount of fugitive dust generated by traffic or other activities. During construction activities, apply water, apply dust-suppression chemicals, apply gravel, or use other control methods to achieve 50 percent fugitive dust control efficiency, except when ground is wet or frozen.

2. Use water or other BLM-approved dust suppression during drilling, completion, and well workover operations for dust abatement on access roads, as needed, to achieve a 50 percent fugitive dust control efficiency, except when ground is wet or frozen.

3. Use water or other BLM-approved dust suppression in high traffic areas during production operations for dust abatement, as needed, to achieve 50 percent fugitive dust control efficiency, except when ground is wet or frozen. Operators will work with local government agencies to improve dust suppression on roads.

4. For oil and gas Project Plans of Development (PODs), oil and gas operators will establish speed limits for project-required unpaved roads in and adjacent to the project area; oil and gas operator employees will comply with these speed limits.

5. For oil and gas Project PODs, oil and gas operators will be encouraged to reduce surface disturbance, vehicle traffic, and fugitive dust emissions by consolidating facilities (e.g., using multi-well pads, storage vessels) when feasible.

6. Diesel drill rig and completion engines greater than 200 hp will meet Tier 4 emission standards for non-road diesel engines. Alternatively, oil and gas operators may use engines that exceed Tier 4 emission standards if modeling or monitoring at the project level or at a programmatic level demonstrates compliance with the NAAQS and protection of AQRVs.

7. For hydraulically fractured gas wells that do not qualify as “low pressure wells,” “wildcat,” or “delineation” wells, oil and gas operators will comply with reduced emissions completion (REC) requirements specified in Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution (40 CFR §60.5375) within six months of ROD issuance.

8. Non-road diesel engines will be required to use ultra-low sulfur diesel fuel (15 ppmw) as required by 40 CFR §80.610(e)(3)(iii).

6.2 Monitoring-Based Mitigation

Enhanced mitigation would be evaluated and implemented if ambient monitoring data at monitor(s) located in oil and gas activity areas within the planning area indicate that pollutant concentrations are approaching or threatening the NAQQS or MAAQS. As of August 1, 2012, one ambient air quality monitor near Malta was located in oil and gas activity areas within the HiLine. If, in future years, additional MDEQ monitoring stations are placed in oil and gas activity areas for the purpose of assessing air quality impacts from oil and gas activity, ambient monitoring data from these stations would be included in ambient air quality assessments used to determine whether enhanced mitigation is needed.

Prior to completion of initial PGM, monitoring-based thresholds would be based on evaluation of exceedances of the NAAQS, as described in Section 6.2.1. After completion of initial PGM, monitoring-based thresholds would be based on BLM-calculated design values, as described in Section 6.2.3.

6.2.1 Monitoring-Based Thresholds Before PGM Completion

Based on requests from EPA during the MOU review process, the BLM would review NAAQS exceedances and determine if enhanced mitigation would be warranted during the interim period between ROD issuance and PGM completion. The BLM would require enhanced mitigation for BLM-authorized oil and gas activities if there is a monitored exceedance of the NAAQS at the Malta monitor, unless the BLM determines that enhanced mitigation is not warranted after completing specified steps as outlined below.

1. The BLM would notify the EPA and the MDEQ within 30 days after Malta monitoring data showing an exceedance has been posted on EPA's Air Quality System (AQS). An exceedance is defined as any monitored concentration (other than one occurring during an exceptional event) that is greater than the NAAQS, without consideration of the statistical form of the NAAQS or multi-year averaging. The notification would state that (1) the BLM requests concurrence from the MDEQ and EPA that an exceedance occurred, and (2) the BLM would, upon concurrence by both agencies, review the exceedance according to this procedure.

2. After consulting with the MDEQ, the BLM would determine whether an exceptional event[1] may have caused the exceedance.

    - If the MDEQ informs the BLM that an exceptional event likely caused the exceedance, the BLM would provide a letter to that effect to the EPA. No further action would be necessary.

    - If an exceptional event did not cause the exceedance or if MDEQ would not submit an exceptional event waiver to EPA, the BLM would perform Step 3.

3. The BLM would conduct a screening level analysis[2] to determine the likely source and location of the exceedance and whether mitigation is needed.[3]

    - If the screening analysis indicates that the exceedance was not caused by BLM-authorized oil and gas source(s) within the planning area or indicates that the BLM-authorized oil and gas source(s) within the planning did not contribute to the exceedance, the BLM would convey this finding in writing to the MDEQ and EPA for review and comment. No further action would be necessary.

    - If the screening analysis indicates that the exceedance was caused or contributed to by BLM-authorized oil and gas sources inside the planning area, the BLM would perform Step 4.

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[1] The BLM would not formally decide that an exceptional event occurred as this decision would be made by MDEQ. Until a final determination of an exceptional event is presented to EPA by MDEQ, and the EPA has concurred, the BLM would assume that an exceptional event occurred based on a stated intention by the MDEQ to submit an exceptional event waiver.

[2] Publically available web based applications suggested by EPA to identify sources of air pollution and potential impacts include the following sites: trajectory analysis tools like HySplit (http://ready.arl.noaa.gov/), air quality data at the EPA's AQS site (http://airnow.gov), state regulatory agency sites and airnowtech.org, an interactive snow site (http://www.nohrsc.nws.gov/interactive/html/map.html), daily ozone modeling (http://airquality.weather.gov/), daily ozone and $PM_{2.5}$ modeling site (http://www.getbluesky.org/), and daily satellite imagery site (http://ge.ssec.wisc.edu/modis-today/).

[3] If data necessary to conduct a screening level analysis are not available, the BLM would consult with the MDEQ and the EPA regarding source attribution and the need for mitigation.

4. The BLM would consult with the MDEQ and EPA to determine whether there is a need for: 1) a refined attribution analysis (e.g., attribution test using CAMx ozone source attribution technology or anthropogenic precursor's culpability assessment) or 2) mitigation on BLM-authorized oil and gas emission sources within the planning area. If the refined analysis:

    - is warranted, the BLM would perform the refined analysis within 6 months of completing Step 3 in consultation with MDEQ and EPA.
    - indicates that the exceedance was not caused or contributed to by BLM-authorized oil and gas sources inside the planning area, the BLM would provide that recommendation to the MDEQ and EPA for review and comment. No further action would be necessary.
    - indicates that the exceedance was caused by BLM-authorized oil and gas sources within the planning area, the BLM would evaluate enhanced mitigation measures, as described in Section 6.2.2.

6.2.2 Determination of Enhanced Mitigation Measures Before PGM Completion

If a NAAQS exceedance occurs prior to completion of PGM and the refined analysis in Step 4 above determined that the exceedance was caused by BLM-authorized oil and gas sources within the planning area, one or more enhanced mitigation measures would be evaluated and selected by the BLM, in cooperation with the MDEQ and the EPA. The geographic extent of the mitigation measure(s) would be determined based on the analysis performed under Section 6.2.1 and would be limited to the area determined to be at risk for future exceedances. Preference would be given to mitigation methods that the MDEQ intends to impose as new regulations or air quality permitting provisions. Selected mitigation measures would be implemented within one year after the BLM decision to apply additional mitigation.

Potential enhanced mitigation measures include one or more of the measures listed below based on current information concerning potential emission reduction technologies. Additional measures or equivalent methods or emission restrictions may be identified in the future.

- Drilling and/or blowdown activity restrictions based on meteorological conditions
- Construction activity restrictions based on meteorological conditions
- Centralization of gathering facilities
- Electric drill rigs
- Field electrification for compressors and/or pumpjack engines
- Plunger lift systems with smart automation
- Oil tank load out vapor recovery
- VOC controls on tanks with a potential to emit less than 5 tpy
- Selective catalytic reduction on non-drill rig stationary engines
- Reduced emission completions beyond those required by EPA regulations, if determined to be technically and economically feasible
- Well pad density limitations
- Reducing the total number of drill rigs operating simultaneously
- Seasonally reducing or ceasing drilling during specified periods
- Using only lower-emitting drill and completion rig engines during specified time periods
- Using natural gas-fired drill and completion rig engines
- Replacing internal combustion engines with gas turbines for natural gas compression
- Employing a monthly forward looking infrared (FLIR) leak detection program to reduce VOCs
- Tank load out vapor recovery
- Enhanced VOC emission controls with 95% control efficiency on additional production equipment having a potential to emit of greater than 5 tpy
- Enhanced direct inspection and maintenance program

6.2.3 Monitoring-Based Thresholds After PGM Completion

By May 31 of each year following completion of PGM, the BLM would calculate design values for each pollutant monitored at a federal reference monitor federal equivalent method monitor within the planning area and identified as a representative monitor in Section 3.0. The design value would be calculated based on calendar year monitoring data

available at the time. Monitoring data from the appropriate prior period would be used. For example, based on PGM completion in summer 2015, the first annual design value calculation would be performed by May 31, 2016 and would include monitoring data for calendar years 2013, 2014, and 2015 for three-year design values and on monitoring data for calendar year 2015 for single-year design values.

Calculation methods would, to the extent possible, follow EPA procedures provided in the following appendices within Title 40 of the Code of Federal Regulations (CFR), Part 50 in effect as of December 1, 2012. These procedures may be updated by future EPA regulations and this section of the ARMP would be revised to reflect changing regulations.

- NO_2 (Appendix S)
- O_3 (Appendix P)
- PM_{10} (Appendix K)
- $PM_{2.5}$ (Appendix N)
- SO_2 (Appendix T)

Design values would be calculated on a site-specific basis (i.e., no spatial averaging of multiple monitors). The BLM design value calculations would exclude data associated with exceptional events identified by MDEQ.

6.2.4 Determination of Enhanced Mitigation Measures After PGM Completion

If the air quality assessment described in Section 6.2.3 indicates that a BLM-calculated design value is greater than 85 percent of a NAAQS, one or more enhanced mitigation measures addressing that pollutant or pollutant precursor would be evaluated and selected by the BLM, in cooperation with the MDEQ and EPA. The geographic extent of the mitigation measure(s) would be determined in conjunction with the MDEQ. Potential enhanced mitigation measures to be considered include the measures listed above in Section 6.2.2, as well as additional measures that may be identified in the future. Selected mitigation measures would be implemented within 1 year after the BLM decision to apply additional mitigation.

6.3 Modeling-Based Mitigation

6.3.1 Modeling-Based Thresholds

Future modeling would assess air quality and AQRV impacts from future BLM-authorized oil and gas activity and would include regional PGM and project-specific modeling. Modeling-based thresholds for evaluating enhanced mitigation would include potential future impacts on NAAQS or MAAQS or impacts above specific levels of concern for AQRVs in Class I or sensitive Class II areas (as identified on a case-by-case basis by MDEQ or a federal land management or tribal agency).

6.3.2 Determination of Modeling-Based Enhanced Mitigation Measures

If BLM-authorized oil and gas activity is predicted to cause or contribute to impacts above the thresholds described above, the BLM would facilitate an interagency process to ensure that a comprehensive strategy is developed to manage air quality impacts from future oil and gas development within the region. The local, state, federal, and Tribal agencies involved in the regulation of air quality and the authorization of oil and gas development would evaluate modeling results from future modeling studies and identify potential air quality concerns and necessary reductions in air emissions. If the modeling predicts significant impacts, these agencies would use their respective authorities to implement enhanced emission control strategies, operating limitations, equipment standards, and/or pacing of development as necessary to ensure continued compliance with applicable ambient air quality standards, including the enhanced mitigation measures listed in Section 6.2.2, other future mitigation measures identified through BLM's adaptive management strategy, or reasonable mitigation measures suggested by the MDEQ or AQTW. If necessary, implementation of mitigation measures would occur within one year of obtaining final modeling results for mitigation measures that conform to currently implemented land use planning decisions and constraints.

7.0 Bibliography

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MDEQ 2013. State of Montana Ambient Monitoring Network Plan. Montana Department of Environmental Quality. May 2013. http://deq.mt.gov/AirQuality/AQInfo/PDF/MT_2013_NETWORK_PLAN.pdf

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Appendix C
Best Management Practices

Introduction

The following Mitigation Measures and Conservation Actions are a compilation of Best Management Practices (BMPs) and/or operating procedures used by the BLM to meet statutory requirements for environmental protection and comply with resource-specific Goals and Objectives set forward in this land use plan. The BLM will apply mitigation measures and conservation actions to modify the operations of authorized lands uses or activities to meet these obligations. Additional direction regarding mitigation can be found in the Interim Policy, Draft - Regional Mitigation Manual Section - 1794 (IM 2013-142) or subsequent decision documents.

These measures and actions will be applied to avoid, minimize, rectify, reduce, and compensate for impacts if an evaluation of the authorization area indicates the presence of resources of concern which include, but are not limited to air, water, soils, cultural resources, national historic trails, recreation values and important wildlife habitat in order to reduce impacts associated with authorized land uses or activities such as road, pipeline, or powerline construction, fluid and solid mineral development, range improvements, and recreational activities. The mitigation measures and conservation actions for authorizations will be identified as part of the National Environmental Policy Act (NEPA) process, through interdisciplinary analysis involving resource specialists, project proponents, government entities, landowners or other Surface Management Agencies. Those measures selected for implementation will be identified in the Record of Decision (ROD) or Decision Record (DR) for those authorizations and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals to mitigate impacts from those authorizations. Because these actions create a clear obligation for the BLM to ensure any proposed mitigation action adopted in the environmental review process is performed, there is assurance that mitigation will lead to a reduction of environmental impacts in the implementation stage and include binding mechanisms for enforcement (CEQ Memorandum for Heads of Federal Departments and Agencies 2011).

Because of site-specific circumstances and localized resource conditions, some mitigation measures and conservation actions may not apply to some or all activities (e.g., a resource or conflict is not present on a given site) and/or may require slight variations from what is described in this appendix. The BLM may add additional measures as deemed necessary through the environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Application of mitigation measures and conservation actions is subject to valid existing rights, technical and economic feasibility.

Implementation and effectiveness of mitigation measures and conservation actions would be monitored to determine whether the practices are achieving resource objectives and accomplishing desired goals. Timely adjustments would be made as necessary to meet the resource goals and objectives.

The list included in this appendix is not limiting, but references the most frequently used sources. The BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Because mitigation measures and conservation actions change or are modified, based on new information, the guidelines will be updated periodically. As new publications are developed; the BLM may consider those BMPs. In addition, many BLM handbooks (such as BLM Manual 9113-Roads and 9213-Interagency Standards for Fire and Aviation Operation) also contain BMP-type measures for minimizing impacts. These BLM-specific guidance and direction documents are not referenced in this appendix. The EIS for this RMP does not decide or dictate the exact wording or inclusion of these mitigation measures and conservation actions. Rather, they are used in the RMP and EIS process as a tool to help demonstrate at the Land Use Plan scale how they will be applied in considering subsequent activity plans and site-specific authorizations. These mitigation measures and conservation actions and their wording are matters of policy. As such, specific wording is subject to change, primarily through administrative review, not through the RMP and EIS process. Any further changes that may be made in the continuing refinement of these mitigation measures and conservation actions and any development of program-specific standard procedures will be handled in another forum, including appropriate public involvement and input.

General Mitigation Measures and Conservation Actions for Resources

BLM BMPs

The website below provides an introduction to BLM BMPs with links to BLM contacts, General BMP Information, BMP Frequently Asked Questions, BMP Technical Information, Oil and Gas Exploration—The Gold Book, Specific Resource BMPs, and, other BLM links.

- http://www.blm.gov/bmp/

Air Resource BMPs

Developed by: Bureau of Land Management

Publication reference: BLM/WO Updated May 9, 2011

Available from: Online at:
http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/technical_information.html.

Description: Identifies a range of typical BMPs for protecting air resources during oil and gas development and production operations. The above-referenced document is supplemented with the following BMPs. Some of the following BMPs, or equivalent measures, are required by state air quality regulations for sources meeting certain criteria. In those cases, compliance with regulatory requirements is considered to meet equivalent BMPs.

- Fugitive dust emissions would be reduced by:
  - restricting the extent of surface impacts during construction activities and ongoing operations by using directional drilling to reduce the number of well pads,
  - locating linear facilities in the same or parallel trenches and constructing them at the same time,
  - mowing rather than removing vegetation,
  - using two-track primitive roads whenever possible rather than developing a dirt road,
  - applying water or chemical suppressants (e.g., magnesium chloride, calcium chloride, lignin, or sulfonate) to unpaved roads,
  - surfacing roads with chip-seal or asphalt, and
  - requiring vehicle speed limits on unpaved roads.

- Fugitive dust and vehicle exhaust emissions (primarily carbon monoxide, carbon dioxide, black carbon, sulfur dioxide, and nitrogen oxides) would be reduced by restricting vehicle trips by:
  - consolidating facilities by using directional drilling and multiwall pads,
  - developing centralized liquid collection (water, produced water, and fracturing liquid) facilities and production (treatment and product storage) facilities to reduce the number and distance of vehicle trips,
  - using shuttles or vanpools for employee commuting,
  - using automated equipment and remote telemetry, and
  - using solar power to add automated equipment in areas without access to electricity.

- Non-vehicular engine exhaust emissions would be reduced by:
  - electrifying equipment when feasible,
  - achieving high levels of emission control on diesel drill rig engines by using Tier 4 drill rig engines or engines that have been retrofitted with additional emission controls such as nonselective catalytic reduction,
  - using natural gas driven engines rather than diesel engines,
  - using compressor engines that meet New Source Performance Standards for spark-ignition and compression-ignition engines (Title 40 Code of Federal Regulations [CFR] 60, Subparts IIII and JJJJ) regardless of engine age,
  - using alternative energy (solar power, wind power, or both) to power new water source developments, and
  - converting power sources at existing water wells to alternative energy sources.

- Fugitive volatile organic compound (VOC), hazardous air pollutant (HAP), or methane (a GHG) would be reduced by:
  - using green completion technology to capture methane (and some VOC and HAP) emissions during completion and routing them to sales pipelines,
  - using flaring rather than venting, but only in cases in which product capture is not feasible,
  - using closed tanks rather than open tanks or pits,
  - installing vapor recovery units on storage tanks,
  - using closed-loop drilling,
  - replacing pneumatic (natural gas) pumps with electric or solar pumps,
  - optimizing glycol circulation rates on glycol dehydrators,
  - replacing wet seals with dry seals in centrifugal compressors,
  - replacing worn rod packing in reciprocating compressors,
  - installing automated plunger lift systems in natural gas wells, and
  - monitoring and repairing equipment leaks.

Communication Tower BMPs

Developed by: United States Fish and Wildlife Service

Publication reference: Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers

Available from: http://www.fws.gov/habitatconservation/com_tow_guidelines.pdf

Description: These guidelines were developed by Service personnel from research conducted in several eastern, midwestern, and southern States, and have been refined through Regional review. They are based on the best information available at this time, and are the most prudent and effective measures for avoiding bird strikes at towers.

- Any company/applicant/licensee proposing to construct a new communications tower should be strongly encouraged to collocate the communications equipment on an existing communication tower or other structure (e.g., billboard, water tower, or building mount). Depending on tower load factors, from 6 to 10 providers may collocate on an existing tower.

- If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level, using construction techniques which do not require guy wires (e.g., use a lattice structure, monopole, etc.). Such towers should be unlighted if Federal Aviation Administration regulations permit.

- If constructing multiple towers, providers should consider the cumulative impacts of all of those towers to migratory birds and threatened and endangered species as well as the impacts of each individual tower.

- If at all possible, new towers should be sited within existing "antenna farms" (clusters of towers). Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., State or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist, and low ceilings.

- If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.

- Tower designs using guy wires for support which are proposed to be located in known raptor or waterbird concentration areas or daily movement routes, or in major diurnal migratory bird movement routes or stopover sites, should have daytime visual markers on the wires to prevent collisions by these diurnally moving species. (For guidance on markers, see Avian Power Line Interaction Committee (APLIC) 1994, as amended in 2006, 2012. (Avian Power Line Interaction Committee. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C. Available online at http://www.aplic.org/uploads/files/11218/Reducing_Avian_Collisions_2012watermarkLR.pdf.)

- Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint." However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.

- If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternate site should be recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.

- In order to reduce the number of towers needed in the future, providers should be encouraged to design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.

- Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.

- If a tower is constructed or proposed for construction, Service personnel or researchers from the Communication Tower Working Group should be allowed access to the site to evaluate bird use, conduct dead-bird searches, to place net catchments below the towers but above the ground, and to place radar, Global Positioning System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird movements and to gain information on the impacts of various tower sizes, configurations, and lighting systems.

- Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.

Erosion and Sediment Control Practices: Field Manual

Developed by: Prepared for the Montana Department of Transportation

Publication reference: FHWA/MT-030003/8165

Available from: National Technical Information Service, Springfield, VA 21161

Description: The Erosion and Sediment Control Best Management Practices Construction Field Manual was developed to assist in design, construction, and post-construction phases of MDT projects. This manual provides background to concepts of Erosion and Sediment Control. Most of MDT's Best Management Practices are listed within the manual based on application categories. Each BMP is described; its applications and limitations are listed, as well as its design criteria. Construction phase and post-construction phase BMPs are described. This manual is a field guide and condensed version of the Erosion and Sediment Control Design Construction Best Management Practices Manual. For more detailed discussion on topic found within, refer to the Erosion and Sediment Control Construction Best Management Practices Manual.

Erosion and Sediment Control Practices: Reference Manual

Developed by: Prepared for the Montana Department of Transportation

Publication reference: FHWA/MT-030003/8165

Available from: National Technical Information Service, Springfield, VA 21161

Description: The Erosion and Sediment Control Construction Best Management Practices Manual was developed to assist in the design, construction, and post-construction phases of Montana Department of Transportation (MDT) projects. This manual provides background to State and Federal regulations associated with erosion and sediment control practices including a general overview of the erosion and sediment processes. Best management practices are listed within the manual based on application categories. Each BMP is described; its applications and limitations are listed, as well as its design criteria. The design phase includes development of construction plans, notice of intent (NOI), and stormwater pollution prevention plan (SWPPP). Construction phase includes the finalization of the SWPPP, NOI, and the implementation of BMPs. Post-construction phase includes monitoring, maintenance, and removal activities.

Fluid Minerals BMPs

Developed by: Bureau of Land Management

Publication reference: BLM/WO/ST-06/021+3071

Available from:
Online at: http://www.blm.gov/bmp/
Online at: http://www.mt.blm.gov/oilgas/operations/goldbook/goldbook1.html
Online at: http://www.mt.blm.gov/oilgas/operations/goldbook/Stand_Enviro_Color.pdf
Online at: http://www.mt.blm.gov/oilgas/operations/color.pdf

Description: BMPs for oil and gas demonstrate practical ideas which may eliminate or minimize adverse impacts from oil and gas development to public health and the environment, landowners, and natural resources; enhance the value of natural and landowner resources; and reduce conflict. The publication reference is to the "Gold Book" which is formally titled "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development." In addition, the first internet citation is to a location maintained by the Washington Office of the BLM containing general and technical information on the use and application of BMPs. The second location refers the reader directly to an online version of the "Gold Book." The third and fourth locations refer the reader to color charts for use in selecting paint colors for oil and gas facilities.

Grazing Management BMPs (Guidelines)

Guidelines for grazing management are the types of grazing management methods and practices determined to be appropriate to ensure that rangeland health standards can be met or significant progress can be made toward meeting the standards. Guidelines are best management practices (BMP), treatments, and techniques and implementation of range improvements that will help achieve rangeland health standards. Guidelines are flexible and are applied on site-specific situations. Standards for Rangeland Health and Guidelines for Livestock Grazing Management for the HiLine District are presented in Appendix H.

Healthy Watersheds

The website below provides conservation approaches and tools designed to ensure healthy watersheds remain intact. It also provides site-specific examples.

- http://www.epa.gov/owow/nps/

Management of Land Boundaries

Developed by: Department of the Interior and Bureau of Land Management

Publication reference: DOI 600 DM 5 and BLM H-9600-1

Available from: Online at: http://www.blm.gov/wo/st/en/prog/more/cadastralsurvey/cadastral_review_of.html.

Description: The Departmental Manual 600 Chapter 5, Standards for Federal Lands Boundary Evidence and BLM H-9600-1, Cadastral Survey Handbook, provides general information regarding BLM BMPs for management of public land boundaries. Samples of Management of Land Boundaries BMPs are available with a brief description of types of BMPs and terminology.

Montana Guide to the Streamside Management Zone Law

Developed by: Montana Department of Natural Resources and Conservation Service Forestry Bureau, in cooperation with Montana Department of Environmental Quality, Montana Logging Association, Montana Wood Products Association, Plum Creek Timber LP, USDA Forest Service, USDI Bureau of Land Management

Publication reference: Revised August 2002

Available from: Montana Department of Natural Resources and Conservation, 2705 Spurgin Road, Missoula MT 59801-3199, (406)542-4300, or local MT DNRC field office.

Description: The Montana Guide to the Streamside Management Zone Law is a field guide to compliance with State of Montana Law 77-5-301[1] MCA.) Complementary BMPs are found in the Water Quality BMPS for Montana Forests (also referenced in this appendix). Provides definitions, stream classifications, and guidelines on the seven forest practices prohibited by Montana law in SMZs (broadcast burning, operation of wheeled or tracked vehicles except on established roads, the forest practice of clearcutting, the construction of roads except when necessary to cross a stream or wetland; the handling, storage, application, or disposal of hazardous or toxic materials in a manner that pollutes streams, lakes, or wetlands, or that may cause damage or injury to humans, land, animals, or plants; the side casting of road material into a stream, lake, wetland, or watercourse; and the deposit of slash in streams, lakes, or other water bodies.

Montana Non-Point Source Management Plan

Developed by: Montana Department of Environmental Quality, Water Quality Planning Bureau, Watershed Protection Section

Publication reference: 2012

Available from: Montana Department of Environmental Quality, Water Quality Planning Bureau, Watershed Protection Section, P.O. Box 200901, Helena, MT 59620-0901.
Online at: http://deq.mt.gov/wqinfo/nonpoint/2012NonpointPlan/NPSPlan_Complete_07162012.pdf

Description: This document describes the Montana Department of Environmental Quality's (DEQ) updated strategy for controlling nonpoint source (NPS) water pollution, which is the state's single largest source of water quality impairment. NPS pollution is contaminated runoff from the land surface that can be generated by most land use activities, including agriculture, forestry, urban and suburban development, mining, and others. Common NPS pollutants include sediment, nutrients, temperature, heavy metals, pesticides, pathogens, and salt. The purpose of the Montana NPS Pollution Management Plan (Plan) is: 1) to inform the state's citizens about NPS pollution problems; and 2) to establish goals, objectives, and both long-term and short-term strategies for controlling NPS pollution on a statewide basis. The goal of Montana's NPS Management Program is to protect and restore water quality from the impacts of non-point sources of pollution in order to provide a clean and healthy environment.

Montana Nonpoint Source Management Program

The website below provides links to information on funding for implementing nonpoint source controls, examples of control projects, and Montana's current Nonpoint Source Management Plan. This plan identifies and provides details for BMPs to improve and maintain water quality.

- http://www.deq.mt.gov/wqinfo/nonpoint/nonpointsourceprogram.mcpx

The following would be applied, if warranted, to any BLM authorized activity.

- The total disturbance area would be minimized and to the extent possible.
- Surface disturbances would be collocated in areas of previous or existing disturbance to the extent technically feasible.
- Linear facilities would be located in the same trenches (or immediately parallel to) and when possible, installed during the same period of time.
- Plans of development would be required for major ROWs, renewable energy and minerals development. Such plans would identify measures for reducing impacts.
- Where the federal government owns the surface and the mineral estate is in nonfederal ownership, the BLM would apply appropriate fluid mineral BMPs to surface development.
- Remove facilities and infrastructure when use is completed.
- Vegetation would be removed only when necessary. Mowing would be preferred. If mowed, when possible work would be performed when vegetation is dormant.
- Two-track (primitive) roads would be used when possible.
- Utilization of the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (i.e., The Gold Book) shall be utilized for the design of roads, utilities, and oil and gas operations.
- Directional drilling, drilling multiple wells from the same pad, co-mingling, recompletion, or the use of existing well pads would be employed to the extent technically feasible to minimize surface impacts from oil and gas development.
- Utilities would be ripped or wheel-trenched whenever practical.
- Remote telemetry would be used to reduce vehicle traffic to the extent technically feasible (e.g., monitoring oil and gas operations).
- Perennial streams would be crossed using bore crossing (directional drill) or other environmentally sound method.
- For activities resulting in major surface-disturbance as determined by the authorized officer, a mitigation monitoring and reporting strategy would be developed and implemented (see the Reclamation Appendix for further guidance).
- Operations would avoid sensitive resources including riparian areas, wetlands, floodplains, waterbodies and areas subject to erosion and soil degradation.
- The BLM would, on a case-by-case basis, use temporary or permanent enclosures (e.g., in woody draw or riparian areas) to promote species diversity, recruitment, and structure.

- Accelerated erosion, soil loss, and impacts to water quality would be reduced by diverting stormwater and trapping sediment during activity.
- Pitless or above ground closed-loop drilling technology would be used to the extent technically feasible. Recycle drilling mud and completion fluids for use in future drilling activities.
- Where needed, pits would be lined with an impermeable liner. Pits would not be placed in fill material or natural watercourses, and pits may not be cut or trenched.
- Fertilizer would not be applied within 500 feet of wetlands and waterbodies.
- Vehicle and equipment servicing and refueling activities would take place 500 feet from the outer edge of riparian areas, wet areas, and drainages.
- Activity may be restricted during wet or frozen conditions. Mechanized equipment use would be avoided if the equipment causes rutting to a depth of 4 inches or greater.
- Vehicle wash stations would be used prior to entering or leaving disturbance to reduce the transport and establishment of invasive species.
- Invasive species plant parts would not be transported off site without appropriate disposal measures.
- Use alternative energy (solar or wind power) to power new water source developments.
- Overhead power lines, where authorized would follow the recommendations in the most recent guidance from the Avian Power Line Interaction Committee (1994, as amended 2006, 2012).
- Weed management prescriptions would be included in all new treatment projects and incorporated into existing contracts, agreements, task forces, designated weed-free management areas, and land use authorizations that resulted in ground-disturbing activities.
- Whenever possible, ROWs would be constructed within or next to compatible ROWs, such as roads, pipelines, communications sites, and railroads.
- The operator shall be responsible for locating and protecting existing pipelines, power lines, communication lines, and other related infrastructure.
- Potential changes in climate would be considered when proposing restoration seedings when using native plants. Collection from the warmer component of the species current range would be considered when selecting native species.

Montana Placer Mining BMPs

Developed by: Montana Bureau of Mines and Geology

Publication reference: Special Publication 106, October 1993

Available from: Montana Bureau of Mines and Geology, Main Hall, Montana College of Mineral Science and Technology, Butte MT 59701

Description: Provides guidelines for planning, erosion control, and reclamation in arid to semi-arid, alpine, and subalpine environments, to prevent or decrease environmental damage and degradation of water quality.

National Range and Pasture Handbook

The website below provides procedures in support of NRCS policy for the inventory, analysis, treatment, and management of grazing land resources.

- http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/landuse/rangepasture/?cid=stelprdb1043084

Pasture, Rangeland, and Grazing Operations BMPs

The website below provides BMPs compiled by the EPA to prevent or reduce impacts associated with livestock grazing.

- http://www.epa.gov/oecaagct/anprgbmp.html

Renewable Energy Development

The following resources provide information on BMPs related to renewable energy development.

- Wind Energy Development Programmatic Environmental Impact Statement: http://windeis.anl.gov/documents/fpeis/index.cfm
- BLM Instruction Memorandum 2009-043, Rights-of-Way, Wind Energy: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2009/IM_2009-043.htm.
- Solar Energy Development Programmatic Environmental Impact Statement: http://www.solareis.anl.gov/

Storm Water BMPs

The website below provides BMPs designed to meet the minimum requirements for six control measures specified by the EPA's Phase II Stormwater Program.

- http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

Water Quality BMPs for Montana Forests

Developed by: Montana State University Extension Service

Publication reference: Logan, R. 2001. Water Quality BMPs – Best Management Practices for Montana Forests. EB158, MSU Extension Forestry, Missoula, MT. 58 pp.

Available from: MSU Extension Forestry, 32 Campus Dr., Missoula MT 59812, OR MSU Extension Publications, PO Box 172040 Bozeman MT 59717

Description: Discusses methods for managing forest land while protecting water quality and forest soils. Intended for all forest land in Montana, including non-industrial private, forest industry, and state or federally-owned forests. These are preferred (but voluntary) methods that go beyond Montana State Law (Streamside Management Zones). Includes definitions, basic biological information, and BMPs for Streamside Management Zones; road design, use, planning and locating, construction, drainage, and closure; stream crossings, soil, timber harvesting methods, reforestation, winter planning, and clean-up.

Wind Energy BMPs

Developed by: Bureau of Land Management

Publication reference: Wind Energy Development Programmatic EIS

Available from: FEIS Chapter 2 (section 2.2.3.2) at http://windeis.anl.gov/

Description: As part of the proposed action, BLM developed BMPs for each major step of the wind energy development process, including site monitoring and testing, plan of development preparation, construction, operation, and decommissioning. General BMPs are available for each step, and certain steps also include specific BMPs to address the following resource issues: wildlife and other ecological resources, Visual resources, Roads, Transportation, Noise, Noxious Weeds and Pesticides, Cultural/Historic Resources, Paleontological Resources, Hazardous Materials and Waste Management, Storm Water, Human Health and Safety, monitoring program, air emissions and excavation and blasting activities.

Visual Resources

The website below provides numerous design techniques that can be used to reduce the visual impacts from surface-disturbing projects. The techniques described here should be used in conjunction with BLM's visual resource contrast rating process wherein both the existing landscape and the proposed development or activity are analyzed for their basic element of form, line, color, and texture.

- http://www.blm.gov/pgdata/content/wo/en/prog/Recreation/recreation_national/RMS.html

Appendix D
Fire and Emergency Stabilization and Rehabilitation

Fire

The following table compares fire management categories. The table is an excerpt from the Fire/Fuels Management Plan Environmental Assessment/Plan Amendment for Montana and the Dakotas (2003), and can be found on the internet at http://www.blm.gov/mt/st/en/prog/fireaviation/fire_management_plans/state_plan.html.

Table D.1
Fire Management Category Descriptions

Category A:	***Category B:***	***Category C:***	***Category D:***
Fire is not desired at all (None of this category is in the planning area)	Unplanned fire is likely to cause negative effects	Fire is desired to manage ecosystems, but current vegetative condition creates constraints on use	Fire is desired; no constraints on its use (None of this category is in the planning area)
Fire Management Activities: • Mitigation and suppression required • Fire should not be used to manage fuels	***Fire Management Activities:*** • Suppression required • Fire and non-fire fuels treatments may be used	***Fire Management Activities:*** • Suppression may be required • Fire and non-fire fuels treatments may be used	***Fire Management Activities:*** • Suppression may not be necessary • Both fire and non-fire treatments could be used
Rationale for Categorization: • Direct threats to life or property • Ecosystems not fire dependent • Long fire return intervals	***Rationale for Categorization:*** • Unplanned ignitions would have negative effects on ecosystems unless mitigated	***Rationale for Categorization:*** • Significant ecological, social, or political constraints	***Rationale for Categorization:*** • Few ecological, social, or political constraints • Less need for fuels treatment
Fire Suppression Considerations: • Emphasis on prevention, detection, and rapid suppression response and techniques	***Fire Suppression Considerations:*** • Emphasis on prevention/education and suppression	***Fire Suppression/Use Considerations:*** • Emphasis on reducing unwanted ignitions, resource threats, and fuels accumulations	***Fire Suppression/Use Considerations:*** • Emphasis on using planned and unplanned wildfire to achieve resource objectives
Multiple Fire Priority: [1] Highest	***Multiple Fire Priority:*** [1] High	***Multiple Fire Priority:*** [1] Medium	***Multiple Fire Priority:*** [1] Lowest

[1] If multiple fires were burning, Categories A and B would generally receive priority for fire management resources.

Emergency Stabilization and Rehabilitation (ES&R)

Introduction

Emergency stabilization plans and/or rehabilitation plans are prepared after a wildland fire to minimize threats to life or property and stabilize and prevent unacceptable degradation to natural and cultural resources resulting from the effects of the fire, in a cost-effective and expeditious manner. Not all fires need emergency stabilization and/or rehabilitation.

The Burned Area Emergency Stabilization and Rehabilitation Handbook (H-1742-1) provides detailed information specific to BLM policies, standards, and procedures used in the Burned Area ES&R programs. The Handbook is intended to be the primary guidance to BLM ES&R activities. ES&R activities and treatment undertaken in the HiLine District will follow the Handbook guidance. ES&R activities and treatments in Wilderness Study Areas will comply with policy in the Management of BLM Wilderness Study Areas (BLM Manual 6330). As updates and revisions to the departmental manuals are completed, conformance to the new direction will supersede the criteria included herein.

Emergency stabilization is defined as "Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life and property resulting from the effects of a fire, or to repair/ replace/construct physical improvements necessary to prevent degradation of land or resources. Emergency Stabilization actions must be taken within one year following containment of a wildland fire." (620 DM 3.3E)

Rehabilitation is defined as "Efforts undertaken within three years of containment of a wildland fire to repair or improve fire-damaged lands unlikely to recover naturally to management approved conditions, or to repair or replace minor facilities damaged by fire." (620 DM 3.3M)

Emergency stabilization and rehabilitation funds are not used for rehabilitation of wildland fire suppression efforts; this includes rehabilitating firelines, helispots, fire camp, etc. Costs for rehabilitating wildland fire suppression efforts will be funded by the wildland fire project code.

Emergency Stabilization and Rehabilitation Protocols

Emergency stabilization protection priorities are: 1) human life and safety; and 2) property and unique biological resources (designated Critical Habitat for Federal and State listed, proposed or candidate threatened and endangered species) and significant heritage sites (620 DM 3.7A). Burned area rehabilitation protection priorities are: 1) to repair or improve lands damaged directly by a wildland fire; and 2) to rehabilitate or establish healthy, stable ecosystems in the burned area (620 DM 3.8A).

Emergency Stabilization

The objective of emergency stabilization is "To determine the need for and to prescribe and implement emergency treatments to minimize threats to life or property or to stabilize and prevent unacceptable degradation to natural and cultural resources resulting from the effects of a fire." (620 DM 3.4A)

Emergency stabilization plans are prepared by an interdisciplinary team, immediately following a wildland fire and specify emergency treatments and activities to be carried out within one year following containment of the wildfire. Generally, activities are only prescribed within the perimeter of a burned area.

Allowable emergency stabilization actions are limited to the following items, grouped by issue topic:

Human Life and Safety

- Replacing or repairing minor facilities essential to public health and safety when no other protection options are available.

Soil/Water Stabilization

- Placing structures to slow soil and water movement.
- Stabilizing soil to prevent loss of degradation or productivity.
- Increasing road drainage frequency and/or capacity to handle additional post-fire runoff.
- Installing protective fences or barriers to protect treated or recovering areas.

Designated Critical Habitat for Federal/State Listed, Proposed, or Candidate Species

- Conducting assessments of critical habitat in those areas affected by emergency stabilization treatments.
- Seeding or planting to prevent permanent impairment of designated Critical Habitat for Federal and State listed, proposed or candidate threatened and endangered species.

Critical Heritage Resources

- Conducting assessments of significant heritage sites in those areas affected by emergency stabilization treatments.
- Stabilizing critical heritage resources.
- Patrolling, camouflaging, burying significant heritage sites to prevent looting.

Greater Sage-Grouse Priority Areas and Protection Priority Areas

- Prioritize native seed allocation for use in Greater Sage-Grouse habitat in years when preferred native seed is in short supply. Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat conservation objectives. Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential, shall be the highest priority for rehabilitation efforts.
- Design post-ES&R management to ensure long term persistence of seeded or pre-burn native plants.
- Consider potential changes in climate when proposing post-fire seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed.

Invasive Plants

- Seeding to prevent establishment of invasive plants, and direct treatment of invasive plants. Such actions will be specified in the emergency stabilization plan only when immediate action is required and when standard treatments are used that have been validated by monitoring data from previous projects, or when there is documented research establishing the effectiveness of such actions.
- Using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area. When there is an existing approved management plan that addresses non-native invasive species, emergency stabilization treatments may be used to stabilize the invasive species.

Monitoring

- Monitoring of treatments and activities for up to three years from date of fire containment.

Burned Area Rehabilitation

The objectives of rehabilitation are: 1) to evaluate actual and potential long-term post- fire impacts to critical cultural and natural resources and identify those areas unlikely to recover naturally from severe wildland fire damage; 2) to develop and implement cost-effective plans to emulate historical or pre-fire ecosystem structure, function, diversity, and dynamics consistent with approved land management plans, or if that is infeasible, then to restore or establish a healthy, stable ecosystem in which native species are well represented; and 3) to repair or replace minor facilities damaged by wildland fire (620 DM 3.4B).

Rehabilitation plans are prepared by an interdisciplinary team as a separate plan, independent of an emergency stabilization plan. The rehabilitation plan specifies non-emergency treatments and activities to be carried out within three years following containment of a wildfire. Generally, rehabilitation activities are prescribed only within the perimeter of a burned area.

Allowable rehabilitation actions are limited to the following items, grouped by issue topic:

Lands Unlikely to Recover Naturally

- Repair or improve lands unlikely to recover naturally from wildland fire damage by emulating historical or pre-fire ecosystem structure, function, diversity, and dynamics consistent with existing land management plans.

Weed Treatments

- Chemical, manual, and mechanical removal of invasive species, and planting of native and non-native species, restore or establish a healthy, stable ecosystem even if this ecosystem cannot fully emulate historical or pre-fire conditions.

Tree Planting

- Tree planting to reestablish burned habitat, reestablish native tree species lost in fire, prevent establishment of invasive plants.

Repair/Replace Fire Damage to Minor Facilities

- Repair or replace fire damage to minor operating facilities (e.g., fences, campgrounds, interpretive signs and exhibits, shade shelters, wildlife guzzlers, etc.) Rehabilitation may not include the planning or replacement of major infrastructure, such as visitor centers, residential structures, administration offices, work centers and similar facilities. Rehabilitation does not include the construction of new facilities that did not exist before the fire, except for temporary and minor facilities necessary to implement burned area rehabilitation efforts.

Monitoring

- Monitoring of treatments and activities for up to three years from date of fire containment.
- After three years, the long-term monitoring of an ES&R project will be officially transferred to a designated resource program. Long-term responsibility for tracking the ES&R investment should be identified early in the ES&R planning process through an interdisciplinary team. The resource program is encouraged to conduct an evaluation at the five-year interval to identify management changes needed to ensure project success in reaching the intended objectives. (WO-IM-2010-195, 9/3/2010).

Policies on timeframes for ES&R planning funding, and implementation are very specific. ES&R treatments must be implemented, to the extent possible, before additional damage occurs to the burned area, immediately down slope of the burned area, or before undesirable vegetation becomes established. Treatments must be implemented at a time that will ensure a high or maximum probability of success. The ES&R Program timeframes in relations to tasks and responsibilities are shown in Table D.2.

Due to the broad spectrum of situations encountered in emergency stabilization and/or rehabilitation, several options of possible treatments, either separately or in combination, must be considered. The ES&R Handbook list several treatments under the Treatment Guidance section.

Table D.2
ES&R Program Timeframes, Tasks, and Responsibilities

Event	*Timeframes*	*Task*
Wildfire occurs.	Immediately	Manager assigns a Resource Advisor (RA). While the fire is still burning, the RA, in consultation with resource specialists and the appropriate Manager, decides if ES&R is warranted bases on Values-at-Risk/ Resources-at-Risk. If it is decided that ES&R is warranted, the RA is to notify the Central Montana Fire Zone (CMFZ) or District Office ES&R lead, prior to containment. The CMFZ or District Office ES&R Lead will then notify the State Office ES&R Program Lead of the scope of the fire and the anticipated fire containment date.
Initial ES Plan needed. Submit Form 1310-2 plus supplemental attachments (both 2822 and 2881 may be indicated on Form, although funding under 2881 may not occur until the following fiscal year).	Within 7 days of fire containment	Concurrently to State ES&R Program Lead, National ES&R Program Lead, and Denver Budget Office (BC-612).
Complete ES Plan needed. Prepare/Submit complete ES Plan.	Within 21 days of fire containment	<$100,000 submit to State ES&R Program Lead. ≥$100,000 submit to State ES&R Program Lead (for review) and concurrently to National ES&R Program Lead.
Receive approval/disapproval of ES Plan.	Within 6 working days of receipt by Approval Office	Requesting Office receives memo approving funding, or need for revision on a plan by plan basis. State Director or acting has funding approval authority for plans <$100,000. Bureau Budget Officer, after concurrence with Assistant Director WO-200 or their designee, has funding approval authority for plans ≥$100,000.
Receive notification of ES funding approval.	Immediately	Local fire office enters project data into NFPORS.
BAR Plan needed. Prepare/Submit BAR Plan.	Timely, ideally soon after submitting ES Plan, but no later than Sept. 5 annually	To State ES&R Program Lead and National ES&R Program Lead. Field Office. Local fire office enters project data into NFPORS.
Receive approval/disapproval of BAR Plan funding.	Before October 31 annually	Funding for BAR Plans is approved via the Annual Work Plan.
Accomplishment Report and Funding Request Form for next FY 2881 funds.	Early September	To State ES&R Program Lead for review and submission to National ES&R Program Lead for concurrence. Funding for years 2 and 3 is approved via the Annual Work Plan.
Close-out Report.	Early September of 3rd year	To State ES&R Program Lead for review and submission to National ES&R Program Lead.

Appendix E
Fluid Minerals

E.1 Oil and Gas Operations

Geophysical Exploration

Oil and gas can be discovered by either direct or indirect exploration methods, such as the mapping of rock outcrops, seeps, borehole data, and remote sensing data. In many cases, indirect methods such as seismic, gravity, and magnetic surveys are required to delineate subsurface features that may contain oil and gas. Geophysical exploration may provide information that increases the chances of drilling a discovery well and information that may discourage drilling and the associated surface disturbance. More sophisticated geophysical techniques, like three-dimensional (3-D) seismic surveys, may supply enough information to model a reservoir and optimize drilling to prevent excess wells and the associated surface disturbance. Geophysical exploration does not include core drilling for subsurface geologic information or well drilling for oil and gas.

Gravity Surveys

Gravitational prospecting detects micro-variations in gravitational attraction caused by the differences in the density of various types of rock. Gravity data are used to generate anomaly maps from which faults and general structural trends can be interpreted. These surveys are generally not considered definitive because of the many corrections required (e.g., terrain, elevation, latitude) and the poor resolution of complex subsurface structures. The instrument used for gravity surveys is a small portable device called a gravimeter. Generally, measurements are taken at many points along a linear transect, and the gravimeter is transported either by backpack, helicopter, or off-road vehicle. The only surface disturbance associated with gravity prospecting is that caused by a vehicle, if used.

Geomagnetic Surveys

Magnetic prospecting is most commonly used for locating metallic ore bodies, but is used to a limited extent in oil and gas exploration. Magnetic surveys use an instrument called a magnetometer to detect small magnetic anomalies caused by mineral and lithologic variations in the earth's crust. These surveys can detect trends in basement rock and the approximate depth to those basement rocks but, in general, they provide little specific data to aid in petroleum exploration. Many corrections are required to obtain reliable information. The generated maps lack resolution and are considered rudimentary views of subsurface geology. Magnetometers vary greatly in size and complexity and, in general, most magnetic surveys are conducted from the air by suspending a magnetometer under an airplane. Magnetic surveys conducted on the ground are nearly identical to gravity surveys and surface disturbance is minimal to nonexistent.

Seismic Reflection Surveys

Seismic prospecting is the best and most popular indirect method used for locating subsurface structures and stratigraphy that may contain hydrocarbons. Seismic energy (shock waves) is induced into the earth using one of several methods. As these waves travel downward and outward, they encounter various rock strata, each having a different seismic velocity characteristic. As the wave energy encounters the interface between rock layers, where the lower layer is of lower seismic velocity, some of the seismic energy is reflected upward. Sensing devices, commonly called geophones, are placed on the surface to detect these reflections. The geophones are connected to a recording truck that stores the data. The time required for the shock waves to travel from the shot point down to a given reflector and back to the geophone is related to depth, and this value is mapped to give an underground picture of the geologic structure. Many methods are available today that an explorationist can use to induce the initial seismic energy into the earth. All methods require preliminary surveying and laying of geophones. The thumper and vibrator methods pound or vibrate the earth to create a shock wave. Usually large trucks are used, each equipped with vibrator pads (about 4 feet square). The pads are

lowered to the ground, and vibrators on all trucks are triggered electronically from the recording truck. Information is recorded and then the trucks move forward a short distance and the process is repeated. Less than 50 square feet of surface area is required to operate the equipment at each test site. The trucks are equipped with large flotation type tires, which reduce the impact of driving over undisturbed terrain.

The drilling method uses truck-mounted drills that drill small-diameter holes to depths of 100 to 200 feet. Four to 12 holes are drilled per mile of line. Usually, a 50-pound charge of explosives is placed in the hole, covered, and detonated. The detonated explosive sends a shock wave below the earth's surface that is subsequently reflected back to the surface from various subsurface rock layers. In rugged topography, a portable drill is sometimes carried in by helicopter. Charges are placed in the hole as is done in a truck-mounted operation. Another portable technique is to carry the charges in a helicopter and place the charges on wooden sticks, or lath, about 3 feet above the ground. Usually, 10 charges in a line are detonated at once. In remote areas where there is little known subsurface data, a series of short seismic lines may be required to determine the subsurface geology. Subsequently, more extensive seismic lines are arranged to obtain the greatest amount of geologic information.

Seismic information can be obtained in two-dimensional (2-D) or 3-D configurations. To obtain 3-D seismic information, the seismic sensors and energy source are located along lines in a grid pattern. This type of survey differs from the more common 2-D surveys because of the large volume of data and the intensive computerization of the data. The results are expensive to obtain but give a more detailed and informative subsurface picture. The orientation and arrangement of the components in 3-D seismic surveys are less tolerant of adjustments to the physical locations of the lines and geophones, but they are also more compact in the area they cover. Although alignment can be fairly critical, spacing of the lines can often be changed to significantly increase the information collected. The depth of the desired geologic information will dictate the spacing of the grid lines, with smaller spacing detailing shallower formations. The 3-D surveys are very expensive and usually conducted after 2-D surveys or drilling has delineated a geologic prospect that will justify the extra cost. Extensive computer processing of the raw data is required to produce a usable seismic section from which geophysicists can interpret structural relationships to depths of 30,000 feet or more. The effective depth of investigation and resolution are determined, to some degree, by which method is used.

A typical drilling seismic operation can use 10 to 15 men operating five to seven trucks. Under normal conditions, three to five miles of line can be surveyed each day using the explosive method. The vehicles used for a drilling program include several heavy truck-mounted drill rigs, water trucks, a computer recording truck, and several light pickup trucks for the surveyors, shot hole crew, geophone crew permit man, and party chief.

Public roads and existing private roads and vehicle routes are used. Off-highway cross-country travel may be necessary to carry out tasks. Motor graders and/or dozers may be required to provide access to remote areas. Vehicle use for necessary tasks, such as geophysical exploration, including project survey and layout, would be allowed. Concern about unnecessary surface disturbance has caused government and industry to more carefully plan surveys. As a result, earth-moving equipment is now only rarely used in seismic exploration work. Several trips a day are made along a seismograph line; this usually establishes a well-defined two-track vehicle route. The repeated movement back and forth along the line (particularly the light pickup trucks) defines the vehicle route. Spreading vehicles out so that vehicle routes are not straight, and vehicles do not retrace the same route, has in some cases prevented the establishment of new vehicle routes and has reduced impacts. Drilling water, when needed, is usually obtained from the nearest source.

Each of the foregoing exploration methods has inherent strengths and weaknesses, and explorationists must decide which method is the most practical with regard to surface constraints (such as topography) while still producing useful information. Economics and past information also play a role in determining the method used. Reconnaissance-type surveys of gravity and geomagnetic can be run in areas where little information is available, with the attendant lower costs and fewer impacts. More expensive and higher impact seismic surveys are run when more detailed information is required.

Geophysical Management (Permitting Process)

Geophysical operations on and off an oil and gas lease are reviewed by the appropriate federal Surface Management Agency (i.e., Bureau of Land Management (BLM), Bureau of Reclamation, or U.S. Forest Service). Although a federal

oil and gas lease is not required before conducting geophysical operations, exploration on public lands requires review and approval following the procedures in 43 CFR Subparts 3150, 3151, and 3154. During a 13-year period (from 1998 through 2010) the planning area processed 80 seismic exploration notices or permits on public land in the planning area (Table E.1.1). An average of 6 notices or permits can be expected to be processed in any given year.

Table E.1.1
Seismic Exploration Permits on Public Lands in the Planning Area

Year	***Number***
1998	4
1999	3
2000	2
2001	3
2002	8
2003	28
2004	7
2005	7
2006	7
2007	4
2008	5
2009	1
2010	1
Total	80

The responsibilities of the geophysical operator and the authorized officer are as follows:

- **Geophysical Operator** – An operator is required to file with the authorized officer a "Notice of Intent (NOI) to Conduct Oil and Gas Exploration Operations." The NOI shall include a map (preferably 1:24,000 scale) showing the location of the line, all access routes, and ancillary facilities. The party filing the NOI shall be bonded. A copy of the bond or other evidence of satisfactory bonding shall accompany the NOI. Proper bonding may include a $5,000 individual, $25,000 statewide, or $50,000 nationwide geophysical exploration bond. In lieu of an exploration bond, a statewide or nationwide oil and gas performance bond may be used if it includes a rider for geophysical exploration. For geophysical operation methods involving surface disturbance, a pre-work field conference may be conducted. Special requirements or procedures that are identified by the authorized officer would be included in the Terms and Conditions for Notice of Intent to Conduct Geophysical Exploration. Any changes in the original Notice of Intent must be submitted in writing to the authorized officer and written approval must be secured before activities proceed. Additionally, the operator is required to comply with applicable federal, state, and local laws such as the Federal Land Policy and Management Act of 1976, the National Historic Preservation Act of 1966, and the Endangered Species Act of 1973, as amended. Operators may be required to submit an archaeological evaluation if dirt work is contemplated, or if there is reason to believe that significant cultural resources may be adversely affected. Upon completion of operations, including required rehabilitation, the operator is required to file a "Notice of Completion of Oil and Gas Exploration Operations." The Notice should include a map that shows the actual line location, access route, and other survey details.

- **Authorized Officer** – The authorized officer is required to contact the operator within five working days after the NOI is filed to explain the terms of the notice, including the "Terms and Conditions for Notice of Intent to Conduct Geophysical Exploration," current laws, and BLM administrative requirements. The written orders or instructions should be given to the operator at the time of the prework conference or field inspection. The authorized officer is also responsible for the examination of resource values to determine appropriate surface protection and reclamation measures. After the operations are completed, as specified by the "Notice of Completion," the authorized officer shall complete a final inspection and notify the operator within 30 days of receipt of the notice whether the terms and conditions of the NOI have been met or if additional action is required. Consent to release the bond or termination of liability shall not be granted until the terms and

conditions have been met; however, the bonding liability will automatically terminate within 90 days after receipt of the Notice of Completion unless the authorized officer notifies the operator of the need for additional reclamation work.

State Standards

In Montana, the operator is required to apply for a permit with the Montana Department of Natural Resources and Conservation (DNRC). DNRC standards for plugging shot holes, personnel safety, and so on, would be followed as specified in the State permit.

Mitigation

When a geophysical Notice of Intent is received, restrictions may be placed on the application to protect resource values or to mitigate impacts. Many of these requirements may be the same as the oil and gas lease stipulations adopted in the resource management plan (RMP). Other less restrictive measures may be used when impacts to resource values will be less severe. This is due in part to the temporary nature of geophysical exploration and the idea that decisions concerning the level of protection required should be made on a case-by-case basis.

The most critical management practice is compliance monitoring during and after seismic activity. Compliance inspections during the operation ensure that stipulations are being followed. Compliance inspections upon completion of work ensure that the lines are clean and the drill holes are properly plugged.

Oil and Gas Leasing

The Mineral Leasing Act provides that all public lands are open to oil and gas leasing unless a specific order has been issued to close an area. Based on the Federal Onshore Oil and Gas Leasing Reform Act of 1987, all leases must be exposed to competitive lease sales. Lands for which bids are not received at the lease sale will be available for noncompetitive leasing for a period not to exceed two years. All offers filed the day after the sale (referred to as day-after-the-sale filings) are considered simultaneously filed. This means that if more than one offer is filed for a specific parcel the day after the sale, a drawing must be held to determine the priority on multiple offers. Noncompetitive offers filed after that time are on a first-come first-served basis. If no offers are filed for a parcel during the two-year period after the sale, the lands must be nominated again for competitive leasing. Competitive sales will be held at least quarterly and by oral auction. Competitive and noncompetitive leases are issued for a term of 10 years or for as long as oil and/or gas are produced. Rental payments for these leases are $1.50 per acre for the first five years and $2.00 per acre thereafter until production is established. Royalty is received at the rate of 12½% of the total saleable production, one-half of which is typically returned to the State of Montana. Minimum royalty is the same amount as the rental.

The leasing of federal oil and gas is also affected by other acts such as the National Environmental Policy Act of 1969 (NEPA), Wilderness Act of 1964, National Historic Preservation Act of 1966, Endangered Species Act of 1973, and Federal Land Policy and Management Act of 1976. The federal regulations that govern oil and gas leasing are contained in 43 CFR Part 3100 with additional requirements and clarification found in Onshore Operating Orders and Washington Office (WO) manuals, handbooks and instruction memorandums.

The Energy Policy and Conservation Act Amendments (EPCA) of 2000, Public Law (PL) 106-469, directed the Secretary of the Interior to conduct an inventory of oil and natural gas resources beneath federal lands. The Act also directed the Department of the Interior to identify the extent and nature of any restrictions to resource development. As a result, the Departments of the Interior, Agriculture, and Energy released a report, “Inventory of Onshore Federal Oil and Natural Gas Resources Restrictions to Their Development” (referred to as the “EPCA Phase III Inventory”) in May 2008.

The BLM is integrating the results of the EPCA inventory into its RMPs. The oil and gas resource inventory data are integrated into the RFD scenario that predicts future mineral development within the planning area. The restrictions and impediments to mineral resource development would be considered throughout the RMP with the intent to:

- Clearly present mitigation requirements necessary to reduce impacts of oil and gas operations on other resources.

- Ensure that such mitigation is either statutorily required or scientifically justifiable and is the least restrictive measure necessary to accomplish the desired level of resource protection. The mitigation requirements would be monitored to determine if more or less restrictive measures might accomplish the same goal.

Once a lease is issued, it grants the right to the lessee(s) to explore, extract, remove, and dispose of oil and gas deposits that may be found in the leased lands. Lease rights may be subject to lease stipulations and permit approval requirements. Stipulations and permit requirements describe how lease rights are modified. Lease constraints or requirements may also be applied to Applications for Permit to Drill (APDs) on existing leases provided the constraints or requirements are within the authority reserved by the terms and conditions of the lease. The stipulations and conditions of approval must be in accordance with existing laws, regulations and lease terms.

The BLM planning process is the mechanism used to evaluate and determine where and how federal oil and gas resources will be made available for leasing. In areas where oil and gas development may conflict with other resources, the areas may be closed to leasing. Areas where oil and gas development could coexist with other land uses or resources will be open to leasing. Leases in these areas will be issued with standard lease terms or with added stipulations based upon decisions in the land use document. Added stipulations are a part of the lease only when environmental and planning records demonstrate the necessity for the stipulations.

Consistent with WO IM No. 2010-117, the BLM will form an Interdisciplinary Parcel Review (IDPR) team of resource specialists to review lease sale parcels and ensure compliance with NEPA and other legal and policy requirements. The IDPR team will include subject matter experts for the resources potentially affected by leasing. When appropriate, the IDPR team should consider including staff specialists from other agencies when lands and/or resources administered by those agencies could be impacted by future development on the lease parcels under review. To benefit from the team's skills, experience, and expertise, the parcel reviews should be conducted in a group setting, thereby encouraging group discussion and interaction. Data and recommendations should be reviewed and discussed as a team, allowing parcels to be compared and contrasted in an open discussion. The IDPR team must be familiar with current oil and gas development technologies and impacts, and should periodically visit areas of existing oil and gas development as a team to gain a better understanding of the potential impacts of development on prospective lease sale parcels. The IDPR team will ensure the following steps are performed for the review of parcels in each lease sale, including review of split estate parcels where the mineral estate is federally owned:

- gather and evaluate existing environmental resource information;
- determine whether leasing the parcel is in conformance with the RMP;
- review parcels in light of the most current national and local program-specific guidance to determine availability of parcels for leasing and/or applicable stipulations;
- usually conduct site visits to validate existing data or gather new information in order to make an informed leasing recommendation;
- coordinate and/or consult on the parcel review and NEPA analysis with stakeholders that may be affected by the BLM's leasing decisions; and
- provide for public participation as part of the review of parcels identified for potential leasing through the NEPA compliance documentation process.

Oil and gas lease stipulations may be modified or eliminated using the exception, modification, or waiver criteria outlined in this RMP (Appendix E.4) or through more site-specific environmental analysis. Stipulations that are either too restrictive or too lenient to accomplish the desired resource protection would be changed if monitoring or new scientific data justify the change. Clarifying changes may be made to the wording of oil and gas lease stipulations as long as there is no substantial change to the mitigated protection, as justified by new scientific data or monitoring.

The authorized officer has the authority to relocate, control timing, and impose other mitigation measures under Section 6 of the Standard Lease Form, provided appropriate environmental documentation can justify the modification. This authority is invoked when specific lease stipulations are not attached to the lease or new resources are discovered on a lease. Lease stipulations are conditions of lease issuance that provide protection for other resource values or land uses by establishing authority for delay, site changes, or the denial of operations within the terms of the lease contract. These

stipulations adhere to the Uniform Format for Oil and Gas Lease Stipulations prepared by the Rocky Mountain Regional Coordinating Committee in March 1989. The stipulations are specified for each applicable parcel in the Notice of Competitive Oil and Gas Lease Sale and are intended to inform interested parties (potential lessees, operators) that certain activities will be regulated or prohibited unless the operator and the Surface Management Agency arrive at an acceptable plan for mitigation of anticipated impacts. These stipulations are attached to the whole lease, regardless of whether the protection measure affects only a specific portion of the lease. Lease stipulations are based on the perceived resource requirements and land uses as specified in NEPA documentation. New science, comprehensive documentation of resource requirements, land pattern interference, and ongoing monitoring of the effectiveness of a stipulation may allow granting of an exception, modification, or waiver to a stipulation. An *exception* is a one-time exemption to a lease stipulation and is determined on a case-by-case basis. A *modification* is a change to the provisions of a lease stipulation either temporarily or for the term of the lease. A lease stipulation *waiver* is a permanent exemption to a lease stipulation.

Master Leasing Plan

In some areas, additional planning and analysis may be necessary prior to new oil and gas leasing because of changing circumstances, updated policies, and new information. A Master Leasing Plan (MLP) is a mechanism for completing the additional planning, analysis, and decisionmaking that may be necessary for areas that meet specific criteria (WO Instructional Memorandum (IM) No. 2010-117). The preparation of an MLP is required when all four of the following criteria are met:

1. A substantial portion of the area to be analyzed in the MLP is not currently leased.
2. There is a majority federal mineral interest.
3. The oil and gas industry has expressed a specific interest in leasing, and there is a moderate or high potential for oil and gas confirmed by the discovery of oil and gas in the general area.
4. Additional analysis or information is needed to address likely resource or cumulative impacts if oil and gas development were to occur where there are:
    - multiple-use or natural/cultural resource conflicts;
    - impacts to air quality;
    - impacts on the resources or values of any unit of the national park system, national wildlife refuge, or national forest wilderness area, as determined after consultation or coordination with the National Park Service, U.S. Fish and Wildlife Service, or the U.S. Forest Service; or
    - impacts on other specially designated areas.

Five areas were considered for an MLP (Table E.1.2), including one external proposal. In July 2010, The Wilderness Society submitted a proposal for an MLP for an area called the Bitter Creek/Frenchman Breaks in northern Phillips and Valley counties.

The BLM reviewed all five areas and determined that they did not meet all four of the criteria as required by WO IM No. 2010-117 and the areas do not warrant preparation of a MLP (Table E.1.2). An MLP will not be completed for the HiLine RMP.

Table E.1.2
Master Leasing Plan Areas Considered in the Planning Area

Master Leasing Plan Area	*Percent Unleased*	*Federal Mineral Interest*	*Development Potential*	*Additional Analysis Needed*
Bears Paw South	22%	47%	High	No
Bitter Creek/Frenchman Breaks	76%	56%	Low/Very Low	No
Bowdoin	22%	55%	Moderate	No
Creedman Coulee	21%	8%	High	No
North Blaine	39%	30%	Moderate	No

Bears Paw South

The Bears Paw South area is located in southern Blaine County and is adjacent to the Upper Missouri River Breaks National Monument (Figure E.1 and Map E.1, which is located at the end of the Oil and Gas Operations section). This area was considered by the BLM due to continued natural gas development and potential resource conflicts with wildlife.

The BLM reviewed this proposal and determined that the Bears Paw South did not meet all four of the criteria as required by WO IM No. 2010-117 and the proposal does not warrant preparation of an MLP.

- The area contains 177,127 acres of federal oil and gas mineral estate of which 38,400 acres (22%) are currently unleased. Therefore, this area does not meet the criteria that a substantial portion is not currently leased.

- There is not a majority federal oil and gas mineral estate in the area. The area contains 374,523 acres of which 177,127 acres (47%) are federal oil and gas mineral estate. Of the 177,127 acres of federal minerals, 108,474 acres (61%) are non-BLM managed surface.

- The oil and gas industry has expressed some interest in leasing the unleased lands in the area. The majority of the leased lands are held by production. Most of the area has high development potential (Figure E.1 and Map E.1). There is substantial gas production throughout the area and there will continue to be new wells drilled on existing leases potentially with an increase in density.

- BLM land in the Bears Paw South area is concentrated within the southcentral and northeast sections of the area. Resources include Greater Sage-Grouse winter range and nesting habitat and big game winter range. BLM lands in the southern and eastern portions of the area contain steep slopes with highly erodible soils. Oil and gas lease stipulations within the range of alternatives considered in the RMP address this area including those management actions for Greater Sage-Grouse (restoration area), winter range, and soils. This planning process involves a great deal of information and analysis to illustrate the environmental consequences of oil and gas development. There is no identified need for additional analysis or information to address likely resource or cumulative impacts.

Bitter Creek/Frenchman Breaks

In July 2010, The Wilderness Society submitted a proposal for a Master Leasing Plan (MLP) for an area called the Bitter Creek/Frenchman Breaks in northern Phillips and Valley counties (Figure E.2).

The BLM reviewed this proposal and determined that the Bitter Creek/Frenchman Breaks did not meet all four of the criteria as required by WO IM No. 2010-117 and the proposal does not warrant preparation of an MLP.

- The area contains 582,157 acres of federal oil and gas mineral estate of which 441,748 acres (76%) are currently unleased. Therefore, this area does not meet the criteria that a substantial portion is not currently leased. However, 60,700 acres are within the Bitter Creek Wilderness Study Area and are unavailable for leasing.

- There is a majority federal oil and gas mineral estate in the area. The area contains 1,045,915 acres of which 582,157 acres (56%) are federal oil and gas mineral estate. Of the 582,157 acres of federal minerals, 112,545 acres (19%) are non-BLM managed surface.

- The oil and gas industry has expressed some interest in the past in leasing in the area. Some leasing has been deferred in the area pending completion of the HiLine RMP. None of the area is considered to have high development potential (Figure E.2). About 2% of the area is considered to have moderate development potential. The remainder of the area is considered to have low to very low development potential. The southwestern portion of the area is within the Bowdoin Dome area, which was established in 1954. In the last 10 years, there have been 47 wells drilled within the area of which 39 were drilled within the Bowdoin gas field. All 39 were completed as producing gas wells. The other 8 wells were drilled outside of the Bowdoin gas field, and all 8 were dry holes. Therefore, there is not a discovery outside of the Bowdoin Dome area.

- Oil and gas lease stipulations within the range of alternatives considered in the RMP address this area including those management actions for the Frenchman Breaks ACEC, the grassland bird priority area, and crucial winter range. This planning process involves a great deal of information and analysis to illustrate the environmental consequences of oil and gas development. There is no identified need for additional analysis or information to address likely resource or cumulative impacts.

Bowdoin

The Bowdoin area is located in northern Phillips County and west-central Valley County (Figure E.3 and Map E.1, which is located at the end of the Oil and Gas Operations section). This area was considered by the BLM since it surrounds and encompasses the Bowdoin Natural Gas Project Area.

The BLM reviewed this proposal and determined that Bowdoin did not meet all four of the criteria as required by WO IM No. 2010-117 and the proposal does not warrant preparation of a MLP.

- The area contains 449,563 acres of federal oil and gas mineral estate of which 96,657 acres (22%) are currently unleased. Therefore, this area does not meet the criteria that a substantial portion is not currently leased. Most of the unleased federal mineral estate is located along the southern portion of the area. Much of this unleased area was previously leased, but the leases expired due to lack of production.

- There is a majority federal oil and gas mineral estate in the area. The area contains 814,065 acres of which 449,563 acres (55%) are federal oil and gas mineral estate. Of the 449,563 acres of federal minerals, 224,006 acres (50%) are non-BLM managed surface.

- The oil and gas industry has expressed an interest in leasing in the area in the past as indicated by 352,906 acres that are currently leased. Most of the area has moderate development potential (Figure E.3 and Map E.1). The area encompasses the Bowdoin Natural Gas Project Area, which is one of the top producing gas fields in Montana. The Bowdoin gas field is an old established field. Recent interest in the area has consisted of step-out wells, infill wells, and replacement wells. Because of this recent interest, a field development environmental assessment was completed in December of 2008 (BLM 2008a).

- The Bowdoin MLP area is within an established, producing natural gas field, and the majority of federal mineral interest has been leased. Resources and potential resource conflicts have been fully analyzed in the Bowdoin Natural Gas Development Project EA (BLM 2008a). Oil and gas lease stipulations and best management practices (BMPs) within the range of alternatives considered in the RMP address this area including those management actions for the Bowdoin Natural Gas Project Area. This planning process involves a great deal of information and analysis to illustrate the environmental consequences of oil and gas development. There is no identified need for additional analysis or information to address likely resource or cumulative impacts.

Creedman Coulee

The Creedman Coulee area is located in northwestern Blaine County (Figure E.4). This area was considered by the BLM since it was identified as having high development potential for oil and gas.

The BLM reviewed this proposal and determined that the Bears Paw South did not meet all four of the criteria as required by WO IM No. 2010-117 and the proposal does not warrant preparation of an MLP.

- The area contains 5,446 acres of federal oil and gas mineral estate of which 1,163 acres (21%) are currently unleased. Therefore, this area does not meet the criteria that a substantial portion is not currently leased.

- There is not a majority federal oil and gas mineral estate in the area. The area contains 68,040 acres of which 5,466 acres (8%) are federal oil and gas mineral estate. Of the 5,446 acres of federal minerals, 5,325 acres (98%) are non-BLM managed surface.

- The oil and gas industry has expressed very little interest in leasing the unleased lands in the area. The majority of the leased lands are held by production. All of the area is identified as having high development potential. (Figure E.4). There is substantial gas production throughout the area and there will continue to be some new wells drilled on existing leases.

- The Creedman Coulee MLP area is 98% fee surface. A small wildlife refuge is located within the boundary of the MLP area. The Creedman Coulee National Wildlife Refuge is comprised of 80 acres of federal surface and 2,648 acres of fee surface under a conservation easement. Resource conflicts due to increased oil and gas development would be minimal due to NSO stipulations, and additional analysis or information is not required.

North Blaine

The North Blaine area is located in northern Blaine County (Figure E.5 and Map E.1, which is located at the end of the Oil and Gas Operations section). This area was considered by the BLM because there have been proposals in the past for an expansion of the existing natural gas production.

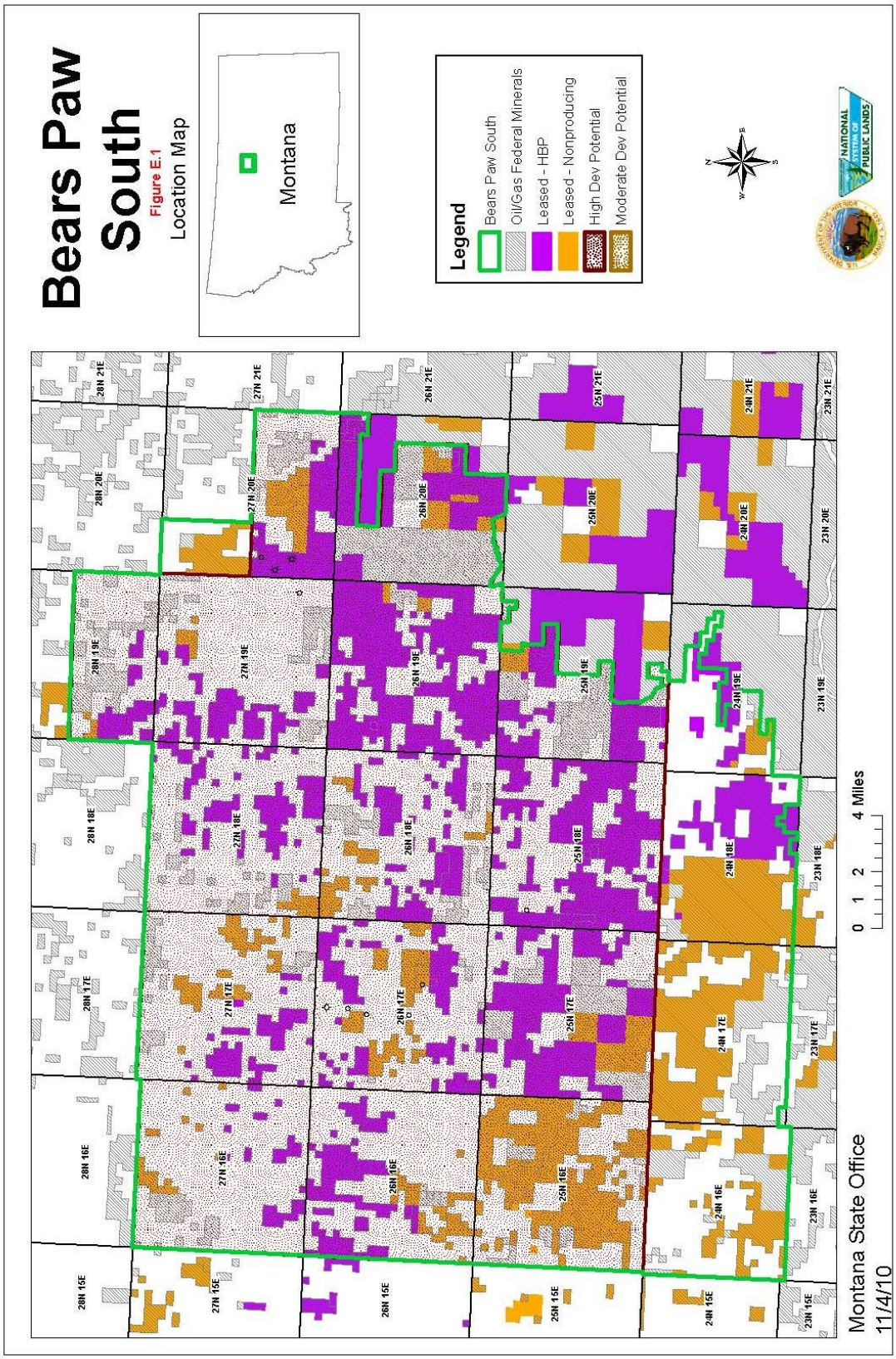
The BLM reviewed this proposal and determined that North Blaine did not meet all four of the criteria as required by WO IM No. 2010-117 and the proposal does not warrant preparation of an MLP.

- The area contains 82,822 acres of federal oil and gas mineral estate of which 32,169 acres (39%) are currently unleased. Therefore, this area does not meet the criteria that a substantial portion is not currently leased.

- There is not a majority federal oil and gas mineral estate in the area. The area contains 276,364 acres of which 82,822 acres (30%) are federal oil and gas mineral estate. Of the 82,822 acres of federal minerals, 8,027 acres (10%) are non-BLM managed surface.

- The oil and gas industry has expressed very little interest in leasing the unleased lands in the area. The majority of the leased lands are held by production. A portion of the area has moderate development potential (Figure E.5 and Map E.1). There is substantial gas production throughout the area and there will continue to be some new wells drilled on existing leases. There is some oil production within the area as well.

- Resources within the North Blaine MLP area include active sage-grouse leks, sage-grouse winter range and nesting habitat, pronghorn winter range, mule deer winter range, and numerous raptor nests. The North Blaine MLP area does contain a developed natural gas field. Oil and gas lease stipulations and best management practices (BMPs) within the range of alternatives considered in the RMP address this area including those management actions for Greater Sage-Grouse, big game winter range, and raptors. This planning process involves a great deal of information and analysis to illustrate the environmental consequences of oil and gas development. There is no identified need for additional analysis or information to address likely resource or cumulative impacts.


Bears Paw South
Figure E.1
Location Map
Montana
Legend
Bears Paw South
Oil/Gas Federal Minerals
Leased - HBP
Leased - Nonproducing
High Dev Potential
Moderate Dev Potential
0 1 2 4 Miles
Montana State Office
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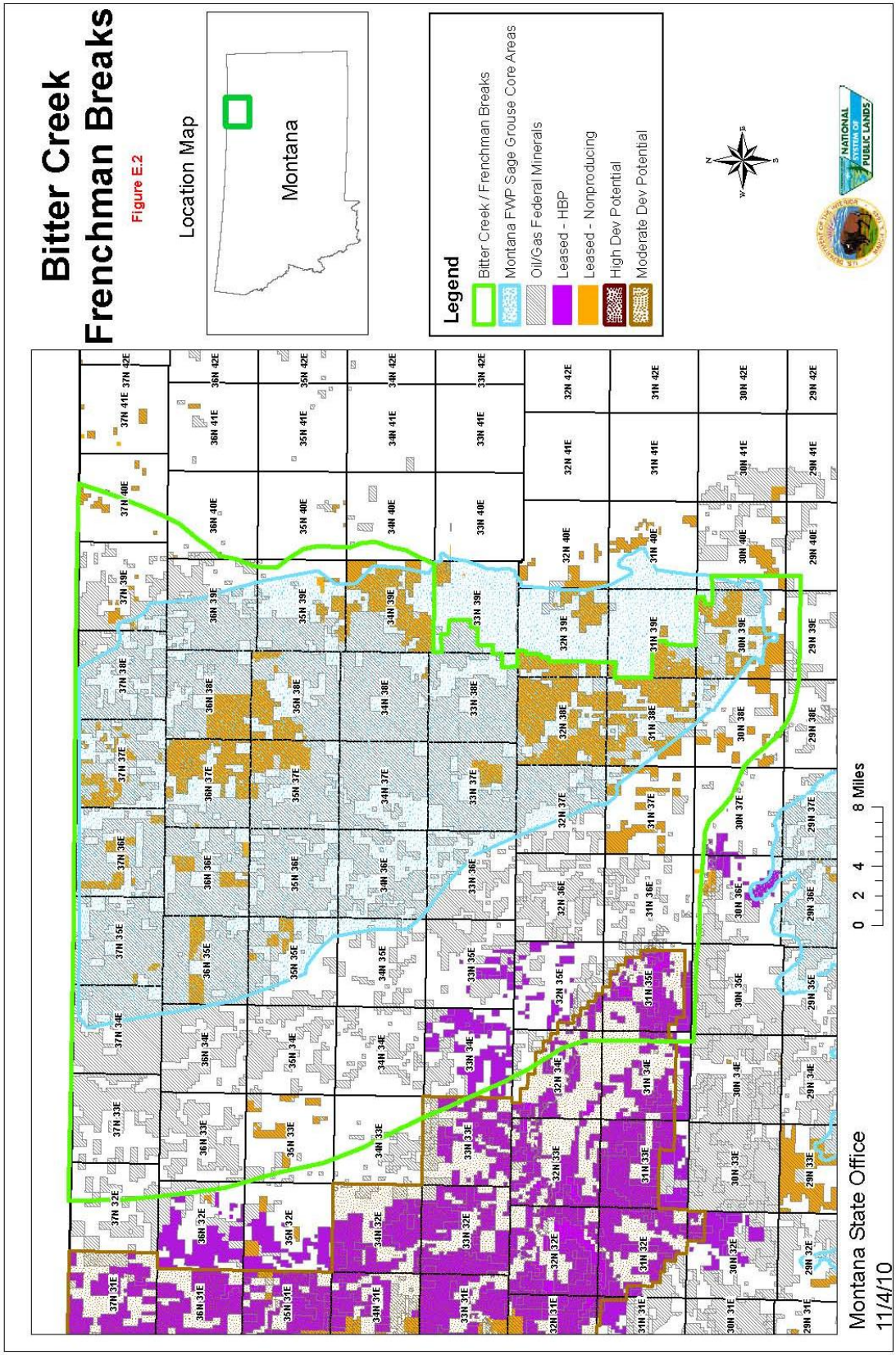
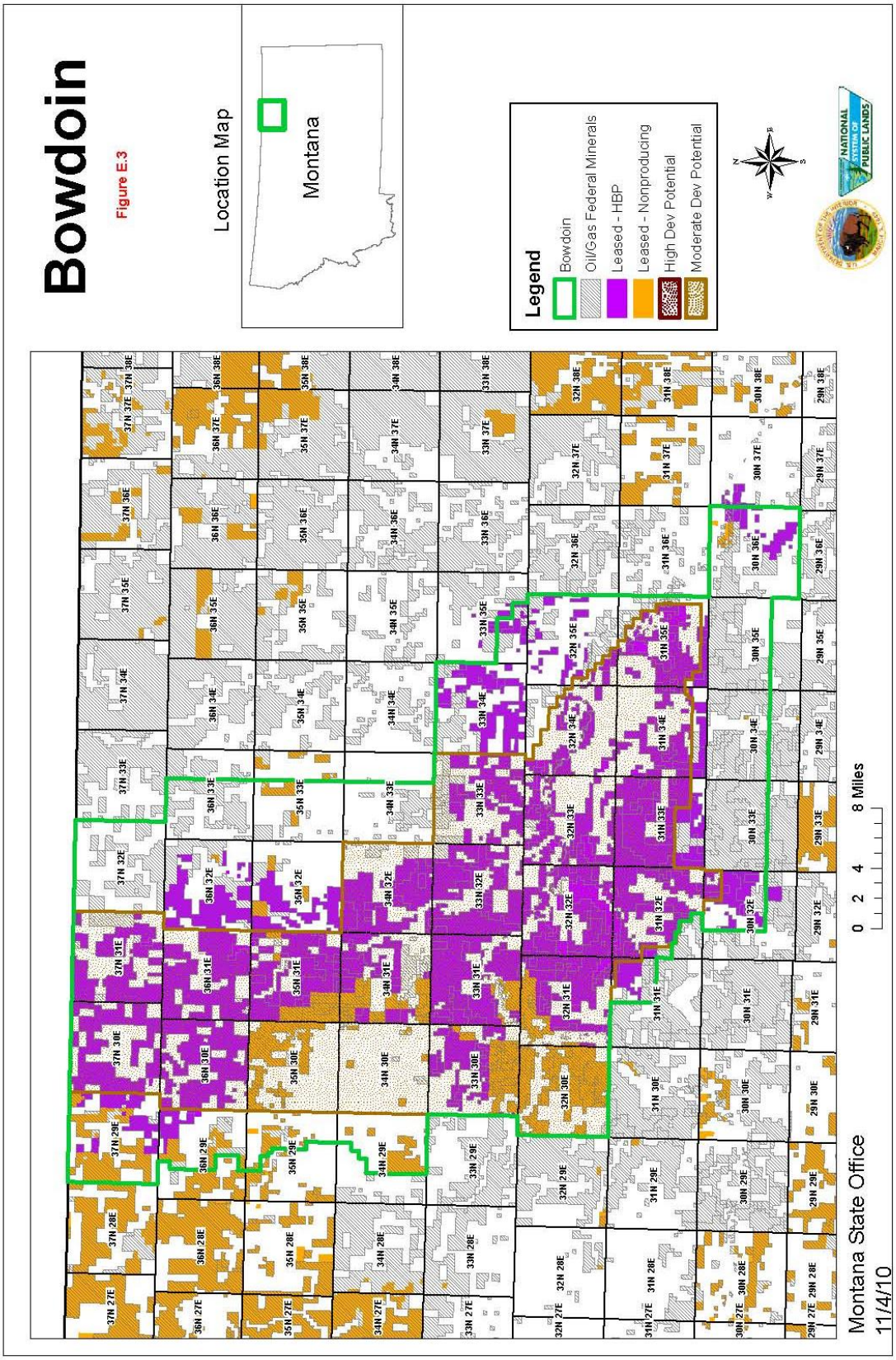
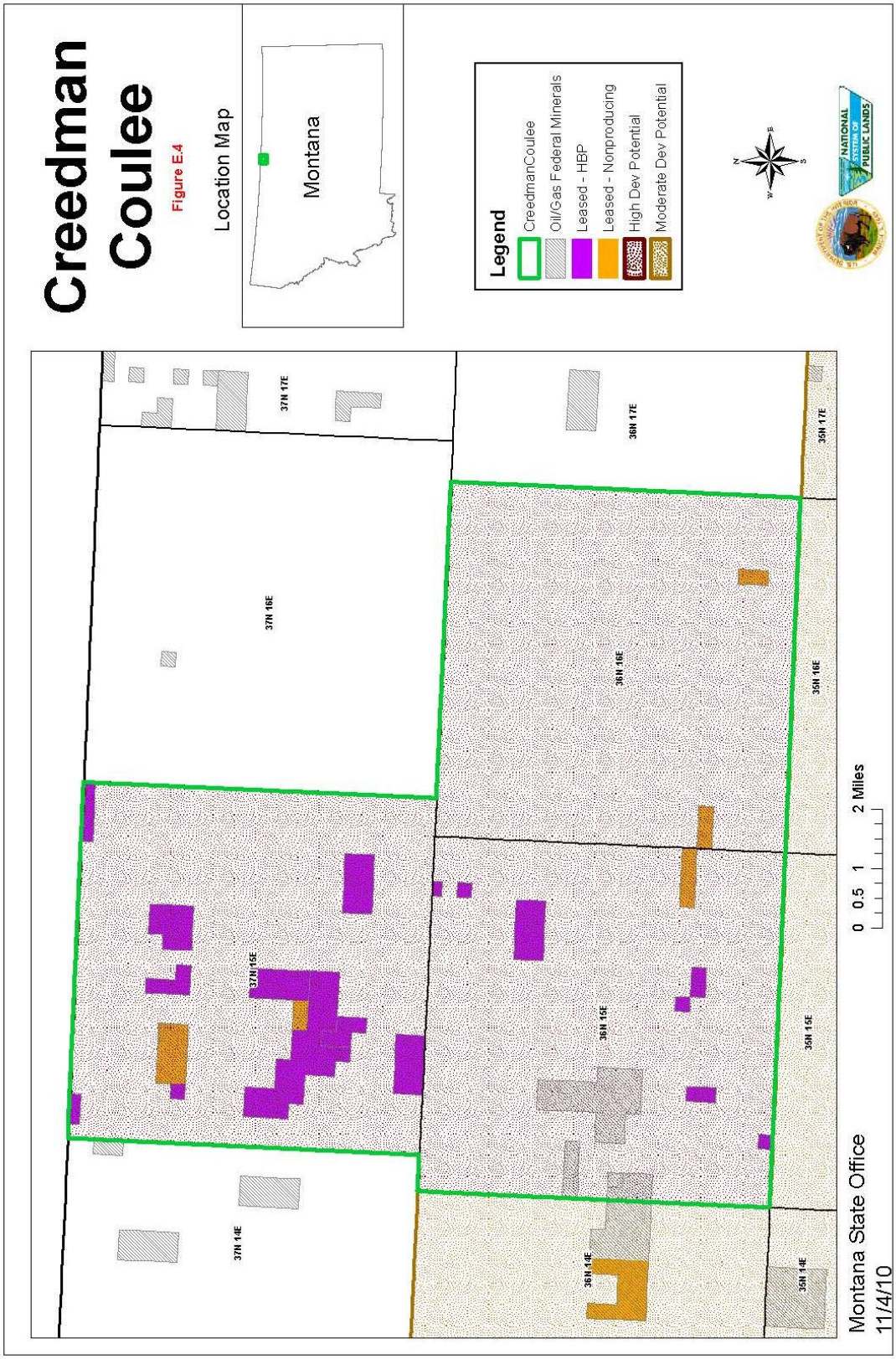

Bitter Creek
Frenchman Breaks
Figure E.2
Location Map
Montana
Legend
Bitter Creek / Frenchman Breaks
Montana FWP Sage Grouse Core Areas
Oil/Gas Federal Minerals
Leased - HBP
Leased - Nonproducing
High Dev Potential
Moderate Dev Potential
0 2 4 8 Miles
Montana State Office
11/4/10


Bowdoin
Figure E.3
Location Map
Montana
Legend
Bowdoin
Oil/Gas Federal Minerals
Leased - HBP
Leased - Nonproducing
High Dev Potential
Moderate Dev Potential
NATIONAL SYSTEM OF PUBLIC LANDS
0 2 4 8 Miles
Montana State Office
11/4/10


Creedman Coulee
Figure E.4
Location Map
Montana
Legend
CreedmanCoulee
Oil/Gas Federal Minerals
Leased - HBP
Leased - Nonproducing
High Dev Potential
Moderate Dev Potential
NATIONAL SYSTEM OF PUBLIC LANDS
37N 17E
37N 16E
37N 15E
37N 14E
36N 17E
36N 16E
36N 16E
36N 15E
36N 14E
35N 17E
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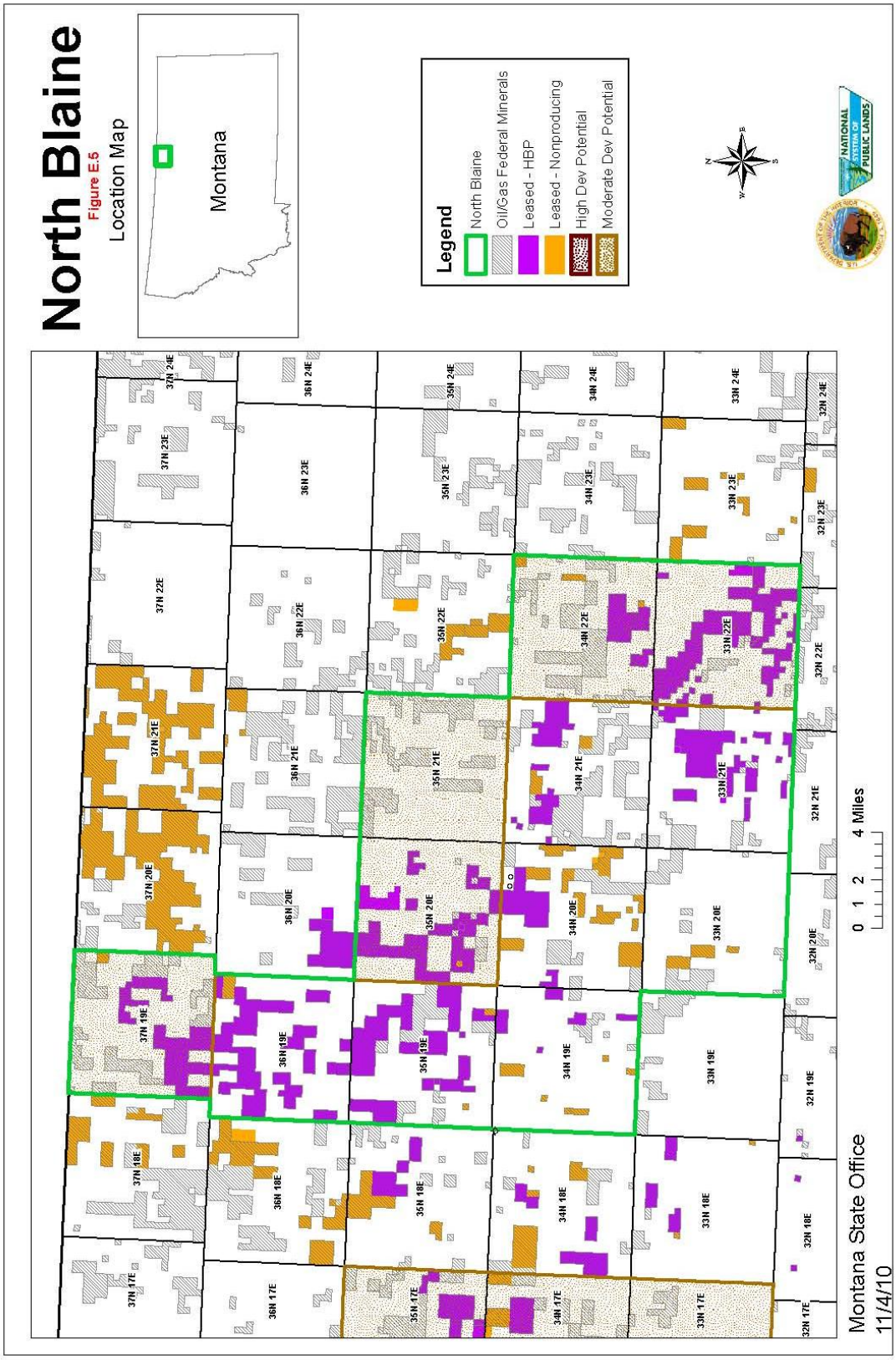
Montana State Office
11/4/10


North Blaine
Figure E.5
Location Map
Montana
Legend
North Blaine
Oil/Gas Federal Minerals
Leased - HBP
Leased - Nonproducing
High Dev Potential
Moderate Dev Potential
0 1 2 4 Miles
Montana State Office
11/4/10

Lease Stipulations

Certain resources in the planning area require protection from impacts associated with oil and gas activities. The specific resource and the method of protection are contained in lease stipulations. Lease stipulations are usually No Surface Occupancy, Controlled Surface Use, or Timing Limitation (Seasonal Restriction). A notice may also be included with a lease to provide guidance regarding resources or land uses. While the actual wording of the stipulations may be adjusted at the time of leasing, the protection standards described will be maintained.

No Surface Occupancy

Use or occupancy of the surface land for fluid mineral extraction or development is prohibited in order to protect identified resource values. The no surface occupancy stipulation includes stipulations which may have been worded as "No Surface Use and Occupancy," "No Surface Disturbance," "Conditional No Surface Occupancy" and "Surface Disturbance or Occupancy Restriction (by location)."

Controlled Surface Use

Use or occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify the lease rights. A Controlled Surface Use stipulation is used for operating guidance, not as a substitute for the No Surface Occupancy or Timing stipulations.

Timing Limitation (Seasonal Restriction)

Surface use is prohibited during specified times to protect identified resource values. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project-specific mitigation measures would be insufficient.

Plan Maintenance

New information may lead to changes in existing resource inventories. New use areas and resource locations may be identified or use areas and resource locations that are no longer valid may be identified. These resources usually cover small areas requiring the same protection or mitigation as identified in this plan. Identification of new areas or removal of old areas that no longer have those resource values will result in the use of the same lease stipulation identified in this plan. These areas will be added to the existing data inventory without a plan amendment. In cases where the changes constitute a change in resource allocation outside the scope of this plan, a plan amendment would be required.

Drilling Permit Process

A federal lessee or the operator of record is governed by procedures set forth in Onshore Oil and Gas Order No. 1 (updated in May 2007), "Approval of Operations on Onshore Federal and Indian Oil and Gas Leases," issued under 43 CFR 3164. These procedures cover the full scope of operations on federal minerals, from initial permitting of the well, to subsequent operations, to final abandonment. Before beginning construction or drilling a well, the lessee must have an approved APD, including requirements for surface and subsurface operations. Many other lease operations, including surface and subsurface, must be approved by a Sundry Notice. When a well is no longer useful, the well is plugged and the surface reclaimed. The well plugging and reclamation operations are typically approved via a Sundry Notice; however, verbal approval for plugging may be given for a well that was drilled but not completed for production (dry hole). The period of bond liability is terminated after all wells covered by the bond are properly plugged and the surface reclaimed.

All APDs processed in the planning area are filed with the Great Falls Oil and Gas Field Office. A copy of the APD is posted in the Great Falls Oil and Gas Field Office and in the Havre Field Office, Glasgow Field Office, or Malta Field Office depending upon the office having jurisdiction over the lands described in the application. If applicable, a copy of the APD is also posted with the Surface Management Agency. The APD must be posted for a minimum of 30 days to

allow for review by the public. After 30 days, the APD can be approved in accordance with (a) lease stipulations, (b) Onshore Oil and Gas Orders, and (c) Onshore Oil and Gas regulations (43 CFR Part 3160) if it is administratively and technically complete.

Evidence of bond coverage for lease operations must be submitted with the application. Bond amount must not be less than a $10,000 lease bond, a $25,000 statewide bond, or a $150,000 nationwide bond.

Occasionally, the BLM may require that a lessee drill a well on a lease if it is determined that federally owned minerals are being drained by an adjacent well on private or state-owned lands. This may cause conflicts in areas of sensitive surface resources. If the economics are not sufficient to drill a directional well from a location on the federal lease, drainage protection may require compromising the sensitive surface resource after a thorough environmental review.

Permitting

In the initial permitting process, the operator selects the location of a proposed drill site based upon Montana Board of Oil and Gas (MBOG) spacing requirements, subsurface geology, topography, and avoidance of known sensitive surface resource values. At that point, the operator is able to survey and stake the well, access road and pipeline without notice to the BLM. Cultural inventories can also be obtained without notice.

After the operator makes the decision to drill a well, it must decide whether to submit a Notice of Staking (NOS) or APD. The NOS and APD are described as follows:

- **Notice of Staking (NOS)** – The NOS is an abbreviated notice that consists of an NOS form, staked location map, and sketched site plan. This notice is posted for a 30-day public review and begins the processing timeframe for approval of the APD. The NOS triggers the onsite inspection of the well, which determines whether any conflicts with critical resource values are evident and provides the preliminary data to assess what additional items are necessary to complete the APD.

- **Application for Permit to Drill (APD)** – The operator can submit a completed APD in lieu of an NOS but, in either case, no surface-disturbing activity can be conducted in conjunction with the drilling operations until the APD is approved by the authorized officer.

If the APD option is used, an APD is submitted to the Great Falls Oil and Gas Field Office and a field inspection is held with the operator and any other interested party. The purpose of the onsite field inspection is to evaluate the operator's plan, assess the situation for possible impacts (surface and subsurface), and formulate resource protection stipulations. To lessen environmental impacts, a site can be moved, reoriented, or resized, within certain limits, at the onsite inspection. The proposed access road or pipeline can also be rerouted. If necessary, site-specific mitigations are added to the APD as Conditions of Approval (COAs) for protection of surface and/or subsurface resource values in the vicinity of the proposed activity.

The authorized officer is responsible for preparing environmental documentation necessary to satisfy the NEPA requirements and provide any mitigation measures needed to protect the affected surface resource values. Consideration is also given to the protection of subsurface water resources. When processing an APD, the BLM geologist is required to identify the maximum depth of usable water as defined in Onshore Oil and Gas Order No. 2. Usable water is defined as that water containing 10,000 parts per million or less of total dissolved solids. Water of this quality is to be protected, usually by surface casing and cement. Determining the depth to fresh water requires specific water quality data in the proposed well vicinity or geophysical log determination of water quality, depending on existing well proximity and log availability. If water quality data or logs from nearby wells are not available, the area within a 2-mile radius of the proposed well is checked for water wells. If wells exist, surface casing is required to be set below the deepest fresh water zone found in these wells or to be placed below a depth reasonably estimated for future water wells.

For operations proposed on privately-owned surface, if the operator after a good-faith effort is unable to reach an agreement with the private surface owner, the operator must post a bond to cover loss of crops and damages to tangible improvements prior to the approval of the APD.

The Great Falls Oil and Gas Field Office will act on the application in one of two ways:

- approve the application (a) as submitted or (b) with appropriate modifications or COAs; or
- return the application and advise the lessee or operator of the reasons for denial or why final action has been delayed and the date such final action is expected.

When final approval is given by the BLM, the operator can commence construction and drilling operations. Approval of an APD is valid for 2 years. If drilling does not begin within 2 years, the stipulations can be revised prior to extending the APD for another year.

For drilling operations proposed on lands with state or private mineral ownership, the lessee must meet the requirements of the mineral owner and the state regulatory agency. The BLM does not have jurisdiction over non-federal minerals; however, the BLM has surface management responsibility in situations of BLM surface located over non-federal mineral ownership.

Conditions of Approval

Conditions of approval are mitigation measures that implement restrictions in light of site-specific conditions. General guidance for COAs is found in the BLM and U.S. Forest Service brochure entitled "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (BLM 2007e) and BLM Manual 9113 entitled "Roads."

The following mitigation measures may be applied to approved permits as COAs. The listing is not all-inclusive, but presents some standard COAs that are currently being used in the planning area. The wording of the COAs may be modified or additional COAs may be developed to address specific conditions.

1. Informational Notice:

a. Approval of this APD does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

b. The lessee shall comply with applicable laws and regulation; lease terms, Onshore Oil and Gas Orders; Notices to Lessee; and other orders and instructions of the authorized officer.

c. A complete copy of the approved APD must be on the well site and available for reference during the construction and drilling phase.

d. Any deviation from the terms of this APD requires prior approval.

e. This drilling permit is valid for either 2 years from the approval date or until lease expiration, whichever occurs first.

f. Each drilling, producing or abandoned well shall be identified with the Operator's name, the lease serial number, the well number, and the surveyed description of the well (either footages or the quarter section, the section, township and range). All markings must be legible and in a conspicuous place.

g. Pursuant to Onshore Oil and Gas Order No. 1, Section IV, General Operating Requirements, Operator Responsibilities, paragraph (e), Completion Reports, the operator is encouraged to submit all well logs in an electronic format, such as ".LAS" format, in lieu of providing the BLM with two (2) paper copies of all well logs, as currently required.

h. The operator must provide the Surface Use Plan of Operations to the private surface owner of the well site location.

2. Notification Requirements:

The Bureau of Land Management, Great Falls Oil and Gas Field Office, 1101 15th Street North, Great Falls, Montana, shall be notified in advance of actual work so that a representative may have an opportunity to witness the operation. BLM office hours are 8:00 a.m. to 4:30 p.m. Monday through Friday. The BLM's office telephone number is (406) 791-7700. Following are the notification requirements:

a. Notify this office at least 48 hours before beginning dirt work.
b. Notify this office verbally at least 6 hours before the well is spudded.
c. Notify this office verbally at least 6 hours prior to running/cementing casing.
d. Notify this office verbally at least 6 hours prior to conducting blowout preventer (BOP) tests.
e. Notify this office at least 6 hours prior to plugging for verbal plugging orders.

3. Downhole Stipulations:

a. Surface casing will have centralizers on each of the bottom three joints and will be cemented back to surface.

b. The BOP system will be consistent with Onshore Oil and Gas Order No. 2.

c. Fresh water will be required for cementing. If the fresh water source is from a reservoir, a water quality analysis will need to be performed and submitted to the BLM to ensure that the quality of the water will not degrade the cement.

d. The operator will have sufficient weighting materials and lost circulation materials on location in the event of a pressure kick or lost circulation.

4. Plugging Requirements:

a. Prior approval for abandonment must be obtained. Initial approval for abandonment during drilling operations may be verbal, but must be followed by written notification on Sundry Notice Form 3160-5, in triplicate.

b. Upon completion of the approved plugging, the Operator will cut the well off four (4) feet below reclaimed ground level and a 1/4" x 12" x 12" plate (with a 1/8" weep hole) shall be welded onto a fitting to be screwed into a collar either welded or screwed to the production casing. **The standard above-ground dry hole marker in accordance with 43 CFR 3162.6(d) has been waived by the Great Falls Oil and Gas Field Office**. Pits must be fenced until dry or pumped and then filled in and recontoured unless otherwise approved by the authorized officer.

c. The following minimum information shall be permanently placed on the plate: "Fed" or "Ind" as applicable; "Lease Number, Operator, Well Number, and Location by quarter/quarter, Section, Township, and Range."

5. Reports and Notifications:

a. All submitted information not marked "CONFIDENTIAL INFORMATION" will be available for public inspection upon request. The exception is Indian lease information, which is always considered confidential.

b. Production Startup Notification is required not later than the fifth business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in the case of a well which has been off production for more than 90 days. The operator will notify the authorized officer by letter, Sundry Notice Form 3160-5, or orally to be followed by a letter or Sundry Notice of the date on which such production has begun or resumed.

6. Hazardous Materials:

a. Operators and their contractors are to ensure all production, use, storage, transport, and disposal of hazardous materials resulting from the proposed project is in accordance with all applicable federal, state and local laws,

regulations and guidelines, existing or hereafter enacted or promulgated that affect the management of hazardous material, as defined in this paragraph. Hazardous material means any substance, pollutant, or contaminant listed as a hazardous substance under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended, 42 USC 9601 et seq., and its regulations (found at 40 CFR 302). The definition of hazardous substances under CERCLA includes "hazardous waste" defined in the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 USC 6901 et seq., and its regulations. The term also includes any extremely hazardous substances defined by 40 CFR 355, and any nuclear or byproduct material defined by the Atomic Energy Act of 1954, as amended, 42 USC 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof not otherwise listed or designated as a hazardous substance under CERCLA section 101 (14), 42 USC 9601 (14), or natural gas.

b. Only drilling muds, drilling fluids, cuttings, native soils, cementing materials and/or approved pit solidifying materials will be placed in the reserve or working pits.

c. Nonexempt wastes will not be mixed with exempt wastes.

d. No hazardous materials will be used in the drilling and construction of well sites and access roads. Commercial preparations, which may contain hazardous materials, may be used in production operations and will be transported within the project area. These materials will be handled in an appropriate manner to minimize potential for leaks or spills to the environment. Other waste disposal methods and locations should be described on the APD or Sundry Notice and approved by the BLM prior to disposal.

7. Environmental Obligations and Disposal of Produced Water:

a. The operator is required to take all necessary steps to prevent any death of a migratory bird in pits or open vessels associated with the drilling, testing, completion, or production of this well. The death of any migratory bird found in such a pit or open vessel is a violation of the Migratory Bird Treaty Act and is considered a criminal act. Any deaths of migratory birds attributable to pits or open vessels associated with drilling, testing, completion, or production operations must be reported to this office and the United States Fish and Wildlife Service within 24 hours.

b. The BLM may require that the pit be designed or the open vessel be covered to deter the entry of birds in any facility associated with drilling, testing, completion, or production of this well. Fencing, screening, and netting of pits may be required as a means to deter bird entry. These conditions would most likely be imposed to prevent the entry of migratory birds if oil is left in pits or open vessels after the cessation of drilling or completion operations, if water disposal pits consistently receive oil, or if pits or open vessels are used repeatedly for emergency situations which result in the accumulation of oil.

c. Voluntary pit fencing, screening, and netting or sealing vessels is encouraged, thus avoiding potential instances that may result in the death of a migratory bird.

d. With BLM approval, water produced from newly completed wells may be temporarily disposed of in unlined pits for up to 90 days. During this initial period, application for the permanent disposal method must be made in accordance with Onshore Order No. 7.

8. Surface Conditions of Approval:

a. Access road maintenance will need prior BLM approval.

b. The operator will be responsible for weed control on the access road, well location, and pipeline for the life of the well plus three (3) years. The operator will be responsible for control of noxious weeds occurring as a result of operations.

c. The operator will clean the undercarriage of all rigs prior to entering onto the leasehold to reduce the chances for noxious weed infestations.

d. The operator will identify soil type(s) and depth of topsoil/surface layer (usually 4-6 inches) for removal and clearly separate and stockpile topsoil from excess spoil material. Topsoil will be stored and protected from erosion for use in reclamation on all areas of surface disturbance. Topsoil that is not respread within 30 days will be covered with a tackifier, mulch, or other approved cover.

e. If safety, disrepair, erosion and/or excessive rutting problems are discovered along the access roads, the holder will be responsible to repair, improve and/or maintain the roads to assure safety and stability, and to limit soil erosion/rutting.

f. Construction, drilling, completion, interim or final reclamation activities will not be performed during periods when the soil is too wet to adequately support equipment/vehicles. If equipment/vehicles create ruts in excess of 3 inches deep, operations must cease as the soil will be deemed too wet to adequately support equipment/vehicles.

g. Site reclamation will initiate with the ripping of any compacted areas and grading to blend with the adjacent site characteristics and topography. In no instances will grading material and/or subsoil be placed over topsoil. The order of soil replacement will be the reverse of removal (e.g., first off, last on).

h. To prevent improper settling of soil material, interim or final reclamation activities will not be conducted using frozen or saturated soil material.

i. The holder will prepare a seedbed by: (a) scarifying the disturbed area; and (b) disking the topsoil as directed by the authorized officer.

j. Rehabilitation of upland sites following disturbance would use the plant species listed below for seeding. The species used for rehabilitation would vary depending on the adjacent habitat conditions, site potential, soils and precipitation. Species not in the following list could be added if site conditions warrant, species availability changes, or if large acreages are involved.

k. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of the first growing season following seeding. Broadcast seeding will no longer be allowed. All seed must be drill seeded for optimum success in minimal time.

l. The holder will mulch disturbed areas designated by the authorized officer. The type of mulch will meet one of the following requirements:

   i. Straw used for mulching will be from oats, wheat, rye, or other approved grain crops, and free from noxious weeds or other objectionable material as determined by the authorized officer. Straw mulch will be suitable for placing with mulch blower equipment.

   ii. Hay will be of approved herbaceous mowings, free from noxious weeds or objectionable material as determined by the Authorized Office. Hay will be suitable for placing with mulch blower equipment.

   iii. Wood cellulose fiber will be natural or cooked wood cellulose fiber, will disperse readily in water, and will be nontoxic. The homogeneous slurry or moisture will be capable of application with power spray equipment. A colored dye that is noninjurious to plant growth may be used when specified. Wood cellulose fiber will be packaged in new, labeled containers.

m. All permanent structures will be painted the neutral color of Desert Brown as displayed in the Supplemental Environmental Color chart (available at the BLM office) except where another color is required for safety.

9. Paleontological/Cultural Stipulations:

Paleontological and archaeological field checks by BLM personnel or other authorized personnel will occur prior to disturbance as deemed appropriate by the BLM. A BLM-approved archaeologist or paleontologist will conduct

monitoring during surface-disturbing activities. Paleontological or cultural resource sites will be avoided or mitigated as necessary prior to disturbance. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values.

Surface Disturbance Associated With Exploratory Drilling

After the APD is approved, the operator moves construction equipment, usually dozers (track-mounted and rubber-tired), scrapers, and motor graders, over existing roads to the point where the access road will begin. Moving equipment to the construction site requires several loads (some overweight and over width) on public and private roads. Existing roads and vehicle routes are improved in places and, occasionally, culverts and cattle guards are installed as specified in the approved APD.

The length of the access road varies. The shortest feasible route is usually selected to reduce the haul distance and construction costs. Environmental factors or the landowner's wishes may dictate a longer route. Because of the gentle topography and shallow depth of wells (1,500 to 3,000 feet) that are prevalent across the majority of the planning area, the wells can all typically be drilled using a truck-mounted rig, which often means that very little or no access road work is needed. In rough terrain, the type of construction is sidecasting (using the material taken from the cut portion of the road to construct the fill portion); slightly less than one-half of the roadbed is on a cut area and the rest is on a fill area. Roads are usually constructed with a l4-foot (single lane) or 24-foot (double lane) running surface (in relatively level terrain). Soil texture, steepness of the topography, and moisture conditions may dictate surfacing the access road. The total acreage disturbed for each mile of access road constructed varies significantly with the steepness of the slope.

Well locations are constructed by one of three different general types of construction but, in every case, all soil material suitable for plant growth is first removed and stockpiled in a designated area. Sites on flat terrain usually require little more than removing the topsoil material and vegetation. Drilling sites on ridge tops and hillsides are constructed by cutting and filling portions of the location. The majority of the excess cut material is stockpiled in an area that will allow it to be easily recovered for rehabilitation. It is important to confine extra cut material in a stockpile rather than cast it down hillsides and drainages where it cannot be recovered for rehabilitation.

The amount of level surface required for safely assembling and operating a drilling rig varies with the type of rig, and the depth and type of the well. The amount of level surface required averages 200 by 250 feet and should be constructed so that the drill rig can be placed on the cut surface instead of fill material to prevent the derrick from leaning or toppling as a result of the settling of uncompacted soil.

In addition to the drilling rig footprint, a reserve pit is constructed, usually square or oblong, but sometimes in another shape to accommodate topography. Generally, the reserve pit is 6 to 12 feet deep by 15 to 20 feet wide by 40 to 50 feet in length, but may be deeper to compensate for smaller length and width or deeper drilling depths. For air drilling, smaller reserve pits are used, usually less than 10 feet by 10 feet and approximately 6 to 10 feet in depth. Depending upon the soil permeability, pits can be lined with an impermeable material to contain the drilling fluids. If water is encountered while digging the reserve pit, a closed mud system consisting of steel tanks may be required. For oil-base mud, closed systems are mandatory, and the mud and cuttings must be recycled or disposed of in an approved manner.

Depending on how the drill site is located relative to a natural drainage, it may be necessary to construct water bars or diversions to control surface runoff and erosion. The area disturbed for construction and the potential for successful revegetation depends largely on topography, soil type, climate and the degree of disturbance.

Typical equipment used for drilling wells in the planning area includes the following:

<u>Drill Pad Construction</u>

- Cat-type dozer and backhoe. Two semi-loaded trailers used to transport these pieces of equipment.
- Two 3/4-ton pickup trucks can also be used as support vehicles.

Drilling Operations

- Drill rig (including a 55-86 foot freestanding mast) either truck-mounted or trailer-mounted and elevated anywhere from 5 to 9 feet above ground level, powered by a diesel engine with a power rating from 280 to 420 horsepower.
- Mud pump, powered by a diesel engine with a power rating from 350 to 600 horsepower.
- Diesel electric generator for lights and other electrical equipment with a power rating from 150 to 400 horsepower.
- Other support equipment such as a mud and chemical trailer, dog house, drill pipe racks, water tanks, mud tanks, fuel tanks, two to three camp trailers, and a portable latrine.

Drilling activities usually begin within a week or two after the location and access road have been constructed. The conventional drilling rig and associated equipment are moved to the location and erected. Moving a drill rig may require transporting 8 to 15 truckloads of equipment over public highways and private roads. The derrick, when erected, is approximately 100 feet high. Water for drilling is hauled to rig storage tanks or transported by surface pipeline. Water sources are usually wells or commercial water sources. Occasionally, water supply wells are drilled on or close to the site. The operator must obtain a permit from the Montana State Engineer for the use of surface or subsurface water for drilling and any applicable BLM surface use permits. When drilling commences, and as long as it progresses, water is continually transported to the rig location. Approximately 300 barrels or 12,600 gallons of water are required to drill an oil or gas well to the depth of 2,500 feet. More water is required if circulation is lost or permeable zones are encountered that cannot withstand the pressure of the drilling fluid.

During casing and cementing operations, a semi-type cement bulk truck, cement pump truck and a 3/4-ton truck could potentially come on to location twice during the operation: once for running and cementing the surface casing, and again for running and cementing the production casing if a successful well is drilled.

Some drilling operations may require that the well safety equipment (blowout prevention equipment, or BOPE) be tested by a third party rather than utilize the equipment of the drill rig. This would require the need for a 1-ton type truck at the location for a minimum of four hours.

A 4-ton truck is required to perform a petrophysical survey (formation logging) of the wellbore. This is normally conducted after the well is drilled to total depth.

Once the well is cased with pipe and cemented back to the surface, the drill rig and support equipment rig down and move out to the next location, usually within a half day after the decision to move. If the well is determined to be a dry hole, it will typically be plugged while the drill rig is still on location.

Drilling Operations

Rotary Drilling

The actual commencement of the drilling is referred to as spudding in. Initially, drilling proceeds rapidly because of the unconsolidated nature of shallow formations. Drilling is accomplished by rotating the drill string and putting variable weights on the bit located at the bottom of the string. The weight on the bits is controlled to maintain as vertical a hole as possible or deviate from vertical when desired, and to prevent premature wearing of the bit. While drilling, the derrick and associated hoisting equipment bear a majority of the drill string's weight. The combination of rotary motion and weight on the bit causes rock to be gouged away at the bottom of the hole. The rotary motion is created by a square or hexagonal rod, called a kelly, which fits through a square or hexagonal hole in a large turntable, called a rotary table. The rotary table sits on the drilling rig floor and, as the bit advances, the kelly slides down through it. When the kelly has gone as deep as it can, it is raised and a new piece of drill pipe about 30 feet in length is attached in its place. The

drill pipe is then lowered, the kelly is reattached, and drilling recommences. When the bit becomes dull, it is necessary to "trip" the drill string and replace the bit. This is a time-consuming process of withdrawing 90-foot sections of the drill pipe until the bit is out of the hole. Once the bit is replaced the drill string is reassembled, lowered into the hole, and drilling recommences. This process requires a large part of the total drilling time and may cause other hole problems. New bits constructed with modern metals and manufactured polycrystalline diamonds, along with down hole mud motors, have revolutionized drilling operations so that thousands of feet of hole can be drilled with one bit run.

Drilling mud is circulated through the drill pipe to the bottom of the hole, through the bit, up the annulus of the well, across a screen that separates the rock chips, and into holding tanks from which finer sediments settle from the mud before it is pumped back into the well. The mud is maintained at a required weight and viscosity to cool the bit, reduce the drag of the drill pipe on the sides of the hole, seal off any porous zones, contain formation fluids to prevent a blowout, and bring the rock chips to the surface for disposal. Various additives are used in maintaining the mud at the appropriate viscosity and weight. Most of the mud consists of bentonite, a naturally occurring mineral that is mined in Montana. Drilling muds are not allowed to contain any hazardous or toxic substances.

High pressure air is sometimes used in place of mud. The use of mud or air is largely dependent upon the target formation, drilling depth and type of completion desired. When drilling with air, the cuttings are blown into another pit called the blooie pit, where compressed air and cuttings leave the drill system. By regulation, the blooie pit must be located no closer than 100 feet from the well bore.

Drilling operations are continuous, 24 hours a day, 7 days a week. The crews usually work three 8-hour shifts or two 12-hour shifts a day. Pickup trucks or cars are used for workers' transportation to and from the site. A typical well drilled in the planning area take three to four days to reach total depth. BLM personnel, usually petroleum engineering technicians, will conduct inspections of the drilling rig and operations to ensure compliance with the approved plans in the APD and regulations.

Completion Operations

Upon completion of the drilling, a determination is made regarding the productive potential of the well. If oil or gas is not discovered in commercial quantities, the well is considered dry. The operator is then required to follow BLM procedures to properly plug the dry hole. The drill site and access road are then rehabilitated in accordance with the stipulations attached to the APD and the plugging approval. If the well is a producer, drilling rig operations continue until the production casing is cemented into the well prior to removing the drilling equipment from the location.

Completion operations can begin as early as one week after the drill rig moves off location, but they normally occur within two to three weeks.

The typical equipment used for completing a well in the planning area includes the following:

- Wire line truck and mast trailer (~30 tons combined) used to determine the depth of the zone of interest and perforate the well (to expose the formation with natural gas in it to the well bore)
- 3/4-ton support truck
- Workover unit (semi-mounted mast) used to hoist tubing in and out of the well
- Stand-alone air compressor unit
- Supply trailer
- Tubing trailer
- Two 3/4-ton trucks

Or, in place of the workover unit, a semi-mounted coiled tubing unit which includes the following:

- Air compressor
- Coil tubing
- Reel and injector head
- Catch tank trailer to catch any formation water or make up water that is blown off the well
- Two 3/4-ton support trucks

Logging

Geophysical logs are obtained by running various instruments into the hole on a wire cable. Logs are usually run at a depth point where casing will be installed. A log is not usually run before surface casing is set but, in most instances, a log recording natural gamma radiation is run through the surface casing to determine the geology of that section. The logs can determine water resistivity, hydrocarbon saturations, natural gamma radiations, porosity of the rock by density, nuclear receptivity and sonic measurements, permeability, pressure, temperature, hole geometry, and subsurface track. Logs are used to evaluate whether the well is dry or has the potential for a satisfactory completion. Logs also delineate the various geologic horizons; hydrocarbon zones; fresh, usable, and unusable water; and sands, shales, limestones, coals, and other minerals. The hydrocarbon intervals are usually randomly situated in each well, and logs are required to specify these intervals so that they can be perforated and stimulated during the completion program. Normally in the planning area, logs recording resistivity and a combined porosity log of density and nuclear receptivity are run in the well. The dual porosity logs are a direct indicator of gas because the measured values can be compared to provide contrasting porosities.

Casing

Various types of casing are placed in the drilled hole to enhance completion operations and safety. Casing is a string of steel pipe composed of approximately 40-foot lengths of pipe that are threaded together. Casing is cemented into the well to protect against migration of fluids within the hole and to isolate the productive zones so they can be completed and produced without interference from other zones containing hydrocarbons or water. Hole deviation, depth, bore hole environment, placement of centralizers (if any), and a myriad of other factors affect the integrity of the casing and cement job and must be considered in the original design.

Surface casing that is properly set and cemented also protects surface aquifers from contamination by drilling and production operations. Surface casing should be set to a depth greater than the deepest fresh water aquifer that could be reasonably developed. Usable water may exist at greater depths but these aquifers are not normally considered to be important water sources. Surface casing is designed to be large enough to allow subsequent strings of smaller casing to be set as the well is drilled deeper. Cement is placed in the annulus of the surface casing from casing shoe to ground level. The surface casing is the first string on which blowout prevention (BOP) equipment is installed. The BOP allows the well to be shut in at any time that conditions warrant, protecting against unanticipated formation pressures and allowing safe control of the well. Blowout prevention equipment is tested and inspected regularly by both the rig personnel and the inspection and enforcement branch of BLM. Minimum standards and enforcement provisions are part of Onshore Order No. 2. Well-trained rig personnel are a necessity for proper blowout prevention.

Generally, the production casing in the planning area is required to be cemented from the production casing shoe all the way to the surface. This requirement ensures adequate protection from interzonal migration of unsuitable water and hydrocarbons. The production casing is designed to provide isolation of oil and gas formations and also to provide a high-pressure conduit to the hydrocarbon zones that allows stimulation of these intervals to improve the productivity.

During completion operations, the production casing is perforated into zones containing the oil or gas. In much of the planning area, the low permeability character of the productive formations requires these zones to be “fracked,” or stimulated by treated fresh water and large quantities of sand, which improves the productivity to an economic rate. In those instances in which the wells would require a frack, the following pieces of equipment would be required:

- Blender truck (a semi-type truck)
- Chemical van (lab and chemicals, semi-type truck)
- Data van (computer monitoring equipment, similar sized truck to a wire line truck)
- Liquid pump truck
- One to two nitrogen pump trucks (semi-type trucks)
- Iron truck (semi-type truck carrying surface pipe supplies)
- Sand storage unit (semi-type truck)
- One 400 barrel water holding tank on location (transported via semi-type truck)
- One 250 barrel flowback tank (semi-type truck)
- Up to four 3/4-ton trucks for support

In the planning area, the frack operation usually takes less than half a day and on average the frack operation/post operation (flowback and well cleanup) lasts up to four days.

After completion, operations are finished and wellhead equipment consisting of various valves and pressure regulators is installed to control the oil or gas flow to the production facilities and allow safely shutting in the well under any conditions.

Production Operations

Gas, oil, and water are currently being produced in the planning area by means of natural flow (velocity strings) and artificial lift (gas and electric pumping units and submersible pumps).

Gas Production

The installation of gas production facilities generally requires little additional surface disturbance beyond that necessary for drilling and completion; however, additional disturbance could result from pipeline and gathering line installations if they are installed across undisturbed areas. If pipelines follow existing access roads, no appreciable additional surface disturbance is necessary to hook the well up to production. The typical equipment used for installing production equipment to a well includes the following:

- Pipe trailer transported via semi-type truck or poly pipe that is spooled off a coiled tubing reel trailer pulled by a 3/4-ton truck
- Excavator or a trenching piece of equipment brought into the site via a semi-type tractor trailer or a large goose neck trailer pulled by a 3/4-ton truck

Equipment that would stay with the well during its life includes the following:

- Well head and a gas meter house – usually a 10 feet by 10 feet by 8 feet skid-mounted steel shed that houses the well head and gas flow meter
- Pumpjack – used when water is produced with the gas, and the gas reservoir pressure declines to a point that is not adequate to overcome the hydrostatic pressure created by a column of water in the well. Pumpjacks are usually 8 to 10 feet in height, require a slightly larger surface area than a gas meter house, and may or may not be skid-mounted. They are powered by either electric motors or natural gas/propane internal combustion engines.

If the gas well is producing some oil or condensate, oil tanks are used to store the oil or condensate until it is sold via truck or pipeline. Pipeline quality gas at the wellhead requires a minimum of processing equipment. As the quality of gas decreases with the increased presence of water, solids, or liquid hydrocarbons, the amount of processing equipment increases. Water or liquid hydrocarbons in the gas are removed before the gas is sold, usually in the separation equipment near the wellhead. If liquid hydrocarbons are present, storage facilities (tank batteries) are required to store the liquids until they accumulate in sufficient quantities to be hauled out by large trucks. Gas wells which produce water require a disposal pit for evaporation or to catch the water to be hauled away later by truck. Each water pit is sized to fit the operation but can be expected to range from 30 feet by 20 feet by 8 feet, to 40 feet by 40 feet by 10 feet. Operators in the planning area have constructed larger pits that handle water from multiple wells, with the biggest pits located in the Battle Creek field area in north Blaine County. Gas dehydration equipment may also be present to remove water entrained in the gas to a water content defined by pipeline specifications.

Typical wells in the planning area are identified as “sweet gas” wells, that is, they contain no hydrogen sulfide gas (H2S); therefore, H2S facilities are generally not required to be used in order to produce the gas. As the wells produce in an area, pressures eventually become depleted to the point that they require an artificial lift method to lower the pressure of the gathering system to allow for production to continue. Once this occurs, the operator will design and install a compressor station that further enables the production of natural gas from the wells.

Gas that occurs with oil is separated by venting it at the tank battery; it may also be collected into feeder lines leading to compressors that boost the pressure to the transportation system. If enough casinghead gas is separated to make it economical for marketing, a plant can be constructed to process the gas, or a pipeline can be constructed to carry the product to an existing plant. If the volume of casinghead gas is insufficient to warrant treatment in a gas plant, it is usually used as fuel for pump engines in the field or as heating fuel for the heater-treaters. Gas is flared or vented into the atmosphere if it exceeds the fuel requirements on the lease but is not in commercial quantities. Montana law prohibits the flaring or venting of natural gas. Exceptions allowed by the MBOG are (1) during testing of a new well, or (2) when the amount of gas produced with the oil is so small that pipeline construction is not practical. Otherwise, if a well produces both oil and gas, provisions for conserving the gas must be made before oil production can continue. BLM Notice to Lessee 4A (NTL4A) requires that all gas not used on the lease, vented, or flared without prior authorization either by the BLM or the MBOG/BLM, or avoidably lost, is subject to royalty obligations. The small amount of casinghead gas that is produced in the planning area occurs in the mature oil fields located in the western portion of the planning area.

In 2006, the planning area produced 56.3 billion cubic feet of natural gas. Natural gas production was 61% of Montana's total natural gas production. The planning area is clearly an important natural gas production area for Montana. Production for 2006 was about 41% greater than the production recorded for 1990. For the 17-year time period, 2001 recorded the highest production at almost 56.8 million cubic feet of natural gas.

Oil Production

In the planning area, oil is generally produced using artificial lift methods (pump units). The oil production equipment (heater-treater, tank battery, and holding facility for production water) is either placed on a portion of the location (on cut rather than fill) and located a safe distance from the wellhead, or placed as a centralized facility that services a number of wells with a pipeline connection. The heater-treater and tanks are surrounded by earthen dikes to contain accidental spills. Either all of the facilities or only the produced water pit (if present) will be fenced. Production facility colors are required to be from the standard color chart and are specified in the APD COAs.

Production from several wells on one lease can be carried by pipeline to a central tank battery. Use of a central tank battery can depend on whether the oil is from the same formation, the same lease ownership, or multiple lease ownerships and formations if a commingling agreement is approved. Generally, because of the nature of the oil, adequate separation of oil and water is only obtained through applications of heat. The fluid stream arrives at a separator point where the flash gas is taken off and, in most cases; this flash gas is used for lease operations. The remainder of the flash gas is either compressed and sold or flared. Flash gas is defined as solution gas liberated from the oil through a reduction in pressure. Water and oil are also separated at this point by gravity segregation. The oil is sent to storage tanks, and the water is sent to a disposal or injection facility. Once the oil is in the storage tanks, it can then be measured and sold. The primary method of oil measurement in the planning area is tank gauging. Measurement is required by 43 CFR 3162.7-2 and Onshore Order No. 4 to ensure proper and full payment of federal royalty.

Oil wells can be completed as flowing (those wells with sufficient underground pressure to raise the oil to the surface) or, if the pressure is inadequate, they are completed with the installation of subsurface pumps. The subsurface pumps are usually mechanically powered by a pumping unit. Pumping units come in a variety of sizes; however, most pumping units in the planning area are 15 feet or less in height. The units are powered by internal combustion engines or electric motors. Fuel for the engines may be casinghead gas or propane. In cases where large volumes of water are produced with the oil, electric submersible pumps may be installed. These pumps may produce up to 6,000 barrels of fluid per day at an oil cut of 1/2 of 1% oil.

Oil producing fields in the planning area presently make a smaller contribution to the state's oil production. In 2006, oil production in the planning area was only about 4% of Montana's total oil production (Montana Oil and Gas Conservation Commission, 2006a and 2007). In 2005, the planning area produced 1.225 million barrels of oil (Montana Oil and Gas Conservation Division, 2006a). That year's production was about 50% less than the production recorded for 1991. The reported 1991 production was the highest of the 16-year time period and production has declined each year since then. It is unlikely that oil production in the planning area will increase in the future, and will most likely continue to decline.

Coalbed Natural Gas Production

Coalbed natural gas (CBNG) exploration has been negligible within the planning area. With that said, the planning area lies within the Northern Great Plains Coal Province. The Blackfeet-Valier, North Central, and Fort Union coal regions lie within this province. The two westernmost coal regions contain Cretaceous aged bituminous and sub bituminous coals and the easternmost region contains Tertiary aged lignite coals. Wood and Bour (1988) reported some information about these coal regions. They found:

- The Blackfeet-Valier Coal Region contains five known coal beds greater than 30 inches thick and at depths less than 2,000 feet in most of the area and less than 3,000 in some small areas;
- The North Central Coal Region contains three known coal beds greater than 30 inches thick and at depths less than 2,000 feet; and
- The Fort Union Coal Region contains up to 20 coal beds greater than 30 inches thick and at depths less than 2,000 feet. The planning area probably contains far fewer than 20 coal beds.

The Potential Gas Committee (2003) estimated 1.2 trillion cubic feet of potential recoverable coalbed gas resources in North Central Montana, which includes the Blackfeet-Valier and North Central coal regions and large areas to the south of the planning area. The Reasonable Foreseeable Development Scenario is projecting that 150 total CBNG wells will be drilled in the time period of 1997-2026.

Typical CBNG production combines high water production rates of some oil fields with low-pressure operations of some gas fields. Because of the reservoir characteristics of coal, high water production rates are initially required to dewater the reservoir and allow gas to be liberated from cleat surfaces within the coal. In a coal reservoir, gas is primarily trapped on the face of the coal within the cleat system via molecular attraction. Pressure must be reduced to liberate the gas molecules from the coal face. The production history of typical CBNG wells shows that water production rates begin high, with little or no gas. The water rate then drops at a constant rate, with increasing gas rates until a maximum gas rate is achieved relative to the original gas saturation and reservoir pressures. The gas rate then declines to the economic limit. This process is the exact opposite of that associated with most oil and gas production, which starts at high hydrocarbon rates and low water rates and advances to low hydrocarbon rates and high water rates. The depth limit of a CBNG well is dictated by the coal permeability, which is highly sensitive to overburden weight. A CBNG operation usually consists of a high-capacity submersible or progressive cavity pump, with water produced out of the tubing and low-pressure gas produced out of the casing. Centralized facilities collect the gas for compression to pipeline pressures and the water for disposal. Electric power is usually used to power the well pumps and is connected to the well via a subsurface cable (or overhead power) laid with the water and gas lines. The producing well pad is very small, with only the well head and an insulating house to cover the well head. The centralized production facilities typically contain well header buildings where the individual well gas is measured and that house collection tanks, injection wells, pumps for disposal of the water, and multistage compressors to bring the very low pressure gas to sales line pressure.

Water Production

Associated water produced with the oil, gas, or CBNG is disposed of by trucking the water to an authorized disposal pit, placing the water in lined or unlined pits, discharging the water into surface drainages, or through subsurface injection. The disposal of produced water in an injection or disposal well requires permit(s) from the primacy state or Environmental Protection Agency (EPA). Primacy means that a state or agency has the ultimate responsibility for permitting and monitoring the Underground Injection Control (UIC) program for Class 2 wells (saltwater disposal and secondary recovery wells). Montana is currently a primacy state candidate; operators in Montana must seek EPA approval until primacy is granted. In some instances, an additional surface management agency authorization may be necessary. The quality of the water often dictates the appropriate disposal method, and the Montana Department of Environmental Quality has primacy through the EPA to approve surface disposal of this water. An environmental assessment is prepared for all requests concerning disposal of produced water from federal wells.

In the planning area, approximately 193.6 million barrels of associated water were produced in the ten-year period from 2003-2012 (PI/Dwights Production Data, December 2012). This water production occurred as a byproduct of natural gas

production. Of the total 193.6 million barrels of produced water, 156.4 million barrels, or roughly 81%, were produced in Glacier (61.2 million barrels) and Toole (95.2 million barrels) Counties, primarily from mature oil fields that employ water flooding operations. The remaining 37.2 million barrels of water were produced from the remaining counties (1997-2006) as follows:

Blaine	18,316,470 barrels	Liberty	7,618,436 barrels
Chouteau	79,828 barrels	Phillips	7,999,896 barrels
Hill	2,955,812 barrels	Valley	165,875 barrels

During the production phase the BLM monitors and approves field activities needed for well and field operations. Many operations, such as plugging completion in a different zone, deepening, etc., require prior approval. Other actions, such as acidizing and fracturing, do not require prior approval but a subsequent report of operations describing the operation in detail must be filed.

Secondary and Enhanced Oil Recovery

Gas reservoirs typically have no secondary recovery associated with the recovery of gas. This is because natural gas is produced by expansion resulting from the reduction of reservoir pressure. Typically a high reservoir recovery factor can be expected from this expansion process unless the reservoir is of such low permeability that economics becomes a factor in the recovery efficiency. Economics is a determining factor because of the expense of operating compression facilities to reduce the reservoir pressure to the minimum. In the planning area, most of the reservoirs are overpressured but have very low permeability. The overpressure allows more gas to be stored but the low permeability limits the recovery to a smaller portion of the area around each well.

In rare cases where the gas is very rich and contains a large quantity of entrained liquids, secondary recovery uses inert gases like nitrogen or dry natural gas to keep the reservoir pressure above the condensation point in order to produce the maximum amount of liquids. This secondary recovery process requires sweeping the reservoir with undersaturated gas to entrain and sweep out the rich gas. After this secondary process is accomplished, especially in dry natural gas secondary recovery operations, the reservoir is depressurized to recover the maximum amount of the remaining gas reserves.

Secondary recovery in coal reservoirs has been tested in the San Juan Basin and found to be technically feasible. It involves the molecular replacement of natural gas by carbon dioxide or nitrogen. This process has also been touted as a method of sequestering CO2 to remove the greenhouse gas from the atmosphere.

An oil reservoir typically contains oil, gas, and water trapped within the rock matrix under pressure. Because of the pressure, much or all of the gas is dissolved in the oil. “Primary drive” is accomplished by the expansion of gas in solution, which forces oil out of the reservoir into the well and up to the surface. Oil flowing out of the reservoir drains energy from the formation and the primary drive diminishes. To keep oil flowing in the reservoir, pressure drawdown is required, and subsurface pumps may be used to lift oil to the surface. As reservoir pressures continue to drop, solution gas in the oil escapes, forming bubbles in the pore space. These bubbles further retard the flow of oil and increase the gas saturation and the flow of solution gas. This process accelerates as the pressure declines and, at some point, production rates become uneconomical, with as much as 80% of the original oil remaining in the reservoir. In the United States, primary oil recovery accounts for less than half of the current oil production. The remaining oil is produced via secondary and enhanced recovery techniques.

Two basic secondary recovery methods are in use: (1) water flooding, and (2) displacement by gas. The preferred secondary recovery method is water flooding. This process involves injecting water into oil reservoirs to maintain or increase pressure. The process is usually most efficient when the pressure has not fallen to the point where the reservoir is highly saturated with gas. Reservoir heterogeneity in the form of fractures, directional permeability, and thin zones may limit the success of this process.

The process of injecting gas is a less popular secondary recovery technique. Historically, produced gas was considered a waste product and was flared (burned) at the point of production. Later, it was recognized that the energy could be conserved and the recovery of oil increased if the produced gas was reinjected into the reservoir. Increased production

was achieved by (1) maintaining reservoir pressure by injecting the gas into the existing gas cap; and (2) injecting the gas directly into the oil-saturated zone, creating an immiscible gas drive that displaced the oil. To achieve miscibility, the reservoir must have reasonably high pressures and temperatures and contain high-gravity oil. Many gas injection projects use the water and gas (WAG) process (i.e., inject water and gas alternately to achieve better contact with the oil within the reservoir). Currently, the high price and demand for natural gas has precluded this type of secondary recovery.

The term "enhanced recovery" is used to describe recovery processes other than the more traditional secondary recovery procedures. These enhanced recovery methods include thermal, chemical, and miscible (mixable) drives. No enhanced recovery techniques are currently being implemented within the planning area, but it is unknown whether these techniques could be applicable in the future based on economics and new discoveries.

Some reservoirs contain large quantities of heavy oil that cannot be produced using normal or secondary methods. These may be stimulated by thermal drive processes in which heat is introduced from the surface or developed in place in the subsurface reservoir. In the surface introduction process, hot water or steam is injected. Raising the temperature of heavy oil reduces the viscosity and makes the oil more mobile. Thermal recovery techniques are not likely to be tried in the planning area because the oils present are not heavy oils. In the in-situ process, both heavy and light oils can be processed. Spontaneous or induced ignition within the reservoir is induced by injected air to develop a fire front that burns the hydrocarbons. Evaporation of the lighter ends immediately ahead of the fire front and later condensation is the primary recovery mechanism. The remaining hydrocarbons are consumed by the fire and are generally not considered of any value. These techniques are very expensive and must have large reserves and thick pay zones to be economical. It is unlikely they will be used within the planning area in the immediate future unless new discoveries are made.

Several chemical drive techniques are currently in use, including (1) polymer flooding, (2) caustic flooding, and (3) surfactant-polymer injection. These methods attempt to change reservoir conditions to allow recovery of additional oil. Caustic and surfactant-polymer flooding have not been economical in the past, and unless a breakthrough in technology is achieved, they will probably not be considered during the planning period. Polymer flooding is an economically viable process but is used mainly in viscous reservoirs with high permeability. No such reservoirs currently exist in the planning area, but future discoveries could be made.

Carbon dioxide appears to have the best potential for enhanced and tertiary recovery methods. CO2 is miscible with oil at relatively low pressures and temperatures, and can be used with oil with a wide range of characteristics. CO2 miscibility reduces the oil viscosity and allows much more efficient displacement by water. Usually CO2 is injected via the WAG process in alternating slugs of CO2 and water. Not only does CO2 create miscible flow but it also can displace oil by gravity segregation between the CO2, gas, and oil. This process may allow sequestration of large volumes of the CO2 greenhouse gas in the many applicable reservoirs in the western portion of the planning area and recover the last possible oil reserves. Sequestration of CO2 is advocated as a method to remove the gas from the earth's atmosphere by storing the gas for geologic time.

Gas Storage

Pipeline-quality gas can be stored in good quality reservoirs with excellent sealing parameters. This gas is pumped into the reservoir during nonpeak, usually lower priced time periods, and then pumped out into the transmission lines at times of peak demand and good prices. The differential in price pays the governmental storage fees for the use of the reservoir and the injection/compression costs required to store and retrieve the gas. It also serves as a buffer for cold periods when demand is high and levels out the summer slack period of production. Currently, 63 active gas storage wells are located in three different gas storage fields within the planning area.

Plugging and Abandonment Operations

The purpose of plugging and abandoning a well is to prevent fluid migration between zones, protect minerals from damage, and restore the surface area. Each well must be handled individually due to a combination of factors, including geology, subsurface well design, and specific rehabilitation concerns. Therefore, only minimum requirements can be established, and these must be modified for individual wells.

The first step in the plugging process is the filing of the Notice of Intent to Abandon. This notice will be reviewed by both the surface management agency and the BLM petroleum engineer. The notice must be filed and approved prior to plugging a past producing well. Verbal plugging instructions can be given for plugging current drilling operations, but a notice must be filed after the work is completed. If usable fresh water was encountered while the well was being drilled, the surface management agency may be allowed, if interested, to assume future responsibility for the well, and the operator will be reimbursed for the attendant costs. This assumption of responsibility becomes effective after the deeper zones are plugged back to the usable water zone. Usually the operator is more than satisfied to remove the surface reclamation liability and will not charge for the remaining well equipment.

The operator's plan for securing the well bore is reviewed. The minimum requirements as stated in Onshore Order No. 2, are as follows: In open hole situations, cement plugs must extend at least 50 feet above and below zones that have fluid with the potential to migrate, zones of lost circulation (this type of zone may require an alternate method to isolate it), and zones of potentially valuable minerals. Thick zones may be isolated using cement plugs across the top and bottom of the zone. In the absence of productive zones and minerals, long sections of open hole may be plugged with cement plugs placed every 3,000 feet. In cased holes, cement plugs must be placed opposite perforations and extend 50 feet above and below, except where limited by plug back depth. The length of the plug is 100 feet plus 10% per 1,000 feet (e.g., at 10,000 feet, the plug will be 200 feet long).

Cement plugs could be replaced with a cement retainer, if the retainer is set 50 feet above the open perforations and the perforations are squeezed with cement. A bridge plug may also be used to isolate a producing zone and must be capped, if placed through tubing, with a minimum of 50 feet of cement. If the cap is placed using a dump bailer, a minimum of 35 feet of cement is required. A dump bailer is an apparatus run on wire line to convey the cement to the bottom of the hole. In the event that the casing has been cut and recovered, a plug is placed 50 feet within the casing stub, and the 100 feet plus 10% per 1,000 feet rule is used for the space above the cutoff point. In all cases, a plug is set at the bottom of the surface casing that has a volume of cement using the 100 feet plus 10% per 1,000 feet rule. This may require perforating the casing and circulating or squeezing cement behind the production casing if that casing is not removed. Annular space at the surface will be plugged with 50 feet of cement using small-diameter tubing or by perforating and circulating cement.

If the integrity of a plug is questionable or the position is extremely vital, it can be tested with pressure or by tagging the plug with the tubing or drill string. Tagging the plug involves running pipe into the hole until the plug is encountered and placing a specified amount of weight on the plug to verify its placement and competency. The surface plug within the casing must be a minimum of 50 feet. The interval between plugs must be filled with mud that will balance the subsurface pressures, and if this balance point is unknown, a minimum of 9 pounds per gallon is specified. After the casing has been cut off below the ground level, any void at the top of the casing must be filled with cement. A metal plate is welded over the top of the casing with a weep hole in the plate and the well identity and location permanently inscribed.

Typical equipment associated with plugging operations includes:

- Well workover/pulling unit
- Cement bulk truck, cement pump truck, and water hauling truck (all semi-type trucks)
- Two to three, 1/2 to 3/4-ton pickup trucks

Depending on the depth of the well, the plugging operation can last from one to three days.

Disturbance from plugging operations is usually contained within the existing disturbed area used to drill or produce the well, whichever the case may be. If the well to be plugged is a depleted producer, it is customary that the operator will dig a small catch pit (10 feet long by 10 feet wide by 8 feet deep) to contain any fluids pumped in and out of the well. Typical fluids that may come out of the well and travel into the catch pit are formation water, drilling mud and cement. These fluid materials are removed from the pit within 48 hours of the well being plugged. Within a week of plugging the well, initial reclamation (dirt work) begins depending on the time of the year that the well is plugged.

The surface management agency is responsible for establishing and approving methods for surface rehabilitation and determining when this rehabilitation has been satisfactorily accomplished. With satisfactory rehabilitation, a Subsequent Report of Abandonment is approved, and the well bond released.

Regulations, Laws, and Special Procedures

Units and Communitization Agreements

Units and Communitization Agreements can be formed in the interest of conservation and to allow for the orderly development of oil and gas reserves.

In areas of federal and mixed mineral ownership, an exploratory unit can be formed before a wildcat exploratory well is drilled. The boundary of the unit is based on geologic data and attempts to consolidate the interests in an entire structure or geologic play. The developers of the unit enter into an agreement to develop and operate as a single entity, without regard to separate lease ownerships. Costs and benefits are allocated according to agreed-upon terms. Development in a unitized field can proceed more efficiently than in a field composed of individual leases because competition between lease operators and drainage considerations is not a primary concern. Unitization also can reduce surface use requirements because all wells are operated as though under a single lease, and operations can be planned for more efficiency. Duplication of field processing facilities is eliminated, and consolidation of facilities into more efficient systems is probable. Unitization can also involve wider spacing than usual or spacing based on a reservoir factor rather than a set rule. This could result in fewer wells and higher recovery efficiency. Through planning, access roads are usually shorter and better organized, facilities are usually consolidated, and well efficiency is maximized to a degree not seen in individual lease operations.

A secondary unit is formed after the field has been defined and enhanced recovery techniques are being utilized. The different types of secondary recovery have already been described previously in this document in the section titled *Secondary and Enhanced Oil Recovery*. Injection is utilized to maintain the reservoir pressure which, in turn, maintains steady oil production. The secondary unit agreement provides for the allocation of production among all interest owners.

A communitization agreement combines two or more leases (federal, state, or fee) that otherwise could not be independently developed in conformity with established well spacing patterns. The leases within the spacing unit share in the costs and benefits of the well drilled in the spacing unit. Therefore, unit and communitization agreements can lessen the amount of damage to the environment by eliminating unnecessary wells, roads, pipelines, and other lease equipment.

Drainage Provisions

All federal oil and gas leases include a clause that the lessee must protect the leased area from drainage by off-lease wells. The regulations at 43 CFR 3162-2-9(b) state that the lessee/operating rights owner has an obligation to notify the BLM if drainage is occurring. If the lessee/operating rights owner has an interest in draining the well, he must notify the BLM within 60 days after completion of a drill stems, production, pressure analysis, or flow tests of the well. However, if the lessee/operating rights owner has no interest in the well, he must notify the BLM within 60 days after well completion or first production reports for the draining well are filed with either the BLM, State Oil and Gas Commissions, or regulatory agencies and are publicly available. The lessee/operating rights owner must inform the BLM of his plan to either protect the lease from drainage, or demonstrate that a protective well would not be economic. The lessee has the option of drilling a protective well on lease or paying compensatory royalty for the lost oil or gas. The lessee also has the options of submitting data showing that drainage is not occurring or relinquish the portion of the lease subject to drainage after payment of compensatory royalty for drainage that did occur. The objective of the drainage program is to prevent the loss of federal oil and gas due to drainage by requiring the drilling of protective wells and, where appropriate, to assess a compensatory royalty for such losses.

Drilling Access with No Surface Occupancy Stipulations on Oil and Gas Leases

No surface occupancy stipulations can restrict the development potential of a federal oil and gas lease by limiting the amount of surface acreage available for occupancy. No surface occupancy restrictions often do not affect access to oil and gas resources unless blocks of contiguous land have a no surface occupancy stipulation or the drilling depth is presumed to be shallow. The drilling access area is that area under a no surface occupancy lease or lease parcel that can be accessed by the well bore from a surface location outside of the area.

Lands near the outer boundary of a lease affected by a no surface occupancy stipulation can theoretically be developed by directional drilling. The BLM cannot assume that a prudent operator would use new technology such as horizontal drilling to access an entire lease area. Although the technology might allow exploration, the expense might make the venture uneconomical. However, the BLM can assume that an operator might be willing to directionally drill wells using equipment and drilling techniques that make the venture economical. For a directionally drilled well, a maximum deviation of approximately five degrees is a commonly used rule of thumb for how much a vertical hole can be economically deviated using a standard drilling rig.

A "directional drilling accessibility" concept has been developed for leases affected by no surface occupancy stipulations. Shallow wells in Montana, less than 6,000 feet deep, can be deviated up to 1/8 mile and have the angle of deviation remain reasonably close to five degrees. This will place the bottom hole location in the center of a 40-acre tract.

Because these wells are commonly spaced on a 40-acre basis, all spacing units within 1/4 mile of the outer boundary of the lease can be tested. Wells between 6,000 and 11,000 feet deep can also be deviated up to 1/4 mile. This will place the bottom hole location of the well the maximum allowable distance from the lease line for a well of this depth. Because these wells are spaced on a 160-acre basis, all spacing units within 1/2 mile of the exterior boundary of the lease can be tested.

Wells in Montana with a total depth greater than 11,000 feet are normally spaced on a 320-acre basis. These wells can be deviated up to 1/4 mile using the above criteria. Using this distance, all spacing units within 1/2 mile of the outer boundaries of an affected lease can be tested.

Split Estate

Part of the planning area contains lands known as split estate lands. These are lands where the surface ownership is different from the mineral ownership. Management of federal oil and gas resources on these lands is somewhat different from management on lands where both surface and mineral ownership is federal. On split estate lands where the surface ownership is private, the BLM places necessary restrictions and requirements on its leases and permit approvals and works in cooperation with the surface owner. The BLM has established policies for the management of federal oil and gas resources in accordance with federal laws and regulations.

The BLM does not have the legal authority to regulate how private surface is managed, but does have the statutory authority to require measures by lessees to avoid or minimize adverse impacts that may result from federally authorized mineral lease activities. These measures, in the form of lease stipulations or permit conditions of approval, are intended to protect or preserve the privately owned resources and prevent adverse impacts to adjoining lands, not to dictate management to the surface owner.

The term split estate can also refer to lands where the surface ownership is federal and the mineral ownership is private. In this situation, the BLM is the surface owner and works in cooperation with the proponent and the state regulatory agency that approves private mineral applications. The BLM has responsibilities under the previously mentioned statutes; however, it does not have the authority to approve or disapprove the mineral owner's actions. The mineral estate owner usually has the right to enter the land and use the surface that is necessary and reasonable for mineral development through either a reserved or an outstanding right contained in the deed.

Field Development

New field development is analyzed in an environmental assessment or environmental impact statement after the sufficient confirmation wells are drilled. The operator generally can estimate the extent of drilling and disturbance required to extract and produce the oil and gas at that time. Many fields go through several development stages. A field can be considered fully developed and produce for many years when it is determined that a well can be drilled to a deeper pay zone or a new interval is discovered to be economically attractive. In this situation, there is generally little new disturbance because the old well bores or the old well pads are used for the new completions. A new stage of field development, such as infill drilling, can lead to increases in roads and facilities. All new construction, reconstruction, or alterations of existing facilities, including roads, flow lines, pipelines, tank batteries, or other production facilities, must

be approved by the BLM and may require a new environmental analysis. Throughout field development, partial restoration and rehabilitation is required to reduce the surface impacts to the minimum required to produce the resource.

Well Spacing Requirements

The most important factor in further development of an oil or gas field is the economics of production. When an oil or gas discovery is made, a well spacing pattern must be established before development drilling begins. This is dependent upon the current statewide or areawide spacing. Well spacing is regulated by MBOG, and factors considered in the establishment of a spacing pattern include data from the discovery well that translate into recovery efficiency. These data include porosity, permeability, pressure, composition of reservoir and fluids, depth of formations, well production rates, and the economic effect of the proposed spacing on recovery. These data are relatively sparse in the initial phase of development, and extended production permits refinement of these values. The State of Montana establishes well spacing requirements for both exploratory and development wells which the BLM generally adopts. The state specifies the minimum distance from lease lines or government survey lines for bottom hole location of the well bore depending upon the depth of the well. The spacing regulations determine the acres assigned to each well. Spacing unit size is established to provide for the most efficient and economic recovery of oil or gas from a reservoir. Well spacing ranges from 40 acres to 640 acres. Wells deeper than 11,000 feet can be no closer than 1,650 feet to other producing wells below 11,000 feet. Only one producing well per formation is allowed in each 40, 80, 160, 320, and 640-acre unit. Spacing requirements can pose problems in selecting an environmentally sound location or in the cumulative overall impacts. Reservoir characteristics determine the most efficient spacing to achieve maximum recovery. If an operator determines that a different spacing is necessary to achieve maximum recovery, the state (with input from the BLM) may grant exceptions to the spacing requirements.

Reasonably Foreseeable Development Scenarios for Resource Management Plan Alternatives

The Final Environmental Impact Statement for the HiLine Resource Management Plan contains five management alternatives. Each alternative contains management imposed restrictions that may negatively affect oil and gas development. These restrictions can effectively decrease the baseline estimated number of well locations in areas of federal oil and gas ownership. For each alternative, we have analyzed the restrictions and estimated the number of resulting well locations that could be reduced from the baseline total.

Procedures Used to Determine Well Location Reductions

Well location reductions from the baseline reasonable foreseeable development scenario for each alternative, are due to proposed management restrictions. Restrictions applied to each alternative can affect oil and gas development activities by not allowing leasing, not allowing surface occupancy, controlling surface use, or placing restrictive stipulations on conditions of approval of federal applications to drill. Reduced oil and gas activities result in increased exploration and development costs, fewer drilled wells, and reduced production. For reasonable foreseeable development scenario analysis purposes, the restrictions for the five alternatives analyzed were separated into four categories designated A, B, C, and D. Restrictions on drilling are progressively more limiting from restriction category A to restriction category D and are:

- ***Restriction Category A*** - areas open to leasing. Restrictions are relatively minor and result in standard lease terms and conditions that are applied to every federal oil and gas lease sold in the planning area. These restrictions are considered to have little to no effect on the number of future well locations or production for any alternative.

- ***Restriction Category B*** – areas open to leasing subject to relatively minor constraints. These restrictions can have a moderate effect such as multiple, consecutive timing restrictions for protection of wildlife values (e.g., crucial winter range, raptor nesting habitat, or sage-grouse strutting grounds). We also considered restrictions such as avoidance of areas within wetlands, riparian areas, or perennial waters could have a moderate effect on the potential locations of future wells and cumulative production.

- ***Restriction Category C*** – areas open to leasing subject to major constraints. These restrictions can have a moderate to severe effect on the location of wells; such as no surface occupancy stipulations on an area more than 40 acres in size or requirements that viewsheds be protected, thus requiring that well locations and production facilities not be visible from areas such as historic trails. Overlapping minor constraints may also severely limit the future development of oil and gas resources.

- ***Restriction Category D*** – areas closed to leasing. These are areas where a determination is made that other land uses or resource values cannot be adequately protected with even the most restrictive lease stipulations. Because areas are closed to leasing, this category has the most severe restrictions on future oil and gas activity and production.

Estimates of future reductions in well locations from the baseline reasonable foreseeable development projection were determined as described below:

- An estimate of the number of well locations/township (average well density) that could be drilled in each development potential category over the 20-year life of the Resource Management Plan was made for conventional oil and gas development activity (within the Bowdoin Natural Gas Project Area (BNGPA) and within the rest of the planning area) and for CBNG development activity. The average well density per township was projected to be 110 wells for high development potential; 60 wells for moderate development potential; 10 wells for low development potential; and 0.5 wells for very low development potential.

- The acres of federal oil and gas ownership for each area of non-CBNG development potential were determined using GIS software. Acres of non-federal oil and gas minerals were not included because proposed Resource Management Plan decisions will only apply to federal oil and gas minerals. It was assumed that development on non-federal minerals will occur as estimated in the baseline foreseeable development projection.

- The acres of federal oil and gas ownership for each area of CBNG development potential were determined using GIS software. Acres of non-federal oil and gas minerals were not included because proposed Resource Management Plan decisions will only apply to federal oil and gas minerals. It was assumed that development on non-federal minerals will occur as estimated in the baseline foreseeable development projection.

- Next, the areas covered by each restriction category (B, C, or D) within the high, moderate, low, or very low development potential areas for non-CBNG (within the BNGPA area and within the rest of the planning area) and CBNG potential were calculated using GIS software. The area within category A was not calculated, because it was previously determined that this type of restriction would have no significant effect on the number of well locations for any alternative. As an example, the Alternative B acreage calculations for each potential area are presented in Table E.1.3.

Table E.1.3
Development Potential in the HiLine Planning Area by Restriction Category Under Alternative B

Development Potential	*Restriction Category B (Federal Acres)*	*Restriction Category C (Federal Acres)*	*Restriction Category D (Federal Acres)*
Non-CBNG Oil and Gas – Excluding BNGPA			
High	0	6,889	138,489
Moderate	0	14,119	50,383
Low	0	65,915	258,858
Very Low	0	133,968	2,427,013
Non-CBNG Oil and Gas – BNGPA			
High	0	0	0
Moderate	0	31,128	232,964
Low	0	6,497	65,870
Very Low	0	0	0
CBNG			
Very Low	8,245	103,740	548,175

- After the acres of federal oil and gas were calculated for each alternative in each restriction category, the percent reduction in well locations for each alternative in each category of restriction was estimated. This estimate is a percent of the well locations that would not be drilled in each area due to the specific category of restriction. As an example, the results of calculations for Alternative B, Category C restrictions are shown in Table E.1.4 below. Category C restrictions for Alternative B indicate there would be a reduction of about 40 non-CBNG well locations in the area excluding the BNGPA area, about 34 non-CBNG well locations in the BNGPA, and about 1.4 CBNG well locations on federal lands. The number of townships was calculated by dividing the federal acres by 23,040 acres per township.

Table E.1.4
Analysis Results Showing the Calculated Reduction in Federal Wells of Each Type for Alternative B Due to Category C Restrictions

Development Potential	*Well Locations per Township*	*Federal Oil and Gas Mineral Acres*	*Federal Oil and Gas Mineral Townships*	*Percent Reduction in Federal Well Locations*	*Reduction in Federal Well Locations*
Non-Coalbed Oil and Gas – Excluding BNGPA					
High	110	6,889	0.299	30%	9.866
Moderate	60	14,119	0.613	40%	14.707
Low	10	65,915	2.861	50%	14.305
Very Low	0.5	133,968	5.815	55%	1.599
Non-Coalbed Oil and Gas – BNGPA					
High	110	0	0.000	30%	0.000
Moderate	60	31,128	1.351	40%	32.425
Low	10	6,497	0.282	50%	1.410
Very Low	0	0	0.000	0	0.000
CBNG					
Very Low	0.5	103,740	4.50	60%	1.35

- The percent reduction in well location for each alternative, each category of restriction, and each development potential combination was determined. The estimates of reduction in well locations were then summed for non-CBNG wells in all areas excluding BNGPA, the BNGPA, and for CBNG wells for each alternative. The results of these calculations are shown in Table E.1.5.

- Because reductions in well locations were calculated only for federal wells, the percent of federal wells projected to be drilled for each alternative is different. The percentage of federal wells projected to be drilled for each alternative is modified from the baseline analysis and is presented in Table E.1.5.

Table E.1.5
Total Wells Projected to be Drilled within the Planning Area for the Baseline and Each Alternative for the Period 2011-2030

	CBNG Wells (% Federal Wells)	*Non-CBNG Wells Excluding BNGPA (% Federal Wells)*	*Non-CBNG Well BNGPA (% Federal Wells)*	*Total Wells*
Baseline	150 (16.00%)	4,861 (26.97%)	1,091 (57.47%)	6,102
Alternative A	149 (15.44%)	4,802 (26.01%)	1,066 (56.47%)	6,017
Alternative B	137 (8.03%)	4,102 (13.58%)	546 (14.47%)	4,785
Alternative C	146 (13.70%)	4,686 (24.07%)	933 (50.27%)	5,765
Alternative D	149 (15.44%)	4,817 (26.30%)	1,068 (56.55%)	6,034
Alternative E	144 (12.50%)	4,740 (25.11%)	11,024 (54.69%)	5,908

Estimated Future Oil and Gas Production

Table E.1.6 (Tables E.1.6 through E.1.17 are located at the end of Appendix E.1) presents yearly baseline estimates of future numbers of newly completed producing oil and gas wells within the planning area. These well counts were derived from the projection of total new gas and oil wells (Table E.1.5). The average number of producing gas wells completed from 2001 through 2006 was 219 while the average number of producing oil wells completed was 8. We estimated that in 2011, producing gas well completions would decrease to 208 and producing oil well completions would increase to 13. The yearly numbers of producing gas well completions varied from a low of 113 to a high of 334 through 2030. Yearly producing oil well completions were held constant for the entire 20-year period at 13 each year.

Table E.1.6 well counts and analysis of their likely production rates, along with production data from existing wells, was used to project yearly oil and gas production for the 20-year period from 2011 to 2030, which is also presented in Table E.1.6. The actual yearly gas production from 2001 through 2006 averaged 55.886 million cubic feet with little fluctuation from year to year. Yearly gas production was assumed to fluctuate for the 20-year period from 2011 to 2030 between 36,759 and 92,783 million cubic feet. The number of gas well completions described above corresponds to this rate.

The actual yearly oil production from 2001 through 2006 averaged 1.275 million barrels with some fluctuation from year to year. Some increase in oil production occurred in 2006. Most of this increase occurred in Toole County, which appears to have been due to the large number of workovers of existing wells. These wells appear to have been worked over due to the incentive of higher oil prices received in 2006 as compared to previous years. We estimated that yearly oil production for the 20-year period would fluctuate yearly, with estimated production of 220,783 barrels in 2011, a high of 1,210,240 barrels in 2020, and the lowest production of 38,143 barrels occurring in 2030. This annual fluctuation is due to the large number of existing oil wells in the planning area that are approaching the end of their productive life and the small number of new wells that would be completed. Drilling only 13 new oil wells per year would not add significantly to yearly oil production; consequently, future workovers of existing wells are assumed to be the main reason for the relatively low decline rate that is being predicted in the estimated yearly oil production.

Table E.1.6 also presents our estimates of the number of new oil and gas wells on federal lands, oil and gas production rates on federal lands, and abandonments of producing federal wells. The projections of numbers of new federal wells were derived from the projected total numbers of new wells by using calculated percentages of federal versus other types of producing wells, such as wells producing on private and state lands.

Since there is no history of CBNG production near the planning area, no attempt was made to try to project rates of gas production for this type of development. CBNG wells produce relatively low volumes of gas at other productive locations in the Rocky Mountains, so we do not project that there would be a significant increase in gas production from any CBNG wells found to be productive.

The above types of projections were also made for each alternative (Alternative A – Table E.1.7; Alternative B – Table E.1.8; Alternative C – Table E.1.9; Alternative D – Table E.1.10; and Alternative E – Table E.1.11) and reflect the adjusted well count projections presented for each alternative from Table E.1.5.

Potential Surface Disturbance

Table E.1.12 presents our estimates of short-term and long-term disturbance associated with the baseline projection of wells that could be drilled for the period of 2011 through 2030 that is presented in Table E.1.6. The upper portion of Table E.1.12 shows our projection of 6,102 new exploratory and development wells ((150+1,091+4,861) with 1,962 (24+627+1,311) of those wells managed by the Bureau) that could be drilled. An additional 9,214 existing unplugged wells (1,594 unplugged wells on Bureau-managed lands) lie within the planning area. This portion of Table E.1.12 also calculates associated acres of total surface disturbance (short-term disturbance) directly associated with those wells. Approximately 28,814 acres (428+3,109+25,277) of new short-term surface disturbance (8,674 acres (68+1,786+6,820) of Bureau-managed surface disturbance) could occur if all projected wells are drilled. Including existing wells, short-term surface disturbance is projected to be about 36,970 acres (9,960 acres of Bureau-managed surface disturbance).

In addition, the lower portion of Table E.1.12 calculates the estimated numbers of wells remaining after dry holes are abandoned and reclaimed and producing wells cease to be productive and are also abandoned and reclaimed (4,924 wells (135+1,058+3,731) with 1,637 of those wells (22+608+1,007) managed by the Bureau). An additional 7,858 (1,579+6,279) existing unplugged and unreclaimed wells (1,345 (887+458) unplugged and unreclaimed wells on Bureau-managed lands) are projected to remain within the planning area in the long-term. This portion of Table E.1.12 also calculates unreclaimed associated acres of total surface disturbance (long-term disturbance) directly associated with those wells. Approximately 4,327 acres (101+794+3,432) of new unreclaimed surface disturbance (1,398 acres (16+456+926) of Bureau-managed unreclaimed surface disturbance) could remain in the long-term. Including existing wells, long-term unreclaimed surface disturbance is projected to be about 11,288 acres (2,484 acres of Bureau-managed unreclaimed surface disturbance).

In the BNGPA, approximately 55% of all wells drilled are expected to be wells managed by the Bureau. In the rest of the planning area approximately 27% of all new wells are expected to be wells managed by the Bureau. We assumed that since Bureau-managed minerals occupy about 16% of the planning area, any future drilling on Bureau-managed minerals would likely mirror that percentage.

As additional wells are being drilled, some existing wells are being plugged and abandoned. The great majority of these are wells which are either unproductive (dry holes), or have become depleted and are not economic to produce. We have projected that total abandonments will be at a rate of:

- 10% for CBNG wells
- 3% for new exploratory and development wells in the BNGPA
- 23.25% for new exploratory and development wells in the rest of the planning area
- 7.8% for existing wells in the BNGPA
- 22.9% for existing wells in the rest of the planning area

Assumptions used in Table E.1.12 to calculate short-term and long-term surface disturbance from access roads/flow lines and well pads associated with oil/gas exploration and development drilling activities are based on existing and planned oil and gas development across the planning area.

For each alternative, the same above-described methods of calculating surface disturbance (short-term and long-term) were used. Projections of future wells for each alternative were brought forward from Table E.1.5 and used in these calculations. The resulting short-term and long-term surface disturbance figures for each alternative are presented in Tables E.1.12 through E.1.17.

Summary

For our baseline projection we analyzed the oil and gas resource within the planning area, discussed types of future development that may occur, estimated the development potential for each type of resource, and projected baseline activity levels for the period 2011 through 2030. For our analysis of the baseline projection, we assumed that the only land use restrictions on future oil and gas resource development would be those that have been legislatively imposed. Projections of future well numbers, oil and gas production, and surface disturbance were prepared (Tables E.1.6 and E.1.12). Projections of future well numbers (Table E.1.5), oil and gas production (Tables E.1.7 through E.1.11), and surface disturbance (Tables E.1.13 through E.1.17) were also prepared for each alternative.

Table E.1.6
Projected New Producing Well Numbers, and
Oil and Gas Production for All Producing Wells and All Federal Producing Wells
Baseline – 2011-2030

Year	*Gas Produced (MMcf[1])*	*Oil Produced (barrels)*	*New Oil Wells*	*New Gas Wells*	*Total New Producing Wells*	*New Federal Oil Wells*	*New Federal Gas Wells*	*Total New Producing Federal Wells*	*Federal Oil Produced (barrels)*	*Federal Gas Produced (MMcf[1])*	*Federal Wells Abandoned*
2011	57,867	220,783	13	208	221	1.54	73.07	74.61	105,453	19,513	12.45
2012	40,174	184,796	13	161	175	1.54	57.34	58.87	101,225	13,547	12.45
2013	55,514	277,350	13	199	212	1.54	69.82	71.35	112,100	18,719	12.45
2014	47,587	128,719	13	158	171	1.54	56.25	57.79	94,635	16,046	12.45
2015	65,035	235,060	13	230	243	1.54	80.40	81.94	107,131	21,930	12.45
2016	71,481	705,834	13	293	307	1.54	101.83	103.37	162,446	24,103	12.45
2017	85,803	888,018	13	262	275	1.54	91.25	92.79	183,853	28,933	12.45
2018	52,815	750,251	13	212	225	1.54	74.43	75.97	167,665	17,809	12.45
2019	74,181	1,051,983	13	261	274	1.54	90.98	92.52	203,119	25,014	12.45
2020	90,401	1,210,240	13	334	348	1.54	115.67	117.21	221,714	30,483	12.45
2021	74,950	807,801	13	212	225	1.54	74.43	75.97	174,428	25,273	12.45
2022	58,561	704,847	13	208	221	1.54	73.07	74.61	162,331	19,747	12.45
2023	72,033	670,475	13	275	288	1.54	95.59	97.13	158,292	24,289	12.45
2024	79,680	652,209	13	240	253	1.54	83.92	85.46	156,146	26,868	12.45
2025	92,783	729,452	13	297	310	1.54	102.92	104.45	165,222	31,286	12.45
2026	51,637	369,962	13	182	196	1.54	64.39	65.93	122,982	17,412	12.45
2027	84,153	246,420	13	235	248	1.54	82.02	83.56	108,465	28,377	12.45
2028	71,814	499,269	13	227	240	1.54	79.31	80.85	138,175	24,216	12.45
2029	36,759	87,134	13	113	126	1.54	41.06	42.60	89,749	12,395	12.45
2030	65,199	38,143	13	218	231	1.54	76.33	77.87	83,993	21,985	12.45
Totals	**1,328,427**	**10,458,746**	**262**	**4,527**	**4,789**	**31**	**1,584**	**1,615**	**2,819,123**	**447,946**	**249**

[1] MMcf = million cubic feet

Table E.1.7
Projected New Producing Well Numbers, and
Oil and Gas Production for All Producing Wells and All Federal Producing Wells
Alternative A (Current Management) – 2011-2030

Year	*Gas Produced (MMcf[1])*	*Oil Produced (barrels)*	*New Oil Wells*	*New Gas Wells*	*Total New Producing Wells*	*New Federal Oil Wells*	*New Federal Gas Wells*	*Total New Producing Federal Wells*	*Federal Oil Produced (barrels)*	*Federal Gas Produced (MMcf[1])*	*Federal Wells Abandoned*
2011	57,021	217,556	13	205	218	1.52	69.78	71.30	105,074	18,652	12.45
2012	39,587	182,095	13	159	172	1.52	54.78	56.30	100,907	12,949	12.45
2013	54,703	273,296	13	196	209	1.52	66.89	68.40	111,623	17,893	12.45
2014	46,891	126,837	13	156	169	1.52	53.73	55.25	94,414	15,338	12.45
2015	64,084	231,625	13	227	240	1.52	76.88	78.40	106,727	20,962	12.45
2016	70,436	695,517	13	290	302	1.52	97.40	98.92	161,234	23,040	12.45
2017	84,549	875,038	13	258	271	1.52	87.14	88.66	182,328	27,656	12.45
2018	52,043	739,285	13	209	222	1.52	71.10	72.61	166,377	17,023	12.45
2019	73,097	1,036,606	13	257	270	1.52	86.88	88.40	201,312	23,910	12.45
2020	89,080	1,192,550	13	327	340	1.52	109.77	111.29	219,636	29,138	12.45
2021	73,854	795,994	13	209	222	1.52	71.10	72.61	173,040	24,158	12.45
2022	57,705	694,545	13	205	218	1.52	69.78	71.30	161,120	18,875	12.45
2023	70,980	660,674	13	271	284	1.52	91.35	92.87	157,140	23,218	12.45
2024	78,515	642,676	13	236	249	1.52	80.04	81.56	155,025	25,682	12.45
2025	91,427	718,789	13	292	305	1.52	98.19	99.71	163,969	29,906	12.45
2026	50,882	364,555	13	180	193	1.52	61.62	63.14	122,346	16,643	12.45
2027	82,923	242,818	13	231	244	1.52	78.20	79.72	108,042	27,124	12.45
2028	70,764	491,971	13	224	236	1.52	75.83	77.35	137,318	23,147	12.45
2029	36,222	85,861	13	112	125	1.52	39.26	40.78	89,600	11,848	12.45
2030	64,246	37,585	13	215	228	1.52	72.94	74.45	83,927	21,015	12.45
Totals	**1,309,010**	**10,305,873**	**258**	**4,459**	**4,717**	**30**	**1,513**	**1,543**	**2,801,160**	**428,177**	**249**

[1] MMcf = million cubic feet

Table E.1.8
Projected New Producing Well Numbers, and
Oil and Gas Production for All Producing Wells and All Federal Producing Wells
Alternative B – 2011-2030

Year	*Gas Produced (MMcf[1])*	*Oil Produced (barrels)*	*New Oil Wells*	*New Gas Wells*	*Total New Producing Wells*	*New Federal Oil Wells*	*New Federal Gas Wells*	*Total New Producing Federal Wells*	*Federal Oil Produced (barrels)*	*Federal Gas Produced (MMcf[1])*	*Federal Wells Abandoned*
2011	45,209	172,487	10	160	170	1.20	22.09	23.29	99,778	6,189	12.45
2012	31,386	144,372	10	124	135	1.20	17.22	18.42	96,475	4,297	12.45
2013	43,371	216,680	10	153	163	1.20	21.12	22.32	104,971	5,937	12.45
2014	37,177	100,561	10	121	131	1.20	16.78	17.98	91,327	5,090	12.45
2015	50,808	183,641	10	177	187	1.20	24.37	25.57	101,089	6,956	12.45
2016	55,844	551,433	10	226	236	1.20	31.08	32.29	144,304	7,645	12.45
2017	67,034	693,764	10	202	212	1.20	27.83	29.04	161,028	9,177	12.45
2018	41,262	586,134	10	163	173	1.20	22.52	23.73	148,382	5,649	12.45
2019	57,954	821,862	10	200	211	1.20	27.62	28.82	176,080	7,934	12.45
2020	70,626	945,500	10	255	265	1.20	35.09	36.29	190,607	9,669	12.45
2021	58,555	631,095	10	163	173	1.20	22.52	23.73	153,665	8,016	12.45
2022	45,751	550,662	10	160	170	1.20	22.09	23.29	144,214	6,263	12.45
2023	56,276	523,808	10	211	222	1.20	29.13	30.34	141,058	7,704	12.45
2024	62,250	509,538	10	184	195	1.20	25.45	26.65	139,382	8,522	12.45
2025	72,487	569,884	10	228	238	1.20	31.41	32.61	146,472	9,923	12.45
2026	40,341	289,033	10	140	150	1.20	19.38	20.59	113,472	5,523	12.45
2027	65,745	192,516	10	180	190	1.20	24.80	26.00	102,132	9,000	12.45
2028	56,105	390,054	10	174	184	1.20	24.04	25.24	125,342	7,681	12.45
2029	28,718	68,074	10	87	97	1.20	12.12	13.33	87,510	3,932	12.45
2030	50,937	29,799	10	167	177	1.20	23.07	24.27	83,012	6,973	12.45
Totals	**1,037,834**	**8,170,897**	**205**	**3,475**	**3,680**	**24**	**480**	**504**	**2,550,300**	**142,079**	**249**

[1] MMcf = million cubic feet

Table E.1.9
Projected New Producing Well Numbers, and
Oil and Gas Production for All Producing Wells and All Federal Producing Wells
Alternative C – 2011-2030

Year	*Gas Produced (MMcf[1])*	*Oil Produced (barrels)*	*New Oil Wells*	*New Gas Wells*	*Total New Producing Wells*	*New Federal Oil Wells*	*New Federal Gas Wells*	*Total New Producing Federal Wells*	*Federal Oil Produced (barrels)*	*Federal Gas Produced (MMcf[1])*	*Federal Wells Abandoned*
2011	54,182	206,725	12	195	207	1.45	59.53	60.98	103,801	15,924	12.45
2012	37,616	173,029	12	153	166	1.45	47.29	48.74	99,842	11,055	12.45
2013	51,979	259,689	12	187	199	1.45	57.17	58.63	110,024	15,277	12.45
2014	44,556	120,522	12	150	163	1.45	46.34	47.79	93,672	13,095	12.45
2015	60,894	220,093	12	216	228	1.45	65.65	67.10	105,372	17,897	12.45
2016	66,929	660,889	12	274	286	1.45	82.60	84.05	157,165	19,670	12.45
2017	80,340	831,472	12	246	258	1.45	74.36	75.81	177,209	23,612	12.45
2018	49,452	702,478	12	199	211	1.45	60.71	62.16	162,052	14,534	12.45
2019	69,458	984,997	12	244	256	1.45	73.89	75.34	195,248	20,414	12.45
2020	84,645	1,133,176	12	311	324	1.45	93.67	95.12	212,659	24,877	12.45
2021	70,178	756,364	12	200	212	1.45	60.94	62.39	168,384	20,625	12.45
2022	54,832	659,966	12	195	207	1.45	59.53	60.98	157,057	16,115	12.45
2023	67,446	627,781	12	256	268	1.45	77.42	78.87	153,275	19,822	12.45
2024	74,606	610,679	12	226	238	1.45	68.48	69.93	151,266	21,927	12.45
2025	86,875	683,003	12	276	288	1.45	83.31	84.76	159,764	25,533	12.45
2026	48,349	346,405	12	174	186	1.45	53.17	54.62	120,214	14,210	12.45
2027	78,795	230,729	12	220	232	1.45	66.83	68.28	106,622	23,158	12.45
2028	67,241	467,478	12	213	225	1.45	64.71	66.16	134,440	19,762	12.45
2029	34,419	81,586	12	109	121	1.45	34.10	35.55	89,097	10,116	12.45
2030	61,047	35,714	12	205	217	1.45	62.35	63.81	83,707	17,942	12.45
Totals	**1,243,838**	**9,792,775**	**247**	**4,248**	**4,495**	**29**	**1,292**	**1,321**	**2,740,871**	**365,564**	**249**

[1] MMcf = million cubic feet

Table E.1.10
Projected New Producing Well Numbers, and
Oil and Gas Production for All Producing Wells and All Federal Producing Wells
Alternative D – 2011-2030

Year	*Gas Produced (MMcf[1])*	*Oil Produced (barrels)*	*New Oil Wells*	*New Gas Wells*	*Total New Producing Wells*	*New Federal Oil Wells*	*New Federal Gas Wells*	*Total New Producing Federal Wells*	*Federal Oil Produced (barrels)*	*Federal Gas Produced (MMcf[1])*	*Federal Wells Abandoned*
2011	57,216	218,298	13	205	218	1.52	70.29	71.81	105,161	18,853	12.45
2012	39,722	182,716	13	160	173	1.52	55.45	56.97	100,980	13,088	12.45
2013	54,889	274,228	13	196	209	1.52	67.37	68.90	111,733	18,086	12.45
2014	47,051	127,270	13	156	169	1.52	54.12	55.65	94,465	15,503	12.45
2015	64,303	232,414	13	228	240	1.52	77.71	79.23	106,820	21,188	12.45
2016	70,676	697,888	13	290	303	1.52	98.38	99.90	161,513	23,288	12.45
2017	84,837	878,022	13	260	273	1.52	88.31	89.83	182,679	27,954	12.45
2018	52,220	741,806	13	210	223	1.52	71.88	73.40	166,673	17,207	12.45
2019	73,346	1,040,141	13	258	271	1.52	87.78	89.30	201,728	24,168	12.45
2020	89,387	1,196,616	13	330	343	1.52	111.63	113.15	220,113	29,452	12.45
2021	74,106	798,708	13	210	223	1.52	71.88	73.40	173,359	24,418	12.45
2022	57,902	696,913	13	206	219	1.52	70.55	72.08	161,398	19,079	12.45
2023	71,222	662,927	13	272	285	1.52	92.28	93.80	157,405	23,468	12.45
2024	78,783	644,867	13	237	250	1.52	80.89	82.41	155,283	25,959	12.45
2025	91,738	721,240	13	293	306	1.52	99.17	100.69	164,257	30,228	12.45
2026	51,055	365,798	13	180	193	1.52	62.07	63.60	122,492	16,823	12.45
2027	83,206	243,646	13	232	244	1.52	79.03	80.56	108,139	27,416	12.45
2028	71,006	493,649	13	224	237	1.52	76.65	78.17	137,515	23,396	12.45
2029	36,346	86,153	13	113	125	1.52	39.82	41.34	89,634	11,976	12.45
2030	64,465	37,713	13	215	228	1.52	73.73	75.26	83,942	21,241	12.45
Totals	**1,313,474**	**10,341,013**	**259**	**4,474**	**4,733**	**30**	**1,529**	**1,559**	**2,805,289**	**432,790**	**249**

[1] MMcf = million cubic feet

Table E.1.11
Projected New Producing Well Numbers, and
Oil and Gas Production for All Producing Wells and All Federal Producing Wells
Alternative E (Preferred Alternative) – 2011-2030

Year	*Gas Produced (MMcf[1])*	*Oil Produced (barrels)*	*New Oil Wells*	*New Gas Wells*	*Total New Producing Wells*	*New Federal Oil Wells*	*New Federal Gas Wells*	*Total New Producing Federal Wells*	*Federal Oil Produced (barrels)*	*Federal Gas Produced (MMcf[1])*	*Federal Wells Abandoned*
2011	56,044	213,365	13	200	213	1.49	65.17	66.66	104,581	17,547	12.45
2012	38,908	178,586	13	156	169	1.49	51.34	52.82	100,495	12,182	12.45
2013	53,765	268,030	13	192	205	1.49	62.66	64.14	111,005	16,834	12.45
2014	46,087	124,393	13	152	165	1.49	50.08	51.57	94,127	14,430	12.45
2015	62,985	227,162	13	222	235	1.49	71.96	73.45	106,203	19,721	12.45
2016	69,228	682,116	13	283	296	1.49	91.08	92.57	159,660	21,675	12.45
2017	83,100	858,179	13	253	266	1.49	81.77	83.26	180,347	26,018	12.45
2018	51,151	725,041	13	205	218	1.49	66.68	68.17	164,703	16,015	12.45
2019	71,844	1,016,634	13	252	265	1.49	81.52	83.01	198,965	22,494	12.45
2020	87,553	1,169,573	13	322	335	1.49	103.41	104.89	216,936	27,413	12.45
2021	72,588	780,657	13	206	219	1.49	66.99	68.48	171,238	22,727	12.45
2022	56,716	681,163	13	202	215	1.49	65.74	67.22	159,548	17,758	12.45
2023	69,763	647,945	13	266	279	1.49	85.86	87.35	155,645	21,843	12.45
2024	77,169	630,293	13	233	245	1.49	76.30	77.78	153,570	24,162	12.45
2025	89,859	704,940	13	287	300	1.49	93.40	94.89	162,341	28,135	12.45
2026	50,009	357,531	13	177	190	1.49	58.94	60.43	121,521	15,658	12.45
2027	81,502	238,140	13	227	240	1.49	74.53	76.02	107,492	25,518	12.45
2028	69,551	482,493	13	220	232	1.49	72.27	73.76	136,204	21,776	12.45
2029	35,601	84,206	13	110	123	1.49	38.06	39.55	89,405	11,147	12.45
2030	63,144	36,861	13	211	224	1.49	69.50	70.99	83,842	19,771	12.45
Totals	**1,286,567**	**10,107,308**	**253**	**4,378**	**4,631**	**30**	**1,427**	**1,457**	**2,777,829**	**402,824**	**249**

[1] MMcf = million cubic feet

Table E.1.12
Surface Disturbance
Associated with All New Drilled Wells and Existing Active Wells
Baseline Development Scenario – 2011-2030

Short-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	150	24	1.85	1	428	68
Bowdoin Dome Area	1,091	627	1.85	1	3,109	1,786
Rest of Planning Area	4,861	1,311	3.1	2.1	25,277	6,820
Existing Wells						
Bowdoin Dome Area	1,887	1,060	0.25	0.5	1,415	795
Rest of Planning Area	7,327	534	0.78	0.14	6,741	491
Total Wells/Disturbance	**15,316**	**3,556**			**36,970**	**9,960**

Long-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	135	22	0.25	0.5	101	16
Bowdoin Dome Area	1,058	608	0.25	0.5	794	456
Rest of Planning Area	3,731	1,007	0.78	0.14	3,432	926
Existing Wells						
Bowdoin Dome Area	1,579	887	0.25	0.5	1,184	665
Rest of Planning Area	6,279	458	0.78	0.14	5,777	421
Total Wells/Disturbance	**12,782**	**2,981**			**11,288**	**2,484**

Table E.1.13
Surface Disturbance
Associated with All New Drilled Wells and Existing Active Wells
Alternative A Development Scenario – 2011-2030

Short-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	149	23	1.85	1	425	66
Bowdoin Dome Area	1,066	602	1.85	1	3,038	1,715
Rest of Planning Area	4,802	1,249	3.1	2.1	24,970	6,497
Existing Wells						
Bowdoin Dome Area	1,887	1,060	0.25	0.5	1,415	795
Rest of Planning Area	7,327	534	0.78	0.14	6,741	491
Total Wells/Disturbance	**15,231**	**3,468**			**36,589**	**9,564**

Long-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	134	21	0.25	0.5	101	16
Bowdoin Dome Area	1,034	584	0.25	0.5	776	438
Rest of Planning Area	3,686	959	0.78	0.14	3,391	882
Existing Wells						
Bowdoin Dome Area	1,579	887	0.25	0.5	1,184	665
Rest of Planning Area	6,279	458	0.78	0.14	5,777	421
Total Wells/Disturbance	**12,712**	**2,908**			**11,228**	**2,422**

Table E.1.14
Surface Disturbance
Associated with All New Drilled Wells and Existing Active Wells
Alternative B Development Scenario – 2011-2030

Short-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	137	11	1.85	1	390	31
Bowdoin Dome Area	546	79	1.85	1	1,556	224
Rest of Planning Area	4,102	557	3.1	2.1	21,330	2,899
Existing Wells						
Bowdoin Dome Area	1,887	1,060	0.25	0.5	1,415	795
Rest of Planning Area	7,327	534	0.78	0.14	6,741	491
Total Wells/Disturbance	**13,999**	**2,241**			**31,433**	**4,441**

Long-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	123	10	0.25	0.5	92	7
Bowdoin Dome Area	530	76	0.25	0.5	397	57
Rest of Planning Area	3,148	428	0.78	0.14	2,896	394
Existing Wells						
Bowdoin Dome Area	1,579	887	0.25	0.5	1,184	665
Rest of Planning Area	6,279	458	0.78	0.14	5,777	421
Total Wells/Disturbance	**11,659**	**1,859**			**10,347**	**1,545**

Table E.1.15
Surface Disturbance
Associated with All New Drilled Wells and Existing Active Wells
Alternative C Development Scenario – 2011-2030

Short-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	146	20	1.85	1	416	57
Bowdoin Dome Area	933	469	1.85	1	2,659	1,336
Rest of Planning Area	4,686	1,128	3.1	2.1	24,367	5,868
Existing Wells						
Bowdoin Dome Area	1,887	1,060	0.25	0.5	1,415	795
Rest of Planning Area	7,327	534	0.78	0.14	6,741	491
Total Wells/Disturbance	**14,979**	**3,211**			**35,598**	**8,547**

Long-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	131	18	0.25	0.5	99	14
Bowdoin Dome Area	905	455	0.25	0.5	679	341
Rest of Planning Area	3,597	866	0.78	0.14	3,309	797
Existing Wells						
Bowdoin Dome Area	1,579	887	0.25	0.5	1,184	665
Rest of Planning Area	6,279	458	0.78	0.14	5,777	421
Total Wells/Disturbance	**12,491**	**2,683**			**11,047**	**2,238**

Table E.1.16
Surface Disturbance
Associated with All New Drilled Wells and Existing Active Wells
Alternative D Development Scenario – 2011-2030

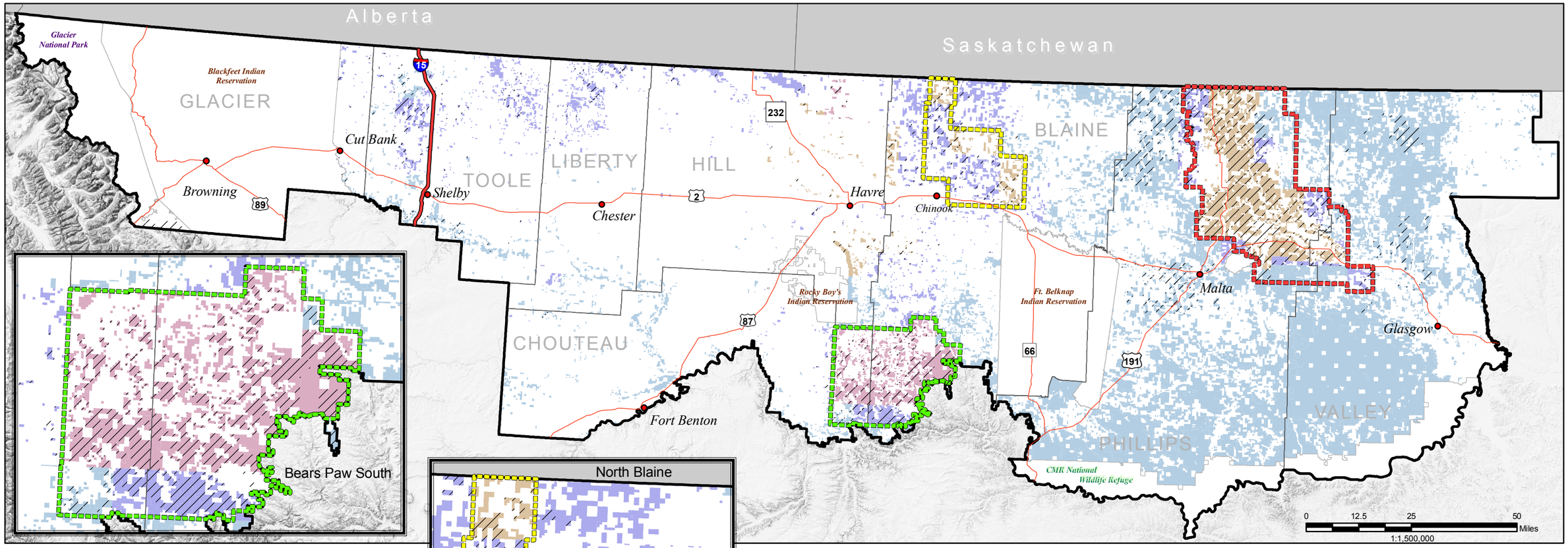
Short-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	149	23	1.85	1	425	66
Bowdoin Dome Area	1,068	604	1.85	1	3,044	1,720
Rest of Planning Area	4,817	1,267	3.1	2.1	25,059	6,591
Existing Wells						
Bowdoin Dome Area	1,887	1,060	0.25	0.5	1,415	795
Rest of Planning Area	7,327	534	0.78	0.14	6,741	491
Total Wells/Disturbance	**15,250**	**3,488**			**36,683**	**9,663**

Long-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	134	21	0.25	0.5	101	16
Bowdoin Dome Area	1,036	586	0.25	0.5	777	439
Rest of Planning Area	3,699	973	0.78	0.14	3,403	895
Existing Wells						
Bowdoin Dome Area	1,579	887	0.25	0.5	1,184	665
Rest of Planning Area	6,279	458	0.78	0.14	5,777	421
Total Wells/Disturbance	**12,727**	**2,924**			**11,241**	**2,436**

Table E.1.17
Surface Disturbance
Associated with All New Drilled Wells and Existing Active Wells
Alternative E Development Scenario – 2011-2030

Short-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	144	18	1.85	1	410	51
Bowdoin Dome Area	1,024	560	1.85	1	2,918	1,597
Rest of Planning Area	4,740	1,190	3.1	2.1	24,648	6,188
Existing Wells						
Bowdoin Dome Area	1,887	1,060	0.25	0.5	1,415	795
Rest of Planning Area	7,327	534	0.78	0.14	6,741	491
Total Wells/Disturbance	**15,122**	**3,362**			**36,133**	**9,123**

Long-Term Surface Disturbance						
Wells			***Acres of Surface Disturbance***			
Type	***Total***	***BLM-Managed***	***Access Roads/ Flow Lines***	***Well Pads***	***Total***	***BLM-Managed***
New Exploratory and Development Wells						
Coalbed Gas	130	16	0.25	0.5	97	12
Bowdoin Dome Area	993	544	0.25	0.5	745	408
Rest of Planning Area	3,638	913	0.78	0.14	3,347	840
Existing Wells						
Bowdoin Dome Area	1,579	887	0.25	0.5	1,184	665
Rest of Planning Area	6,279	458	0.78	0.14	5,777	421
Total Wells/Disturbance	**12,619**	**2,818**			**11,150**	**2,346**



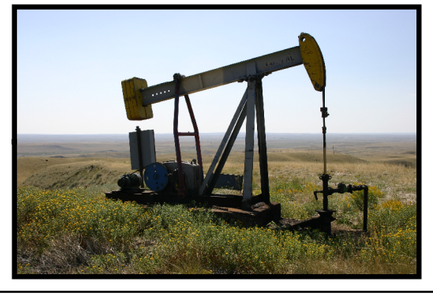
Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012

U.S. DEPARTMENT OF THE INTERIOR

Bureau of Land Management
HiLine District Office

Map E.1

Fluid Mineral Leasing Potential



Map shows the Development Potential and Existing Leases for Oil and Gas on BLM administered subsurface.

This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.

Development Potential

- High
- Moderate
- Low
- Very Low
- Authorized Leases
- High Interest Areas
- RMP boundary
- County Line
- Interstate
- Highway or State Route
- Towns

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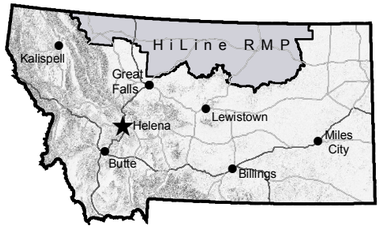

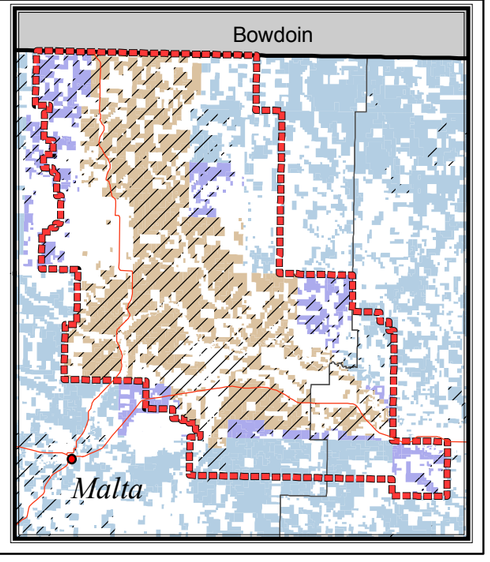

Appendix E
Fluid Minerals

E.2 Oil and Gas Best Management Practices (General Conditions of Approval)

General or typical conditions of approval (COAs) are mitigation measures that may be considered when processing Applications for Permits to Drill (APDs), Sundry Notice Drilling Plans, and Surface Use Plans when they are: 1) not specifically addressed in those plans or existing lease stipulations; and 2) needed to mitigate impacts to resource values identified at the onsite inspection or during review of the plans.

The COAs also allow the BLM to prescribe resource protection measures for lands that were previously leased with varying sets of lease stipulations. However, for lands that are already leased BLM restrictions on development, not required to comply with existing laws, must be reasonable and consistent with existing lease rights. The COAs must not constrain or restrict development beyond the measures anticipated or authorized by the lease terms or regulations and/or interfere with the lessee's opportunity to economically recover the oil and gas resources, considering the lease as a whole.

The following list is not all-inclusive, but presents some general or typical conditions of approval that may be considered in the planning area to address potential impacts at the time of site-specific lease operations. The wording of the conditions of approval may be modified or additional conditions of approval may be developed to address site-specific conditions. An exception, waiver, and modification may be added to a COA during the permitting process, if the permit condition serves a purpose similar to a traditional lease stipulation, such as a timing limitation or a permit condition that restricts development in a particular area. It is important to note that these conditions do not apply to routine operation and maintenance of production facilities.

Historic Properties and/or Cultural Resources

The affected area may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any surface-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Occupancy and use would be avoided if possible within, and for a distance of 300 feet from the boundaries of cultural properties and archaeological/historic districts determined to be eligible or potentially eligible to the National Register of Historic Places. This includes cultural properties designated for conservation use, scientific use, traditional use, public use, and experimental use. Defined archaeological districts include but are not limited to: Sweet Grass Hills ACEC, Big Bend of the Milk River ACEC, Kevin Rim ACEC, and the Medicine Rock, Fantasy and Laundry Springs sites.

Surface-disturbing and disruptive activities would be avoided if possible within 1/2 mile of the boundaries of cultural properties determined to be of particular importance to Native American groups, determined to be Traditional Cultural Properties, and/or designated for traditional use. Such properties include (but are not limited to) burial locations, pictograph/petroglyph sites, vision quest locations, plant gathering locations, and areas considered sacred or used for religious purposes.

An inventory of those portions of the affected area subject to proposed disturbance may be required prior to any surface disturbance to determine if cultural resources are present and to identify needed mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by a lease, the lessee or operator shall:

1. Engage the services of a cultural resource consultant acceptable to the Surface Management Agency (SMA) to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the standard ten-acre minimum to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.

2. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited. The lessee or operator shall immediately bring to the attention of the SMA any cultural resources discovered as a result of approved operations under this lease, and shall not disturb such discoveries until directed to proceed by the SMA.

The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials, and contact the authorized officer. Within five working days the authorized officer will inform the operator as to:

- whether the materials appear eligible for the National Register of Historic Places;
- the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and
- a timeframe for the authorized officer to complete and expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the authorized officer are correct and that mitigation is appropriate.

If the operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with the process, the authorized officer will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for mitigation costs. The authorized officer will provide technical and procedural guidelines for the conduct of the mitigation. Upon verification from the authorized officer that the required mitigation has been completed, the operator will then be allowed to resume construction.

National Historic Trails

Surface-disturbing and disruptive activities would be avoided if possible within 1/4 mile of designated National Historic Trails (Lewis and Clark Trail and Nez Perce Trail).

Noise

Install remote monitoring systems (e.g., Supervisory Control and Data Acquisition (SCADA) or Computer Assisted Operations (CAOs)), where feasible, to mitigate the noise and disruptions associated with increased field truck traffic. Limitations to the feasibility of implementing this recommendation may exist due to the age of the field, the lack of appropriate infrastructure, and the remote nature of the area.

Muffle and maintain all motorized equipment according to manufacturers' specifications in an effort to achieve the recommended standard of 55 dBA (with an average day/night noise level of 49 dBA) for noise impacts to sensitive receptors at 1/4 mile from the source. When background noise exceeds 55 dBA, noise levels will be no greater than 5 dBA above background at 1/4 mile.

Paleontological Resources

Surface-disturbing activities would be avoided if possible within designated paleontological sites/locales.

In areas known to have high potential (Class IV and V) for containing significant paleontological resources and in the Malta Geological ACEC, the Lessee would be required to conduct a paleontological inventory prior to any surface disturbance. The Lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency, to conduct the inventory. An acceptable inventory report is to be submitted to the BLM for review and approval at the time a surface-disturbing plan of operations is submitted.

Inadvertent Discovery – Upon discovery of significant paleontological materials during operations, work in the immediate area of the find shall be diverted and the find will be reported to the authorized officer immediately. Stabilization of the find to prevent further physical damage or erosion should be undertaken as feasible and protective measures to prevent looting should be initiated. An evaluation of the paleontological discovery will be made by a BLM-permitted paleontologist within an appropriate timeframe to determine the appropriate action(s) to minimize the loss of any significant paleontological values. The operator will bear the cost of any required paleontological appraisals, collection of fossils, or salvage of any fossils of significant scientific interest discovered during the operation.

Collection Restrictions – The operator shall provide a background briefing for all project personnel describing procedures and notifications required in the event of discoveries by project personnel. Supervisory personnel shall advise project personnel of restrictions for collection of significant fossils. Supervisory personnel are also required to enforce collection restrictions.

Recreation Sites

Surface-disturbing and disruptive activities would be avoided if possible within and 500 feet from recreation sites.

Residential Structures

Surface-disturbing and disruptive activities would be avoided if possible within and 500 feet from incorporated city limits or occupied residential structures.

Install signage notifying the public of the area of increased activity.

Remotely monitor well production where practical and technically feasible.

Water, Riparian Areas/Wetlands, Floodplains

Surface-disturbing activities would be avoided if possible within perennial or intermittent streams (as indicated by obligate wetland species or hydric soils); lakes, ponds, and reservoirs; floodplains; wetlands; and riparian areas.

Surface-disturbing activities may be controlled within and 300 feet from riparian/wetland areas. Surface-disturbing activities would require a plan with design features that demonstrate how all actions would maintain and/or improve the functionality of riparian/wetland areas. The plan will address: (1) potential impacts to riparian and wetland resources, (2) mitigation to reduce impacts to acceptable levels (including timing restrictions), (3) post project restoration, and (4) a detailed monitoring plan that would show the controlled use is compatible with wetland and riparian objectives (including habitat and water quality).

Limit construction of drainage crossings to no-flow periods or low-flow periods.

Minimize the area of disturbance within ephemeral and intermittent drainage channel environments.

Prohibit construction of well sites, access roads, and pipelines within 300 feet of surface water and/or riparian areas. Exceptions would be granted by the BLM based on an environmental analysis and site-specific mitigation plans.

Implement minor routing variations during access road layout to avoid steep slopes adjacent to ephemeral or intermittent drainage channels. Maintain a 100-foot-wide buffer strip of natural vegetation where possible (not including wetland vegetation) between all construction activities and ephemeral and intermittent drainage channels.

Do not install culverts on ephemeral drainages. The use of culverts on intermittent drainage crossings would be analyzed on a case-by-case basis. Design all drainage-crossing structures to carry 25- to 50-year discharge events or as otherwise directed by the BLM.

Design channel crossings to minimize changes in channel geometry and subsequent changes in flow hydraulics.

Maintain vegetation barriers occurring between construction activities and ephemeral and intermittent channels.

Minimize construction activities in areas of steep slopes and install special slope-stabilizing structures if construction cannot be avoided in these areas.

Install runoff and erosion control measures such as water bars, berms, and interceptor ditches as needed.

Include adequate drainage control devices and measures in the road design (e.g., road berms and drainage ditches, diversion ditches, cross drains, culverts, outsloping, and energy dissipaters) at sufficient intervals and intensities to adequately control and direct surface runoff above, below, and within the road environment in order to avoid erosion-concentrated flows. Use erosion control devices in conjunction with the surface runoff and drainage control devices and measures such as temporary barriers, ditch blocks, erosion stops, mattes, mulches, and vegetative covers. Implement a revegetation program as soon as possible to re-establish the soil protection afforded by a vegetal cover.

Design and construct interception ditches, sediment traps, water bars, and revegetation and soil stabilization measures if needed.

Construct channel crossings for buried pipelines such that the pipe is buried a minimum of four feet below the channel bottom.

Regrade disturbed channel beds to the original geometric configuration with the same or very similar bed material.

Upon completion of construction activities, restore topography to near pre-existing contours at well sites, other facility sites, and along access roads and pipelines. Replace up to 12 inches of topsoil or suitable plant-growth material over all disturbed surfaces. Apply fertilizer, seed (specified in a reclamation plan), and mulch as required.

Ensure that the project complies with EO 11990 (floodplains protection) and RMP management directives that relate to protection of water resources. These regulations require avoidance of stream channels to the maximum practicable extent. Where total avoidance is not practicable, implement measures to minimize impacts to streams and associated floodplains/floodways. Where streams and floodplains cannot be avoided, the operators would be required to show the BLM authorized officer why such resources cannot be totally avoided and how impacts would be minimized during the APD process.

Case wells during drilling, and case and cement all wells in accordance with Onshore Order No. 2 to protect accessible high-quality aquifers. High-quality aquifers are those with known water quality of 10,000 ppm TDS or less. The protection of high-quality aquifers involves well casing and welding of sufficient integrity to contain all fluids under high pressure during drilling and well completion. Further, ensure that wells adhere to the appropriate BLM cementing policy.

Construct reserve pits so that a minimum of one-half of the total depth is below the original ground surface on the lowest point within the pit. To prevent seepage of fluids, utilize drilling mud gel or poly liners to line reserve pits in areas where subsurface material would not contain fluids. Liners would be of sufficient strength and thickness to withstand

normal installation and use. The liner would be impermeable (i.e., having a permeability of less than 10^{-7} cm/sec) and chemically compatible with all substances which may be put in the pit.

Maintain two feet of freeboard on all reserve pits to ensure the reserve pits are not in danger of overflowing. Shut down drilling operations until the problem is corrected if leakage is found outside the pit.

Extract hydrostatic test water used in conjunction with pipeline testing and all water used during construction activities from sources with sufficient quantities and through appropriation permits approved by the State of Montana.

Discharge all concentrated water flows within access road rights-of-way onto or through an energy dissipater structure (e.g., rip-rapped aprons and discharge points) and discharge into undisturbed vegetation.

Develop and implement a stormwater pollution plan for stormwater runoff at drill sites as required per Montana Department of Environmental Quality stormwater MPDES permit requirements.

Coordinate with the U.S. Army Corps of Engineers to determine the specific Clean Water Act (CWA) Section 404 permit requirements and conditions (including the potential requirement of compensatory mitigation) for each facility that occurs in waters of the U.S. to prevent the occurrence of significant impact to such waters.

Ensure that the project must comply with all applicable requirements of the CWA, including the requirement to obtain an MPDES permit.

Evaluate all project facility sites for occurrence and distribution of waters of the U.S., special aquatic sites, and jurisdictional wetlands. Locate all project facilities out of these sensitive areas. If complete avoidance is not possible, minimize impacts through modification and minor relocations. Coordinate activities that involve dredge or fill into wetlands with the Corps of Engineers.

Soils

Prior to any surface disturbance on sensitive soils a reclamation plan must be approved by the authorized officer. The plan must demonstrate that no other practicable alternatives exist for relocating the activity. The plan must include a detailed description of how the activity would: (1) control wind and water erosion; (2) control surface runoff; (3) minimize sediment production; (4) maintain site productivity; and (5) complete reclamation. The plan will consider avoidance, size limitations, timing restrictions (e.g. limiting wet condition road usage), physical mitigation, and off-site mitigation. Sensitive soils are defined as those with severe erosion ratings (wind and water).

Surface-disturbing activities would be avoided if possible on badlands, rock outcrop, or slopes susceptible to mass failure. The authorized officer may grant an exception to this requirement for pipelines if the operator submits a reclamation plan that clearly demonstrates effects from the proposed actions can be adequately mitigated. An exception may also be granted if an activity would occur on a previously disturbed area if the operator submits a reclamation plan that clearly demonstrates effects from the proposed actions can be adequately mitigated.

Stabilization efforts shall be completed within 30 days of the initiation of construction activities.

Reduce the area of disturbance to the absolute minimum necessary for construction and production operations while providing for the safety of personnel. Where possible, disturbance should be limited to the topping of shrubs and grasses. The operator should avoid off-road vehicle activity.

Where feasible, locate buried pipelines immediately adjacent to roads to avoid creating separate areas of disturbance and in order to reduce the total area of disturbance.

Reclamation shall not be conducted using frozen or saturated soil material.

Where possible, minimize disturbance to vegetated cut-and-fill areas on existing improved roads.

Construction, drilling, completion, pipeline installation, interim or final reclamation activities shall not be performed during periods when the soil is too wet to adequately support equipment/vehicles. If such equipment/vehicles create ruts in excess of 3 inches deep, operations must cease as the soil will be deemed too wet to adequately support equipment/vehicles. If safety, disrepair, erosion and/or excessive rutting problems are discovered, the operator will be responsible to repair, improve and/or maintain the roads to assure safety, stability and to limit soil erosion/rutting.

Additional measures can be found in Appendix J, Reclamation.

Visual Resources

Minimizing potential visual impacts from pumpjack units should include consideration of whether a well can be relocated to take advantage of distance, vegetation, or topography to reduce its visibility or contrast with the characteristic landscape from the point of view of recreational use of BLM land. When it can be used, site selection can be critical (as is color choice) in reducing the contrast of a pumpjack unit.

Since the visual impact potential of a pumpjack unit depends on location, Visual Resource Management (VRM) land classification, and visibility from BLM land in and near recreation sites, a determination of impact would require analysis of the specific circumstances surrounding a well. This would occur when the operator submits an APD.

Wastes, Hazardous and Solid

Recycle drilling mud to the extent feasible.

Drilling mud could be provided to private landowners for use as stock pond sealant.

Use closed-loop systems with above-ground steel tankage for exotic drilling mud operations.

Recycle completion fluids to the extent feasible.

Provide receptacles for trash and construction debris generated during construction and operations prior to transport in closed containers to a county sanitarian-approved landfill for disposal.

Recycle used oil and methanol to the extent feasible.

Investigate the feasibility of using produced water in well drilling and completion processes.

Use lined produced-water evaporation pits at high-volume central facilities.

To minimize undue exposure to hazardous situations, require measures that would preclude the public from entering hazardous areas and place warning signs alerting the public to truck traffic.

Institute a Hazard Communication Program for all operator employees and require subcontractor programs in accordance with OSHA 29 CFR 1910.1200. These programs are designed to educate and protect the employees and subcontractors with respect to any chemicals or hazardous substances that may be present in the workplace. As every chemical or hazardous material is brought on location, require that a Material Safety Data Sheet accompany that material and become part of the file kept at the field office as required by 29 CFR 1910.1200. Ensure that all employees receive the proper training in storage, handling, and disposal of hazardous substances.

Inventory and report chemical and hazardous materials in accordance with the Superfund Amendments and Reauthorization Act (SARA) Title III 40 CFR Part 335, if quantities exceeding 10,000 pounds or the threshold planning quantity (TPQ) are to be produced or stored in association with the proposed action. Submit the appropriate Section 311 and 312 forms at the required times to the state and county emergency management coordinators and the local fire departments.

Transport and/or dispose of any hazardous wastes, as defined by the Resource Conservation and Recovery Act (RCRA), in accordance with all applicable federal, state, and local regulations.

Design operations to severely limit or eliminate the need for extremely hazardous substances, and avoid the creation of hazardous wastes as defined by RCRA wherever possible.

Write and implement Spill Prevention Control and Countermeasure (SPCC) Plans as appropriate in accordance with 40 CFR Part 112 to prevent discharge of oil into navigable waters of the United States.

Manage gas transmission system equipment maintenance fluids such as used oil and antifreeze through third-party or in-house recyclers.

Implement the system-wide SPCC, expanded when necessary to cover new facilities, as required by the Clean Water Act (40 CFR 112.7).

Recycle methanol to minimize the need for disposal.

Provide portable toilets for field operations.

Wildlife

Bald Eagle

Surface-disturbing and disruptive activities would be avoided if possible within 1/2 mile of bald eagle nest sites that were active within the preceding 5 breeding seasons.

Bighorn Sheep Lambing

Surface-disturbing and disruptive activities would be avoided if possible within bighorn sheep lambing areas.

Bighorn Sheep Range

Prior to surface-disturbing or disruptive activities a plan to maintain bighorn sheep habitat will be prepared by the proponent and implemented upon approval by the authorized officer. This plan shall address how short-term and long-term direct and indirect effects to bighorn sheep range will be mitigated based on current science and research.

Black-footed Ferret

Surface-disturbing and disruptive activities would be avoided if possible within 1/4 mile of black-footed ferret habitat.

Black-tailed Prairie Dog

Surface-disturbing and disruptive activities would be avoided if possible within 1/4 mile of black-tailed prairie dog habitat.

Colonial Waterbirds

Surface-disturbing and disruptive activities would be avoided if possible within 1/4 mile of a waterbird nesting colony. Additionally, surface-disturbing and disruptive activities would be avoided from April 1 through July 15 within 1/2 mile of a waterbird nesting colony.

Minimize or avoid disturbance near important nesting and foraging areas such as Nelson Reservoir, Whitewater Lake, Pea Lake, Hewitt Lake, and other areas identified by the BLM based on the most current information available.

Crucial Winter Range

Prior to surface-disturbing or disruptive activities a plan to maintain functionality of crucial winter range for big game and/or Greater Sage-Grouse will be prepared by the proponent and implemented upon approval by the authorized officer. Within crucial winter range surface-disturbing or disruptive activities would be avoided if possible within 6/10 of a mile from any existing surface-disturbing or disruptive activity. The plan shall address how short-term and long-term direct and indirect effects to crucial winter range will be mitigated based on current science and research.

Endangered Species Act Section 7 Consultation

This lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid a BLM-approved activity that will contribute to a need to list such species or their habitat. The BLM may require modifications to or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any surface-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. §1531 et seq., including completion of any required procedure for conference or consultation.

Grassland Bird/Greater Sage-Grouse Priority Habitat Management Areas

Surface-disturbing and disruptive activities would be avoided if possible within the boundaries of all Greater Sage-Grouse Priority Habitat Management Areas. Additional conservation measures and BMPs applicable in PHMA can be found in Appendix M, Greater Sage-Grouse.

Greater Sage-Grouse General Habitat Management Areas

Surface-disturbing and disruptive activities would be avoided if possible within 0.6 mile of Greater Sage-Grouse leks. Additional conservation measures and BMPs applicable in GHMA can be found in Appendix M, Greater Sage-Grouse.

Within Greater Sage-Grouse general habitat surface-disturbing and disruptive activities would be avoided if possible within 2 miles of sage-grouse leks to protect nesting and brood rearing habitat March 1 – June 15. Prior to surface-disturbing or disruptive activities a plan to maintain functionality of Greater Sage-Grouse habitat will be prepared by the proponent and implemented upon approval by the authorized officer. This plan shall address how short-term and long-term direct and indirect effects to nesting and brood-rearing areas will be mitigated based on current science and research.

Require a one-day notice prior to any planned activity so that the pad site and any undeveloped access route or pipeline can be nest-dragged to determine the presence or absence of active nests. Require a second nest-drag survey if drilling activity begins more than two days after completion of pad construction.

Prioritize pad development based on suitability of habitat; construct pads that are in less suitable habitat (i.e., along existing roadways or within degraded habitats) during the breeding season, and construct pads located in more suitable habitat prior to or after the critical breeding season.

Avoid sagebrush, but if disturbance is necessary, interim reclamation should include sage plantings/seedings and/or the use of minimum disturbance practices to protect sage on well pads and pipelines.

Manage produced water to reduce the spread of West Nile virus within sage-grouse habitat areas. Implement the following impoundment construction techniques and measures to eliminate water sources that support breeding mosquitoes:

- Overbuild the size of ponds to accommodate a greater volume of water than is discharged. This will result in non-vegetated and muddy shorelines that breeding mosquitoes avoid.

- Build steep shorelines to reduce shallow water and aquatic vegetation around the perimeter of impoundments. Construction of steep shorelines also will increase wave action that deters mosquito production.
- Maintain the water level below rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Always avoid flooding terrestrial vegetation in flat terrain or low-lying areas.
- Use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
- Fence pond sites to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure, and create hoof print pockets of water that are attractive to breeding mosquitoes.
- Use adulticides to target adult mosquito populations and larvicides to control the hatching of mosquito larvae, using approved pesticides and utilizing licensed applicators with a Pesticide Use Plan.

Greater Sage-Grouse Winter Range

Surface-disturbing and disruptive activities would be avoided if possible from December 1 through March 31 in Greater Sage-Grouse winter range.

Interior Least Tern

Surface-disturbing and disruptive activities would be avoided if possible within 1/4 mile of interior least tern occupied habitat.

Mountain Plover

Surface-disturbing and disruptive activities would be avoided if possible within mountain plover habitat. Additionally, surface-disturbing and disruptive activities would be avoided if possible from April 1 through July 15 within 1/4 mile of mountain plover habitat.

Pallid Sturgeon

Prior to surface-disturbing or disruptive activities occurring in or within 1/2 mile of river or stream shorelines identified as pallid sturgeon habitat, a plan to maintain pallid sturgeon habitat would be prepared by the proponent and implemented upon approval by the authorized officer. Any proposed development would require consultation with the USFWS which could result in a revised buffer distance.

Peregrine Falcon

Surface disturbing and disruptive activities would be avoided if possible within 1 mile of peregrine falcon nest sites active within the preceding 7 breeding seasons.

Piping Plover

Surface-disturbing and disruptive activities would be avoided if possible within 1/4 mile of piping plover habitat.

Potential piping plover nesting habitat near drilling and construction sites at Nelson Reservoir and Whitewater Lake will be identified and appropriate surveys will be conducted for this species prior to oil and gas activities. A timing stipulation during the nesting season would protect nesting piping plovers, but would not protect the function and utility of the site for subsequent nesting activity or occupancy. Therefore, no surface occupancy would apply to all new developments as well as to modifications of existing developments within 1/4 mile of piping plover nest sites, piping plover nesting habitat, and designated critical habitat (critical habitat is on the Bowdoin NWR). This condition of

approval will minimize threats and disturbances to piping plovers, and prevent fragmentation and degradation of piping plover nesting habitat and critical habitat. Waivers, exceptions, and modifications may apply if it is determined that the factors leading to its inclusion have changed sufficiently to make the protection provided by the condition of approval no longer justified, so long as the proposed operations would have "No Effect" on piping plovers and would not "Adversely Modify" piping plover critical habitat.

Raptors

Surface-disturbing and disruptive activities would be avoided if possible within 1/4 mile of raptor nest sites that were active within the past 7 years. Additionally, surface-disturbing and disruptive activities would be avoided from March 1 through July 31 within 1/2 mile of active raptor nest sites.

Install and maintain power line facilities to reduce raptor collisions and electrocutions, and discourage perching and nest-building on infrastructure.

Conduct nesting raptor surveys in suitable nesting habitats within 1/2 mile of proposed disturbance. Surveys could be conducted throughout the year; however, any potential nest sites located must be resurveyed during the breeding season to determine activity. Construction activities would be avoided within one mile of an active nest of listed or sensitive raptor species, and 1/2 to 3/4 mile (depending upon species or line of sight) of an active nest of other raptor species from March 1 through August 31, or until fledging and dispersal of the young. The nature of the restrictions and the protection radius would vary according to the raptor species involved and would be determined by the BLM.

Sharp-tailed Grouse Leks

Surface-disturbing and disruptive activities would be avoided within 1/4 mile of sharp-tailed grouse leks.

Sharp-tailed Grouse Nesting Habitat

Surface-disturbing and disruptive activities would be avoided if possible from March 15 through June 30 within 1/2 mile of sharp-tailed grouse nesting habitat.

Sprague's Pipit

Surface-disturbing and disruptive activities would be avoided if possible from April 15 through July 15 in Sprague's pipit habitat.

Winter Range

Surface-disturbing and disruptive activities would be avoided if possible from December 1 through May 15 within identified big game winter range. Within winter ranges, locate disturbances so that specific important vegetation types, as identified by the BLM, would be avoided where possible.

Appendix E
Fluid Minerals

E.3: Bureau of Reclamation Lease Stipulations

Form 3109-1
(December 1972)
(formerly 3103-1)

LEASE STIPULATIONS
BUREAU OF RECLAMATION

The lessee agrees to maintain, if required by the lessor during the period of this lease, including any extension thereof, an additional bond with qualified sureties in such sum as the lessor, if it considers that the bond required under Section 2(a) is insufficient, may at any time require:

(a) to pay for damages sustained by any reclamation homestead entryman to his crops or improvements caused by drilling or other operations of the lessee, such damages to include the reimbursement of the entryman by the lessee, when he uses or occupies the land of any homestead entryman, for all construction and operation and maintenance charges becoming due during such use or occupation upon any portion of the land so used and occupied;

(b) to pay any damage caused to any reclamation project or water supply thereof by the lessee's failure to comply fully with the requirements of this lease; and

(c) to recompense any nonmineral applicant, entryman, purchaser under the Act of May 16, 1930 (46 Stat. 367), or patentee for all damages to crops or to tangible improvements caused by drilling or other prospecting operation, where any of the lands covered by this lease are embraced in any nonmineral application, entry, or patent under rights initiated prior to the date of this lease, with a reservation of the oil deposits, to the United States pursuant to the Act of July 17, 1914 (38 Stat. 509).

As to any lands covered by this lease within the area of any Government reclamation project, or in proximity thereto, the lessee shall take such precautions as required by the irrigation under such project or to the water supply thereof; *provided* that drilling is prohibited on any constructed works or right-of-way of the Bureau of Reclamation, and *provided, further,* that there is reserved to the lessor, its successors and assigns, the superior and prior right at all times to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, and reclamation works, in which construction, operation, and maintenance, the lessor, its successors and assigns, shall have the right to use any or all of the lands herein described without making compensation therefor, and shall not be responsible for any damage from the presence of water thereon or on account of ordinary, extraordinary, unexpected , or unprecedented floods. That nothing shall be done under this lease to increase the cost of, or interfere in any manner with, the construction, operation, and maintenance of such works. It is agreed by the lessee that, if the construction of any or all of said dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone or telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures or reclamation works across, over, or upon said lands should be made more expensive by reason of the existence of the improvements and workings of the lessee thereon, said additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that within thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the United States, or its successors, constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, or reclamation works, across, over, or upon said lands; *provided, however,* that subject to advance written approval by the United States, the location and course of any improvements or works and appurtenances may be changed by the lessee; *provided , further,* that the reservations, agreements, and conditions contained in the within lease shall be and remain applicable notwithstanding any change in the location or course of said improvements or works of lessee. The lessee further agrees that the United States, its officers, agents, and employees, and its successors and assigns shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works hereinabove enumerated. Nothing in this paragraph shall be construed as in any manner limiting other reservations in favor of the United States contained in this lease.

THE LESSEE FURTHER AGREES That there is reserved to the lessor, its successors and assigns, the prior right to use any of the lands herein leased, to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures, and also the right to remove construction materials therefrom, without any payment made by the lessor or its successors for such right, with the agreement on the part of the lessee that if the construction of any or all of such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures across, over, or upon said lands or the removal of construction materials therefrom, should be made more expensive by reason of the existence of improvements or workings of the lessee thereon, such additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that within thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the United States or its successors constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures across, over, or upon said lands or removing construction materials therefrom. The lessee further agrees that the lessor, its officers, agents, and employees and its successors and assigns shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works herein above enumerated. Nothing contained in this paragraph shall be construed as in any manner limiting other reservations in favor of the lessor contained in this lease.

To insure against the contamination of the waters of the Reservoir, Project, State of , the lessee agrees that the following further conditions shall apply to all drilling and operations on lands covered by this lease, which lie within the flowage or drainage area of the Reservoir, as such area is defined by the Bureau of Reclamation:

1. The drilling sites for any and all wells shall be approved by the Superintendent, Bureau of Reclamation, Project, before drilling begins. Sites for the construction of pipe-line rights-of-way or other authorized facilities shall also be approved by the Superintendent before construction begins.

2. All drilling or operation methods or equipment shall, before their employment, be inspected and approved by the Superintendent of the Project, , and by the supervisor of the U.S. Geological Survey having jurisdiction over the area.

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GP-135
(02/03)

SPECIAL STIPULATION – BUREAU OF RECLAMATION

To avoid interference with recreation development and/or impacts to fish and wildlife habitat and to assist in preventing damage to any Bureau of Reclamation dams, reservoirs, canals, ditches, laterals, tunnels, and related facilities, and contamination of the water supply therein, the lessee agrees that the following conditions shall apply to all exploration and developmental activities and other operation of the works thereafter on lands covered by this lease:

1. Prior to commencement of any surface-disturbing work including drilling, access road work, and well location construction, a surface use and operations plan will be filed with the appropriate officials. A copy of this plan will be furnished to the Regional Director, Great Plains Region, Bureau of Reclamation, P.O. Box 36900, Billings, MT 59107-6900, for review and consent prior to approval of the plan. Such approval will be conditioned on reasonable requirements needed to prevent soil erosion, water pollution, and unnecessary damages to the surface vegetation and other resources, including cultural resources, of the United States, its lessees, permittees, or licensees, and to provide for the restoration of the land surface and vegetation. The plan shall contain provisions as the Bureau of Reclamation may deem necessary to maintain proper management of the water, recreation, lands structures, and resources, including cultural resources, within the prospecting, drilling, or construction area.

Drilling sites for all wells and associated investigations such as seismograph work shall be included in the above-mentioned surface use and operation plan.

If later explorations require departure from or additions to the approved plan, these revisions or amendments, together with a justification statement for proposed revisions, will be submitted for approval to the Regional Director, Great Plains Region, Bureau of Reclamation, or his authorized representative.

Any operations conducted in advance of approval of an original, revised, or amended prospecting plan, or which are not in accordance with an approved plan constitute a violation of the terms of this lease. The Bureau of Reclamation reserves the right to close down operations until such corrective action, as is deemed necessary, is taken by the lessee.

2. No occupancy of the surface of the following excluded areas is authorized by this lease. It is understood and agreed that the use of these areas for Bureau of Reclamation purposes is superior to any other use. The following restrictions apply only to mineral tracts located within the boundary of a Bureau of Reclamation project where the United States owns 100 percent of the fee mineral interest.

a. Within 500 feet on either side of the centerline of any and all roads or highways within the leased area.

b. Within 200 feet on either side of the centerline of any and all trails within the leased area.

c. Within 500 feet of the normal high-water line of any and all live streams in the leased area.

d. Within 400 feet of any and all recreation developments within the leased area.

e. Within 400 feet of any improvements either owned, permitted, leased, or otherwise authorized by the Bureau of Reclamation within the leased area.

f. Within 200 feet of established crop fields, food plots, and tree/shrub plantings within the leased area.

g. Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.

h. Within established rights-of-way of canals, laterals, and drainage ditches within the leased area.

i. Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights-of-way within the leased area.

j. Providing that appropriate environmental compliance measures can be ensured, and providing further that Reclamation project works and other public interests can be protected, Reclamation may consider, on a case-by-case basis, waiving the requirement specified in Section 2 hereof**. HOWEVER, LESSEES ARE ADVISED THAT OBTAINING SUCH A WAIVER CAN BE A DIFFICULT, TIME CONSUMING, AND COSTLY PROCESS WITH NO GUARANTEE THAT RECLAMATION WILL GRANT THE REQUESTED WAIVER.**

3. No occupancy of the surface or surface drilling will be allowed in the following areas. In addition, no directional drilling will be allowed that would intersect the subsurface zones delineated by a vertical plane in these areas. The following restrictions apply only to mineral tracts located within the boundary of a Bureau of Reclamation project, where the United States owns 100 percent of the fee mineral interest in said tract, or tracts.

a. Within 1,000 feet of the maximum water surface, as defined in the Standard Operating Procedures (SOP), of any reservoirs and related facilities located within the leased area.

b. Within 2,000 feet of dam embankments and appurtenance structures such as spillway structures, outlet works, etc.

c. Within one-half (1/2) mile horizontal from the centerline of any tunnel within the leased area.

d. Providing that appropriate environmental compliance measures can be ensured, and providing further that Reclamation project works and other public interests can be protected. Reclamation may consider, on a case-by-case basis, waiving the requirements specifies in Section 3 hereof. **HOWEVER, LESSEES ARE ADVISED THAT OBTAINING SUCH A WAIVER CAN BE A DIFFICULT, TIME CONSUMING, AND COSTLY PROCESS WITH NO GUARANTEE THAT RECLAMATION WILL GRANT THE REQUESTED WAIVER.**

4. The distances stated in items 2 and 3 above are intended to be general indicators only. The Bureau of Reclamation reserves the right to revise these distances as needed to protect Bureau of Reclamation facilities.

5. The use of explosives in any manner shall be so controlled that the works and facilities of the United States, its successors and assigns, will in no way be endangered or damaged. In this connection, an explosives use plan shall be submitted to and approved by the Regional Director, Great Plains Region, Bureau of Reclamation, or his/her authorized representative.

6. The lessee shall be liable for all damage to the property of the United States, its successors or assigns, resulting from the exploration, development, or operation of the works contemplated by this lease, and shall further hold the United States, its successors or assigns, and its officers, agents, and employees, harmless from all claims of third parties for injury or damage sustained or in any way resulting from the exercise of the rights and privileges conferred by the lease.

7. The lessee shall be liable for all damages to crops or improvements of any entryman, nonmineral applicant, or patentee, their successors or assigns, caused by or resulting from the drilling or other operations of the lessee, including reimbursement of any entryman or patentee, their successors or assigns, for all construction, operation, and maintenance charges becoming due on any portion of their said lands damaged as a result of the drilling or other operation of the lessee.

8. In addition to any other bond required under the provisions of this lease, the lessee shall provide such bond as the United States may at any time require for damages which may arise under the liability provisions of Section six (6) and seven (7) above.

PARCEL NO.

BOR 17-2

Appendix E
Fluid Minerals

E.4: Oil and Gas Stipulations and Exception, Modification, and Waiver Criteria

"A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if proposed operations would not cause unacceptable impacts. If the authorized officer has determined, prior to lease issuance, that a stipulation involves an issue of major concern to the public, modification or waiver of the stipulation shall be subject to public review for at least a 30-day period. In such cases, the stipulation shall indicate that public review is required before modification or waiver. If subsequent to lease issuance the authorized officer determines that a modification or waiver of a lease term or stipulation is substantial, the modification or waiver shall be subject to public review for at least a 30-day period." (43 CFR 3101.1-4)

The purpose of this appendix is to provide the stipulations that would be applied to future leases within the planning area under each alternative.

Exceptions, Modifications, and Waivers

Any requests for exceptions, modifications, and waivers from the stipulations would be processed by the appropriate BLM office. The requests for exceptions must be initiated in writing by the operator near the time that the work is proposed to be initiated. This requirement is in place due to the unpredictability of weather, animal movement and condition, etc. The analysis of a request will typically include the review of potential mitigation measures and alternatives (traffic restrictions, alternative scheduling, staged activity, etc.). The request is considered as a unique action and is analyzed and documented individually for RMP and NEPA compliance.

The definitions for exceptions, modifications, and waivers are as follows:

Exception – A one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver.

Modification – A change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

Waiver – A permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

Process for Reviewing and Approving an Exception to, Waiver of, or Modification to a Stipulation on a Lease That Has Been Issued (WO IM No. 2008-32)

The authorized officer generally requires the operator to submit a written request for an exception, waiver, or modification and information demonstrating that (1) the factors leading to the inclusion of the stipulation in the lease have changed sufficiently to make the protection provided by the lease stipulation no longer justified or (2) that the proposed operation would not cause unacceptable impacts. Requests from the operator should contain, at a minimum, a plan including related on-site or off-site mitigation efforts, to adequately protect affected resources; data collection and monitoring efforts; and timeframes for initiation and completion of construction, drilling, and completion operations. The operator's request may be included in an APD, Notice of Staking, Sundry Notice, or letter. The BLM may also proactively initiate the process.

During the review process, BLM coordination with other state or federal agencies should be undertaken, as appropriate, and documented. For example, it may be appropriate to coordinate the review of wildlife exceptions, waivers, and modifications with the local office of the State wildlife agency. The BLM will also consult with the federal Surface Management Agency if other than the BLM.

The BLM staff's review and recommendations should be documented along with any necessary mitigation and provided to the authorized officer for approval or disapproval. The applicant is then provided with a written notification of the decision. Decisions on exceptions, waivers, and modifications are subject to administrative review by the State Director and thereafter may be appealed to the Interior Board of Land Appeals pursuant to 43 CFR Part 4. However, decisions on exceptions, waivers, and modifications submitted by the operator after drilling has commenced are final for the Department of the Interior and not subject to administrative review by the State Director or appeal pursuant to 43 CFR Part 4.

After drilling has commenced, the BLM may consider verbal requests for, and grant verbal approvals of, exceptions, waivers, or modifications. However, the operator must submit a written notice within 7 days after the verbal request. The BLM must also confirm verbal approvals in writing. This requirement is provided for in Onshore Oil and Gas Order No. 1. Operators should not be encouraged to submit requests unless the delay in completing the well was due to unforeseen circumstances beyond the reasonable control of the operator or a serious economic or a public health and safety problem could result from denial of the request.

Alternative A (Current Management)

Oil and Gas Lease Stipulations (Form MT-3109-1)

Esthetics – To maintain esthetic values, all surface-disturbing activities, semi-permanent and permanent facilities may require special design including location, painting and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives of the federal Surface Management Agency (SMA).

Erosion Control – Surface-disturbing activities may be prohibited during muddy and/or wet soil periods. This limitation does not apply to operation and maintenance of producing wells using authorized roads.

Controlled or Limited Surface Use Stipulation – This stipulation may be modified by special stipulations which are hereto attached or when specifically approved in writing by the Bureau of Land Management with concurrence of the SMA. Distances and/or time periods may be made less restrictive depending on the actual onground conditions. The prospective lessee should contact the SMA for more specific locations and information regarding the restrictive nature of this stipulation.

The lessee/operator is given notice that the lands within this lease may include special areas and that such areas may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled, or if absolutely necessary, excluded. Use or occupancy will be restricted only when the Bureau of Land Management and/or the SMA demonstrates the restriction necessary for the protection of such special areas and existing or planned uses. Appropriate modifications to imposed restrictions will be made for the maintenance and operations of producing oil and gas wells.

After the SMA has been advised of specific proposed surface use or occupancy on the leased lands, and on request of the lessee/operator, the Agency will furnish further data on any special areas which may include:

100 feet from the edge of the rights-of-way from highways, designated county roads and appropriate federally-owned or controlled roads and recreation trails.

500 feet from, or when necessary, within the 25-year flood plain from reservoirs, lakes, and ponds and intermittent, ephemeral or small perennial streams; 1,000 feet from, or when necessary, within the 100-year flood plain from larger perennial streams, rivers, and domestic water supplies.

500 feet from grouse strutting grounds. Special care to avoid nesting areas associated with strutting grounds will be necessary during the period from March 1 to June 30; 1/4 mile from identified essential habitat of state and federal sensitive species; wildlife winter ranges during the period from December 1 to May 15; and in elk calving areas during the period from May 1 to June 30.

300 feet from occupied buildings, developed recreational areas, undeveloped recreational areas receiving concentrated public use, and sites eligible for or designated as National Register sites.

Seasonal road closures, roads for special uses, specified roads during heavy traffic periods, and on areas having restrictive off-road vehicle designations.

On slopes over 30%, or 20% on extremely erodible or slumping soils.

Notice for Cultural and Paleontological Resources – The federal SMA is responsible for assuring that the leased lands are examined to determine if cultural resources are present and to specify mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator, unless notified to the contrary by the SMA, shall:

1. Contact the appropriate SMA to determine if a site-specific cultural resource inventory is required. If an inventory is required, then;

2. Engage the services of a cultural resource specialist acceptable to the SMA to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the area of proposed disturbance to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.

3. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as testing salvage and recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited.

The lessee or operator shall immediately bring to the attention of the SMA any cultural or paleontological resources discovered as a result of approved operations under this lease, and not disturb such discoveries until directed to proceed by the SMA.

Notice for Endangered or Threatened Species – The SMA is responsible for assuring that the leased land is examined prior to undertaking any surface-disturbing activities to determine effects upon any plant or animal species, listed or proposed for listing as endangered or threatened, or their habitats. The findings of this examination may result in some restrictions to the operator's plans or even disallow use and occupancy that would be in violation of the Endangered Species Act of 1983 by detrimentally affecting endangered or threatened species or their habitats.

The lessee/operator may, unless notified by the authorized officer of the SMA that the examination is not necessary, conduct the examination on the leased lands at his discretion and cost. This examination must be done by or under the supervision of a qualified resources specialist approved by the SMA. An acceptable report must be provided to the SMA identifying the anticipated effects of a proposed action on endangered or threatened species or their habitats.

Alternative B

Oil and Gas Lease Stipulations

Resource: National Register of Historic Places (NRHP) Eligible Properties/Districts – No Surface Occupancy

Stipulation: Occupancy and use is prohibited within the boundaries of cultural properties and archaeological/ historic districts determined to be eligible or potentially eligible to the National Register of Historic Places. This includes cultural properties designated for conservation use, scientific use, traditional use, public use, and experimental use.

Objective: To protect significant cultural properties and archaeological districts and their settings, and to avoid disturbance or inadvertent impacts to these resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Cultural Resource Survey

Stipulation: An inventory of those portions of the leased lands subject to proposed disturbance may be required prior to any surface disturbance to determine if cultural resources are present and to identify needed mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator shall:

1. Engage the services of a cultural resource consultant acceptable to the Surface Management Agency (SMA) to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the standard ten-acre minimum to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.

2. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited. The lessee or operator shall immediately bring to the attention of the SMA any cultural resources discovered as a result of approved operations under this lease, and shall not disturb such discoveries until directed to proceed by the SMA.

Objective: Compliance with Section 106 of the National Historic Preservation Act is required for all actions which may affect cultural properties eligible to the National Register of Historic Places. Section 6 of the Oil and Gas Lease Terms (Form 3100-11) requires that operations be conducted in a manner that minimizes adverse impacts to cultural and other resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Cultural Resources and Tribal Consultation

Stipulation: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any surface-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect significant historic properties and resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Paleontological Resources – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within designated paleontological sites/locales.

Objective: To preserve and protect significant vertebrate fossils and paleontological locales.

Exception: The authorized officer may grant an exception if the lessee or operator submits a plan which demonstrates that the adverse impacts to significant paleontological resources can be mitigated through recovery and extensive recordation. Where impacts to paleontological resources cannot be mitigated to the satisfaction of the surface management agency (SMA), surface occupancy on that area must be prohibited.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the designated paleontological site/locale can be occupied without adversely affecting the resource values.

Waiver: None.

Resource: Paleontological Resource Inventory

Stipulation: Prior to any surface-disturbing activity in areas known to have a high potential (Class 4 and 5) for containing significant paleontological resources, the lessee shall be required to conduct a paleontological inventory. The lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency (SMA), to conduct the inventory. An acceptable inventory report is to be submitted to the SMA for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: To preserve and protect scientifically significant vertebrate fossils and paleontological locales.

Exception: An exception may be granted if the area has already been inventoried for paleontological resources.

Modification: None.

Waiver: None.

Resource: Recreation Sites – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of recreation sites.

Objective: To recognize and protect the public's opportunity for quality recreation experiences at those sites developed for that purpose. Since BLM recreation sites are generally developed to support the use of the surrounding lands, the 1/4 provides protection for perpetuating those opportunities for which the site was developed, reduces the visual intrusion and noise, and protects capital investments at the site.

Exception: The authorized officer may grant an exception if a site is moved or eliminated.

Modification: The list of recreation sites may be modified if a site is removed, or if a site is developed in the future.

Waiver: A waiver may be granted if a site is moved or eliminated.

Resource: National Historic Trails – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of designated National Historic Trails. Designated National Historic Trails include the Lewis and Clark Trail and the Nez Perce Trail.

Objective: To preserve and protect designated National Historic Trails and the natural setting in which they occur.

Exception: The authorized officer may grant an exception if the operator submits a plan demonstrating that impacts to the area and its users can be adequately mitigated.

Modification: No modifications will be granted unless effects of the action will not be apparent to users along the trail.

Waiver: A waiver may be granted if impacts can be mitigated so that area values and user experiences are not negatively affected.

Resource: Residential Structures – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of incorporated city limits or residential structures.

Objective: To ensure a proper distance between development and human occupation for health and safety purposes.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the public's health and safety.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the public's health and safety.

Resource: Sensitive Soils – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited on sensitive soils, badlands, rock outcrop, or slopes susceptible to mass failure.

Objective: To maintain the chemical, physical, and biotic properties of sensitive soils and avoid landforms and areas that are the most difficult and costly to stabilize and successfully reclaim to standards... This includes maintaining soil productivity, soil structure, soil stability, and soil biotic communities. This would prevent excessive erosion and avoid areas with the potential for excessive reclamation problems.

Exception: The authorizing officer may grant an exception to this stipulation for pipelines if the operator submits a reclamation plan that clearly demonstrates effects from the proposed actions can be adequately mitigated. An exception may also be granted if an activity would occur on a previously disturbed area if the operator submits a reclamation plan that clearly demonstrates effects from the proposed actions can be adequately mitigated.

Modification: The area affected by this stipulation may be modified by the authorized officer if it is determined that portions of the area do not include sensitive soils, badlands, rock outcrop, or slopes susceptible to mass failure.

Waiver: This stipulation may be waived by the authorized officer if it is determined that none of the leasehold contains sensitive soils, badlands, rock outcrop, or slopes susceptible to mass failure.

Resource: Big Bend of the Milk River ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Big Bend of the Milk River ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Kevin Rim ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Kevin Rim ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Malta Geological ACEC – Controlled Surface Use

Stipulation: Prior to any surface-disturbing activity in the Malta Geological ACEC the lessee shall be required to conduct a paleontological inventory. The lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency, to conduct the inventory. An acceptable inventory report is to be submitted to the BLM for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Mountain Plover ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Mountain Plover ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: An exception to this stipulation may be granted by the authorized officer if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Sweet Grass Hills ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Sweet Grass Hills ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Zortman/Landusky Mine Reclamation ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Zortman/Landusky Mine Reclamation ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: An exception to this stipulation may be granted by the authorized officer if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Water, Riparian, and Wetlands – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within and 1/4 mile from lentic or lotic riparian areas.

Objective: To maintain riparian/wetland functions and water quality.

Exception: An exception to this stipulation may be granted by the authorized officer if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the riparian/wetland resource.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the riparian/wetland resource.

Resource: Colonial Waterbirds – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1 mile of a waterbird nesting colony from April 1 through July 15.

Objective: To protect colonial waterbirds and to maintain colonial waterbird populations.

Exception: An exception to this stipulation may be granted if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting nesting waterbirds.

Resource: Endangered Species Act Section 7 Consultation

Stipulation: This lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid a BLM-approved activity that will contribute to a need to list such species or their habitat. The BLM may require modifications to or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any surface-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. §1531 *et seq.*, including completion of any required procedure for conference or consultation.

Objective: To protect threatened, endangered species, or special status species.

Exception: None.

Modification: None.

Waiver: None.

Resource: Mountain Plover – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of mountain plover habitat from April 1 through July 31.

Objective: To protect mountain plover habitat and to maintain mountain plover populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting mountain plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting mountain plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer mountain plover habitat.

Resource: Raptors – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1 mile of active raptor nest sites from March 1 through September 1.

Objective: To maintain the reproductive potential of raptor nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains a raptor nest or has a nest that has not been active in 7 years.

Resource: Sharp-tailed Grouse Nesting Habitat – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1 mile of sharp-tailed grouse leks from March 15 through June 30.

Objective: To protect sharp-tailed grouse nesting habitat necessary for long-term maintenance of sharp-tailed grouse populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the sharp-tailed grouse populations. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains sharp-tailed grouse nesting habitat.

Resource: Special Status Species – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of essential habitat of special status species unless other species-specific stipulations apply.

Objective: To protect special status species habitat and to maintain regional wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting special status species habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains special status species habitat.

Alternative C

Oil and Gas Lease Stipulations

Resource: National Register of Historic Places (NRHP) Eligible Properties/Districts – No Surface Occupancy

Stipulation: Occupancy and use is prohibited within the boundaries of cultural properties and archaeological/ historic districts determined to be eligible or potentially eligible to the National Register of Historic Places. This includes cultural properties designated for conservation use, scientific use, traditional use, public use, and experimental use.

Objective: To protect significant cultural properties and archaeological districts and their settings, and to avoid disturbance or inadvertent impacts to these resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Cultural Resource Survey

Stipulation: An inventory of those portions of the leased lands subject to proposed disturbance may be required prior to any surface disturbance to determine if cultural resources are present and to identify needed mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator shall:

1. Engage the services of a cultural resource consultant acceptable to the Surface Management Agency (SMA) to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the standard ten-acre minimum to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.

2. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited. The lessee or operator shall immediately bring to the attention of the SMA any cultural resources discovered as a result of approved operations under this lease, and shall not disturb such discoveries until directed to proceed by the SMA.

Objective: Compliance with Section 106 of the National Historic Preservation Act is required for all actions which may affect cultural properties eligible to the National Register of Historic Places. Section 6 of the Oil and Gas Lease Terms (Form 3100-11) requires that operations be conducted in a manner that minimizes adverse impacts to cultural and other resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Cultural Resources and Tribal Consultation

Stipulation: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any surface-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect significant historic properties and resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Paleontological Resources – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within designated paleontological sites/locales.

Objective: To preserve and protect significant vertebrate fossils and paleontological locales.

Exception: The authorized officer may grant an exception if the lessee or operator submits a plan which demonstrates that the adverse impacts to significant paleontological resources can be mitigated through recovery and extensive recordation. Where impacts to paleontological resources cannot be mitigated to the satisfaction of the surface management agency (SMA), surface occupancy on that area must be prohibited.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the designated paleontological site/locale can be occupied without adversely affecting the resource values.

Waiver: None.

Resource: Paleontological Resource Inventory

Stipulation: Prior to any surface-disturbing activity in areas known to have a high potential (Class 4 and 5) for containing significant paleontological resources, the lessee shall be required to conduct a paleontological inventory. The lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency (SMA), to conduct the inventory. An acceptable inventory report is to be submitted to the SMA for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: To preserve and protect scientifically significant vertebrate fossils and paleontological locales.

Exception: An exception may be granted if the area has already been inventoried for paleontological resources.

Modification: None.

Waiver: None.

Resource: Recreation Sites – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within and 500 feet from recreation sites.

Objective: To recognize and protect the public's opportunity for quality recreation experiences at those sites developed for recreation. Since BLM recreation sites are generally developed to support the use of the surrounding lands, the 500 feet provides protection for perpetuating those opportunities for which the site was developed, reduces the visual intrusion and noise, and protects capital investments at the site.

Exception: The authorized officer may grant an exception if a site is moved or eliminated.

Modification: The list of recreation sites may be modified if a site is removed, or if a site is developed in the future.

Waiver: A waiver may be granted if a site is moved or eliminated.

Resource: National Historic Trails – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of designated National Historic Trails. Designated National Historic Trails include the Lewis and Clark Trail and the Nez Perce Trail.

Objective: To preserve and protect designated National Historic Trails and the natural setting in which they occur.

Exception: The authorized officer may grant an exception if the operator submits a plan demonstrating that impacts to the area and its users can be adequately mitigated.

Modification: No modifications will be granted unless effects of the action will not be apparent to users along the trail.

Waiver: A waiver may be granted if impacts can be mitigated so that area values and user experiences are not negatively affected.

Resource: Residential Structures – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 500 feet of incorporated city limits or residential structures.

Objective: To ensure a proper distance between development and human occupation for health and safety purposes.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the public's health and safety.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the public's health and safety.

Resource: Sensitive Soils – Controlled Surface Use

Stipulation: Prior to any surface disturbance on sensitive soils a reclamation plan must be approved by the authorized officer. The plan must demonstrate that no other practicable alternatives exist for relocating

the activity. The plan must include a detailed description of how the activity would: (1) control wind and water erosion; (2) control surface runoff; (3) minimize sediment production; (4) maintain site productivity; and (5) complete reclamation. The plan will consider avoidance, size limitations, timing restrictions (e.g. limiting wet condition road usage), physical mitigation, and off-site mitigation. Sensitive soils are defined as those with severe erosion ratings (wind and water).

Objective: To maintain the chemical, physical, and biotic properties of sensitive soils. This includes maintaining soil productivity, soil structure, soil stability, and soil biotic communities. This would prevent excessive erosion and avoid areas with the potential for excessive reclamation problems.

Exception: The authorized officer may grant an exception to this stipulation if the operator can demonstrate that the activity would not contribute to degradation of the soil resource or down slope resource conditions.

Modification: The area affected by this stipulation may be modified by the authorized officer if it is determined that portions of the lease area do not contain sensitive soils.

Waiver: This stipulation may be waived by the authorized officer if it is determined that the entire lease area does not contain sensitive soils.

Resource: Badlands, Rock Outcrop, or Slopes Susceptible to Mass Failure – No Surface Occupancy

Stipulation: Surface use and occupancy is prohibited on badlands, rock outcrop, and slopes susceptible to mass failure.

Objective: To avoid landforms and areas that are the most difficult and costly to stabilize and successfully reclaim to standards.

Exception: The authorized officer may grant an exception to this stipulation if the operator submits a reclamation plan that clearly demonstrates effects from the proposed actions can be adequately mitigated. An exception may also be granted if an activity would occur on a previously disturbed area if the operator submits a reclamation plan that clearly demonstrates effects from the proposed actions can be adequately mitigated. The plan must demonstrate that no other practicable alternatives exist for relocating the activity. The plan must include a detailed description of how the activity would: (1) control wind and water erosion; (2) control surface runoff; (3) minimize sediment production; (4) maintain site productivity; and (5) complete reclamation. The plan will consider avoidance, size limitations, timing restrictions (e.g. limiting wet condition road usage), physical mitigation, and off-site mitigation.

Modification: The area affected by this stipulation may be modified by the authorized officer if it is determined that portions of area do not include badlands, rock outcrop, or slopes susceptible to mass failure.

Waiver: This stipulation may be waived by the authorized officer if it is determined that the entire lease area does not contain badlands, rock outcrop, or slopes susceptible to mass failure.

Resource: Big Bend of the Milk River ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Big Bend of the Milk River ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Frenchman Breaks ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Frenchman Breaks ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Kevin Rim ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Kevin Rim ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Malta Geological ACEC – Controlled Surface Use

Stipulation: Prior to any surface-disturbing activity in the Malta Geological ACEC the lessee shall be required to conduct a paleontological inventory. The lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency, to conduct the inventory. An acceptable inventory report is to be submitted to the BLM for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Mountain Plover ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Mountain Plover ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Sweet Grass Hills ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Sweet Grass Hills ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Woody Island ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Woody Island ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Zortman/Landusky Mine Reclamation ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Zortman/Landusky Mine Reclamation ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: An exception to this stipulation may be granted by the authorized officer if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Water, Riparian, Wetland, and Floodplains – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within and 500 feet from lentic or lotic riparian areas.

Objective: To maintain riparian/wetland functions and water quality.

Exception: An exception to this stipulation may be granted by the authorized officer if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the riparian/wetland resource.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the riparian/wetland resource.

Resource: Prairie Grasslands – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Prairie Grasslands area with wilderness characteristics.

Objective: To protect wilderness characteristics as a priority over other multiple uses.

Exception: None.

Modification: None.

Waiver: None.

Resource: Bald Eagle – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of bald eagle nest sites that have been active within the last 7 years.

Objective: To protect bald eagle nesting sites and/or breeding habitat in accordance with the Montana Bald Eagle Management Plan.

Exception: The authorized officer may grant an exception if the operator submits a plan which demonstrates that the proposed action will not affect the bald eagle or its habitat. If the authorized officer determines that the action may have an adverse effect, the operator may submit a plan demonstrating that the impacts can be adequately mitigated. This plan must be approved by the BLM.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting areas. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting bald eagle nest sites or nesting habitat.

Resource: Bighorn Sheep Lambing – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within bighorn sheep lambing areas.

Objective: To protect bighorn sheep lambing areas from disturbance and to facilitate long-term maintenance of bighorn sheep populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain lambing habitat for bighorn sheep.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains bighorn sheep lambing areas.

Resource: Bighorn Sheep Range – Controlled Surface Use

Stipulation: Surface-disturbing or disruptive activities within bighorn sheep range would require a plan to avoid or minimize habitat loss from direct and indirect impacts. The plan would need to be approved by the authorized officer.

Objective: To protect bighorn sheep from disturbance and to facilitate long-term maintenance of wildlife populations.

Exception: The authorized officer may grant an exception if an environmental review determines that the action, as proposed or conditioned, would not compromise the functionality of the habitat for bighorn sheep.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable habitat for bighorn sheep. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains bighorn sheep habitat.

Resource: Black-footed Ferret – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of black-footed ferret habitat.

Objective: To protect black-footed ferret habitat for long-term maintenance of black-footed ferret populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting black-footed ferret habitat. The authorized officer may also modify the

size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold is no longer considered black-footed ferret habitat.

Resource: Black-tailed Prairie Dog – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of black-tailed prairie dog habitat.

Objective: To protect prairie dog towns necessary for long-term maintenance of black-tailed prairie dog populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting prairie dog habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold is no longer considered prairie dog habitat.

Resource: Colonial Waterbirds – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of a waterbird nesting colony.

Objective: To protect colonial waterbird nesting site and to maintain regional colonial waterbird populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting waterbird nesting colonies.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting nesting waterbirds.

Resource: Colonial Waterbirds – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1 mile of a waterbird nesting colony from April 1 through July 15.

Objective: To protect colonial waterbirds and to maintain colonial waterbird populations.

Exception: An exception to this stipulation may be granted if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting nesting waterbirds.

Resource: Crucial Winter Range – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within crucial winter range.

Objective: To protect crucial winter range from disturbance and facilitate long-term maintenance of wildlife populations.

Exception: An exception to this stipulation may be granted by the authorized officer if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable crucial winter range.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains viable crucial winter range.

Resource: Endangered Species Act Section 7 Consultation

Stipulation: This lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid a BLM-approved activity that will contribute to a need to list such species or their habitat. The BLM may require modifications to or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any surface-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. §1531 *et seq.*, including completion of any required procedure for conference or consultation.

Objective: To protect threatened, endangered species, or special status species.

Exception: None.

Modification: None.

Waiver: None.

Resource: Grassland Bird/Greater Sage-Grouse Priority Areas – Controlled Surface Use

Stipulation: Prior to surface-disturbing or disruptive activities a plan to maintain functionality of grassland bird/Greater Sage-Grouse priority habitat will be prepared by the proponent and implemented upon approval by the authorized officer. Within the Priority Areas surface-disturbing or disruptive activities will be restricted or prohibited within 6/10 of a mile from any existing surface-disturbing or disruptive activity. The plan shall address how short-term and long-term direct and indirect effects to important

breeding (leks), nesting, brood-rearing, and wintering areas will be mitigated based on current science and research (Appendix E.5).

Objective: To protect and enhance the integrity of the grassland bird/Greater Sage-Grouse habitat to maintain or improve populations.

Exception: The authorized officer may grant an exception if an environmental review determines that the action as proposed or conditioned (such as exceeding the 6/10 of a mile surface-disturbing or disruptive activity restriction) would not compromise the functionality of the habitat for grassland bird/Greater Sage-Grouse and meet the objective for grassland bird/Greater Sage-Grouse habitat and populations.

Modification: The authorized officer may modify the area subject to the stipulation if an environmental analysis finds that a portion of the area is no longer grassland bird/Greater Sage-Grouse habitat and supports no grassland bird/Greater Sage-Grouse populations. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if it is determined that grassland bird/Greater Sage-Grouse populations no longer occupy significant portions of the Priority Areas and there is no reasonable likelihood of functional grassland bird/Greater Sage-Grouse habitat being restored.

Resource: Greater Sage-Grouse Leks (General Habitat Areas) – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1 mile of Greater Sage-Grouse leks.

Objective: To protect Greater Sage-Grouse leks to maintain Greater Sage-Grouse populations.

Exception: An exception to this stipulation may be granted if the authorized officer, in consultation with Montana Fish, Wildlife and Parks (MFWP), determines that portions of the area can be occupied without adversely affecting Greater Sage-Grouse leks.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with MFWP, determines that portions of the area can be occupied without adversely affecting Greater Sage-Grouse leks. The authorized officer, in consultation with MFWP, may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with MFWP, determines that the entire leasehold is no longer capable of supporting Greater Sage-Grouse leks.

Resource: Greater Sage-Grouse Nesting Habitat (General Habitat Areas) – Controlled Surface Use

Stipulation: To minimize the impacts of surface-disturbing or disruptive activities and insure maintenance of habitat for sustainable populations of sage-grouse, surface-disturbing or disruptive activities are subject to the following requirements. This stipulation does not apply within the boundaries of the Greater Sage-Grouse Protection Priority Area.

a. Surface-disturbing or disruptive activities will prevent or minimize disturbance to sage-grouse or their habitat. Except during emergency situations, activities will not compromise the functionality of the habitat.

b. Continuous noise (related to long-term operations and/or activities) would be no greater than 49 decibels at 1/4 mile from the perimeter of the lek.

c. Temporary noise (related to installation, maintenance, one-time use, emergency operations, etc.) exceeding 49 decibels at 1/4 mile from the perimeter of a lek or surface-disturbing/ disruptive activities may be allowed, but only from 10 a.m. to 4 p.m. between March 15 and May 15.

d. Manage water developments to reduce the spread of West Nile virus within sage-grouse habitat areas.

e. Site and/or minimize linear rights-of-way to reduce disturbance to sagebrush habitats.

f. Maximize placement of new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.

g. Power lines would be buried, eliminated, designed or sited in a manner which does not impact sage-grouse.

h. Placement of other high profile structures, exceeding 10 feet in height, would be eliminated, designed or sited in a manner which does not impact sage-grouse.

i. Remote monitoring of production facilities must be utilized and all permit applications must contain a plan to reduce the frequency of vehicle use.

j. Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.

k. Restore disturbed areas at final reclamation to pre-disturbance conditions or desired plant community.

l. Permanent (longer than 2 months) structures which create movement must be designed or sited to minimize impacts to sage-grouse.

m. Consider use of off-site mitigation, (e.g., creation of sagebrush habitat, purchase conservation easements, or buying down grazing) with proponent dollars to offset habitat losses.

n. Consider creation of a "*Mitigation Trust Account*" when impacts cannot be avoided, minimized, or effectively mitigated through other means. If approved by the BLM, the proponent may contribute funding to maintain habitat function based on the estimated cost of habitat treatments or other mitigation needed to maintain the functions of impacted habitats. Off-site mitigation should only be considered when no feasible options are available to adequately mitigate within and immediately adjacent to the impacted site, or when the off-site location would provide more effective mitigation of the impact than can be achieved on-site.

Objective: Maintain the integrity of the habitat to support sustainable sage-grouse populations.

Exception: The authorized officer may grant an exception to specific requirements of this stipulation if the action, as proposed or conditioned would not compromise the functionality of the habitat for sage-grouse and meet the goals for sage-grouse habitat.

Modification: The authorized officer may modify the area subject to the stipulation if an environmental analysis finds a portion of the area is nonessential or no longer sage-grouse habitat.

Waiver: This stipulation may be waived if it is determined that Greater Sage-Grouse populations no longer occupy significant portions of the area and there is no reasonable likelihood of functional Greater Sage-Grouse habitat being restored.

Resource: Greater Sage-Grouse Protection Priority Area – Controlled Surface Use

Stipulation: Prior to surface-disturbing or disruptive activities a plan to maintain functionality of Greater Sage-Grouse protection priority habitat will be prepared by the proponent and implemented upon approval by the authorized officer. Within the Protection Priority Area surface-disturbing or disruptive activities will be restricted or prohibited within 6/10 of a mile from any existing surface-disturbing or disruptive activity. The plan shall address how short-term and long-term direct and indirect effects to important breeding (leks), nesting, brood-rearing, and wintering areas will be mitigated based on current science and research (Appendix E.5).

Objective: To protect the integrity of the habitat to maintain or improve Greater Sage-Grouse populations.

Exception: The authorized officer may grant an exception if an environmental review determines that the action as proposed or conditioned (such as exceeding the 6/10 of a mile surface-disturbing or disruptive activity restriction) would not compromise the functionality of the habitat for Greater Sage-Grouse and meet the objective for Greater Sage-Grouse habitat and populations.

Modification: The authorized officer may modify the area subject to the stipulation if an environmental analysis finds that a portion of the Protection Priority Area is no longer Greater Sage-Grouse habitat and supports no Greater Sage-Grouse populations.

Waiver: This stipulation may be waived, if it is determined that Greater Sage-Grouse populations no longer occupy significant portions of the Protection Priority Area and there is no reasonable likelihood of functional Greater Sage-Grouse habitat being restored.

Resource: Greater Sage-Grouse Winter Range – Timing Limitation

Stipulation: Surface occupancy and use is prohibited from December 1 through May 15 in Greater Sage-Grouse winter range.

Objective: To protect Greater Sage-Grouse winter range from disturbance during the winter season and to facilitate long-term maintenance of wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable winter range. The dates for the timing restriction may be modified if new wildlife use information indicates that the dates are not valid for the leasehold. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains viable winter range.

Resource: Interior Least Tern – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of interior least tern occupied habitat.

Objective: To protect and maintain habitat needed to support regional interior least tern populations.

Exception: An exception to this stipulation may be granted if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting interior least tern occupied habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with USFWS, determines that portions of the area can be occupied without adversely affecting interior least tern occupied habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold can be occupied without adversely affecting interior least tern occupied habitat.

Resource: Mountain Plover – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within mountain plover habitat.

Objective: To protect mountain plover habitat and to maintain mountain plover populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting mountain plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting mountain plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer mountain plover habitat.

Resource: Mountain Plover – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of mountain plover habitat from April 1 through July 31.

Objective: To protect mountain plover habitat and to maintain mountain plover populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting mountain plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting mountain plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer mountain plover habitat.

Resource: Peregrine Falcon – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of peregrine falcon nest sites that were active within the past 7 years.

Objective: To maintain the reproductive potential of peregrine falcon nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts to peregrine falcons from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of peregrine falcon nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains habitat for peregrine falcon nest sites.

Resource: Piping Plover – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of piping plover habitat.

Objective: To protect piping plover habitat and to maintain regional piping plover populations.

Exception: An exception to this stipulation may be granted if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting piping plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with USFWS, determines that portions of the area can be occupied without adversely affecting piping plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold is no longer piping plover habitat.

Resource: Raptors – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of raptor nest sites that were active within the past 7 years.

Objective: To maintain the reproductive potential of raptor nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts to raptors from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains habitat for raptor nest sites.

Resource: Raptors – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of active raptor nest sites from March 1 through July 31.

Objective: To maintain the reproductive potential of raptor nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains a raptor nest or has a nest that has not been active in 7 years.

Resource: Sharp-tailed Grouse Leks – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of sharp-tailed grouse leks.

Objective: To protect sharp-tailed grouse leks to maintain sharp-tailed grouse populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting sharp-tailed grouse leks. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains sharp-tailed grouse leks.

Resource: Sharp-tailed Grouse Nesting Habitat – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of sharp-tailed grouse leks from March 15 through June 30.

Objective: To protect sharp-tailed grouse nesting habitat necessary for long-term maintenance of sharp-tailed grouse populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the sharp-tailed grouse populations. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains sharp-tailed grouse nesting habitat.

Resource: Special Status Species – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of essential habitat of special status species unless other species-specific stipulations apply.

Objective: To protect special status species habitat and to maintain regional wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting special status species habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer special status species habitat.

Resource: Winter Range – Timing Limitation

Stipulation: Surface occupancy and use is prohibited from December 1 through May 15 in big game and Greater Sage-Grouse winter range.

Objective: To protect big game and Greater Sage-Grouse winter range from disturbance during the winter season and facilitate long-term maintenance of wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable winter range. The dates for the timing restriction may be modified if new wildlife use information indicates that the dates are not valid for the leasehold. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains viable winter range.

Alternative D

Oil and Gas Lease Stipulations

Resource: National Register of Historic Places (NRHP) Eligible Properties/Districts – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the boundaries of cultural properties and archaeological/historic districts determined to be eligible or potentially eligible to the National Register of Historic Places. This includes cultural properties designated for conservation use, scientific use, traditional use, public use, and experimental use.

Objective: To protect significant cultural properties and archaeological districts and their settings, and to avoid disturbance or inadvertent impacts to these resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Cultural Resource Survey

Stipulation: An inventory of those portions of the leased lands subject to proposed disturbance may be required prior to any surface disturbance to determine if cultural resources are present and to identify needed mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator shall:

1. The lessee or operator shall engage the services of a cultural resource consultant acceptable to the Surface Management Agency (SMA) to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the standard ten-acre minimum to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.

2. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited. The lessee or operator shall immediately bring to the attention of the SMA any cultural resources discovered as a result of approved operations under this lease, and shall not disturb such discoveries until directed to proceed by the SMA.

Objective: Compliance with Section 106 of the National Historic Preservation Act is required for all actions which may affect cultural properties eligible to the National Register of Historic Places. Section 6 of the Oil and Gas Lease Terms (Form 3100-11) requires that operations be conducted in a manner that minimizes adverse impacts to cultural and other resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Cultural Resources and Tribal Consultation

Stipulation: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any surface-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect significant historic properties and resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: National Park Service Bear Paw Battlefield – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited in the parcel adjacent to the Bear Paw Battlefield identified as T30N, R19E, Sec. 12, SW1/4NE1/4.

Objective: To avoid disturbance and to protect archaeological properties of the Bear Paw Battlefield.

Exception: None.

Modification: None.

Waiver: None.

Resource: Paleontological Resources – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within designated paleontological sites/locales.

Objective: To preserve and protect significant vertebrate fossils and paleontological locales.

Exception: The authorized officer may grant an exception if the lessee or operator submits a plan which demonstrates that the adverse impacts to significant paleontological resources can be mitigated through recovery and extensive recordation. Where impacts to paleontological resources cannot be mitigated to the satisfaction of the surface management agency (SMA), surface occupancy on that area must be prohibited.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the designated paleontological site/locale can be occupied without adversely affecting the resource values.

Waiver: None.

Resource: Paleontological Resource Inventory

Stipulation: Prior to any surface-disturbing activity in areas known to have a high potential (Class 4 and 5) for containing significant paleontological resources, the lessee shall be required to conduct a

paleontological inventory. The lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency (SMA), to conduct the inventory. An acceptable inventory report is to be submitted to the SMA for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: To preserve and protect scientifically significant vertebrate fossils and paleontological locales.

Exception: An exception may be granted if the area has already been inventoried for paleontological resources.

Modification: None.

Waiver: None.

Resource: Recreation Sites – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 300 feet of recreation sites.

Objective: To recognize and protect the public's opportunity for quality recreation experiences at those sites developed for that purpose. Since BLM recreation sites are generally developed to support the use of the surrounding lands, the 300 feet provides protection for perpetuating those opportunities for which the site was developed, reduces the visual intrusion and noise, and protects capital investments at the site.

Exception: The authorized officer may grant an exception if a site is moved or eliminated.

Modification: The list of recreation sites may be modified if a site is removed, or if a site is developed in the future.

Waiver: A waiver may be granted if a site is moved or eliminated.

Resource: National Historic Trails – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 300 feet of designated National Historic Trails. Designated National Historic Trails include the Lewis and Clark Trail and the Nez Perce Trail.

Objective: To preserve and protect designated National Historic Trails and the natural setting in which they occur.

Exception: The authorized officer may grant an exception if the operator submits a plan demonstrating that impacts to the area and its users can be adequately mitigated.

Modification: No modifications will be granted unless effects of the action will not be apparent to users along the trail.

Waiver: A waiver may be granted if impacts can be mitigated so that area values and user experiences are not negatively affected.

Resource: Residential Structures – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 300 feet of residential structures.

Objective: To ensure a proper distance between development and human occupation for health and safety purposes.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the public's health and safety.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the public's health and safety.

Resource: Big Bend of the Milk River ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Big Bend of the Milk River ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Frenchman Breaks ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Frenchman Breaks ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Kevin Rim ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Kevin Rim ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Little Rocky Mountains ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Little Rocky Mountains ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Malta Geological ACEC – Controlled Surface Use

Stipulation: Prior to any surface-disturbing activity in the Malta Geological ACEC the lessee shall be required to conduct a paleontological inventory. The lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency, to conduct the inventory. An acceptable inventory report is to be submitted to the BLM for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Mountain Plover ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Mountain Plover ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Sweet Grass Hills ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Sweet Grass Hills ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Woody Island ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Woody Island ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Water, Riparian, Wetland, and Floodplains – Controlled Surface Use

Stipulation: Surface occupancy and use may be controlled or excluded within and 300 feet from lentic or lotic riparian areas.

Objective: To maintain riparian/wetland functions and water quality.

Exception: An exception to this stipulation may be granted by the authorized officer if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the riparian/wetland resource.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the riparian/wetland resource.

Resource: Bald Eagle – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of bald eagle nest sites, active within the last 7 years, from January 1 through August 31.

Objective: To protect bald eagle nesting sites and/or breeding habitat in accordance with the Montana Bald Eagle Management Plan.

Exception: The authorized officer may grant an exception if the operator submits a plan which demonstrates that the proposed action will not affect the bald eagle or its habitat. If the authorized officer determines that the action may have an adverse effect, the operator may submit a plan demonstrating that the impacts can be adequately mitigated. This plan must be approved by the BLM.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting areas. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting bald eagle nest sites or nesting habitat.

Resource: Bighorn Sheep Lambing – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within bighorn sheep lambing areas from May 1 through June 30.

Objective: To protect bighorn sheep lambing areas from disturbance and facilitate long-term maintenance of wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain lambing habitat for bighorn sheep.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains bighorn sheep lambing areas.

Resource: Black-footed Ferret – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within black-footed ferret habitat.

Objective: To protect black-footed ferret habitat for long-term maintenance of regional black-footed ferret populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting black-footed ferret habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold is no longer considered black-footed ferret habitat.

Resource: Black-tailed Prairie Dog – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within black-tailed prairie dog habitat.

Objective: To protect prairie dog towns necessary for long-term maintenance of black-tailed prairie dog populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting prairie dog habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold is no longer considered prairie dog habitat.

Resource: Colonial Waterbirds – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of a waterbird nesting colony.

Objective: To protect colonial waterbird nesting sites and to maintain regional colonial waterbird populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting waterbird nesting colonies.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting nesting waterbirds.

Resource: Colonial Waterbirds – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of a waterbird nesting colony from April 1 through July 15.

Objective: To protect colonial waterbirds and to maintain colonial waterbird populations.

Exception: An exception to this stipulation may be granted if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting nesting waterbirds.

Resource: Crucial Winter Range – Controlled Surface Use

Stipulation: Surface-disturbing or disruptive activities within crucial big game and Greater Sage-Grouse winter range would require a plan to maintain functionality of habitat and avoid or minimize habitat loss. This plan would limit the number of disturbed areas (well pads) within crucial winter range to less than 2 well disturbances per 640 acres of crucial winter range. The plan would need to be approved by the authorized officer.

Objective: To protect big game and Greater Sage-Grouse crucial winter range from disturbance and facilitate long-term maintenance of those wildlife populations utilizing crucial winter ranges.

Exception: An exception to this stipulation may be granted by the authorized officer if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable crucial winter range.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains viable crucial winter range.

Resource: Endangered Species Act Section 7 Consultation

Stipulation: This lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid a BLM-approved activity that will contribute to a need to list such species or their habitat. The BLM may require modifications to or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any surface-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. §1531 *et seq.*, including completion of any required procedure for conference or consultation.

Objective: To protect threatened, endangered species, or special status species.

Exception: None.

Modification: None.

Waiver: None.

Resource: Greater Sage-Grouse Leks (General Habitat Areas) – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 6/10 of a mile from Greater Sage-Grouse leks.

Objective: To protect Greater Sage-Grouse leks to maintain Greater Sage-Grouse populations.

Exception: The authorized officer, in consultation with MFWP, may grant an exception if portions of the area can be occupied without adversely affecting Greater Sage-Grouse leks.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with MFWP, determines that portions of the area can be occupied without adversely affecting Greater Sage-Grouse leks. The authorized officer, in consultation with MFWP, may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with MFWP, determines that the entire leasehold is no longer capable of supporting Greater Sage-Grouse leks.

Resource: Greater Sage-Grouse Nesting Habitat (General Habitat Areas) – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1 mile of Greater Sage-Grouse nesting habitat from March 1 through June 15.

Objective: To protect Greater Sage-Grouse nesting habitat necessary for long-term maintenance of regional Greater Sage-Grouse populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the Greater Sage-Grouse populations.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting Greater Sage-Grouse habitat/populations.

Resource: Greater Sage-Grouse Winter Range – Timing Limitation

Stipulation: Surface occupancy and use is prohibited from December 1 through March 31 in Greater Sage-Grouse winter range.

Objective: To protect Greater Sage-Grouse winter range from disturbance during the winter season and to facilitate long-term maintenance of wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable winter range. The dates for the timing restriction may be modified if new wildlife use information indicates that the dates are not valid for the leasehold. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains viable winter range.

Resource: Interior Least Tern – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of interior least tern occupied habitat.

Objective: To protect and maintain habitat needed to support regional interior least tern populations.

Exception: An exception to this stipulation may be granted if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting interior least tern occupied habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with USFWS, determines that portions of the area can be occupied without adversely affecting interior least tern occupied habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold can be occupied without adversely affecting interior least tern occupied habitat.

Resource: Mountain Plover – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within mountain plover habitat.

Objective: To protect mountain plover habitat and to maintain mountain plover populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting mountain plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting mountain plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer mountain plover habitat.

Resource: Peregrine Falcon – Controlled Surface Use

Stipulation: Surface-disturbing or disruptive activities within 1/4 mile of peregrine falcon nests active within the past 7 years would require a plan to maintain the functionality of the nest, avoid or minimize habitat loss, and minimize disturbances to raptors. The plan would need to be approved by the authorized officer.

Objective: To maintain the reproductive potential of peregrine falcon nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains a peregrine falcon nest or has a nest that has not been active in 7 years.

Resource: Piping Plover – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of piping plover habitat from May 15 through July 31.

Objective: To protect piping plover habitat and to maintain regional piping plover populations.

Exception: An exception to this stipulation may be granted if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting piping plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with USFWS, determines that portions of the area can be occupied without adversely affecting piping plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold is no longer piping plover habitat.

Resource: Raptors – Controlled Surface Use

Stipulation: Surface-disturbing or disruptive activities within 1/4 mile of raptor nests active within the past 7 years would require a plan to maintain the functionality of the nest, avoid or minimize habitat loss, and minimize disturbances to raptors. The plan would need to be approved by the authorized officer.

Objective: To maintain the reproductive potential of raptor nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains a raptor nest or has a nest that has not been active in 7 years.

Resource: Raptors – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of active raptor nest sites from March 1 through July 31.

Objective: To maintain the reproductive potential of raptor nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains a raptor nest or has a nest that has not been active in 7 years.

Resource: Sharp-tailed Grouse Leks – Controlled Surface Use

Stipulation: Surface-disturbing or disruptive activities within 1/4 mile of sharp-tailed grouse leks would require a plan to maintain the functionality of the lek, avoid or minimize habitat loss, and minimize disturbances to sharp-tailed grouse. The plan would need to be approved by the authorized officer.

Objective: To protect sharp-tailed grouse leks to maintain regional sharp-tailed grouse populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting sharp-tailed grouse leks. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains sharp-tailed grouse leks.

Resource: Sharp-tailed Grouse Nesting Habitat – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of sharp-tailed grouse leks from March 15 through June 30.

Objective: To protect sharp-tailed grouse nesting habitat necessary for long-term maintenance of sharp-tailed grouse populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the sharp-tailed grouse populations. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains sharp-tailed grouse nesting habitat.

Resource: Special Status Species – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of essential habitat of special status species unless other species-specific stipulations apply.

Objective: To protect special status species habitat and to maintain regional wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting special status species habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer special status species habitat.

Resource: Winter Range – Timing Limitation

Stipulation: Surface occupancy and use is prohibited from December 1 through March 31 in big game and Greater Sage-Grouse winter range.

Objective: To protect big game and Greater Sage-Grouse winter range from disturbance during the winter season and facilitate long-term maintenance of wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable winter range. The dates for the timing restriction may be modified if new wildlife use information indicates that the dates are not valid for the leasehold. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains viable winter range.

Alternative E (Preferred Alternative)

Oil and Gas Lease Stipulations

Resource: Air Resource Protection – Controlled Surface Use

Stipulation: Surface occupancy or use is subject to the following special operating constraint:

Ensure that each diesel-fueled nonroad engine with greater than 200 horsepower (hp) design rating to be used during drilling or completion activities meets one of the following two criteria: (1) the engine was manufactured to meet U.S. Environmental Protection Agency (EPA) nitrogen oxides (NO_x) emission standards for Tier 4 nonroad diesel engines, or (2) the engine emits NO_x at rates less than or equal to EPA emission standards for Tier 4 nonroad diesel engines.

Objective: To protect air resources and ensure compliance with the 1-hour nitrogen dioxide (NO_2) National Ambient Air Quality Standard (NAAQS).

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes.

Exception: An exception may be granted by the authorized officer if air quality modeling, air quality monitoring, or other information demonstrates compliance with the 1-hour NO_2 NAAQS.

Modification: This stipulation may be modified if the EPA or the Montana Department of Environmental Quality (MDEQ) adds, deletes, or revises NO_x emission standards for drill rig, completion rig, or nonroad engines.

Waiver: The stipulation may be waived if air quality modeling, air quality monitoring, or other information demonstrates that all drilling and completion activity within the lease area will meet the 1-hour NO_2 NAAQS. The stipulation may also be waived if the 1-hour NO_2 NAAQS is revoked or otherwise rendered inapplicable to drilling/completion operations.

Resource: National Register of Historic Places (NRHP) Eligible Properties/Districts – No Surface Occupancy

Stipulation: Occupancy and use is prohibited within the boundaries of cultural properties and archaeological/ historic districts determined to be eligible or potentially eligible to the National Register of Historic Places.

Objective: To protect significant cultural properties and archaeological districts and their settings, and to avoid disturbance or inadvertent impacts to these resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Cultural Resource Survey

Stipulation: An inventory of those portions of the leased lands subject to proposed disturbance may be required prior to any surface disturbance to determine if cultural resources are present and to identify needed

mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator shall:

1. Engage the services of a cultural resource consultant acceptable to the Surface Management Agency (SMA) to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the standard ten-acre minimum to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.

2. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited. The lessee or operator shall immediately bring to the attention of the SMA any cultural resources discovered as a result of approved operations under this lease, and shall not disturb such discoveries until directed to proceed by the SMA.

Objective: Compliance with Section 106 of the National Historic Preservation Act is required for all actions which may affect cultural properties eligible to the National Register of Historic Places. Section 6 of the Oil and Gas Lease Terms (Form 3100-11) requires that operations be conducted in a manner that minimizes adverse impacts to cultural and other resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: Cultural Resources and Tribal Consultation

Stipulation: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any surface-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect significant historic properties and resources.

Exception: None.

Modification: None.

Waiver: None.

Resource: National Park Service Bear Paw Battlefield – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited in the parcel adjacent to the Bear Paw Battlefield identified as T30N, R19E, Sec. 12, SW1/4NE1/4.

Objective: To avoid disturbance and to protect archaeological properties of the Bear Paw Battlefield.

Exception: None.

Modification: None.

Waiver: None.

Resource: Paleontological Resources – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within designated paleontological sites/locales.

Objective: To preserve and protect significant vertebrate fossils and paleontological locales.

Exception: The authorized officer may grant an exception if the lessee or operator submits a plan which demonstrates that the adverse impacts to significant paleontological resources can be mitigated through recovery and extensive recordation. Where impacts to paleontological resources cannot be mitigated to the satisfaction of the surface management agency (SMA), surface occupancy on that area must be prohibited.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the designated paleontological site/locale can be occupied without adversely affecting the resource values.

Waiver: None.

Resource: Paleontological Resource Inventory

Stipulation: Prior to any surface-disturbing activity in areas known to have a high potential (Class 4 and 5) for containing significant paleontological resources, the lessee shall be required to conduct a paleontological inventory. The lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency (SMA), to conduct the inventory. An acceptable inventory report is to be submitted to the SMA for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: To preserve and protect scientifically significant vertebrate fossils and paleontological locales.

Exception: The authorized officer may grant an exception if the area has already been inventoried for paleontological resources.

Modification: None.

Waiver: None.

Resource: Recreation Sites – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within and 500 feet from recreation sites.

Objective: To recognize and protect the public's opportunity for quality recreation experiences at those sites developed for recreation. Since BLM recreation sites are generally developed to support the use of the surrounding lands, 500 feet provides protection for perpetuating those opportunities for which the site was developed, reduces the visual intrusion and noise, and protects capital investments at the site.

Exception: The authorized officer may grant an exception if a site is moved or eliminated.

Modification: The list of recreation sites may be modified if a site is removed, or if a site is developed in the future.

Waiver: A waiver may be granted if a site is moved or eliminated.

Resource: National Historic Trails – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the National Trail Management Corridor of designated National Historic Trails. Designated National Historic Trails include the Lewis and Clark Trail and the Nez Perce Trail.

Objective: To protect the nature and purposes; trail resources, qualities, values and associated settings; and primary use or uses of the historic trail, in accordance with the National Trails System Act.

Exception: The authorized officer may grant an exception when the operator submits a comprehensive trail inventory, as outlined in Manual 6280, and presents a proposal which demonstrates resource values are not affected or that adverse impacts can be adequately mitigated to prevent impacts to:

- the nature and purposes of the National Trail,
- National Trail resources, qualities, values, and associated settings.
- National Trail primary use or uses.
- the National Trail from the cumulative or trailwide perspective.

Modification: None.

Waiver: None.

Resource: Residential Structures – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within and 500 feet of incorporated city limits or occupied dwellings.

Objective: To ensure a proper distance between development and human occupation for health and safety purposes; 500 feet provides for reduced visual intrusion, noise, traffic, and dust.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the public's health and safety.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the public's health and safety.

Resource: Soils – Sensitive Soils – Controlled Surface Use

Stipulation: Surface occupancy and use will be controlled on sensitive soils. Sensitive soils are determined using a combination of slope and soil erodibility. Prior to surface disturbance on sensitive soils, a reclamation plan must be approved by the administrative officer. The plan must demonstrate the following: (1) no other practicable alternatives exist for relocating the activity, (2) the activity will be located to reduce impacts to soil and water resources, (3) site productivity will be maintained or restored, (4) surface runoff and sedimentation will be adequately controlled, (5) on- and off-site areas will be protected

from accelerated erosion, (6) that no areas susceptible to mass wasting would be disturbed and (7) surface-disturbing activities will be prohibited during extended wet periods.

Objective: To maintain the chemical, physical, and biotic properties of soils, this includes maintaining soil productivity, soil stability, and soil biotic properties. This will prevent excessive erosion, potential mass wasting, and improve the likelihood of successful reclamation.

Exception: The administrative officer may grant an exception to this stipulation if the operator can demonstrate that the proposed action will not contribute to degradation of the soil resource (e.g., excessive soil erosion, mass wasting, and/or lost productivity) or downslope resource conditions (e.g., reduced water quality due to sedimentation).

Modification: The administrative officer may modify the area affected by this stipulation if it is determined that portions of the leasehold do not contain sensitive soils.

Waiver: The administrative officer may waive this stipulation if it is determined that the entire leasehold does not contain sensitive soils.

Resource: Soils – Badlands, Rock Outcrop – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited on badlands and rock outcrop.

Objective: To prevent excessive soil erosion and to avoid disturbing areas subject to potential reclamation problems.

Exception: The authorized officer may not grant exceptions to this stipulation.

Modification: The authorized officer may modify the area affected by this stipulation if it is determined that portions of the leasehold do not include these types of areas.

Waiver: The authorized officer may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Resource: Big Bend of the Milk River ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Big Bend of the Milk River ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Frenchman Breaks ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Frenchman Breaks ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Kevin Rim ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Kevin Rim ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: None.

Modification: None.

Waiver: None.

Resource: Malta Geological ACEC – Controlled Surface Use

Stipulation: Prior to any surface-disturbing activity in the Malta Geological ACEC the lessee shall be required to conduct a paleontological inventory. The lessee must engage the services of a qualified paleontologist, acceptable to the surface management agency (SMA), to conduct the inventory. An acceptable inventory report is to be submitted to the SMA for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Woody Island ACEC – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within the Woody Island ACEC.

Objective: To provide the protection needed in order to preserve the qualities that prompted the BLM to designate this area as an ACEC.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the qualities of the ACEC.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold can be occupied without adversely affecting the qualities of the ACEC.

Resource: Visual Resources – Controlled Surface Use

Stipulation: In order to retain the existing character of the landscape (VRM Class II Objective), oil and gas development activities will be located, designed, constructed, operated, and reclaimed so that activities should not attract attention to the casual observer within 2 years from initiation of construction. This stipulation does not apply to the operation and maintenance activities.

Objective: To protect visual resource values while allowing energy development and related activities to occur that have been mitigated to retain the character of the existing area.

Exception: None.

Modification: None.

Waiver: None.

Resource: Water, Riparian, Wetland, and Floodplains – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas.

Objective: To protect the unique biological and hydrological features associated with perennial or intermittent streams, lakes, ponds, reservoirs, floodplains, wetlands, and riparian areas.

Exception: No exceptions would be allowed in streams, natural lakes, or wetlands. An exception may be granted by the authorized officer for riparian areas, floodplains, and artificial ponds or reservoirs if the operator can demonstrate that: (1) there are no practicable alternatives to locating facilities in these areas, (2) the proposed actions would maintain or enhance resource functions, and (3) all reclamation goals and objectives would be met.

Modification: The authorized officer may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include these types of areas.

Waiver: The authorized officer may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Resource: Source Water Protection Areas – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within State-designated Source Water Protection Areas.

Objective: To protect human health by minimizing the potential contamination of public water systems. Source water is untreated water from streams, rivers, lakes, or aquifers used to supply public water systems. Ensuring that source water is protected from contamination can reduce the costs of treatment and risks to public health. This stipulation would protect the State-designated Source Water Protection Areas that protect public water systems from potential contamination.

Exception: The authorized officer may not grant exceptions to this stipulation.

Modification: The authorized officer may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include Source Water Protection Areas.

Waiver: The authorized officer may waive this stipulation if it is determined that the entire leasehold does not include Source Water Protection Areas.

Resource: Water, Riparian, and Wetlands – Controlled Surface Use

Stipulation: Surface occupancy and use would be controlled within 300 feet of riparian and/or wetland areas. Surface-disturbing activities would require a plan with design features that demonstrate how all actions would maintain and/or improve the functionality of riparian/wetland areas. The plan will address: (a) potential impacts to riparian and wetland resources, (b) mitigation to reduce impacts to acceptable levels (including timing restrictions), (c) post project restoration, and (d) monitoring (the operator must conduct monitoring capable of detecting early signs of changing riparian and/or wetland conditions).

Objective: To protect the unique biological and hydrological features associated with wetland and riparian areas. Disturbances adjacent to wetland and/or riparian areas (including road use) can adversely impact these sensitive areas. This stipulation would protect these features from indirect effects produced within the adjacent ground. This would also encompass the floodplain along most first to third order streams.

Exception: The authorized officer may grant an exception to this stipulation if the operator can demonstrate that the proposed action would not adversely impact wetland or riparian function or associated water quality.

Modification: The area affected by this stipulation can be modified by the authorized officer if it is determined that portions of the lease area do not contain wetlands or riparian areas.

Waiver: This stipulation can be waived by the authorized officer if it is determined that the entire lease area does not contain wetlands or riparian areas.

Resource: Eastern Breaks and Badlands – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within areas that are managed to protect wilderness characteristics.

Objective: To protect wilderness characteristics as a priority over other multiple uses.

Exception: None.

Modification: None.

Waiver: None.

Resource: Bald Eagle – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of bald eagle nest sites that were active within the preceding 5 breeding seasons.

Objective: To protect bald eagle nesting sites and/or breeding habitat in accordance with the Montana Bald Eagle Management Plan.

Exception: The authorized officer may grant an exception if the operator submits a plan which demonstrates that the proposed action will not affect the bald eagle or its habitat. If the authorized officer determines that the action may have an adverse effect, the operator may submit a plan demonstrating that the impacts can be adequately mitigated. This plan must be approved by the BLM.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting areas. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting bald eagle nest sites or nesting habitat.

Resource: Bighorn Sheep Lambing – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within bighorn sheep lambing areas.

Objective: To protect bighorn sheep lambing areas from disturbance and to facilitate long-term maintenance of bighorn sheep populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain lambing habitat for bighorn sheep.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains bighorn sheep lambing areas.

Resource: Bighorn Sheep Range – Controlled Surface Use

Stipulation: Prior to surface-disturbing or disruptive activities a plan to maintain bighorn sheep habitat will be prepared by the proponent and implemented upon approval by the authorized officer. This plan shall address how short-term and long-term direct and indirect effects to bighorn sheep range will be mitigated based on current science and research (Appendix E.5).

Objective: To protect bighorn sheep habitat and populations from disturbance and to facilitate long-term maintenance of bighorn sheep populations.

Exception: The authorized officer may grant an exception if an environmental review determines that the action, as proposed or conditioned, would not compromise the functionality of the habitat for bighorn sheep.

Modification: The authorized officer may modify the area subject to the stipulation if an environmental analysis finds that a portion of the area is no longer bighorn sheep habitat and supports no bighorn sheep populations. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived, if it is determined that bighorn sheep populations no longer occupy significant portions of the area and there is no reasonable likelihood of functional bighorn sheep habitat being restored.

Resource: Black-footed Ferret – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of black-footed ferret habitat.

Objective: To protect black-footed ferret habitat for long-term maintenance of black-footed ferret populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting black-footed ferret habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold is no longer considered black-footed ferret habitat.

Resource: Black-tailed Prairie Dog – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of black-tailed prairie dog habitat.

Objective: To protect prairie dog towns necessary for long-term maintenance of black-tailed prairie dog populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting prairie dog habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold is no longer considered prairie dog habitat.

Resource: Colonial Waterbirds – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of a waterbird nesting colony.

Objective: To protect colonial waterbird nesting sites and to maintain regional colonial waterbird populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting waterbird nesting colonies.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting nesting waterbirds.

Resource: Colonial Waterbirds – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of a waterbird nesting colony from April 1 through July 15.

Objective: To protect colonial waterbirds and to maintain colonial waterbird populations.

Exception: An exception to this stipulation may be granted if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting waterbird nesting colonies. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer capable of supporting nesting waterbirds.

Resource: Crucial Winter Range – Controlled Surface Use

Stipulation: Prior to surface-disturbing or disruptive activities a plan to maintain functionality of crucial winter range for big game and/or Greater Sage-Grouse will be prepared by the proponent and implemented upon approval by the authorized officer. Within crucial winter range surface-disturbing or disruptive activities will be restricted or prohibited within 6/10 of a mile from any existing surface-disturbing or disruptive activity. The plan shall address how short-term and long-term direct and indirect effects to crucial winter range will be mitigated based on current science and research (Appendix E.5).

Objective: To protect big game and Greater Sage-Grouse crucial winter range from loss and degradation, and to facilitate long-term sustainability of those wildlife populations utilizing crucial winter ranges by minimizing mortality of animals through disturbance and disruption.

Exception: The authorized officer may grant an exception if an environmental review determines that the action as proposed or conditioned (such as exceeding the 6/10 of a mile surface-disturbing or disruptive activity restriction) would not compromise the functionality of the crucial winter range.

Modification: The authorized officer may modify the area subject to the stipulation if an environmental analysis finds that a portion of the area no longer contains crucial winter range and populations of wintering animals no longer occupy the area. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived, if it is determined that wintering animals no longer occupy significant portions of the area and there is no reasonable likelihood of future use as crucial winter range.

Resource: Endangered Species Act Section 7 Consultation

Stipulation: This lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid a BLM-approved activity that will contribute to a need to list such species or their habitat. The BLM may require modifications to or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any surface-disturbing activity that may affect any such species or critical habitat until it completes its

obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. §1531 *et seq.*, including completion of any required procedure for conference or consultation.

Objective: To protect threatened, endangered species, or special status species.

Exception: None.

Modification: None.

Waiver: None.

Resource: Grassland Bird/Greater Sage-Grouse Priority Habitat Management Area – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within Grassland Bird/Greater Sage-Grouse Priority Habitat Management Area.

Objective: To protect and maintain regional grassland bird populations.

Exception: The Authorized Officer may grant an exception to a fluid mineral lease NSO stipulation only where the proposed action:

(i) would not have direct, indirect, or cumulative effects on Greater Sage-Grouse or its habitat; or,

(ii) is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and would provide a clear conservation gain to Greater Sage-Grouse.

Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP revision. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers, sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts.

Any exceptions to this lease stipulation may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action satisfies (i) or (ii). Such finding shall initially be made by a team of one field biologist or other Greater Sage-Grouse expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM State Director, USFWS State Ecological Services Director, and state wildlife agency head for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publically available at least quarterly.

Modification: **None.**

Waiver: **None.**

Resource: Greater Sage-Grouse Leks (General Habitat Areas) – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 0.6 miles of Greater Sage-Grouse leks. This stipulation does not apply within the boundaries of the Greater Sage-Grouse Priority Habitat Management Area.

Objective: To protect Greater Sage-Grouse leks to maintain Greater Sage-Grouse populations.

Exception: The authorized officer, in consultation with Montana Fish, Wildlife and Parks (MFWP), may grant an exception if portions of the area can be occupied without adversely affecting Greater Sage-Grouse leks.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with MFWP, determines that portions of the area can be occupied without adversely affecting Greater Sage-Grouse leks. The authorized officer, in consultation with MFWP, may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with MFWP, determines that the entire leasehold is no longer capable of supporting Greater Sage-Grouse leks.

Resource: Greater Sage-Grouse Nesting Habitat (General Habitat Areas) – Controlled Surface Use

Stipulation: Within Greater Sage-Grouse general habitat surface-disturbing or disruptive activities may be restricted or prohibited within 2 miles of Greater Sage-Grouse leks. Prior to surface-disturbing or disruptive activities a plan to maintain functionality of Greater Sage-Grouse habitat will be prepared by the proponent and implemented upon approval by the authorized officer. This plan shall address how short-term and long-term direct and indirect effects to nesting and brood-rearing areas will be mitigated based on current science and research (Appendix E.5).

Objective: To protect the integrity of the habitat to maintain or improve Greater Sage-Grouse populations.

Exception: The authorized officer may grant an exception if an environmental review determines that the action, as proposed or conditioned, would not compromise the functionality of the habitat for Greater Sage-Grouse and would meet the objective for Greater Sage-Grouse habitat and populations.

Modification: The authorized officer may modify the area subject to the stipulation if an environmental analysis finds that a portion of the area is no longer Greater Sage-Grouse habitat and supports no Greater Sage-Grouse populations.

Waiver: This stipulation may be waived if it is that Greater Sage-Grouse populations no longer occupy significant portions of the area and there is no reasonable likelihood of functional Greater Sage-Grouse habitat being restored.

Resource: Greater Sage-Grouse Priority Habitat Management Area – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within Greater Sage-Grouse Priority Habitat Management Area.

Objective: To protect the integrity of the habitat to maintain or improve Greater Sage-Grouse populations.

Exception: The Authorized Officer may grant an exception to a fluid mineral lease NSO stipulation only where the proposed action:

(i) would not have direct, indirect, or cumulative effects on Greater Sage-Grouse or its habitat; or,

(ii) is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and would provide a clear conservation gain to Greater Sage-Grouse.

Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP revision. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers,

sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts.

Any exceptions to this lease stipulation may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action satisfies (i) or (ii). Such finding shall initially be made by a team of one field biologist or other Greater Sage-Grouse expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM State Director, USFWS State Ecological Services Director, and state wildlife agency head for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publically available at least quarterly.

Modification: **None.**

Waiver: **None.**

Resource: Greater Sage-Grouse Winter Range – Timing Limitation

Stipulation: Surface occupancy and use is prohibited from December 1 through March 31 in Greater Sage-Grouse winter range.

Objective: To protect Greater Sage-Grouse winter range from disturbance during the winter season and to facilitate long-term maintenance of wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable winter range. The dates for the timing restriction may be modified if new wildlife use information indicates that the dates are not valid for the leasehold. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains viable winter range.

Resource: Interior Least Tern – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of interior least tern occupied habitat.

Objective: To protect and maintain habitat needed to support regional interior least tern populations.

Exception: An exception to this stipulation may be granted if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting interior least tern occupied habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with USFWS, determines that portions of the area can be occupied without adversely affecting interior least tern occupied habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold can be occupied without adversely affecting interior least tern occupied habitat.

Resource: Mountain Plover – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within mountain plover habitat.

Objective: To protect mountain plover habitat and to maintain mountain plover populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting mountain plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting mountain plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer mountain plover habitat.

Resource: Mountain Plover – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of mountain plover habitat from April 1 through July 15.

Objective: To protect mountain plover habitat and to maintain mountain plover populations.

Exception: The authorized officer may grant an exception if portions of the area can be occupied without adversely affecting mountain plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting mountain plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold is no longer mountain plover habitat.

Resource: Pallid Sturgeon – Controlled Surface Use

Stipulation: Prior to surface-disturbing or disruptive activities occurring in or within 1/2 mile of river or stream shorelines identified as pallid sturgeon habitat, a plan to maintain pallid sturgeon habitat would be prepared by the proponent and implemented upon approval by the authorized officer.

Objective: To protect and maintain habitat needed to support pallid sturgeon populations.

Exception: An exception to this stipulation may be granted if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting pallid sturgeon habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with USFWS, determines that portions of the area can be occupied without adversely affecting pallid sturgeon habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold can be occupied without adversely affecting pallid sturgeon habitat.

Resource: Peregrine Falcon – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1 mile of peregrine falcon nest sites active within the preceding 7 breeding seasons.

Objective: To maintain the reproductive potential of raptor nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts to raptors from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains habitat for raptor nest sites.

Resource: Piping Plover – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of piping plover habitat.

Objective: To protect piping plover habitat and to maintain regional piping plover populations.

Exception: An exception to this stipulation may be granted if the authorized officer, in consultation with the U.S. Fish and Wildlife Service (USFWS), determines that portions of the area can be occupied without adversely affecting piping plover habitat.

Modification: The boundaries of the stipulated area may be modified if the authorized officer, in consultation with USFWS, determines that portions of the area can be occupied without adversely affecting piping plover habitat. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer, in consultation with USFWS, determines that the entire leasehold is no longer piping plover habitat.

Resource: Raptors – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of raptor nest sites that were active within the past 7 years.

Objective: To maintain the reproductive potential of raptor nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts to raptors from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains habitat for raptor nest sites.

Resource: Raptors – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of active raptor nest sites from March 1 through July 31.

Objective: To maintain the reproductive potential of raptor nest sites.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the production potential of raptor nest sites. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains a raptor nest or has a nest that has not been active in 7 years.

Resource: Sharp-tailed Grouse Leks – No Surface Occupancy

Stipulation: Surface occupancy and use is prohibited within 1/4 mile of sharp-tailed grouse leks.

Objective: To protect sharp-tailed grouse leks and to maintain sharp-tailed grouse populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting sharp-tailed grouse leks. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: The stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains sharp-tailed grouse leks.

Resource: Sharp-tailed Grouse Nesting Habitat – Timing Limitation

Stipulation: Surface occupancy and use is prohibited within 1/2 mile of sharp-tailed grouse leks from March 15 through June 30.

Objective: To protect sharp-tailed grouse nesting habitat necessary for long-term maintenance of sharp-tailed grouse populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area can be occupied without adversely affecting the sharp-tailed grouse populations. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains sharp-tailed grouse nesting habitat.

Resource: Sprague's Pipit – Timing Limitation

Stipulation: Surface occupancy and use is prohibited from April 15 through July 15 in Sprague's pipit habitat.

Objective: To protect Sprague's pipit habitat necessary for long-term maintenance of Sprague's pipit populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain Sprague's pipit habitat. The dates for the timing restriction may be modified if new wildlife use information indicates that the dates are not valid for the leasehold. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains Sprague's pipit habitat.

Resource: Winter Range – Timing Limitation

Stipulation: Surface occupancy and use is prohibited from December 1 through May 15 in big game winter range.

Objective: To protect big game and Greater Sage-Grouse winter range from disturbance during the winter season and to facilitate long-term maintenance of wildlife populations.

Exception: The authorized officer may grant an exception if the operator submits a plan that demonstrates the impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified if the authorized officer determines that portions of the area no longer contain viable winter range. The dates for the timing restriction may be modified if new wildlife use information indicates that the dates are not valid for the leasehold. The authorized officer may also modify the size and shape of the area based on studies documenting actual habitat suitability and/or local periods of actual use.

Waiver: This stipulation may be waived if the authorized officer determines that the entire leasehold no longer contains viable winter range.

Appendix E
Fluid Minerals

E.5: Requirements and/or Guidelines for Wildlife Controlled Surface Use Stipulations

Plans that are required by controlled surface use (CSU) stipulations for bighorn sheep range, crucial winter range, and Greater Sage-Grouse habitat will be subject to guidance presented in Appendices C and M and the following requirements and/or guidelines. These requirements and guidelines may be modified based on the best available science and research, and best management practices.

The plan shall address:

- Mitigation or methods that would be used to abate continuous noise (related to long-term operations and/or activities) or temporary noise (related to installation, maintenance, one-time use, emergency operations, etc.) to minimize disruption to wildlife.
- The management of water developments to reduce the spread of West Nile virus within Greater Sage-Grouse habitat areas.
- The placement of linear rights-of-way to reduce disturbance to wildlife.
- The placement of new utility developments (powerlines, pipelines, etc.) and transportation routes in a manner that does not impact wildlife such as through eliminating the need for powerlines or burying powerlines.
- The design and placement of high profile structures exceeding 10 feet in height in a manner that does not impact wildlife.
- The reduction of the frequency of human visitation at wells sites such as through remote monitoring of production facilities.
- Interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes to maximize the habitat restoration.
- Restoration of disturbed areas at final reclamation to pre-disturbance conditions or desired plant community.
- Placement of permanent (longer than 2 months) structures which create movement to minimize impacts to wildlife.
- A monitoring protocol.

The plan shall consider:

- The use of off-site mitigation, (e.g., creation of sagebrush habitat or conservation easements) with proponent dollars to offset habitat losses.
- The creation of a "*Mitigation Trust Account*" when impacts cannot be avoided, minimized, or effectively mitigated through other means. If approved by the BLM, the proponent may contribute funding to maintain habitat function based on the estimated cost of habitat treatments or other mitigation needed to maintain the functions of impacted habitats. Off-site mitigation should only be considered when no feasible options are available to adequately mitigate within and immediately adjacent to the impacted site, or when the off-site location would provide more effective mitigation of the impact than can be achieved on-site.

Appendix F
Land Ownership Adjustment

F.1 Land Ownership Adjustment Criteria

Land Ownership Adjustments

Management of land ownership adjustments will be based on three categories of BLM land as described below.

- ***Category 1 (Retention):*** BLM lands in Category 1 are identified for retention and include lands with high resource values. These lands tend to be fairly well blocked in terms of land pattern. Included in this category are areas such as wilderness study areas, national historic trails, and ACECs. Acquisition of lands or interests in lands will receive priority if located within and/or adjacent to BLM land in Category 1 provided the lands meet one or more of the acquisition criteria found in Appendix F.1, Land Ownership Adjustment Criteria.

- ***Category 2 (Retention-Limited Disposal):*** BLM lands in Category 2 are generally identified for retention in public ownership. Category 2 includes BLM lands that are fairly well blocked as well as some smaller, isolated parcels as long as they are larger than a quarter-section or its equivalent or half-section or its equivalent. Limited disposal actions involving BLM lands within this category could occur.

  BLM lands designated as Category 2 will not be available for sale. However, BLM lands within this category could be exchanged for lands or interests in lands located anywhere in Montana. In addition, parcels of BLM land within Category 2 may be identified for transfer under the Recreation and Public Purposes (R&PP) Act. Such recreation or public purpose use could be considered on a case-by-case basis for such facilities as schools or other public administration, parks or recreation areas, or historic preservation. Also, BLM land within Category 2 could be considered for airport purposes under the Airport and Airway Improvement Act, for public agency jurisdictional transfer, or for State Indemnity Selections on a case-by-case basis.

  BLM lands in Category 2 may contain significant resource values protected by law or policy, and any disposal action is contingent upon prior review and approval. If actions cannot be taken to adequately mitigate impacts from disposal of those lands, the parcels would be retained. Acquisition of lands or interests in lands located in or adjacent to Category 2 will be considered in accordance with the acquisition criteria found in Appendix F.1, Land Ownership Adjustment Criteria.

- ***Category 3 (Disposal):*** BLM lands in Category 3 are identified for disposal through any method, including sale. These lands generally are surrounded by private land with no legal access, or have been selected for disposal by the BLM due to management issues. BLM land parcels in this category are relatively smaller in size. These parcels usually comprise up to a half-section or its equivalent, or up to a quarter-section or its equivalent.

  BLM lands in Category 3 will be available for disposal through exchange for lands or interests in lands located anywhere within Montana. Those parcels which meet the sale criteria of section 203(a)(1) of FLPMA could be made available for sale. However, disposal of Category 3 lands by exchange will have priority over disposal by sale. In addition, parcels of BLM land within Category 3 may be identified for transfer under the R&PP Act. Such recreation or public purpose use could be considered on a case-by-case basis for such facilities as schools or other public administration, parks or recreation areas, or historic preservation. Also, BLM land within Category 3 could be considered for airport purposes under the Airport and Airway Improvement Act, for public agency jurisdictional transfer, or for State Indemnity Selections on a case-by-case basis.

  Some BLM lands in Category 3 may contain significant resource values protected by law or policy and any disposal action is contingent upon prior review and approval. If actions cannot be taken to adequately mitigate impacts from disposal of those lands, those parcels would be retained.

Retention Criteria

- Congressionally designated and other special management areas (i.e. WSAs, ACECs, Scenic and Historic Trails, etc.)
- Lands adjacent to Upper Missouri River Breaks National Monument
- Lands acquired using Land and Water Conservation Funds (LWCF)

Disposal Criteria for Alternatives B, C, and E (Preferred Alternative)

- Parcels of one-quarter section (160 acres, more or less)
- Surrounded by private land
- No public access
- Selected for management issues

Disposal Criteria for Alternative D

- Parcels of one-half section (320 acres, more or less)
- Surrounded by private land
- No public access
- Selected for management issues

Acquisition Criteria

- Facilitate access to BLM land and resources
- Enhance the manageability of BLM land and resources
- Enhance important public values and uses, especially
  - Special Status Species plant, animal, and fish habitats; as well as identified wildlife corridors
  - Significant historic or cultural resources
  - Significant recreational opportunities
  - Significant scenic values
  - Traditional plant use areas or other properties important to Native Americans
- Enhance local social and economic conditions
- Facilitate implementation of other goals and objectives
- Lands within or adjacent to congressionally designated and other special management areas (i.e., WSAs, ACECs, Scenic and Historic Trails, etc.)
- Title and boundary evidence are sufficient for the intended acquisition.

Avoid the following when considering acquisition proposals:

- Acquiring lands or interests in lands with management problems that outweigh the expected benefits of acquisition, including but not limited to:
  - Presence of hazardous materials
  - Abundance of invasive, non-native species
  - Inadequate access for managing the property for the purpose for which it would be acquired
  - Title or boundary evidence confused and subject to litigation or high level of uncertainty.

F.2 BLM Land Available for Disposal by Exchange or Sale (Category 3)

Alternatives B, C and E (Preferred Alternative)

The parcels of BLM land available for disposal by exchange or sale under Alternatives B, C and E (Preferred Alternative) are shown in Table F.2.1 and Maps F.1 through F.8.

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
- *Lot acres are contained within ( ).*
- *Land identified for disposal in a prior resource management plan is shown with an asterisk (*). This refers to the entire parcel, unless another asterisk (*) within the parcel legal description indicates the portion previously identified.*

Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
Blaine County			
	T. 24 N., R. 17 E.		
B-002	Section 13:	NWNE, N2SE	120.00
	T. 25 N., R. 17 E.		
B-004	Section 1:	SWNE	40.00
	T. 26 N., R. 17 E.		
B-005*	Section 14:	SENW	40.00
B-006	Section 25:	NENW	40.00
B-007	Section 35:	S2NW	80.00
	T. 27 N., R. 17 E.		
B-008*	Section 26:	SWNW, NESW	80.00
	T. 30 N., R. 17 E.		
B-009*	Section 2:	SENW	40.00
	T. 35 N., R. 17 E.		
B-011	Section 12:	NW	160.00
	T. 36 N., R. 17 E.		
B-012	Section 11:	S2NW	80.00
	T. 23 N., R. 18 E.		
B-014	Section 4:	lot 4 (40.01)	40.01
B-015	Section 5:	SWSW	40.00
B-018	Section 20:	SENE	80.00
	Section 21:	SWNW	
	T. 24 N., R. 18 E.		
B-020	Section 26:	NESE	40.00
B-021	Section 33:	SWNW	40.00

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
- *Lot acres are contained within ( ).*
- *Land identified for disposal in a prior resource management plan is shown with an asterisk (*). This refers to the entire parcel, unless another asterisk (*) within the parcel legal description indicates the portion previously identified.*

Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 25 N., R. 18 E.		
B-022	Section 6:	lot 1 (42.19), lot 2 (42.17), S2NE	164.36
B-023	Section 20:	SENE, NESE	80.00
B-024	Section 24:	NWNE	40.00
B-025	Section 32:	E2NE	80.00
	T. 26 N., R. 18 E.		
B-026	Section 19:	SESW	40.00
B-027*	Section 22:	NWNE	40.00
B-028	Section 30:	lot 1 (39.42), lot 2 (39.28)	78.70
	T. 27 N., R. 18 E.		
B-029*	Section 27:	SENE	40.00
B-030*	Section 31:	SESW, SWSE	80.00
B-031*	Section 32:	SENW	40.00
	T. 34 N., R. 18 E.		
B-032*	Section 4:	SWNE	40.00
	T. 37 N., R. 18 E.		
B-035	Section 27:	SE	160.00
	T. 23 N., R. 19 E.		
B-036	Section 6:	lot 1 (40.43), lot 2 (40.31)	80.74
B-037	Section 6:	SENW, E2SW	120.00
	T. 27 N., R. 19 E.		
B-040	Section 30:	SWNE	40.00
	T. 29 N., R. 19 E.		
B-042	Section 17:	SENE	40.00
	T. 32 N., R. 19 E.		
B-043*	Section 33:	SE	160.00
	T. 34 N., R. 19 E.		
B-044	Section 10:	SESW	40.00
	T. 35 N., R. 19 E.		
B-045	Section 20:	NE	160.00
B-046	Section 27:	NESE	40.00
B-047	Section 30:	SESE	40.00
	T. 37 N., R. 19 E.		
B-048	Section 6:	lot 12 (29.58)	29.58
B-049	Section 12:	NE	160.00

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 26 N., R. 20 E.		
B-050	Section 1:	SENE	40.00
	T. 27 N., R. 20 E.		
B-051	Section 14:	SWNE	40.00
B-052	Section 22:	SESE	40.00
B-053	Section 26:	NENW	40.00
	T. 36 N., R. 20 E.		
B-056	Section 10:	NENW	40.00
	T. 37 N., R. 20 E.		
B-058	Section 5:	SENE, N2SE, SWSE	160.00
	T. 28 N., R. 21 E.		
B-060*	Section 6:	SESE	40.00
B-061*	Section 7:	lot 1 (37.06), NENW	77.06
B-062*	Section 17:	S2SE	80.00
B-063*	Section 19:	NWNE	40.00
	T. 29 N., R. 21 E.		
B-064*	Section 6:	SESW	40.00
B-066*	Section 19:	S2NE	80.00
B-067*	Section 20:	SESW	40.00
	T. 33 N., R. 21 E.		
B-068	Section 23:	SWSE	40.00
	T. 33 N., R. 21 E.		79.30
B-069	Section 25:	SENE	
	T. 33 N., R. 22 E.		
	Section 30:	lot 2 (39.30)	
	T. 33 N., R. 21 E.		160.00
B-070	Section 28:	NWNW	
	Section 29:	N2NE, NENW	
	T. 35 N., R., 21 E.		
B-072	Section 26:	SESE	40.00
	T. 36 N., R. 21 E.		
B-074	Section 24:	SW	160.00
	T. 27 N., R. 22 E.		
B-075*	Section 7:	NENE	40.00

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 33 N., R. 22 E.		
B-078	Section 7:	NWSE	40.00
B-079	Section 8:	SWSW	120.00
	Section 17:	N2NW	
B-080	Section 34:	SENE	40.00
	T. 34 N., R. 22 E.		
B-082	Section 13:	W2W2	160.00
	T. 35 N., R. 22 E.		
B-085	Section 35:	SWSW	40.00
B-086	Section 35:	SWSE	40.00
	T. 31 N., R. 23 E.		10.72
B-087	Section 1:	lot 3 (10.72)	
	T. 32 N., R. 23 E.		
B-088	Section 4:	SENE	40.00
B-089*	Section 8:	SENE*, NESE	120.00
	Section 9:	NWSE*	
B-090	Section 26:	lot 2 (0.55)	0.55
B-091	Section 35:	lot 5 (22.46)	22.46
	T. 33 N., R. 23 E.		
B-093	Section 25:	N2SE	80.00
B-094	Section 27:	S2SE	80.00
	T. 37 N., R. 23 E.		80.00
B-097	Section 35:	E2NW	
	T. 31 N., R. 24 E.		
B-098	Section 3:	lot 6 (31.71)	31.71
B-099	Section 12:	lot 5 (13.30)	13.30
B-100	Section 12:	lot 8 (13.36)	41.19
	Section 13:	lot 1 (27.83)	
B-101	Section 13:	lot 2 (30.06)	30.06
	T. 32 N., R. 24 E.		
B-102	Section 6:	S2SE	120.00
	Section 7:	NENE	
B-103	Section 32:	lot 6 (4.00)	4.00
B-104	Section 35:	lot 1 (9.50)	9.50
	T. 37 N., R. 24 E.		
B-106	Section 28:	NENW	40.00
B-107	Section 28:	SWSW	80.00
	Section 29:	SESE	

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 31 N., R. 25 E.		
B-108	Section 5:	N2SW	80.00
B-109	Section 9:	E2NE	160.00
	Section 10:	W2NW	
B-111	Section 11:	SESW	40.00
B-112	Section 17:	lot 3 (23.70)	29.07
	Section 18:	lot 8 (5.37)	
B-113	Section 21:	lot 2 (36.88)	36.88
B-114	Section 21:	lot 5 (36.33)	49.77
	Section 28:	lot 1 (13.44)	
B-115	Section 26:	lot 1 (8.49)	8.49
B-116	Section 26:	lot 6 (19.70)	19.70
B-117	Section 27:	lot 1 (6.06)	6.06
	T. 32 N., R. 25 E.		
B-118	Section 22:	N2NW	80.00
B-120	Section 32:	SWNW, NWSW	80.00
	T. 33 N., R. 25 E.		
B-121	Section 17:	SESW	40.00
B-122	Section 32:	N2NE	80.00
	T. 37 N., R. 25 E.		40.00
B-124	Section 34:	NWSW	
	T. 31 N., R. 26 E.		
B-125	Section 4:	SE	160.00
	T. 34 N., R. 26 E.		
B-130	Section 4:	NWSW	40.00
B-131	Section 5:	E2SW	80.00
	T. 35 N., R. 26 E.		
B-132	Section 28:	SESW, N2SE	120.00
B-133	Section 32:	SENW	40.00
	T. 36 N., R. 26 E.		40.00
B-134	Section 12:	NWNW	
	T. 37 N., R. 26 E.		
B-135	Section 17:	SESW	80.00
	Section 20:	NENW	
B-136	Section 20:	NESW	40.00
	T. 35 N., R. 22 E.		
B-137	Section 30:	SESW	40.00

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
Chouteau County			
	T. 25 N., R. 3 E.		119.80
C-001	Section 18:	lot 1 (39.80), NWNE, NENW	
	T. 27 N., R. 4 E.		
C-002	Section 1:	SWSE	40.00
C-003	Section 32:	SWSE	40.00
	T. 23 N., R. 6 E.		
C-004	Section 1:	SENW	40.00
C-005	Section 14:	SESE	40.00
	T. 24 N., R. 7 E.		40.00
C-006*	Section 11:	NWSW	
	T. 25 N., R. 7 E.		40.00
C-007	Section 33:	SWSW	
	T. 28 N., R. 7 E.		33.45
C-008	Section 2:	lot 4 (33.45)	
	T. 24 N., R. 8 E.		40.00
C-009	Section 32:	SWSW	
	T. 25 N., R. 8 E.		40.00
C-010	Section 12:	NESE	
	T. 26 N., R. 8 E.		
C-011	Section 12:	NWNW, NESW	80.00
C-012	Section 35:	lot 6 (11.04)	11.04
	T. 25 N., R. 9 E.		40.05
C-013	Section 6:	lot 2 (40.05)	
	T. 26 N., R. 9 E.		
C-014	Section 7:	lot 2 (35.70)	35.70
C-015	Section 18:	lot 1 (35.42)	35.42
C-016	Section 30:	SWNE	40.00
	T. 28 N., R. 9 E.		
C-017	Section 4:	lot 2 (14.70), lot 3 (15.50), lot 4 (16.30), lot 7 (40.00)	86.50
	T. 29 N., R. 9 E.		40.00
C-019	Section 30:	SWNE	

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
- *Lot acres are contained within ( ).*
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 26 N., R. 10 E.		80.00
C-021	Section 12:	W2SE	
	T. 26 N., R. 11 E.		
C-022	Section 5:	SWNW	40.00
C-023	Section 19:	SWSE	40.00
C-024	Section 30:	lot 1 (38.15), NENW	78.15
	T. 27 N., R. 11 E.		80.00
C-025	Section 32:	S2SW	
	T. 27 N., R. 12 E.		
C-026*	Section 10:	NESE	40.00
C-027	Section 31:	lot 3 (38.04)	38.04
	T. 24 N., R. 13 E.		40.00
C-028	Section 2:	SWSE	
	T. 25 N., R. 13 E.		40.00
C-029	Section 1:	SENW	
	T. 26 N., R. 13 E.		
C-030	Section 8:	NESW	40.00
C-031	Section 17:	NENW, W2SW	120.00
	T. 23 N., R. 15 E.		40.00
C-033	Section 5:	NESW	
	T. 23 N., R. 16 E.		
C-034	Section 4:	lot 2 (39.83)	39.83
C-035	Section 13:	SWNE	40.00
	T. 24 N., R. 16 E.		
C-037	Section 3:	lot 2 (7.58), lot 3 (7.52)	15.10
C-038	Section 13:	SWNW, NESW	80.00
C-039	Section 15:	NWSW	40.00
C-040	Section 33:	SENW	40.00
	T. 25 N., R. 16 E.		
C-041	Section 5:	lot 4 (42.29)	42.29
C-043	Section 22:	S2SW	80.00
C-045	Section 27:	SWSW	40.00
C-046	Section 34:	NENW	40.00
	T. 26 N., R. 16 E.		
C-047	Section 11:	NWSW	40.00

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 24 N., R. 17 E.		
C-050	Section 19:	lot 12 (30.15), lot 13 (30.21)	60.36
	T. 25 N., R. 17 E.		
C-053	Section 6:	lot 2 (43.13), SWNE, SENW	123.13
	T. 27 N., R. 16 E.		
C-055	Section 11:	NWSE	40.00
Glacier County			
	T. 32 N., R. 5 W.		
G-001*	Section 4:	NESW, S2SW	120.00
G-002*	Section 8:	SENE	40.00
Hill County			
	T. 29 N., R. 8 E.		120.00
H-001	Section 21:	SWSE	
	Section 28:	W2NE	
	T. 37 N., R. 11 E.		114.04
H-002*	Section 2:	lot 5 (18.68), lot 6 (18.57), lot 7 (18.45), lot 8 (18.34), SWNE	
	T. 37 N., R. 15 E.		
H-003*	Section 6:	lot 9 (26.94), lot 10 (26.79)	53.73
H-004	Section 7:	SESE	40.00
H-005*	Section 29:	SENE*, NESE	80.00
	T. 28 N., R. 16 E.		
H-006	Section 1:	lot 14 (23.84), E2NW	103.84
H-007	Section 24:	lot 4 (24.71)	24.71
	T. 30 N., R. 16 E.		17.62
H-010*	Section 35:	lot 3 (17.62)	
	T. 31 N., R. 16 E.		40.00
H-011*	Section 24:	NWSE	
	T. 28 N., R. 17 E.		
H-012	Section 5:	N2SW	80.00
H-013	Section 18:	SWSE	80.00
	Section 19:	NWNE	

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
- *Lot acres are contained within ( ).*
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 30 N., R. 17 E.		
H-014*	Section 4:	NWSE	40.00
H-015*	Section 8:	NESE	40.00
H-016*	Section 29:	lot 7 (8.42)	8.42
	T. 37 N., R. 17 E.		40.00
H-017*	Section 7:	SESE	
Liberty County			
	T. 29 N., R. 5 E.		
L-001	Section 4:	SWSE	40.00
L-002	Section 9:	NENE	40.00
L-003	Section 10:	SWNW	40.00
Phillips County			
	T. 24 N., R. 24 E.		
P-004*	Section 5:	SENE	40.00
	T. 25 N., R. 25 E.		40.00
P-010*	Section 26:	NWSW	
	T. 31 N., R. 27 E.		
P-023*	Section 20:	SWNW	40.00
P-024*	Section 20:	SESE	40.00
	T. 32 N., R. 27 E.		80.00
P-029*	Section 13:	S2NE	
	T. 35 N., R. 27 E.		
P-032*	Section 9:	SWNE	40.00
	T. 36 N., R. 27 E.		80.00
P-035*	Section 33:	S2SE	
	T. 30 N., R. 28 E.		
P-040*	Section 12:	NWSW	40.00
	T. 32 N., R. 28 E.		
P-047*	Section 29:	NWNE, N2NW	120.00
	T. 35 N., R. 28 E.		40.00
P-049	Section 1:	SW	

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 35 N., R. 29 E.		120.00
P-069	Section 8:	NESW, N2SE	
	T. 31 N., R. 30 E.		
P-078*	Section 31:	NESE	40.00
	T. 32 N., R. 30 E.		
P-082	Section 34:	N2NE	80.00
	T. 30 N., R. 31 E.		
P-092*	Section 29:	NWNE	40.00
	T. 35 N., R. 32 E.		40.00
P-120	Section 20:	NWNW	
	T. 33 N., R. 33 E.		
P-144*	Section 3:	lot 3 (41.41)	41.41
	T. 34 N., R. 33 E.		
P-149*	Section 34:	SWSW	40.00
	T. 30 N., R. 34 E.		
P-158	Section 8:	NESE	40.00
P-160	Section 29:	SWNW	40.00
	T. 33 N., R. 34 E.		
P-166*	Section 1:	SESE	40.00
P-168*	Section 14:	SESE	40.00
	T. 34 N., R. 34 E.		
P-170*	Section 2:	SWSE	40.00
P-171*	Section 12:	SWNE	40.00
P-172*	Section 23:	NESE	40.00
Zortman Townsite			
	T. 25 N., R. 25 E.		
P-176*	Section 17:	block 5 (2.89)	2.89
P-177	Section 17:	block 7 (4.36)	4.36
	Section 16:	block 7	
P-178*	Section 17:	block 8, lot 3 (0.72), lot 4 (1.23)	1.95
P-179*	Section 17:	block 11 (6.04)	6.04
P-180*	Section 16:	block 14, lot 2 (0.54), lot 3 (0.54), lot 4 (4.74)	5.82
P-181*	Section 16:	block 15, lot 1 (0.41), lot 2 (0.41), lot 3 (0.32), lot 4 (0.62)	1.76
P-182*	Section 16:	block 16, lot 1 (0.44), lot 2 (0.44), lot 3 (0.44), lot 4 (0.30)	1.62

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
P-183*	Section 16:	block 18, lot 1 (0.75), lot 2 (0.89), lot 3 (0.77), lot 4 (0.65), lot 5 (0.62)	3.68
P-184*	Section 16:	block 19, lot 1 (0.58), lot 2 (0.97), lot 3 (0.92), lot 4 (0.87), lot 5 (1.08), lot 6 (0.67)	5.09
Landusky Townsite			
	T. 25 N., R. 24 E.,		
P-185*	Section 22:	block 8 (1.7)	3.58
	Section 27:	block 8 (1.8)	
Toole County			
	T. 30 N., R. 1 W.		40.00
T-002	Section 8:	NENW	
	T. 31 N., R. 1 W.		
T-003*	Section 19:	NENE	40.00
T-004*	Section 27:	SWSW	40.00
T-005*	Section 30:	lot 1 (38.57), NWNE, NENW	118.57
	T. 35 N., R. 1 W.		
T-006*	Section 19:	NENW	40.00
T-007	Section 28:	W2NE, NWSE	120.00
T-008*	Section 31:	SENW	40.00
	T. 31 N., R. 2 W.		
T-009*	Section 2:	lot 1 (39.76), lot 2 (39.82), SENE	119.58
T-011*	Section 11:	SESW	40.00
T-012*	Section 14:	NESW, S2SW	120.00
	T. 31 N., R. 2 W.		
T-016	Section 25:	NESW	40.00
T-017	Section 35:	lot 6 (16.11)	16.11
	T. 32 N., R. 2 W.		40.00
T-018*	Section 17:	NENE	
	T. 35 N., R. 2 W.		
T-019*	Section 2:	SE	160.00
T-020	Section 7:	SESE	80.00
	Section 18:	NENE	
	T. 31 N., R. 3 W.		
T-021*	Section 5:	lot 1 (40.18), lot 2 (40.14)	80.32

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Please note:
- *Lot acres are contained within ( ).*
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Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 33 N., R. 3 W.		
T-023*	Section 21:	SWNE	40.00
T-024*	Section 22:	NESW, W2SW, NWSE	160.00
T-025*	Section 24:	SESE	40.00
T-026*	Section 27:	NENE	40.00
	T. 35 N., R. 3 W.		
T-030*	Section 33:	W2SE	80.00
T-031*	Section 34:	NENE	40.00
	T. 34 N., R. 4 W.		40.00
T-032	Section 6:	SENE	
	T. 34 N., R. 1 E.		40.00
T-033*	Section 18:	NENE	
	T. 36 N., R. 2 E.		
T-034	Section 15:	SENE	40.00
	T. 37 N., R. 3 E.		40.00
T-037	Section 33:	SENE	
Valley County			
	T. 32 N., R. 35 E.		
V-018*	Section 3:	NWSE	40.00
V-019*	Section 30:	lot 5 (39.97)	39.97
	T. 32 N., R. 35 E.		
V-020	Section 33:	lot 2 (2.95)	2.95
	T. 29 N., R. 38 E.		
V-058	Section 25:	lot 4 (0.83), lot 5 (5.98)	6.81
	T. 30 N., R. 38 E.		
V-062	Section 10:	SESE	40.00
	T. 29 N., R. 39 E.		
V-067	Section 27:	SESE	40.00
V-068	Section 34:	NESE	40.00
	T. 27 N., R. 41 E.		80.00
V-082*	Section 4:	W2NW	

Table F.2.1
BLM Land Available for Disposal under Alternatives B, C and E (Preferred Alternative)

Parcel No.	***Legal Description (Principal Meridian Montana)***		***Acreage of Entire Parcel***
Please note: − *Lot acres are contained within ( ).* − *Land identified for disposal in a prior resource management plan is shown with an asterisk (*). This refers to the entire parcel, unless another asterisk (*) within the parcel legal description indicates the portion previously identified.*			
	T. 27 N., R. 42 E.		
V-086	Section 7:	lot 6 (5.35)	5.35
V-087*	Section 9:	NWSW	40.00
	T. 28 N., R. 39 E.		
V-086	Section 12:	Glasgow Original Townsite, block 08, lots 8 and 9 (0.17)	0.17

Alternative D

The parcels of BLM land available for disposal by exchange or sale under Alternative D include all parcels shown in Table F.2.1, and the additional parcels shown in Table F.2.2.

Table F.2.2
Additional Parcels of BLM Land Available for Disposal under Alternative D

Parcel No.	***Legal Description (Principal Meridian Montana)***	***Acreage of Entire Parcel***
Please note: – *Lot acres are contained within ( ).* – *Land identified for disposal in a prior resource management plan is shown with an asterisk (*). This refers to the entire parcel, unless another asterisk (*) within the parcel legal description indicates the portion previously identified.*		
Blaine County		
	T. 34 N., R. 17 E.	
B-010	Section 34: S2	320.00
	T. 37 N., R. 17 E.	
B-013	Section 2: SE Section 11: NENE	200.00
	T. 24 N., R. 18 E.	
B-019	Section 21: N2SW, NWSE, S2SE Section 28: N2NE, SWNE	320.00
	T. 35 N., R. 18 E.	199.93
B-033	Section 2: lot 3 (39.93) T. 36 N., R. 18 E. Section 35: SW	
	T. 37 N., R. 18 E.	
B-034	Section 10: S2	320.00
	T. 28 N., R. 19 E.	238.31
B-041	Section 26: SWSW Section 27: lot 7 (38.31) Section 35: W2W2	
	T. 34 N., R. 20 E.	
B-054	Section 5: lot 1 (41.21), lot 2 (41.24), S2NE, SE	322.45
B-055	Section 22: N2	320.00
	T. 36 N., R. 20 E.	
B-057	Section 11: W2	320.00
	T. 27 N., R. 21 E.	186.12
B-059*	Section 2: lot 1 (24.34), lot 2 (24.35), lot 3 (24.35), lot 4 (24.36) Section 3: lot 1 (24.36), lot 2 (24.36), lot 8 (40.00)	
	T. 29 N., R. 21 E.	
B-065*	Section 18: lot 3 (39.86), lot 4 (40.31), E2SW, W2SE Section 19: lot 1 (40.44), lot 2 (40.25)	320.86

Table F.2.2
Additional Parcels of BLM Land Available for Disposal under Alternative D

Please note:
- *Lot acres are contained within ( ).*
- *Land identified for disposal in a prior resource management plan is shown with an asterisk (*). This refers to the entire parcel, unless another asterisk (*) within the parcel legal description indicates the portion previously identified.*

Parcel No.	***Legal Description (Principal Meridian Montana)***	***Acreage of Entire Parcel***
B-071	T. 34 N., R. 21 E. Section 24: NESE, S2SE Section 25: N2NE T. 34 N., R. 22 E. Section 19: lot 3 (37.34)	237.34
B-073	T. 35 N., R., 21 E. Section 27: W2NW, SW Section 34: W2NW	320.00
B-077	T. 32 N., R. 22 E. Section 2: lot 1 (41.51) T. 33 N., R. 22 E. Section 33: SESE Section 34: NWSW, S2S2	281.51
B-081	T. 34 N., R. 22 E. Section 1: lot 1 (39.92), lot 2 (39.77), S2NE T. 34 N., R. 23 E. Section 6: lot 3 (39.55), lot 4 (37.35), lot 5 (37.49), SENW	314.08
B-083	T. 34 N., R. 22 E. Section 23: N2	320.00
B-084	Section 32: NE, N2SE Section 33: W2SW	320.00
B-092	T. 33 N., R. 23 E. Section 15: W2SE Section 22: W2NE, NENW	200.00
B-095	T. 34 N., R. 23 E. Section 28: S2	320.00
B-096	Section 32: E2	320.00
B-105	T. 33 N., R. 24 E. Section 29: S2	320.00
B-110	T. 31 N., R. 25 E. Section 10: NE, NWSE	200.00
B-119	T. 32 N., R. 25 E. Section 29: W2NE, NW, NESW, NWSE	320.00
B-123	T. 36 N., R. 25 E. Section 2: S2NE, N2S2, SWSW Section 11: NWNW	320.00

Table F.2.2
Additional Parcels of BLM Land Available for Disposal under Alternative D

Please note:
- *Lot acres are contained within ( ).*
- *Land identified for disposal in a prior resource management plan is shown with an asterisk (*). This refers to the entire parcel, unless another asterisk (*) within the parcel legal description indicates the portion previously identified.*

Parcel No.	*Legal Description (Principal Meridian Montana)*		*Acreage of Entire Parcel*
	T. 31 N., R. 26 E.		
B-126	Section 8:	E2	320.00
	T. 33 N., R. 26 E.		
B-127	Section 8:	NENE, S2NE, SE	280.00
B-128	Section 9:	S2NE, SENW, N2SE	200.00
B-129	Section 17:	W2SW	320.00
	Section 18:	lot 7 (40.00), lot 12 (40.00), SE	
Chouteau County			
	T. 28 N., R. 9 E.		
C-018	Section 8:	E2NE, NESE	240.00
	Section 9:	W2NW, NWSW	
	T. 23 N., R. 16 E.		
C-036	Section 17:	NW	331.45
	Section 18:	lots 1 (30.23), 2 (30.48), 3 (30.74), E2NE	
	T. 25 N., R. 16 E.		
C-044	Section 22:	E2SE	240.00
	Section 27:	NENE, S2NE, NWSE	
	T. 26 N., R. 16 E.		
C-048	Section 32:	W2NE, NW	240.00
	T. 24 N., R. 17 E.		
C-051	Section 31:	NWNE, S2NE, N2SE	200.00
	T. 25 N., R. 17 E.		
C-052	Section 4:	lot 1 (40.49), lot 2 (40.52), lot 3 (40.54), lot 4 (40.57), S2NE, SENW	282.12
Hill County			
	T. 28 N., R. 16 E.		
H-008	Section 32:	NW, N2SW	240.00
H-009	Section 33:	N2NE	200.00
	Section 34:	NWNE, N2NW	

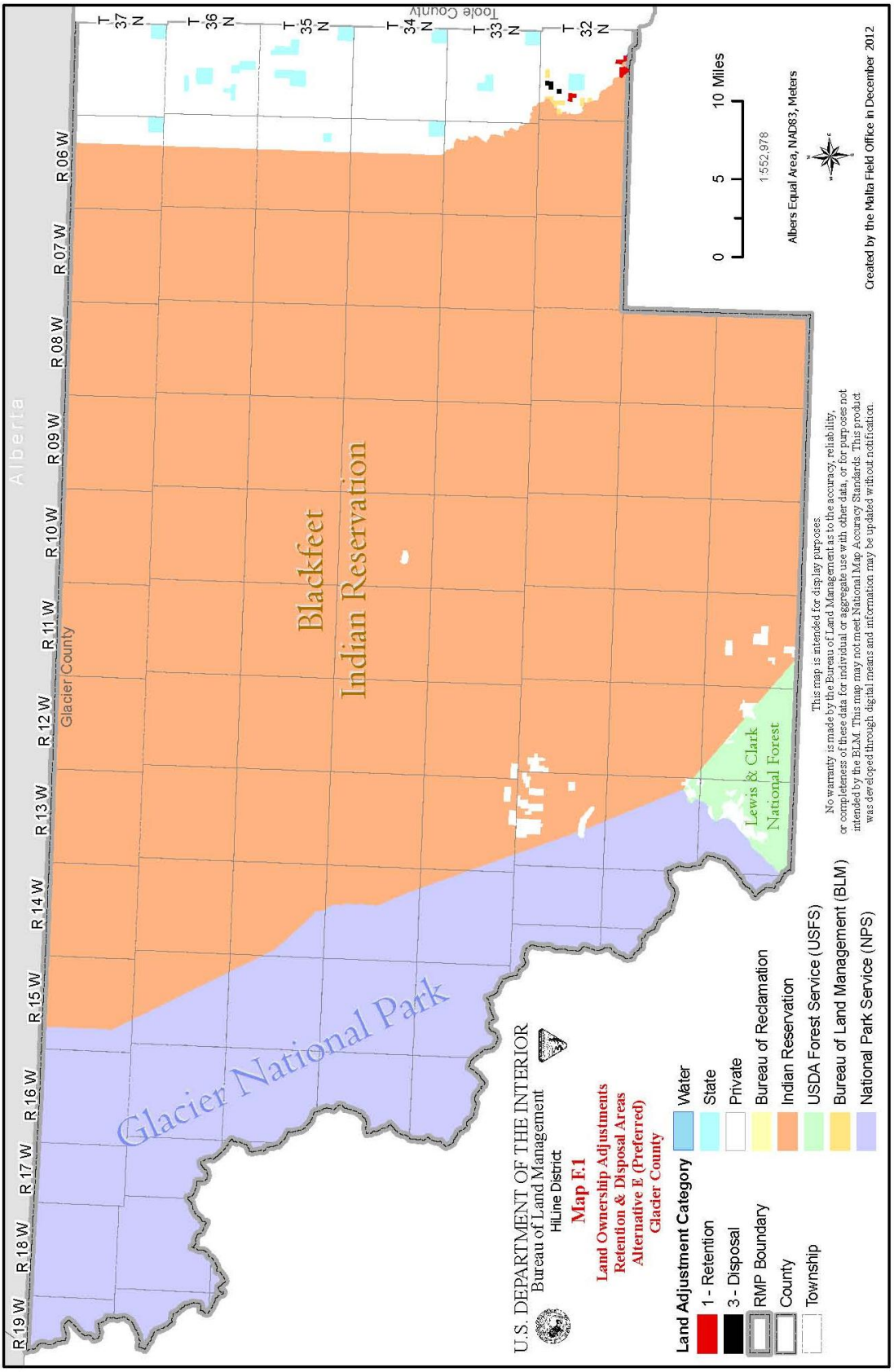
Table F.2.2
Additional Parcels of BLM Land Available for Disposal under Alternative D

Parcel No.	***Legal Description (Principal Meridian Montana)***	***Acreage of Entire Parcel***
Please note: − *Lot acres are contained within ( ).* − *Land identified for disposal in a prior resource management plan is shown with an asterisk (*). This refers to the entire parcel, unless another asterisk (*) within the parcel legal description indicates the portion previously identified.*		
Toole County		
T-010*	T. 31 N., R. 2 W. Section 2: SESW*, W2SE Section 11: W2NE, NENW*	240.00
T-022	T. 31 N., R. 3 W. Section 15: SESE Section 22: E2NE, NESE Section 23: W2SW	240.00
T-028*	T. 34 N., R. 3 W. Section 28: NWSW, S2SW Section 33: NWNE, N2NW	240.00
Valley County		
V-007	T. 23 N., R. 35 E. Section 4: S2SW Section 5: S2NE, SE	320.00
V-010	T. 24 N., R. 35 E. Section 23: W2SE Section 25: W2NW Section 26: N2NE, SENE	280.00
V-013*	T. 30 N., R. 35 E. Section 35: W2	320.00
V-014*	T. 31 N., R. 35 E. Section 4: lot 3 (40.00), lot 4* (40.00) T. 32 N., R. 35 E. Section 33: SENW*, E2SW*	200.00
V-017*	T. 32 N., R. 35 E. Section 3: lot 4 (41.14), SWNW Section 4: lot 1 (41.24), SENE T. 33 N., R. 35 E. Section 32: E2SW, W2SE	322.38
V-028	T. 29 N., R. 36 E. Section 10: SE Section 11: SW	320.00
V-029	T. 30 N., R. 36 E. Section 13: NW Section 14: NE	320.00

Table F.2.2
Additional Parcels of BLM Land Available for Disposal under Alternative D

Please note:
- *Lot acres are contained within ( ).*
- *Land identified for disposal in a prior resource management plan is shown with an asterisk (*). This refers to the entire parcel, unless another asterisk (*) within the parcel legal description indicates the portion previously identified.*

Parcel No.	***Legal Description (Principal Meridian Montana)***		***Acreage of Entire Parcel***
	T. 31 N., R. 36 E.		
V-034	Section 18:	SESW, S2SE	320.00
	Section 19:	NE, NENW	
	T. 29 N., R. 37 E.		
V-044*	Section 28:	N2	320.00
	T. 31 N., R. 37 E.		
V-048*	Section 20:	NESE, S2SE	200.00
	Section 21:	W2SW	
	T. 37 N., R. 37 E.		
V-056	Section 2:	lot 3 (46.12), lot 4 (46.13), S2NW, NWSW	212.25
V-057	Section 10:	SENE, E2SE	320.00
	Section 11:	S2NW, N2SW, SWSW	
	T. 30 N., R. 38 E.		199.99
V-059	Section 2:	lot 4 (39.99)	
	T. 31 N., R. 38 E.		
	Section 35:	SW	
	T. 30 N., R. 39 E.		
V-070	Section 35:	SW, SWSE	200.00
	T. 34 N., R. 40 E.		320.00
V-080*	Section 4:	S2SW	
	Section 9:	NW, N2SW	
	T. 35 N., R. 40 E.		320.00
V-081*	Section 27:	W2NE, E2SW, W2SE, NESE	
	Section 34:	NENW	
	T. 37 N., R. 42 E.		320.00
V-088*	Section 22:	E2SE	
	Section 23:	W2SW	
	Section 26:	NW	


R 19 W
R 18 W
R 17 W
R 16 W
R 15 W
R 14 W
R 13 W
R 12 W
R 11 W
R 10 W
R 09 W
R 08 W
R 07 W
R 06 W
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
Alberta
Glacier County
Toole County
Blackfeet Indian Reservation
Glacier National Park
Lewis & Clark National Forest
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map F1
Land Ownership Adjustments
Retention & Disposal Areas
Alternative E (Preferred)
Glacier County
Land Adjustment Category
1 - Retention
3 - Disposal
RMP Boundary
County
Township
Water
State
Private
Bureau of Reclamation
Indian Reservation
USDA Forest Service (USFS)
Bureau of Land Management (BLM)
National Park Service (NPS)
This map is intended for display purposes.
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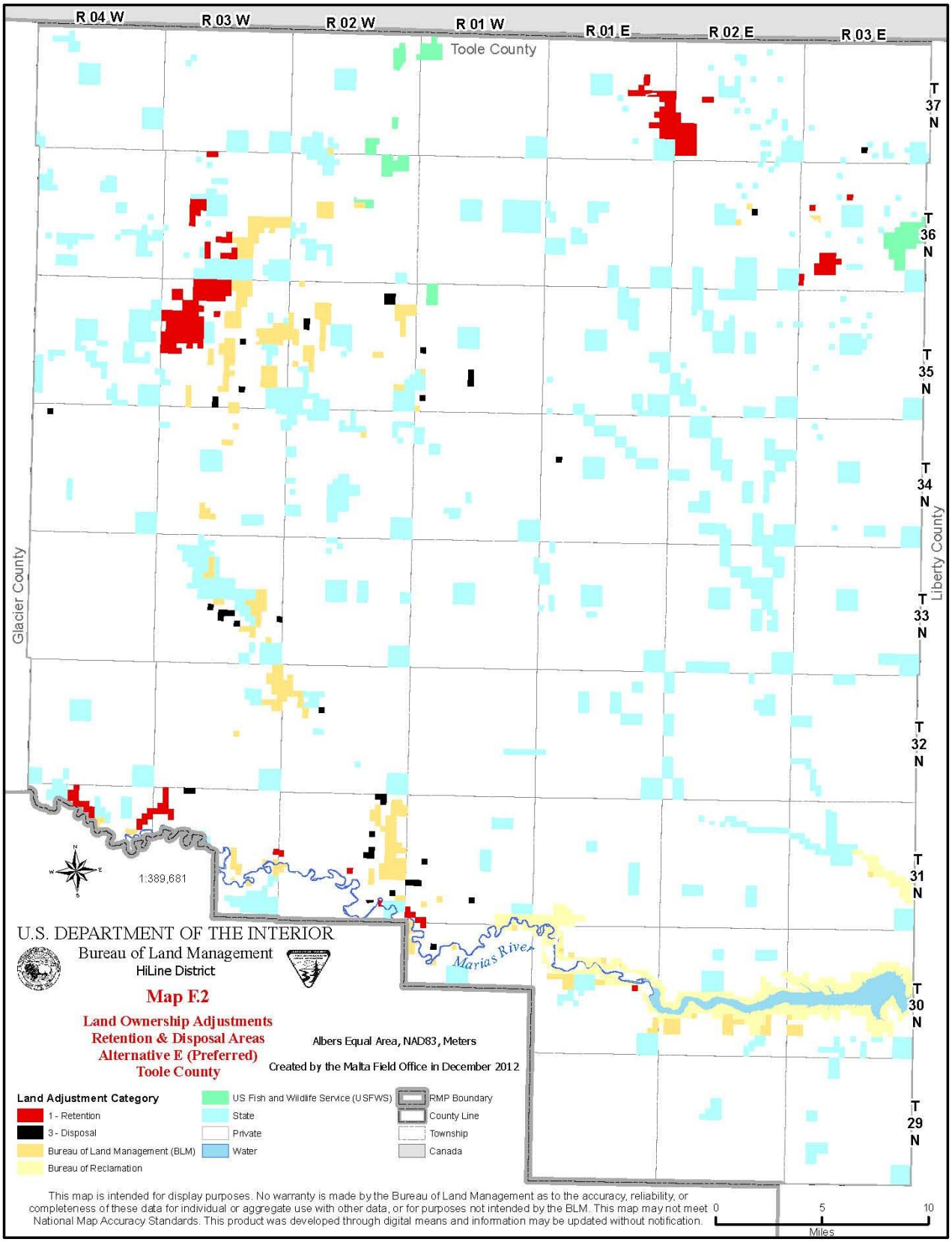
5
10 Miles
1:552,978
Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012


R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
Toole County
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
Glacier County
Liberty County
Marias River
1:389,681
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map F.2
Land Ownership Adjustments
Retention & Disposal Areas
Alternative E (Preferred)
Toole County
Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012
Land Adjustment Category
1 - Retention
3 - Disposal
Bureau of Land Management (BLM)
Bureau of Reclamation
US Fish and Wildlife Service (USFWS)
State
Private
Water
RMP Boundary
County Line
Township
Canada
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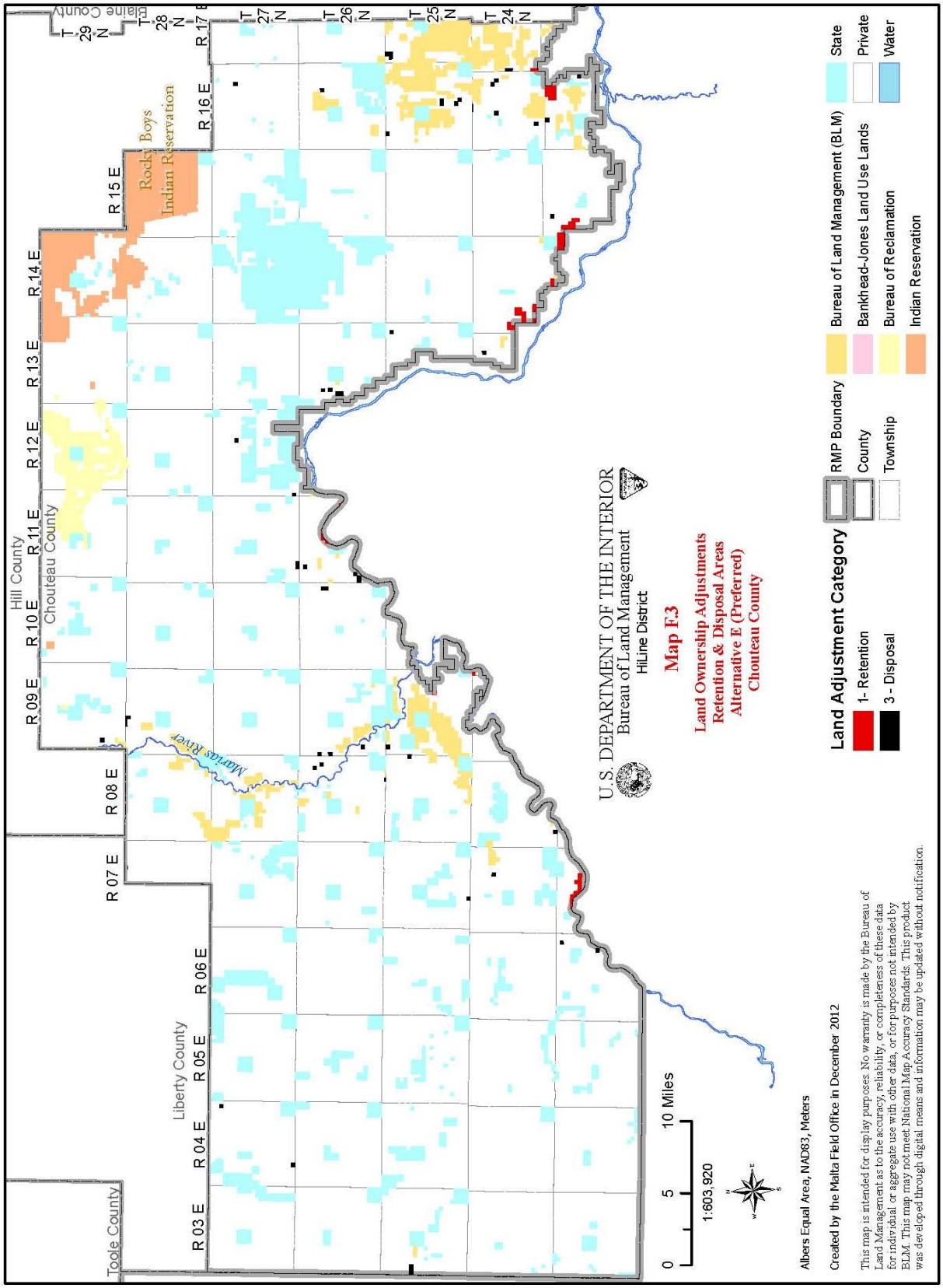
Miles


U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map F3
Land Ownership Adjustments
Retention & Disposal Areas
Alternative E (Preferred)
Chouteau County
Land Adjustment Category
1- Retention
3 - Disposal
RMP Boundary
County
Township
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Bureau of Reclamation
Indian Reservation
State
Private
Water
Hill County
Chouteau County
Liberty County
Toole County
Blaine County
Rocky Boys Indian Reservation
Marias River
R 03 E
R 04 E
R 05 E
R 06 E
R 07 E
R 08 E
R 09 E
R 10 E
R 11 E
R 12 E
R 13 E
R 14 E
R 15 E
R 16 E
R 17 E
T 29 N
T 28 N
T 27 N
T 26 N
T 25 N
T 24 N
0 5 10 Miles
1:603,920
Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012
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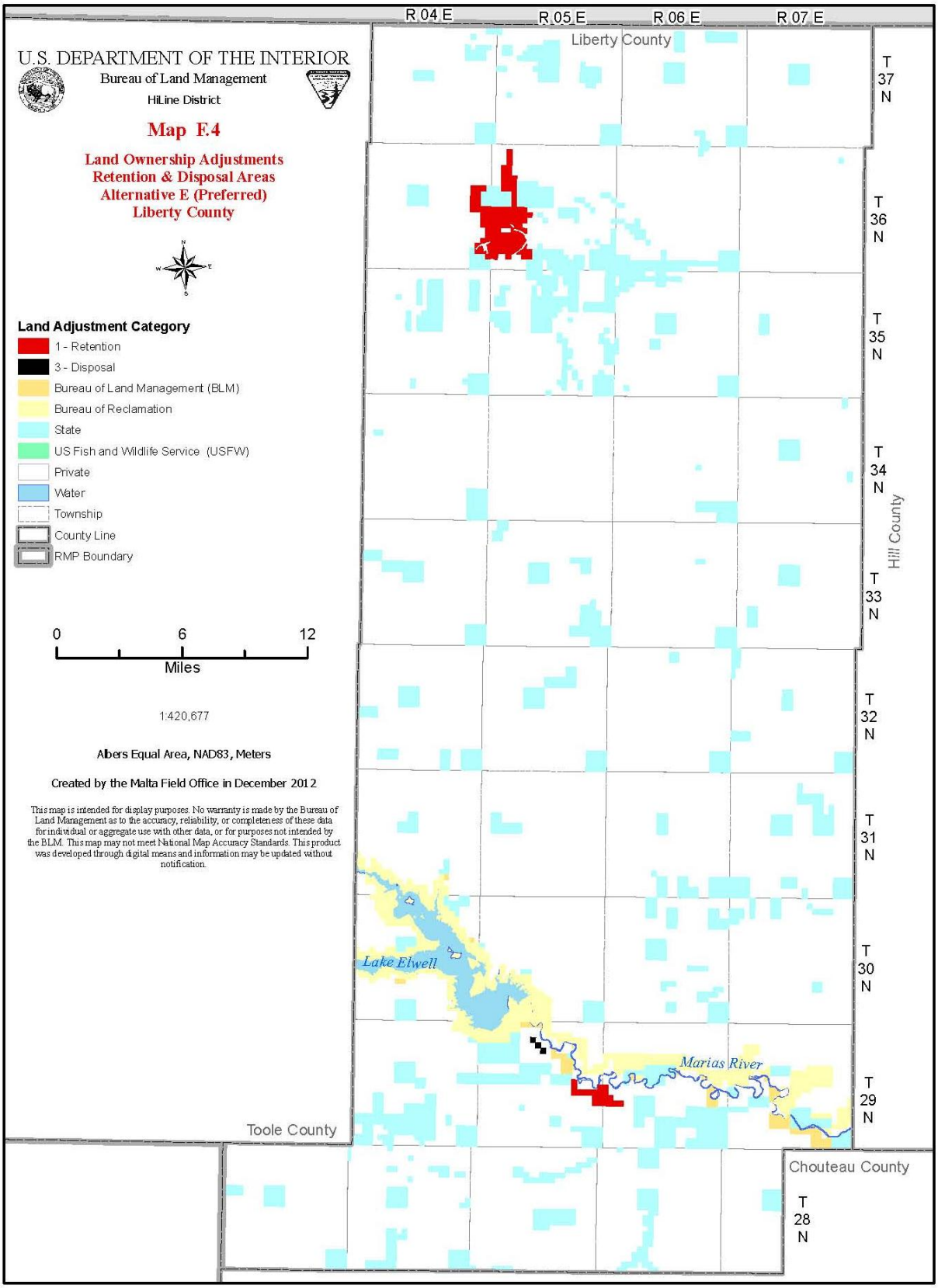
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map F.4
Land Ownership Adjustments
Retention & Disposal Areas
Alternative E (Preferred)
Liberty County
Land Adjustment Category
1 - Retention
3 - Disposal
Bureau of Land Management (BLM)
Bureau of Reclamation
State
US Fish and Wildlife Service (USFW)
Private
Water
Township
County Line
RMP Boundary
0
6
12
Miles
1:420,677
Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012
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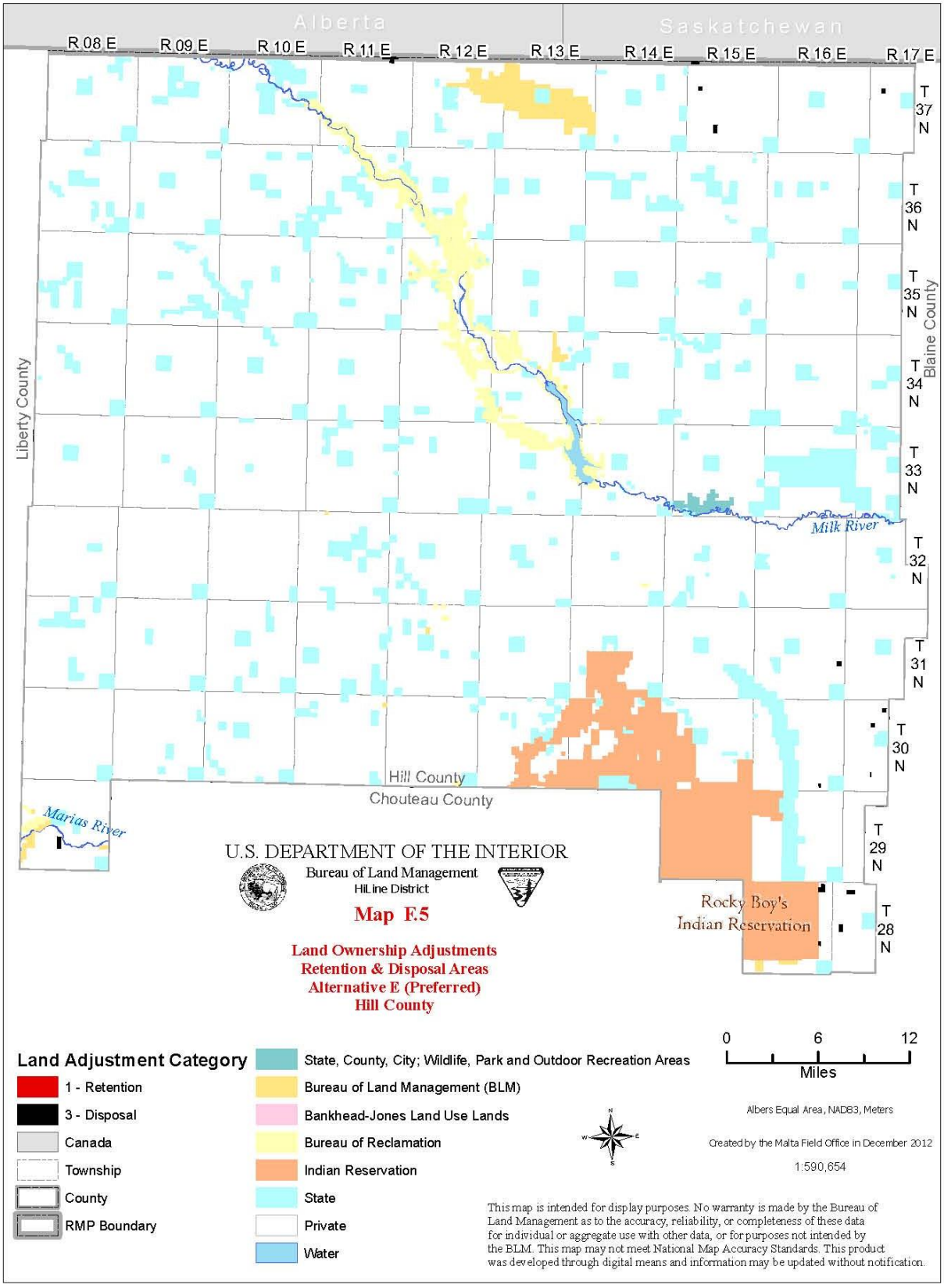
R 04 E
R 05 E
R 06 E
R 07 E
Liberty County
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
T 28 N
Hill County
Lake Elwell
Marias River
Toole County
Chouteau County


Alberta
Saskatchewan
R 08 E
R 09 E
R 10 E
R 11 E
R 12 E
R 13 E
R 14 E
R 15 E
R 16 E
R 17 E
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
T 28 N
Liberty County
Blaine County
Hill County
Chouteau County
Milk River
Marias River
Rocky Boy's Indian Reservation
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map F.5
Land Ownership Adjustments
Retention & Disposal Areas
Alternative E (Preferred)
Hill County
Land Adjustment Category
1 - Retention
3 - Disposal
Canada
Township
County
RMP Boundary
State, County, City; Wildlife, Park and Outdoor Recreation Areas
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Bureau of Reclamation
Indian Reservation
State
Private
Water
0 6 12
Miles
Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012
1:590,654
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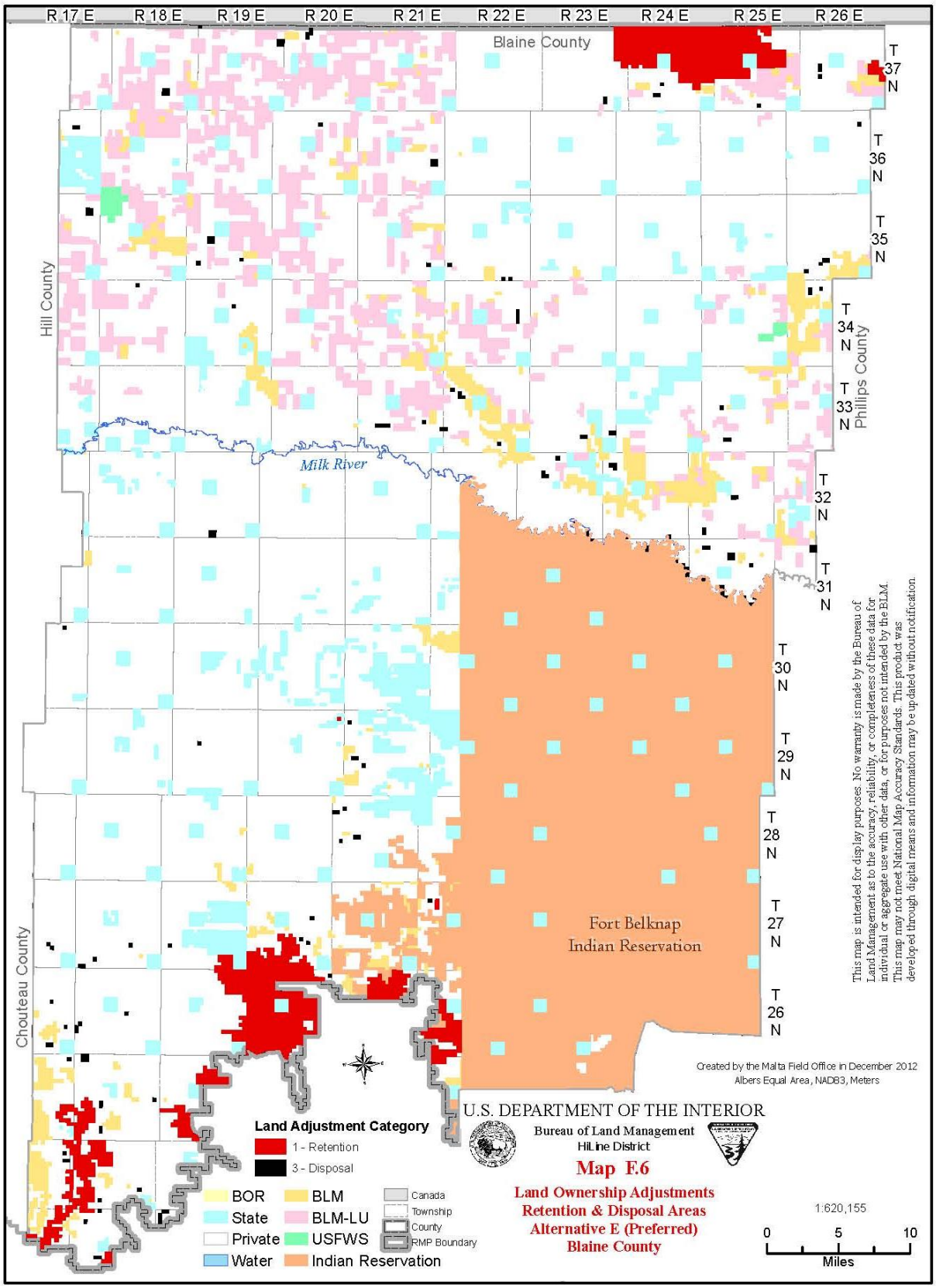
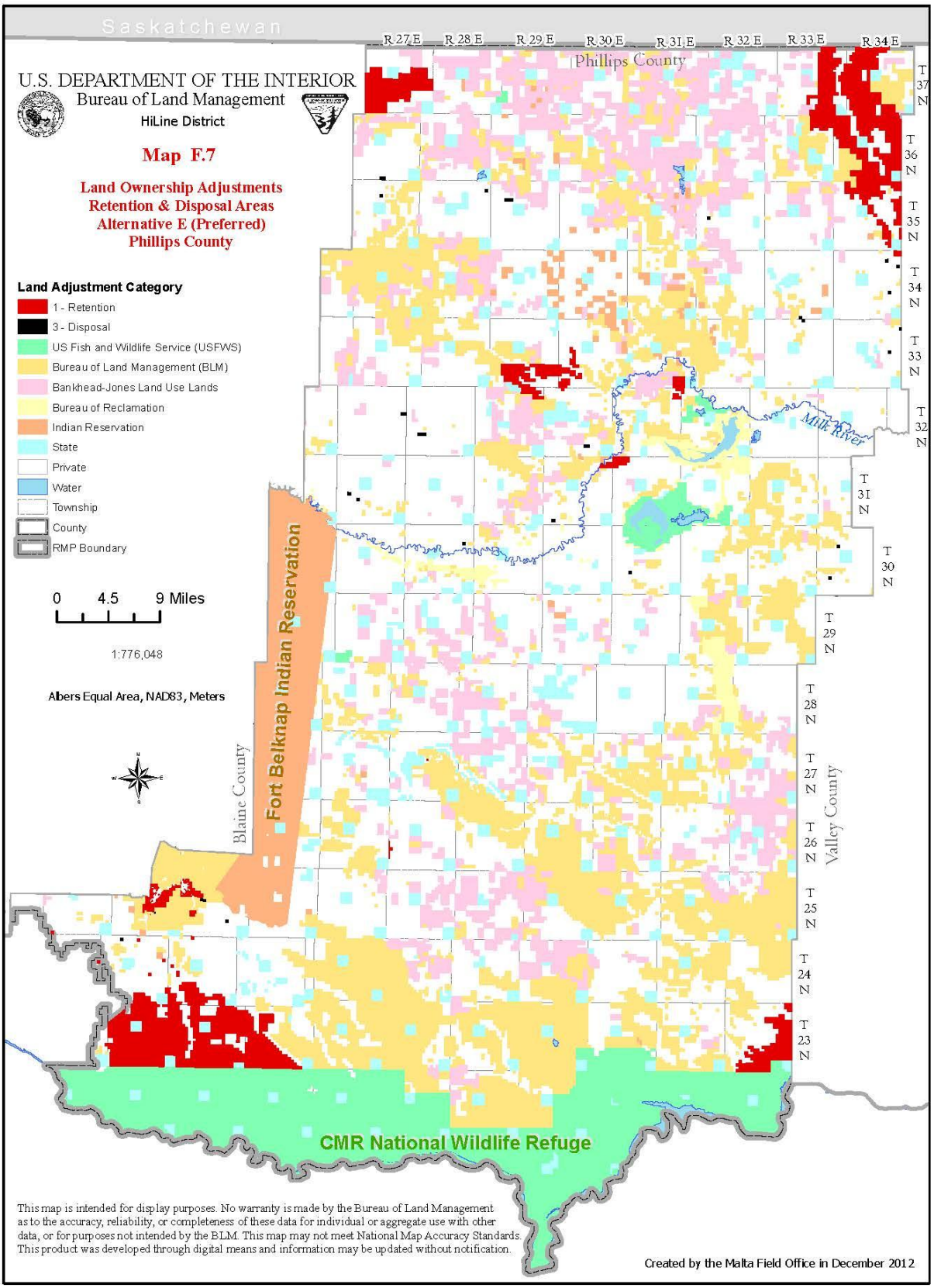

R 17 E
R 18 E
R 19 E
R 20 E
R 21 E
R 22 E
R 23 E
R 24 E
R 25 E
R 26 E
Blaine County
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
T 28 N
T 27 N
T 26 N
Hill County
Phillips County
Chouteau County
Milk River
Fort Belknap Indian Reservation
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.
Created by the Malta Field Office in December 2012
Albers Equal Area, NAD83, Meters
Land Adjustment Category
1 - Retention
3 - Disposal
BOR
State
Private
Water
BLM
BLM-LU
USFWS
Indian Reservation
Canada
Township
County
RMP Boundary
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map F.6
Land Ownership Adjustments
Retention & Disposal Areas
Alternative E (Preferred)
Blaine County
1:620,155
0
5
10
Miles


Saskatchewan
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map F.7
Land Ownership Adjustments
Retention & Disposal Areas
Alternative E (Preferred)
Phillips County
Land Adjustment Category
1 - Retention
3 - Disposal
US Fish and Wildlife Service (USFWS)
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Bureau of Reclamation
Indian Reservation
State
Private
Water
Township
County
RMP Boundary
0 4.5 9 Miles
1:776,048
Albers Equal Area, NAD83, Meters
R 27 E
R 28 E
R 29 E
R 30 E
R 31 E
R 32 E
R 33 E
R 34 E
Phillips County
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
T 28 N
T 27 N
T 26 N
T 25 N
T 24 N
T 23 N
Milk River
Fort Belknap Indian Reservation
Blaine County
Valley County
CMR National Wildlife Refuge
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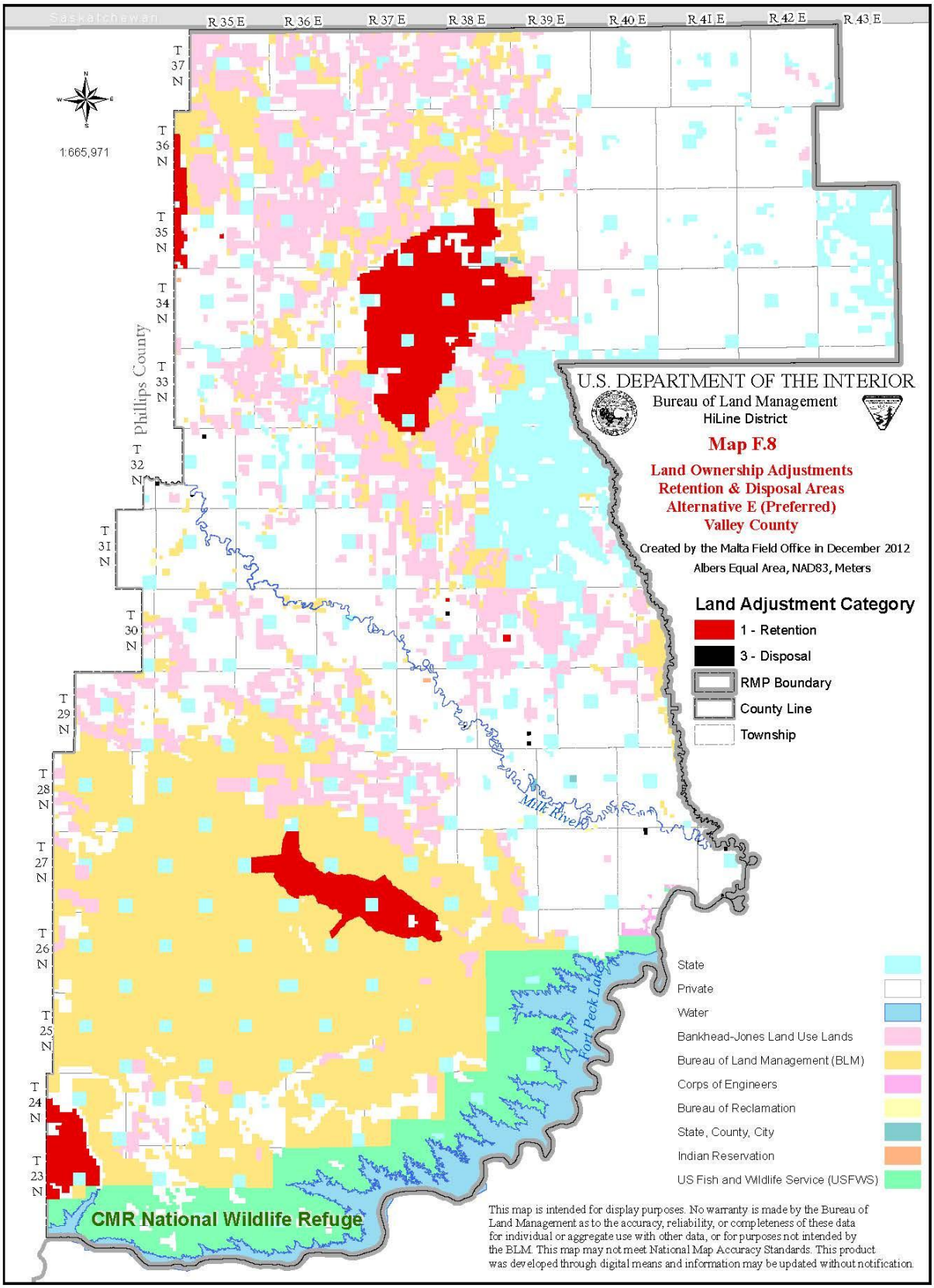
Saskatchewan
R 35 E
R 36 E
R 37 E
R 38 E
R 39 E
R 40 E
R 41 E
R 42 E
R 43 E
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
T 28 N
T 27 N
T 26 N
T 25 N
T 24 N
T 23 N
1:665,971
Phillips County
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map F.8
Land Ownership Adjustments
Retention & Disposal Areas
Alternative E (Preferred)
Valley County
Created by the Malta Field Office in December 2012
Albers Equal Area, NAD83, Meters
Land Adjustment Category
1 - Retention
3 - Disposal
RMP Boundary
County Line
Township
Milk River
Fort Peck Lake
State
Private
Water
Bankhead-Jones Land Use Lands
Bureau of Land Management (BLM)
Corps of Engineers
Bureau of Reclamation
State, County, City
Indian Reservation
US Fish and Wildlife Service (USFWS)
CMR National Wildlife Refuge
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Appendix G
Livestock Allocations

Livestock will continue to be allocated approximately 386,600 animal unit months (AUMs) of forage each year from BLM land in the planning area. The livestock allocations for the planning area are shown in Table G.1.

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
Havre Field Office						
00844	T32N R24E SEC 22 LATERAL	C		160	36	Y
00862	T26N R9E SEC 30	C		40	6	N
00869	T27N R11E SEC 32	C		80	8	Y
00871	ANCHORS ISLAND 25.10.04	C		40	8	Y
00873	T26N R10E SEC 12	C		80	8	Y
00874	T35N R12E SEC 18	C		40	8	Y
00875	T32N R23E SEC 5	C		40	7	Y
00877	T29N R9E SEC. 19 & 30	C		79	8	Y
00878	HL/BL LDFIL 32.17.1	C		59	12	N
00881	T27N R4E SEC 1	C		40	8	Y
00882	CADUFF	C		40	4	Y
00883	T23N 18E SEC 4	C		40	5	Y
00886	T31N R23E SEC 1	C		11	2	Y
00887	T32N R23E SEC 26	C		1	1	Y
00889	T37N R2W SEC 32	C		40	1	N
00899	T31N R4E SEC 35	C		40	5	Y
00900	T31N R3E SEC 22 SENE	C		40	6	N
00901	T30N R4E SEC 13 NWNE	C		40	8	Y
00902	T37N R17E SEC 7	C		40	8	Y
00904	T31N R12E SEC 3 NWNE	C		40	8	Y
00907	T34N R2W SEC 10 NWNE	C		40	3	Y
00908	T31N R1W SEC 27 SWSW	C		40	8	Y
00909	T31N R1W SEC 19 NENE	C		40	8	Y
00911	LONESOME LAKE FARM TRACTS	C		2120		Y
00916	T27N R12E SEC 140	C		40	8	Y
00917	T25N R09E SEC 4	C		12	3	Y
00918	T32N R22E SEC 21	C		25	5	Y
00930	SULLIVAN BRIDGE #2	C		40	12	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
00940	ESKAY SCHOOL	C		40	8	Y
00959	HAUGO SE/DAGNL NE	M		1002	211	Y
03091	AKSEL	M		317	58	N
03184	ELWOOD	C		40	6	Y
03186	JEWEL COULEE	C		335	71	Y
03199	LOST FORTY	C		40	7	Y
03230	WEST WAYNE CREEK	M		320	40	Y
05049	PHILLIPS COUNTY	C		160	27	Y
05097	LIESE-VAN VOAST	M		3215	750	Y
05608	LOWER SQUAW CREEK	C		177	43	NL
05611*	UPPER CYPRIAN CREEK	M		3779	646	Y
06001	NORTHWEST	M		1813	363	Y
06002	PEBBLE CREEK	C		160	30	Y
06003	SIX MILE COULEE	C		158	27	Y
06004	DRIFTWOOD	M		400	68	Y
06005	DAVIES RANCH	M	06/01/87	6211	1146	Y
06006	WEST UNIT	I	05/01/85	11043	2187	NL
06007	LYONS CREEK	I		1850	322	NL
06008	CANADA LINE	M		1921	368	Y
06010	EAST FORK	M	04/01/72	2053	633	Y
06011	BENNETT COULEE	M	05/01/69	3830	1082	Y
06012	BORDER UNIT 99	M	06/01/69	10897	2410	Y
06013	RESERVOIR-07	M		1686	366	Y
06014	SILVER BOW	I	06/01/86	1520	322	Y
06015	UPPER 30 MILE	M	06/01/85	1193	197	Y
06016	WOODY COULEE	M		200	40	Y
06017	MURRAY/WOODY ISLAND COULEE	M		760	153	Y
06018	CHERRY RIDGE	I	05/01/85	8284	1839	Y
06020	PETRIE RANCH	I	06/01/85	12992	2681	Y
06021	CUSTOMS	I	06/01/86	829	157	Y
06022	UPPER WOODY ISLAND	I	05/01/66	2360	541	Y
06023	RIFLE RANCH	M		80	16	Y
06024	NORTH WOODY ISLAND	I	01/31/80	9925	2076	Y
06026	BORDERLINE	C		77	24	Y
06027	ANDERSON RANCH	M	03/01/85	880	142	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06028	ELLOAM	C		1200	221	Y
06031	BAHR X 3	M	04/01/86	1191	229	Y
06032	OLD CREEK	M		80	17	Y
06033	CORRAL CREEK	I	05/01/85	2380	463	N
06034	STEVEN	M		480	89	Y
06035	UPPER HORSE CORRAL COULEE	I		1760	321	NL
06036	ONLY FORTY	I		40	9	NL
06037	LITTLE CHERRY	M		672	91	Y
06039	HAUGO-03	M		1090	224	Y
06040	DIAGONAL-03	I		670	174	NL
06041	CHERRY HILLS	M		941	181	Y
06044	BUCKLEY COULEE	I		80	13	NL
06046	JERGESEN	I		1600	282	Y
06047	MUD LAKE	I	03/10/97	1000	213	Y
06048	LODGE CREEK	I		1161	232	Y
06049	CHINOOK RESERVOIR	I		2798	448	NL
06051	TEE TRAIL	M	06/01/87	3955	745	Y
06052	NORWEGIAN	I	05/01/85	1600	339	Y
06053	MARKER	M		480	102	Y
06054	SKOYEN	C		320	77	N
06055	LOWER CHOUTEAU COULEE	M	05/01/75	1053	267	Y
06056	DRY FORK	M		1640	333	Y
06057	HOLMAN	M	01/27/94	4268	997	Y
06058	CHOUTEAU COULEE	I	03/01/82	7280	1650	Y
06059	BOOT RESERVOIR	M		480	103	Y
06060	NELSON PLACE	M		1080	211	Y
06061	FIFTEEN MILE COULEE	M		640	130	Y
06062	TILLEMAN UNIT	I		2171	458	NL
06064	BR-12 NW 30-MILE	I	04/01/96	2018	369	Y
06066	HAMMER	I		1787	376	Y
06067	FH	I		40	7	NL
06069	SECOND BEND	M		560	105	Y
06070	BLAINE COUNTY	M		859	192	Y
06071	HANSON FLAT	I	05/01/67	3360	751	Y
06072	RED ROCK COULEE	M		1120	253	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06074	WILLIAMS BENCH	M	05/01/67	640	236	Y
06075	RESER	I		1720	352	Y
06076	PRIDGEON PLACE	M		320	64	Y
06077	NORTH	M		480	111	Y
06078	GENE CREEK	M		160	35	Y
06079	EAST	M		197	39	N
06081	SIEMENS	C		40	5	Y
06082	RABBIT HILLS	M		240	39	Y
06083	BATTLE CK / SALMO	I	02/18/87	3383	498	Y
06084	ANDY RESERVOIR	C		438	58	Y
06085	COAL COULEE	M		643	147	Y
06087	NORTH COAL COULEE	M		1611	343	Y
06088	WEST COAL COULEE	M		640	151	Y
06089	POND CL/15 MILE	I	03/01/96	2120	422	Y
06090	ZURICH PARK	M		585	96	Y
06091	TWO STEP	M		667	136	Y
06092	ROAD BEND	M	05/01/87	1280	297	Y
06094	TRIANGLE	M	05/05/87	1450	309	Y
06095	PAULY/30 MILE	M	05/01/93	2994	517	Y
06096	WEST FORK/HALSETH	M		1360	269	Y
06097	WAYNE CREEK	M		2140	453	Y
06098	BUCKSHOT	M		1160	247	Y
06099	UPPER RIGGIN - JEWEL	I	05/01/65	3590	718	Y
06101	MODIC	M		956	220	Y
06103	NORTH REFUGE	M		600	127	Y
06104	STOPLIGHT	C		40	9	Y
06107	LIESE-VANVOAST BL CO	M		2625	597	Y
06109	MILES BUTTE	C		601	115	Y
06110	S SLASH B	M		640	143	Y
06111	ZURICH BENCH	M	05/01/69	3239	674	Y
06114	HARVEY PLACE	M		460	53	Y
06115	GREENLAND	M		1330	179	Y
06116	RODEO/HARLEM	M		1258	179	Y
06117	SIPHON	C		145	28	Y
06118	COLONY	M		200	46	N
06119	LOWER WAYNE CREEK	M	05/05/87	6510	1072	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06120	WILLIE	M		1640	322	Y
06121	EXCLOSURE	M		1480	328	Y
06122	BLACK CREEK	M		2080	476	Y
06123	FINGER LAKES	M		720	165	Y
06125	MATADOR	M		1400	279	Y
06127	RAILROAD	C		200	56	N
06129	SAVOY CREEK	I	03/16/88	6032	1126	Y
06130	LOWER SAVOY CREEK	M		440	79	Y
06131	DRAKE CREEK	M		1840	378	Y
06132	MILK CREEK	M		2080	439	Y
06133	WEST COBURG	M		880	199	Y
06134	COBURG	I		1652	276	NL
06136	JUNCTION	M	08/10/93	2587	658	Y
06137	EUREKA	I		1441	317	NL
06140	PIPELINE	C		160	26	Y
06142	SOUTH MAGDA	C		40	10	Y
06144	COUNTY ROAD	M		343	82	Y
06150	ALKALI LAKE	I	01/01/71	1612	245	Y
06152	BEN	C		80	21	Y
06153	GAP CREEK	M		1037	116	Y
06154	BIRDTAIL BUTTE	M		561	134	Y
06155	MCCANN BUTTE	C		40	7	Y
06157	REEDER FIELD	M		381	46	Y
06159	MYRTLE BUTTE	C		1308	271	Y
06160	NORTH & MCGUIRE	C		905	201	Y
06161	REED PLACE	M		240	80	Y
06162	HENDERSON PLACE	C		80	13	Y
06163	SAWTOOTH MOUNTAIN	C		200	52	Y
06164*	3-MILE RIDGE	M	06/03/85	10321	1460	Y
06165	TU BENCH	M	06/01/98	1874	330	Y
06166	PIONEER	M		600	60	Y
06167	TIN CUP	M		559	64	Y
06168*	AL'S CREEK	I		3385	366	NL
06169*	CHIMNEY BUTTE	I	03/01/88	7112	720	Y
06171*	LITTLE SUCTION	M	03/01/88	1405	139	Y
06172*	TIMBER RIDGE	I		11599	1662	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06173	SAND CREEK-SEC.3&15	M		5349	876	Y
06174	BENCH MARK	C		240	44	Y
06175	NIELSON HOMESTEAD	M		632	97	Y
06178	BOGGESS PLACE	M		467	73	Y
06180	BULLSEYE	C		40	5	Y
06181*	BULLWHACKER	I	04/01/69	40243	4491	Y
06183	BIRCH CREEK	M		3315	281	Y
06184	GREENS BENCH	I	05/01/70	12038	1219	NL
06185	SCATTERED TRACTS	M		577	86	Y
06187	FORK OF BLACK COULEE	M		1013	135	Y
06189	NORTH RANCH	M		420	69	Y
06190	OLIVER	C		241	36	Y
06192*	NORTH FK LION COULEE	I	01/01/99	3930	592	Y
06193*	LION COULEE	I	05/01/82	3351	432	Y
06195	CORNER	I		120	21	NL
06197	LAPORTE PLACE	M	06/01/71	2115	584	Y
06198*	CHASE HILL COMMON	M	04/01/83	923	112	Y
06199	GREENS COULEE	M	04/01/83	1486	109	Y
06200	CHIP CREEK	M		1160	387	Y
06202	CUMMINGS BENCH	M	06/01/88	2115	202	Y
06203*	GOLF BENCH	M	05/01/69	3319	230	Y
06204	BLACK COULEE COMMON	M	03/01/85	4642	372	Y
06205	MORAVEC INDIVIDUAL	C		440	14	Y
06206	UPPER BLACK COULEE	M	06/01/93	1036	104	Y
06207*	RAGLAND RIDGE	M		1085	25	Y
06208*	LOST RIDGE	M	06/01/82	6253	487	Y
06213	RANKIN LAND	C		97	16	Y
06215*	DARK BUTTE	M		4404	362	Y
06216*	PABLO RAPIDS	M	01/01/93	2644	130	Y
06219	FOURMILE HILL	C		40	14	Y
06220*	EIGHT MILE BENCH	C		818	89	Y
06223*	HUSAR HOME PLACE	C		83	13	Y
06226	SHARPLES PLACE	M		320	60	Y
06227	48 RITTERBUSH	I	05/01/85	4160	816	Y
06228	FORT	M		280	54	Y
06229	GUIDE	I		480	130	NL

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06230	HORSE CORRAL COULEE	M	06/01/69	1915	369	Y
06233	AIRSTRIP	I		2629	495	Y
06235	MB EAST PASTURE	M	05/01/71	1709	321	Y
06238	HIGHWAY	M		310	65	Y
06239	FORGEY CREEK	I	04/01/85	3840	555	NL
06241	BELDEN	M		80	9	Y
06242	WAYLEE	C		80	9	Y
06246	ZURICH/CHERRY RIDGE RD	I		40	8	NL
06247	WEST WILDHORSE	C		114	32	Y
06249	MILLER NORTH	I	05/01/71	1923	295	Y
06250	MILK RIVER	C		167	35	N
06251	EAST UNIT	I	05/01/85	5096	1097	Y
06255	GRABER UNIT	M		624	113	Y
06257	NORTH ZURICH	M		1896	420	Y
06261	NUEVO	M		320	64	Y
06263	RESERVOIR COULEE	M	04/27/90	1765	399	Y
06264	MITCHELL	M	01/28/91	920	302	Y
06266	NORTH CHOUTEAU COULEE	M		480	81	Y
06267	LOMA RANCH	C		101	20	Y
06268	THIBADEAU	M		920	222	Y
06269*	NORTH TIMBER RIDGE	I		1125	145	Y
06271	HOLMS	M		520	98	Y
06274	LOWER RIGGIN	M	05/01/65	2354	491	Y
06275	STONE PLACE	M		454	79	Y
06276	WEST STONE	M		1415	256	Y
06277	VOLCANO	C		168	35	Y
06278	FLAT ROCK	C		164	34	Y
06279	SOUTH 40	C		40	9	Y
06286	CECRLE PLACE	C		40	11	Y
06287	JACOBSEN	C		40	14	Y
06293	WHITLASH	M		560	75	Y
06305	HAY COULEE/GOLD BUTTE	C		105	33	Y
06339	SULLIVAN BRIDGE	M		290	83	N
06340	MARIAS WILLOWS	I		607	203	NL
06341	LITTLE BOXELDER CR	C		8	2	Y
06344	RED HORSE	C		49	6	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06345	MEDICINE ROCK COULEE	M		1885	171	Y
06348	HOME PLACE	M		3117	500	Y
06349	FALCON	M		4101	454	Y
06351	HALVORSON	C		40	14	Y
06352	DAHLEN	C		160	36	Y
06354	BYE RIM	M		571	153	Y
06356	NINEMILE CR.	C		400	116	Y
06357	RAIL EIGHTY	C		80	15	Y
06358	WILMA	M		2874	358	Y
06359	RIMROCK	M		404	125	Y
06360	SHEEP	M		720	150	Y
06361	SALTBUSH	M		320	53	Y
06362	VIRDEN LAKE	M		1409	89	Y
06363	OPEN FLAT	M		560	80	Y
06364	SHELBY	M		905	36	Y
06365	MONUMENT FIELD	C		40	12	Y
06366	ALKALI FLAT	C		80	13	Y
06367	BIG DAMP	I		833	167	Y
06368	MARIAS GREENS	M		156	28	Y
06369	ROUN	C		181	37	N
06370	KIMMET PLACE	M		548	117	Y
06371	WAMSLEY LEASE	M		247	75	Y
06373	OILMONT	M		320	105	N
06374	SANDON	M	05/01/85	480	120	Y
06375	PSALMIST	C		80	8	Y
06376	FERTIG	C		120	40	Y
06377	HENRY	C		40	5	Y
06379	COUNTY LINE	M		320	40	Y
06380	KEIL	M		186	62	N
06381	M AND M	M		157	35	Y
06383	DRY FORK	C		32	7	N
06384	MYRON	C		62	10	Y
06385	MARIAS BREAKS	C		240	37	Y
06386	MACK	M		360	90	Y
06387	NAISMITH	M		203	68	N
06388	SWEETGRASS HILLS	M		120	37	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06389	WEST BUTTE	M		1870	312	Y
06390	MCDERMOTT PLACE	M		200	37	Y
06391	FEY LEASE	M		40	7	Y
06392	GOLD BUTTE	M		57	18	Y
06393	ARROWHEAD	C		80	15	Y
06394	MINERS COULEE	M		327	32	Y
06395	MOUNT ROYAL	M		2499	185	Y
06396	MARIAS BRIDGE	M		2418	470	Y
06397	BIG SPRING	M		712	39	Y
06398	BALD EAGLE	M		1130	82	Y
06399	PUGSLEY BRIDGE	M		1603	636	Y
06402	LINK	C		237	34	Y
06403	HOFFMAN COULEE	C		680	66	Y
06404	NW FORTY	C		40	10	Y
06405	NORTH STAR	M		443	70	Y
06406	WEST VIRDEN	C		40	5	Y
06411	PREFERENCE LANDS	C		248	38	Y
06412	BUCKSKIN	M		840	110	Y
06414	TRIANGLE P. U.	M		282	47	Y
06415	DOGTOWN	M	04/01/83	1136	91	Y
06416	PIGTAIL COULEE	M	04/01/83	1248	132	Y
06417	TALFALGER	C		40	5	Y
06418	GREEN ROOF	M		383	71	Y
06420*	CLINARD COULEE	C		628	76	Y
06421	SEVCIK PLACE	C		80	23	Y
06422*	N HANGING 5	M		474	57	N
06423	ANTELOPE	C		120	34	Y
06424*	BLAZEK	M		336	90	N
06425*	PIEDRAS	M		1002	54	Y
06427	DILLMAN PLACE	M	04/29/99	120	24	Y
06428*	OSTERMAN	C		200	42	Y
06429*	PUMA	C		156	53	Y
06430	BRAUN	C		96	12	Y
06432	ARROYO	M		529	133	Y
06433	VALKYRIE	C		80	5	Y
06434*	CABIN	M		1783	223	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06435	NORTH RAPP	M		287	7	Y
06437	VALLIE PLACE	M		40	8	Y
06438	HACKAMORE	M		352	41	N
06439	HOMESTEAD COULEE	M		1520	151	Y
06440	LATIGO	M		400	66	Y
06441	STEVENS	C		267	41	Y
06442	MARIAS RIVER ONE	I		471	114	Y
06444	SHEEP COULEE	M		1771	241	Y
06445	MARIAS BREAKS	C		177	40	Y
06446	NOME	M		1221	185	Y
06448	CHRISTOFFERSON	M	11/27/89	5325	1200	Y
06450	IHMSEN WELL	M	03/28/94	2718	537	Y
06451	LONESOME PRAIRIE	M	05/26/93	2128	406	Y
06453	HARDWARE	M		438	176	Y
06454	TWO BIT	C		40	10	Y
06455	HAYSTACK	M	02/07/97	2800	560	Y
06456	RESERVATION	C		244	34	Y
06457	EDWARDS LEASE	C		300	43	Y
06458	BEAR PAW	C		25	4	Y
06459	BULLHOOK	C		80	17	Y
06460	KREMLIN	C		80	27	Y
06461	FRESNO	C		120	16	Y
06462	LONG BEACH	C		78	25	Y
06465	SIGNAL	C		174	35	Y
06466	HAUGEN	C		40	12	Y
06468	LOBO	M		680	167	Y
06470	NAGELHUS PLACE	M		1600	153	Y
06471	WILD HORSE LAKE	M		9754	799	Y
06473	SUNBURST	C		440	10	Y
06474	GOOD	C		80	27	N
06475	VIMY POINT	M		127	17	N
06476	CHAUVET	C		120	22	Y
06477	DIETZ	C		160	18	Y
06478	TETON	M		560	77	Y
06479	SHAMROCK	C		40	14	Y
06482	BADGER	C		426	46	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
06483	TUNIS	C		40	12	Y
06484	SUNSET	M		600	160	Y
06485	MARIAS RIVER TWO	M		532	116	Y
06486	LAZY K 6	M		1421	151	Y
06487	MELBY	C		120	32	Y
06489	GOLD EAGLE	M		210	14	Y
06490	FORK COULEE	M		1081	191	Y
06491	PINE TREE	C		80	18	Y
06492	GOLD FORTY	C		80	18	Y
06494	RED WING	C		18	3	Y
06495	FOWLER	C		77	12	Y
06496	CUT BANK INDIVIDUAL	C		11	1	N
06554	T28 R17 SEC5-NSW	C		80	19	Y
06558	THE HILLS	C		40	9	Y
06569	OUTLOOK SCHOOL	M		200	17	Y
06570	MCPHILLIPS	C		40	8	Y
16301	NORTH SNAKE	M		266	47	Y
16302	SNAKE BUTTE	M		862	145	Y
16304	SNAKE BUTTE EAST	M		1106	190	Y
16350*	SOUTH VIMY	M		904	93	Y
16406	KAUN	C		40	14	Y
16407	BOOTLEGGER	C		120	35	Y
16408	PINTO	C		120	37	Y
19661	DEVILS CHIMNEY	M		200	18	Y
19662	GALLUP	M		322	29	Y
Glasgow Field Office						
01148	WEST BRAZIL CREEK	I	05/01/88	13420	1606	Y
01195	EAST BRAZIL CREEK	I	05/01/05	13173	2120	Y
03144	HAMMOND COULEE	I	04/01/07	6289	683	NL
04000	UPPER CROW CREEK	I	06/01/67	6061	1033	Y
04002	UPPER BLUFF CREEK	M	05/01/67	3064	586	Y
04003	UPPER EASTFORK CROW	I	04/01/79	5588	944	Y
04004	MT04004	M		46	10	Y
04005	FLINT RESERVOIR	I		1443	330	Y
04006	BLUFF CREEK	M		1885	286	Y
04007	MT04007	C		52	7	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
04008	WESTFORK BLUFF CREEK	I	05/01/67	4090	787	Y
04009	CHAMBERS CREEK	I	05/01/89	1511	347	Y
04010	MT04010	M		2687	574	Y
04011	MT04011	M		129	28	Y
04012	LOWER TOMATO CREEK	M	07/01/87	5239	984	N
04013	NORTH TOMATO CREEK	M		1439	287	N
04014	NORTHFORK ROCK CREEK	M	03/01/91	3775	647	Y
04015	SOUTH CREEK	I	03/01/89	12427	2268	Y
04016	UPPER MORGAN CREEK	M		1194	156	Y
04017	MORGAN CREEK	M	03/01/91	415	28	Y
04018	UPPER SOUTH CREEK	M		1440	254	Y
04019	SNAKE CREEK	I	07/19/88	7225	1005	Y
04021	UPPER LITTLE SNAKE	M	05/01/90	2206	375	Y
04022	LOWER BLUFF CREEK	M	04/01/79	4459	798	Y
04023	CHAMBERS COULEE	M	05/01/89	4429	671	Y
04024	DIVIDE	I	05/01/92	6645	1092	Y
04025	SOUTHFORK ROCK CREEK	I	05/01/06	9243	1950	Y
04026	MT04026	M		1520	321	Y
04027	MT04027	M		124	15	Y
04028	MT04028	C		200	44	Y
04029	MT04029	M		800	165	Y
04031	MT04031	M	03/01/95	803	150	Y
04032	LOWER SNAKE CREEK	I	03/01/95	3991	651	N
04033	MT04033	M		40	7	Y
04034	MT04034	C		466	64	Y
04035	LITTLE SNAKE CREEK	M		383	94	Y
04036	MT04036	C		40	7	Y
04037	MT04037	M	03/01/95	562	117	Y
04038	MT04038	M		798	159	Y
04041	ANDERSON-OJUEL	I	05/01/69	17132	2572	Y
04042	MT04042	M		490	99	Y
04043	SHAW COULEE	M		49	9	Y
04044	MT04044	C		399	94	Y
04047	UPPER WESTFORK CASHE	C		404	64	Y
04049	MT04049	M		487	100	Y
04051	MT04051	M		120	22	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
04052	MT04052	I	03/01/95	1108	231	NL
04053	EASTFORK WILLOW CREE	I	04/01/78	15605	2013	NL
04054	CHISHOLM CREEK	I	03/01/86	27881	4116	Y
04056	MT04056	M		2375	393	Y
04058	MT04058	M		1025	310	Y
04059	WARDS DAM	M	05/01/89	2286	535	Y
04061	LOWER WEST PORCUPINE	M		635	202	Y
04062	MT04062	M		1166	208	Y
04063	MT04063	C		120	23	Y
04064	MT04064	M		160	36	Y
04065	MT04065	M		362	87	Y
04066	CACHE CREEK	M		998	244	Y
04067	PAPOOSE CREEK	M		1823	339	Y
04068	MT04068	M		987	174	Y
04069	LOWER UNGER COULEE	I	11/01/84	890	198	N
04070	MT04070	M		481	112	Y
04071	UPPER CANYON CREEK	I	03/01/85	10266	1459	Y
04073	MT04073	C		57	14	Y
04075	MT04075	M		440	76	Y
04076	MT04076	M		200	34	Y
04077	MT04077	M		480	94	Y
04078	UPPER LIME CREEK	M	06/01/69	3163	504	N
04079	SOUTH LIME CREEK	M		2446	456	Y
04080	HALL COULEE	M		1548	276	Y
04081	MT04081	M		95	16	Y
04082	BLACK COULEE	M		1754	343	Y
04083	MT04083	M		479	99	Y
04084	MT04084	C		162	26	Y
04088	ELLSWORTH COULEE	I		1281	234	Y
04089	ALKALI CREEK	M		920	179	Y
04090	LOWER ALKALI CREEK	M		320	55	Y
04091	LOWER BEAR CREEK	C		800	168	Y
04092	UPPER UNGER COULEE	I	05/01/89	2090	522	N
04095	LOWER LIME CREEK	M		157	24	Y
04096	MT04096	C		318	55	Y
04097	EASTFORK CACHE CREEK	M		531	99	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
04098	MT04098	M		160	37	Y
04200	LOWER PORCUPINE CREE	M		672	87	Y
04201	MT04201	M		40	6	Y
04202	LENZ COULEE	M		200	15	Y
04205	BUTCH COULEE	C		160	39	Y
04206	MT04206	C		80	16	Y
04207	LOWER MILK RIVER	C		107	28	Y
04301	UPPER BUGGY CREEK	M	04/01/78	9864	1958	Y
04303	BUGGY CREEK	I	05/01/89	28422	5658	Y
04304	PORCUPINE CREEK	M		2967	597	Y
04307	LOWER SPRING CREEK	M	05/01/89	240	63	Y
04308	SPRING CREEK	M	04/15/91	4914	1044	Y
04309	WESTFORK	M		2424	568	Y
04310	NORTH WESTFORK	C		397	116	Y
04500	MT04500	C		40	7	Y
04501	MILES CROSSING COULEE	M		360	72	Y
04502	LOWER MILES CROSSING	C		120	24	Y
04504	MT04504	M		160	15	Y
04508	LITTLE HORN COULEE	M		601	64	Y
04509	TANK COULEE	M		1564	231	Y
04510	BIG COULEE	M		800	107	Y
04511	KENT COULEE	M		508	54	Y
04513	RATTLESNAKE ALLOT.	M		976	199	NL
04514	PAYNE PLACE	M		2255	463	Y
04515	MT04515	M	07/01/96	320	76	Y
04517	WESTFORK ASH COULEE	M	03/01/99	640	116	Y
04518	ASH COULEE	I		750	172	Y
04519	LARB CREEK	I	06/01/74	7181	1712	NL
04520	MCGREGOR COULEE	M		120	20	Y
04521	UPPER BUFFALO COULEE	C		720	138	Y
04523	LOWER BUFFALO COULEE	M		320	71	Y
04524	UPPER HAY COULEE	C		40	9	Y
04526	LOWER SQUARE COULEE	M		839	181	Y
04527	MT04527	M	07/01/96	1953	358	Y
04528	MT04528	C		120	35	Y
04529	SQUARE COULEE	M		755	116	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
04530	LOWER COON COULEE	C		240	60	Y
04531	UPPER SQUARE COULEE	C		80	20	Y
04532	MT04532	M		160	36	Y
04533	UPPER ANTELOPE CREEK	M		1800	456	Y
04534	NORTHFORK ANTELOPE	I		2420	504	Y
04535	SOUTHFORK ANTELOPE C	I	05/01/89	9338	1275	Y
04536	TRUAX COULEE	M		2094	405	Y
04537	LOWER NORTHFORK ANTE	I		2280	420	Y
04538	LOWER HARDSCRABBLE	I		1160	229	Y
04539	HARDSCRABBLE CREEK	I	03/01/93	2282	480	Y
04540	HAY COULEE	M	03/01/93	3236	568	N
04541	LOWER HAY COULEE	C		570	97	Y
04542	ANTELOPE CREEK	I		4633	801	Y
04543	LOWER ANTELOPE CREEK	C		480	84	Y
04544	MT04544	C		80	14	Y
04546	LOST COULEE	I	05/01/90	11186	1865	NL
04547	MT04547	M	06/07/71	560	144	Y
04548	BOX ELDER CREEK	I	05/01/71	13312	2034	Y
04549	MT04549	M		160	28	Y
04550	SOUTH SHED COULEE	M	03/01/89	14166	2289	Y
04551	UPPER BRAZIL CREEK	I	05/01/88	26500	3117	Y
04552	UPPER LITTLE BEAVER	I	05/01/89	8068	678	N
04554	LOWER SOUTHFORK ANTE	I	05/01/87	3342	483	Y
04555	BULLOCK COULEE	C		2016	299	Y
04556	HAY FEVER	C		660	101	Y
04557	SECOND BRAZIL CREEK	I	05/01/95	3073	665	Y
04558	WIRENET CORRAL PAST.	M		568	111	Y
04559	MT04559	M		320	67	Y
04560	LOWER BRAZIL CREEK	M		1870	502	Y
04561	HOMESTEAD PASTURE	M		120	24	Y
04562	LITTLE BRAZIL CREEK	M		160	32	Y
04563	COYOTE CREEK	I	04/01/71	6213	957	Y
04564	ALKALI COULEE	M		1188	43	Y
04565	THEOFIEL COULEE	C		40	10	Y
04566	MT04566	C		40	8	Y
04567	GRAVEL PITS	M		240	36	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
04569	MT04569	C		528	118	Y
04570	MT04570	C		80	5	Y
04571	GRANT COULEE	I	04/01/72	13329	2410	Y
04572	CORRAL COULEE	I	03/01/83	8494	750	Y
04573	LITTLE BEAVER CREEK	I	04/20/99	8277	705	Y
04574	MILLER COULEE	I	04/01/73	22415	2300	NL
04575	MT04575	M		135	12	Y
04576	LOWER WILLOW CREEK	M	04/01/67	5340	488	Y
04577	MUD CREEK	I		3635	360	N
04578	GRANDPA COULEE	M	03/01/83	1914	396	Y
04579	UPPER LARB CREEK	I	06/01/82	5976	854	Y
04581	LONETREE CREEK	I	05/01/74	40415	2772	Y
04582	LONETREE HUB	C		80	10	Y
04583	LOWER LITTLE BEAVER	I	05/01/73	22541	2322	N
04584	MT04584	C		536	56	Y
04585	LEWIS RESERVOIR	M	04/01/67	8974	965	Y
04586	UPPER MUD CREEK	M		2268	232	Y
04587	DUCK CREEK	M		1440	171	Y
04588	TIMBER CREEK	M	03/01/83	17150	1766	Y
04589	SOUTHFORK WILLOW CR.	M	03/01/83	9099	1138	Y
04591	SUTHERLAND	C		810	186	Y
04592	BOMBER COULEE	M	06/01/75	14321	1025	Y
04593	SKUNK COULEE	M		2640	265	Y
04595	CARPENTER CREEK	I	10/20/87	130399	14180	Y
04596	MATADOR CREEK	M	03/01/83	3162	613	Y
04597	MT04597	C		40	7	Y
04598	SEVEN POINT	M	05/01/74	14827	2102	Y
04600	CABIN COULEE	M		5669	875	Y
04601	NORTH LITTLE BEAVER	I	05/01/87	3273	354	Y
04655	NORTH POPLAR RIVER	M		320	54	Y
04656	WEST ROANWOOD COULEE	M		136	19	Y
04657	ROCK CREEK DIVIDE	M		473	107	Y
04660	SOUTH POPLAR RIVER	M		560	100	Y
04662	LOWER POPLAR RIVER	M		360	60	Y
04663	UPPER MIDDLE PORCUPI	M		320	54	Y
04665	MIDDLEFORK PORCUPINE	M		400	62	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
04700	UPPER MCEACHRAN CREE	I	11/01/69	5124	958	Y
04701	DAVIDSON COULEE	I	06/01/73	5278	1184	Y
04702	MCEACHRAN CREEK	M		1040	211	Y
04703	UPPER ROCK COULEE	I	05/01/89	2586	560	Y
04704	MT04704	M		1600	445	Y
04707	EASTFORK CROW CREEK	I	03/01/87	15397	2378	Y
04708	ITCHPAIR CREEK	M	05/01/68	11497	2350	Y
04709	MT04709	M		671	155	Y
04710	MT04710	M		390	88	Y
04711	NORTH WILLOW CREEK	I	03/01/87	9600	1851	Y
04713	LOWER CROW CREEK	M	04/01/74	3394	641	Y
04714	ROCK CREEK	I		1220	234	Y
04715	EAST ROCK CREEK	M	04/01/72	2016	264	NL
04716	JONES COULEE	M	04/01/76	3664	739	Y
04717	WILLOW CREEK	I	03/01/00	3853	927	Y
04718	UPPER WILLOW CREEK	I	05/01/69	27251	3944	Y
04719	MT04719	M		305	60	Y
04720	OREGON RESERVOIR	M		120	22	Y
04721	CLARA RESERVOIR	M		2563	285	Y
04722	BITTER CREEK	I	03/01/87	5434	439	Y
04723	LITTLE PAPOOSE CREEK	M	04/01/72	9289	1626	Y
04724	LOWER ROCK CREEK	C		309	49	N
04725	MT04725	M		337	64	Y
04726	EAGLES NEST COULEE	M	05/01/68	18058	2823	N
04727	MT04727	M		1493	245	Y
04728	LIME CREEK	M	03/01/87	2096	369	Y
04729	WEST ROCK CREEK	I	03/01/89	1912	343	Y
04730	THOENY	I		1436	358	Y
14100	MT14100	M		310	72	Y
14101	ANTELOPE SPRING	M		875	163	Y
14102	DRY COULEE	M		1829	355	Y
14103	MT14103	C		413	110	Y
14104	MT14104	M		420	96	Y
14105	MT14105	M		817	192	Y
14106	UPPER RICHARDSON COU	M		3031	573	Y
14107	MT14107	M		80	20	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
14108	UPPER MARTIN COULEE	C		480	103	Y
14109	CHERRY CREEK	I	05/01/90	3872	668	Y
14110	UPPER SCHOOL SECTION	M		305	48	Y
14111	FOSS COULEE	M		2773	553	Y
14112	UPPER SPRING CREEK	I	06/03/91	4177	906	Y
14113	SPRING COULEE	I		1321	273	Y
14114	LOWER SPRING COULEE	M		93	18	Y
14115	MT14115	M		640	119	Y
14116	HAWK COULEE	I	03/01/93	5358	739	Y
14117	CHAPMAN COULEE	M		786	124	Y
14118	MOONEY COULEE	C		346	58	Y
14119	LOWER MOONEY COULEE	C		40	6	Y
14121	LOWER CHERRY CREEK	M		640	302	Y
14122	LOWER FOSS COULEE	M		40	7	Y
14124	EAST CHERRY CREEK	M		734	108	Y
14125	LOWER PORCUPINE CK	M		290	30	Y
14126	DRY WEST	M		880	166	Y
14127	MT14127	M		80	16	Y
14128	MIDDLE FOSS COULEE	M	03/01/93	860	588	Y
14129	CHERRY CREEK FORKS	C		160	31	Y
14130	MT14130	M		40	6	Y
15348	MT15348	I		160	34	Y
15431	WEST LARB CREEK	M	06/01/82	1760	279	Y
Malta Field Office						
01551	FOOTHILL	C		40	8	Y
01554	WEST ARMSTRONG COULEE	C		1280	184	Y
03112	NORTH PLAINSVIEW	C		465	100	Y
03113	MID PLAINSVIEW	C		1661	381	Y
03239	CROSS ROADS	C		40	6	Y
04020	WODTKEY COULEE	I		1601	51	Y
04030	TWO MILE COULEE	I		2119	276	Y
05001	BORDER	I	05/01/65	1848	525	Y
05003	WEST SUNNYSLOPE	I	05/01/65	1440	277	Y
05009	UPPER WHITEWATER CK.	M		4680	1010	Y
05010	FANNING COULEE	I		1712	337	Y
05011	WEST BIG COULEE	M		4312	1017	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
05013	DIVIDE	M		7706	1785	Y
05014	NORTH PEA LAKE	M	11/28/90	5948	1486	Y
05015	PEA LAKE	M	06/30/94	14470	3457	Y
05016	LEIBEL COULEE	I		2039	471	Y
05021	ORREY COULEE	I		2160	514	Y
05022	EAST PLAINSVIEW	M		1966	421	Y
05023	FRENCHMAN CREEK	I		22312	1878	Y
05024	UPPER SNAKE CREEK	I		7535	1042	Y
05025	MIDDLE FRENCHMAN	C		1090	128	Y
05026	WODTKEY COULEE	I		12323	1320	Y
05027	COTTONWOOD CREEK	I		6016	696	Y
05028	WEST COTTONWOOD	C		575	110	Y
05029	WRIGHT COULEE	C		365	67	Y
05030	DUNHAN COULEE	M	04/01/75	2688	895	Y
05031	WALLIS COULEE	M		1280	204	Y
05032	JOHNS COULEE	C		1040	239	Y
05033	KASHAW COULEE	I		320	66	Y
05034	PLAINSVIEW	M	05/01/69	4725	981	Y
05035	NORTH WHITEWATER LK	I		6745	1391	Y
05036	WEST WHITEWATER LAKE	M	05/01/70	7473	1467	Y
05037	LONE TREE COULEE	M	02/15/75	7191	1531	Y
05038	RESERVOIR	I	05/01/69	1039	214	Y
05039	WHITEWATER CREEK	M		5453	1125	Y
05040	WREN COULEE	C		1062	210	Y
05041	LAKE COULEE	M		7164	1078	Y
05042	FLAT COULEE	M		2597	481	Y
05043	HORSESHOE LAKE	M		11467	2422	Y
05044	NORTH HORSESHOE LAKE	M	10/19/09	2005	385	Y
05045	ALL PRONTO	C		640	97	Y
05046	NORTH COWIE COULEE	C		510	112	Y
05047	HORSESHOE COULEE	M	05/01/65	6526	1404	Y
05048	COUNTYLINE	C		40	9	Y
05050	KEGAL COULEE	C		235	37	Y
05051	WOODY ISLAND	M	03/01/69	6957	1204	Y
05052	COWIE COULEE	C		455	109	Y
05053	TAKE-AWAY	M		2905	509	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
05055	MARTIN LAKE COULEE	C		285	50	Y
05056	LOWER LAKE COULEE	M		1200	221	Y
05058	NORTH DIBBLE COULEE	C		650	131	Y
05059	DIBBLE COULEE	M		2125	451	Y
05060	SOUTH DIBBLE COULEE	C		40	9	Y
05061	UPPER SINK COULEE	C		480	90	Y
05062	AUSTIN LAKE	M	01/31/07	9560	1851	Y
05063	SINK COULEE	C		1133	204	Y
05064	WHITEWATER	M		1486	256	Y
05065	EASTFORK WHITEWATER	I	05/01/75	6202	1206	Y
05067	LONE TREE	M	09/15/05	760	130	Y
05069	WESTFORK STINKY	M		1705	398	Y
05070	STINKY CREEK	C		720	99	Y
05071	TURKEY TRACK	M		6040	1182	Y
05072	UPPER E FK STINKY	C		552	122	Y
05073	EKLUND COULEE	M		1915	181	Y
05075	TWO MILE COULEE	M		2887	303	Y
05076	PAN HANDLE COULEE	C		794	142	Y
05077	ASH COULEE	C		153	27	Y
05078	RATTLESNAKE COULEE	C		310	60	Y
05080	EASTFORK STINKY CR.	C		1960	431	Y
05081	FORTY	C		40	10	Y
05082	BENCH	C		40	9	Y
05084	UPPER COOP COULEE	I	05/01/70	1906	329	Y
05085	COOP COULEE	M	05/01/65	896	168	Y
05086	LOWER COOP COULEE	M		2786	557	Y
05087	JOE BELL COULEE	M		3372	670	Y
05088	LOWER LUSH COULEE	M		5250	1037	Y
05089	MARTINS COULEE	I		5851	1160	Y
05090	UPPER LUSH COULEE	C		240	59	Y
05091	BELLE COULEE	C		860	148	Y
05092	MOUNT COULEE	C		55	9	Y
05093	LAMBING COULEE	I	05/01/75	10629	2053	Y
05094	UPPER COTTONWOOD	I	08/20/90	14469	2436	Y
05095	JOINER COULEE	I		5151	849	Y
05096	LAMERE COULEE	I	05/01/75	15133	2021	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
05100	MUD CREEK	I		1775	340	Y
05101	UPPER MUD CREEK	C		880	197	Y
05102	UPPER NORTHFORK	C		40	10	Y
05103	SOUTH JOINER COULEE	C		880	186	Y
05104	PIERSON COULEE	M		730	123	Y
05105	UPPER PIERSON COULEE	C		80	18	Y
05106	SHED COULEE	C		1662	295	Y
05107	GARLAND CREEK	M		4565	799	Y
05108	DAVENPORT COULEE	C		970	158	Y
05109	WEST GARLAND	M		3346	563	Y
05110	EAST GARLAND	M		6824	1111	Y
05111	LITTLE COTTONWOOD CR	C		3485	635	Y
05112	BUGHOUSE COULEE	C		1440	237	Y
05114	RIVER UNIT	C		392	31	Y
05115	BIG BEND	C	05/01/70	1474	227	Y
05116	ALKALI COULEE	M		3447	772	Y
05117	UPPER EXETER CREEK	C		47	8	Y
05118	LOWER STINKY CREEK	C		447	80	Y
05119	WEST STINKY CREEK	C		145	19	Y
05120	EAST STINKY CREEK	C		40	6	Y
05121	LITTLE COULEE	C		80	17	Y
05122	ROCK COULEE	C		811	98	Y
05123	BRUSH COULEE	C		360	53	Y
05124	BURNT SHED COULEE	C		200	45	Y
05125	MCCHESNEY RESERVOIR	C		80	6	Y
05126	LEMKE COULEE	C		114	23	Y
05127	DRY STINKY COULEE	C		320	51	Y
05128	EAST LOWER STINKY CR	C		45	8	Y
05129	LOWER WHITEWATER	C		320	57	Y
05130	HORSE CAMP COULEE	M	02/27/87	6105	813	Y
05131	BASIN COULEE	M		3182	731	Y
05132	ASSINIBOINE EAST	M		940	200	Y
05133	ASSINIBOINE CREEK	I	05/01/65	4927	828	Y
05134	ASSINIBOINE WEST	C		260	61	Y
05135	SOUTHFORK GARLAND	C		371	81	Y
05137	GOERTZ COULEE	C		40	9	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
05138	EAST SHEEP COULEE	C		80	20	Y
05139	SHEEP COULEE	C		320	74	Y
05140	WILLIAMS COULEE	C		200	42	Y
05144	DODSON CREEK	M	08/03/05	3240	640	Y
05145	EAST EUREKA CREEK	C		310	33	Y
05146	VAUGHN COULEE	C		280	42	Y
05147	LOWER VAUGHN COULEE	C		80	8	Y
05148	UPPER SPRING CREEK	C		240	51	Y
05149	SPRING CREEK	C		763	118	Y
05150	UPPER EXETER CREEK	C		500	102	Y
05151	DRY COULEE	C		120	30	Y
05152	EXETER CREEK	M		1283	275	Y
05153	WILSON COULEE	M		3795	820	Y
05154	DRY FORK	M		2544	430	Y
05155	SPRING CREEK	M		2295	416	Y
05156	LOWER ASSINNIBOINE	M		565	115	Y
05157	LOWER RATTLESNAKE CO	C		80	12	Y
05158	LORING	C		284	56	Y
05160	LOWER WILSON COULEE	M		925	166	Y
05163	SOUTH WOODY ISLAND	M		5151	664	Y
05164	ALBRIGHT COULEE	C		1112	221	Y
05165	NORTH DODSON CREEK	C	12/12/06	880	212	Y
05166	SOUTH DODSON CREEK	C		825	112	Y
05167	LOWER MILK	C		80	16	Y
05168	FANNING HILL	C		835	128	Y
05169	GARLAND	M		1650	376	Y
05170	LUSH COULEE	I		3327	666	Y
05171	HDQT	C		625	67	Y
05172	UPPER MARTIN	I		4689	894	Y
05173	MILK RIVER	C		25	5	Y
05174	HIGHWAY	M		40	9	Y
05175	COW CAMP	M		125	15	Y
05303	CANTY COULEE	C		1036	207	Y
05313	WEST SACO DUMP	C		110	21	Y
05317	NORTH CACTUS FLAT	C		180	14	Y
05319	UPPER SECOND CREEK	M		2494	611	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
05327	NORTH ROCKY POINT	C		80	17	Y
05328	ROCKY POINT	C		1600	372	Y
05334	LOWER ALKALI CREEK	C		560	89	Y
05351	RIEGAL COULEE	M		3565	820	Y
05365	JUNCTION	C		320	78	Y
05383	UPPER WEST ALKAI	C		340	38	Y
05384	NORTH WILD HORSE	C		1142	143	Y
05385	SOUTH WILD HORSE	C		719	104	Y
05386	TRESSLER COULEE	I		3754	571	Y
05387	WEST ALKALI CREEK	I	05/01/67	9871	1841	Y
05388	RUDOLPH COULEE	I	04/01/67	6917	1827	Y
05389	UPPER ALKALI CREEK	I		960	220	Y
05390	UPPER OVERFLOW COULEE	I		2682	478	Y
05391	N OVERFLOW COULEE	C		640	137	Y
05392	BENNETT LAKE	C		440	139	Y
05393	NELSON RESERVOIR	C		85	19	Y
05394	BEAUCOUP	C	02/01/93	1652	393	Y
05395	POINT OF ROCKS	C	02/15/93	160	31	Y
05396	MID WILD HORSE	C		103	13	Y
05397	THREE MILE	C		400	77	Y
05398	NORTH DHS CREEK	C		260	43	Y
05399	SOUTHFORK COTTONWOOD	I		1367	240	Y
05400	NORTHFORK COTTONWOOD	M		970	155	Y
05401	SEVEN MILE COULEE	C		640	128	Y
05402	LOWER SEVEN MILE	M		33	6	Y
05406	LOWER ALBERT COULEE	I	03/01/88	5518	1121	Y
05410	D. H. S. CREEK	C		721	135	Y
05411	BEAVER CREEK	I		4781	614	Y
05412	SHED COULEE	M		735	68	Y
05413	ARMSTRONG COULEE	M		1537	292	Y
05415	OVERFLOW COULEE	I	05/01/74	7794	1204	Y
05420	BIG WARMSPRING CREEK	C		1154	179	Y
05421	CABBAGE COULEE	C		800	132	Y
05423	SOUTH SPRING COULEE	C		522	90	Y
05425	UPPER WHITE ROCK	C		559	70	Y
05428	RHEUMATISM COULEE	M	11/01/72	3918	511	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
05430	TALLOW CREEK	C		810	115	Y
05436	LONE HORSE COULEE	I		6250	650	Y
05442	MICKEY RESERVOIR	M		3009	602	Y
05445	UPPER FIRST CREEK	M	05/01/73	4179	723	Y
05447	GAREY COULEE	M		3020	561	Y
05452	LONG COULEE	I	05/01/79	8505	1518	Y
05600	PARROT LAKE	I		3739	719	Y
05601	BEST COULEE	I		2735	532	Y
05602	DRY GULCH	C		280	142	
05603	MONTANA GULCH	M		2840	59	
05604	UPPER BULL CREEK	C		400	40	Y
05605	UPPER CABIN CREEK	C		160	48	Y
05606	SQUAW CREEK	C		255	45	Y
05612	SQUARE BUTTE	I	07/28/93	9599	1006	Y
05613	CAMP CREEK	I	03/01/81	2766	523	Y
05614	UPPER BEAUCHAMP CR.	M	03/01/81	3051	593	Y
05615	WEST DRY FORK	I	05/01/71	14854	1923	Y
05616	FRENCH COULEE	C		80	7	Y
05617	EAST DRY FORK	I	05/01/65	18672	2634	Y
05618	UPPER GAREY COULEE	M	05/01/82	1551	438	Y
05619	LOWER GAREY COULEE	C		345	63	Y
05620	UPPER FOURCHETTE CR.	I		3296	662	Y
05621	UPPER C.K. CREEK	C		204	31	Y
05622	GROUSE CREEK	C		90	24	Y
05623	UPPER SEVEN MILE CR.	M		3947	794	Y
05624	EAST ROCK CREEK	M	03/01/81	4137	672	Y
05625	LAVELLE CREEK	I	05/01/73	9726	1391	Y
05626	ROCK CREEK	I		5764	800	Y
05627	CURRENT	I	04/01/65	13726	2144	Y
05628	BEAUCHAMP CREEK	I		2735	282	Y
05631	CRUIKSCHANK	I	01/31/89	7080	989	Y
05632	THORNHILL	I		5208	774	Y
05651	NORTH FOURCHETTE	I	04/01/82	5080	985	Y
05652	THIRD CREEK	I	05/01/82	10128	1862	Y
05653	LOWER THIRD CREEK	I	05/01/83	5243	700	Y
05654	TELEGRAPH CREEK	I	05/01/70	11546	1481	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
05656	UPPER LONETREE COULEE	C		554	109	Y
05657	SOUTH FORK TELEGRAPH	M		3360	701	Y
05658	NORTH FORK TELEGRAPH	M	04/01/82	4427	712	Y
05660	LARB HILLS	M		6153	903	Y
05661	KILLED WOMAN	I	05/01/65	2057	342	Y
05662	FOURCHETTE CREEK	I	05/01/83	20518	2815	Y
05663	FIRST COULEE	I	04/01/88	4818	708	Y
05665	KARSTEN COULEE	I	05/01/83	5215	1108	Y
05667	BURNT LODGE	I		5245	974	Y
14506	JERNIGAN COULEE	I		80	13	Y
15000	CORNER	C		480	142	Y
15004	MID-SUNNYSLOPE	M		800	181	Y
15006	NORTH SUNNYSLOPE	M		1758	345	Y
15007	EAST SUNNYSLOPE	M	05/01/65	800	165	Y
15008	SUNNYSLOPE	M	05/01/75	3290	704	Y
15012	BIG COULEE	M	12/08/92	17138	3414	Y
15300	SOUTH BIG BEND	M	06/01/84	3758	896	Y
15301	DRY LAKE	C		1205	257	Y
15304	WEST HEWITT LAKE	M		2735	643	Y
15305	LONE TREE SAG	C		260	55	Y
15306	LOWER GONZALES	C		160	38	Y
15307	BIG BEND	C	05/01/65	611	147	Y
15309	SOUTH HEWITT LAKE	M		802	203	Y
15310	NORTH NELSON	C		195	34	Y
15311	LOWER ALKALI CREEK	I		2112	400	Y
15312	SACO DUMP	C		1265	262	Y
15314	NORTH FIRST CREEK	C		265	37	Y
15315	SACO	C		2082	429	Y
15316	SACO HILLS	M		5473	876	Y
15318	CACTUS FLATS	C		130	8	Y
15320	THOMAS COULEE	M		1539	197	Y
15322	SO. NELSON RESERVOIR	C		375	92	Y
15323	UPPER DELANEY COULEE	C		360	74	Y
15324	NORTH BOWDOIN	I		1867	413	Y
15325	HORSE CAMP COULEE	M	01/31/80	1292	244	Y
15326	DELANEY COULEE	C		40	9	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
15329	COW CREEK	M	04/01/69	644	234	Y
15330	DAVISON COULEE	C		401	93	Y
15331	GRAVEL COULEE	C		440	85	Y
15332	DODSON CANAL	C		200	39	Y
15333	SOUTH DODSON CANAL	C		40	8	Y
15335	TURMELL COULEE	C		230	46	Y
15336	SOUTH BOWDOIN	C		760	136	Y
15337	NORTH CLANTON	C		810	180	Y
15339	CROOKS COULEE	M	05/01/72	3120	458	Y
15342	UPPER CROOKS COULEE	C		575	133	Y
15343	THIRD CREEK	M		1910	422	Y
15344	FOURTH CREEK	M	05/01/69	4723	904	Y
15345	SECOND CREEK	C	05/01/67	1940	416	Y
15346	NORTH THIRD CREEK	C		400	66	Y
15347	WEST COULEE	C		120	17	Y
15349	UPPER MOSS COULEE	M		3590	629	Y
15352	MOSS COULEE	M		961	218	Y
15353	LOWER MOSS COULEE	M		401	93	Y
15354	GUSTON COULEE	I	03/01/88	7548	1201	Y
15355	ALKALI LAKE COULEE	I				Y
15356	LENOIR COULEE	C		320	63	Y
15357	ROCK CORRAL	C		1272	221	Y
15358	NORTH SEVEN MILE	C		40	7	Y
15359	UPPER TETRAULT COULE	C		640	139	Y
15360	SOUTH LENOIR CO	C		160	34	Y
15362	UPPER GONZALES COULE	C		40	9	Y
15363	BLACK COULEE	M	05/01/69	1600	439	Y
15364	MIDDLE BLACK COULEE	C		40	7	Y
15366	WATERS HOLDING PAST.	C		480	115	Y
15367	EAST ALKALI	C		1240	247	Y
15369	SOUTH ALKALI CREEK	M		640	126	Y
15372	ALKALI CREEK	I		2836	560	Y
15373	LOWER HALF-WAY COULE	C		640	114	Y
15374	HALF WAY COULEE	I	05/01/84	2200	532	Y
15376	NICE POND	C		705	145	Y
15378	UPPER WIND COULEE	C		640	105	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
15379	WIND COULEE	C		200	54	Y
15380	UPPER COW CREEK	C		160	19	Y
15403	BAETH	C		733	115	Y
15404	COTTONWOOD CREEK	C		455	76	Y
15405	LOWER COTTONWOOD CK	M		4922	1156	Y
15407	ALBERT COULEE	I	03/01/72	3000	860	Y
15408	TRUEBLOOD COULEE	I		8490	2015	Y
15409	LOWER D.H.S. CREEK	C		623	108	Y
15414	SMITH COULEE	M		2187	258	Y
15416	SANFORD COULEE	I		11005	1503	Y
15417	WHITEROCK COULEE	I	05/01/75	16942	2056	Y
15418	WILDHORSE	C		956	147	Y
15419	NORTH CABBAGE COULEE	C		650	107	Y
15422	SPRING COULEE	C		388	68	Y
15424	LITTLE WARM SPR. CR.	I		11967	2066	Y
15426	ALKALI COULEE	M		4523	872	Y
15427	NORTH FLAT CREEK	I	05/01/75	18334	2271	Y
15429	SPRING CREEK	I	05/01/73	14134	2651	Y
15432	UPPER BLACK COULEE	M	11/01/72	5810	751	Y
15434	SHOTGUN COULEE	I		17545	2195	Y
15435	BUCKLEY LAKE	C		699	114	Y
15437	SAGE CREEK	I	05/01/72	3152	329	Y
15438	NORTH THOMAS COULEE	M		1050	137	Y
15439	FLAT CREEK	I	05/01/74	13075	1243	Y
15440	WEST FLAT CREEK	M	05/01/75	9099	709	Y
15441	LOWER ALKALI COULEE	M	05/01/75	1216	245	Y
15443	FIRST CREEK HALL	M	05/01/75	4274	884	Y
15444	SCOTT COULEE	I	03/31/06	2679	533	Y
15446	PARROT COULEE	M		2693	478	Y
15448	GAREY COULEE	C		800	133	Y
15450	FIRST CREEK SCHOOL	M	05/01/75	1120	217	Y
15451	UPPER LONG COULEE	I	05/01/74	1789	505	Y
15453	STRATTON COULEE	I	03/01/73	8080	1194	Y
15455	LOWER DOG CREEK	I	05/01/75	3115	500	Y
15456	LONETREE COULEE	I		1080	103	Y
15457	UPPER DOG CREEK	I	05/01/82	3491	554	Y

Table G.1						
Allotment Number	***Allotment Name***	***Allotment Category***	***AMP Implementation Date***	***Public Acres***	***Public AUMs***	***Standards Assessment***
15458	COAL MINE COULEE	M	05/01/82	3486	585	Y
15459	PLUM CREEK	C		482	87	Y
15460	HORSE PASTURE COULEE	M		4786	489	Y
15461	SOUTH ARMSTRONG COUL	C		690	91	Y
15463	LOWER TALLOW CREEK	C		414	71	Y
15464	WEST ALBERT COULEE	I	07/06/90	4501	948	Y
15465	UPPER TRESSLER COULE	C		320	57	Y
15633	C.K. CREEK	I	08/11/93	14352	2466	Y
15634	BOX ELDER	I	04/01/82	6488	1041	Y

* Allotments that are jointly managed with the Upper Missouri River Breaks National Monument

Y - All standards for rangeland health were met.
N - At least one standard for rangeland health was not met and livestock were not the cause.
NL - At least one standard for rangeland health was not met and livestock were the cause. In all cases, corrective actions have been taken.

C - Custodial
M - Maintain
I - Improve

Appendix H
Standards for Rangeland Health
and
Guidelines for Livestock Grazing Management

The BLM developed Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Montana, North Dakota, and South Dakota which was approved by the Secretary of the Interior in August 1997. The following standards and guidelines apply to the HiLine District.

Standards for Rangeland Health

Standards are statements of physical and biological condition or degree of function required for healthy sustainable rangelands. Achieving or making significant and measurable progress towards these functions and conditions is required of all uses of public rangelands. Historical data, when available, should be used when assessing progress towards these standards.

Standard #1: Uplands are in proper functioning condition.

This means that soils are stable and provide for capture, storage and safe release of water appropriate to soil type, climate and landform. The amount and distribution of ground cover (i.e., litter, live and standing dead vegetation, microbiotic crusts, and rock/gravel) for identified ecological site(s) or soil-plant associations are appropriate for soil stability.

Evidence of accelerated erosion in the form of rills and/or gullies, erosional pedestals, flow patterns, physical soil crusts/surface scaling and compaction layers below the soil surface is minimal. Ecological processes including hydrologic cycle, nutrient cycle and energy flow are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential and there is a diversity of species characteristic of and appropriate to the site. Assessing proper functioning conditions will consider use of historical data.

As indicated by:

Physical Environment

- erosional flow patterns
- surface litter
- soil movement by water and wind
- soil crusting and surface sealing
- compaction layer
- rills
- gullies
- cover amount
- cover distribution

Biotic Environment

- community richness
- community structure
- exotic plants
- plant status
- seed production
- recruitment
- nutrient cycle

Standard #2: Riparian and wetland areas are in proper functioning condition.

This means that the functioning condition of riparian-wetland areas is a result of the interaction among geology, soil, water and vegetation. Riparian-wetland areas are functioning properly when adequate vegetation, landform or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood water retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for native fish production, waterfowl breeding, and other uses appropriate for the area that will support greater species richness.

The riparian-wetland vegetation is a mosaic of species richness and community structure serving to control erosion, shade water, provide thermal protection, filter sediment, aid floodplain development, dissipate energy, delay flood water, and increase recharge of groundwater where appropriate to landform. The stream channels and flood plain dissipate energy of high water flows and transport sediment appropriate for the geomorphology (e.g., gradient, size, shape, roughness, confinement, and sinuosity), climate, and landform. Soils support appropriate riparian-wetland vegetation, allowing water movement, filtering sediment, and slowing ground water movement for later release. Stream channels are not entrenching beyond natural climatic variations and water levels maintain appropriate riparian-wetland species. Riparian areas are defined as land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil. Assessing proper functioning conditions will consider use of historical data.

As indicated by:

Hydrologic

- floodplain inundated in relatively frequent events (1-3 years)
- amount of altered streambanks
- sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
- upland watershed not contributing to riparian degradation

Erosion/Deposition

- floodplain and channel characteristics; i.e., rocks, coarse and/or woody debris adequate to dissipate energy
- point bars are being created and older point bars are being vegetated
- lateral stream movement is associated with natural sinuosity
- system is vertically stable
- stream is in balance with water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Vegetation

- reproduction and diverse age class of vegetation
- diverse composition of vegetation
- species present indicate maintenance of riparian soil moisture characteristics
- streambank vegetation is comprised of those plants or plant communities that have deep binding root masses capable of withstanding high streamflow events
- utilization of trees and shrubs
- riparian plants exhibit high vigor
- adequate vegetative cover present to protect banks and dissipate energy during high flows
- where appropriate, plant communities in the riparian area are an adequate source of woody debris

Standard #3: Water quality meets Montana state standards.

This means that surface and ground water on public lands fully support designated beneficial uses described in the Montana Water Quality Standards. Assessing proper functioning conditions will consider use of historical data.

As indicated by:

- dissolved oxygen concentration
- pH
- turbidity
- temperature
- fecal coliform
- sediment
- color
- toxins
- others: ammonia, barium, boron, chlorides, chromium, cyanide, endosulfan, lindane, nitrates, phenols, phosphorus, sodium, sulfates, etc.

Standard #4: Air quality meets Montana state standards.

This means that air quality on public lands helps meet the goals set out in the State of Montana Air Quality Implementation Plan. Efforts will be made to limit unnecessary emissions from existing and new point or non-point sources.

The BLM management actions or use authorizations do not contribute to air pollution that violates the quantitative or narrative Montana Air Quality Standards or contributes to deterioration of air quality in selected class area.

As indicated by:

Section 176(c) Clean Air Act which states that activities of all federal agencies must conform to the intent of the appropriate State Air Quality Implementation Plan and not:

- cause or contribute to any violations of ambient air quality standards
- increase the frequency of any existing violations
- impede the State's progress in meeting their air quality goals

Standard #5: Habitats are provided to maintain healthy, productive and diverse populations of native plant and animal species, including special status species (federally threatened, endangered, candidate or Montana species of special concern as defined in BLM Manual 6840, Special Status Species Management).

This means that native plant and animal communities will be maintained or improved to ensure the proper functioning of ecological processes and continued productivity and diversity of native plant lifeforms. Where native communities exist, the conversion to exotic communities after disturbance will be minimized. Management for indigenous vegetation and animals is a priority. Ecological processes including hydrologic cycle, and energy flow, and plant succession are maintained and support healthy biotic populations. Plants are vigorous, biomass production is near potential, and there is a diversity of plant and animal species characteristic of and appropriate to the site. The environment contains components necessary to support viable populations of a sensitive/threatened and endangered species in a given area relative to site potential. Viable populations are wildlife or plant populations that contain an adequate number of reproductive individuals distributed on the landscape to ensure the long-term existence of the species. Assessing proper functioning conditions will consider use of historical data.

As indicated by:

- plants and animals are diverse, vigorous and reproducing satisfactorily; noxious weeds are absent or insignificant in the overall plant community
- spatial distribution of species is suitable to ensure reproductive capability and recovery
- a variety of age classes are present
- connectivity of habitat or presence of corridors prevents habitat fragmentation
- species richness (including plants, animals, insects and microbes) are represented
- plant communities in a variety of successional stages are represented across the landscape

Guidelines for Livestock Grazing Management

Guidelines for management of herbivory (including domestic animals and wildlife) are preferred or advisable approaches to ensure that standards can be met or that significant progress can be made toward meeting the standard(s). Responsible state and federal wildlife agencies must be involved in this management if standards are to be achieved.

Guidelines are provided to maintain or improve resource conditions in upland and riparian habitats. In both riparian and upland habitats, these guidelines focus on establishing and maintaining proper functioning conditions. The application of these guidelines is dependent on individual management objectives. Desired future conditions in plant communities and streambank characteristics will be determined on a case-by-case basis.

Guideline #1: Grazing will be managed in a manner that will maintain the proper balance between soils, water, and vegetation over time. This balance varies with location and management objectives, historic use, and natural fluctuations, but acceptable levels of use can be developed that are compatible with resource objectives.

Guideline #2: Manage grazing to maintain watershed vegetation, species richness, and floodplain function. Maintain riparian vegetative cover and structure to trap and hold sediments during run-off events to build streambanks, recharge aquifers, and dissipate flood energy. Grazing management should promote deep-rooted herbaceous vegetation to enhance streambank stability. Where non-native species are contributing to proper functioning conditions, they are acceptable. Where potential for palatable woody shrub species (willows, dogwood, etc.) exists, promote their growth and expansion within riparian zones.

Guideline #3: Pastures and allotments will be managed based on their sensitivity and suitability for livestock grazing. Where determinations have not been previously documented, suitability for grazing will be determined by: topography, slope, distance from water, vegetation habitat types, and soil types must be considered when determining grazing suitability. Unsuitable areas should be excluded from grazing.

Guideline #4: Management strategies for livestock grazing will ensure that long-term resource capabilities can be sustained. End of season stubble heights, streambank moisture content, and utilization of herbaceous and woody vegetation are critical factors which must be evaluated in any grazing strategy. These considerations are essential to achieving long-term vegetation or stream channel objectives and should be identified on a site-specific basis and used as terms and conditions.

Guideline #5: Grazing will be managed to promote desired plants and plant communities of various age classes, based on the rate and physiological conditions of plant growth. Management approaches will be identified on a site-specific basis and implemented through terms and conditions. Caution should be used to avoid early spring grazing use when soils and streambanks are wet and susceptible to compaction and physical damage that occurs with animal trampling. Likewise, late summer and fall treatments in woody shrub communities should be monitored closely to avoid excessive utilization.

Guideline #6: The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect the ecological functions and processes of those sites.

Guideline #7: Locate facilities (e.g., corrals, water developments) away from riparian-wetland areas.

Guideline #8: When provided, supplemental salt and minerals should not be placed adjacent to watering locations or in riparian-wetland areas so not to adversely impact streambank stability, riparian vegetation, water quality, or other sensitive areas (i.e., key wildlife wintering areas). Salt and minerals should be placed in upland sites to draw livestock away from watering areas or other sensitive areas and to contribute to more uniform grazing distribution.

Guideline #9: Noxious weed control is essential and should include: cooperative agreements, public education, and integrated pest management (mechanical, biological, chemical).

Guideline #10: Livestock management should utilize practices such as those referenced by the NRCS published prescribed grazing technical guide to maintain, restore or enhance water quality.

Guideline #11: Grazing management should maintain or improve habitat for federally listed threatened, endangered, and sensitive plants and animals.

Guideline #12: Grazing management should maintain or promote the physical and biological conditions to sustain native populations and communities.

Guideline #13: Grazing management should give priority to native species. Non-native plant species should only be used in those situations where native seed is not readily available in sufficient quantities, where native plant species cannot maintain or achieve standards, or where non-native plant species provide an alternative for the management and protection of native rangelands.

Guideline #14: Allotment monitoring determines how ongoing management practices are affecting rangeland. To do so, the evaluations should be based on: 1. measurable management objectives; 2. permanent and/or repeatable monitoring locations; and; 3. short-term and long-term data.

Appendix I
Guidelines for the Use of Yearling Conversion Factors

Introduction

The use of conversion factors may be authorized when resource conditions and range management considerations warrant their use or when an operator requests the conversion.

Traditionally, an animal unit month (AUM) is defined as the amount of forage a 1,000 lb. cow and her calf up to 6 months of age consumes during the course of one month. It is widely accepted that an animal unit equivalent (AU) is considered to be one, one-thousandth the body weight of a grazing animal (i.e. BW/1000, or BW*.001). For example, a 1,200 lb. cow would be 1.2 AU. Similarly, a 750 lb. yearling would be 0.75 AU (see discussions in Taylor and Field, 1999; Ensminger et al., 1990).

An adaptive management approach may be taken on any allotment by taking into account animal size when calculating AUM usage. Accounting for animal size reduces the need to adjust carrying capacity by more aptly accounting for differences in forage consumption from herds of differing livestock size. In other words, stocking rates can be more accurately aligned to carrying capacity.

Conversion Guidelines

Conversion factors would function within the following framework:

1. Yearling cattle may be authorized for the same terms and conditions, including season of use and livestock numbers as customarily licensed for cow/calf pairs without special approval.

2. Conversion factors of less than 1:1 may be denied if the proposed use would result in a greater than customary percentage of the use being licensed during the growing season.

3. Yearling factors would be based on a pre-agreed to factor of .75 or the midweight of the yearlings for the period of time they are controlled by the applicant. This midweight would be determined as discussed below. If the management situation and conditions warrant, the average daily gain in the second and subsequent years may be calculated using the previous year's weight tickets. The calculation of the conversion factors would be the responsibility of the authorized officer and is not subject to negotiation by the lessee. It is the responsibility of the grazing operator to supply all weight tickets necessary to calculate the conversion factor or the conversion would be denied.

4. All yearling applications must be supported by current proof of control of the livestock to be grazed such as a bill of sale, cattle lease, or management agreement. This must be in conformance with 43 CFR 4130.7.

5. A monitoring plan would be in place to determine if adjustments to the conversion factor are required.

6. An environmental assessment (EA) would be done for all allotments where yearling conversion factors are requested. The EA would address any land use plan decisions for the allotment, the impact to the vegetation, wildlife, watershed, or other resource values as a result of a change in foraging habits and numbers of animals.

7. Other Policy Considerations:

a. The term of the conversion must be for not less than a 3 year period.

b. If a grazing lease or permit is transferred the conversion may be allowed to remain in place under the same conditions.

c. No yearling conversions would be allowed for replacement heifers if run in common with cow-calf pairs.

d. No sheep or bison yearling conversions would be allowed.

e. The full fee shall be charged for each animal unit month of authorized grazing use in accordance with 43 CFR 4130.8-1(c).

8. Required Terms and Conditions of Permit/Lease:

a. The allotment management plan (AMP), coordinated resource management plan (CRMP), management agreement or similar document guiding management of the grazing allotment would be made part of the lease/permit.

b. Any future monitoring which indicates that livestock use is resulting in resource damage or over use of the vegetation would require that the conversion factor be reviewed by the authorized officer.

c. The conversion factor may be terminated at any time at the discretion of the BLM after consultation with the grazing lessee.

Determination of Yearling Conversion Factor

1. The beginning weight for yearling cattle must be determined prior to turning the animals into the allotment. This must be supported by certified weight tickets. The date for the weight tickets may be for any date, no more than two (2) weeks prior to turning yearlings into the allotment.

2. The midweight would be determined by using the following formula:

$$InWeight + \frac{\text{Days} * 2\text{lbs}}{2} = MidWeight$$

* Days refers to the total number of days yearling cattle are in the allotment.
* 2 pounds is the assumed daily weight gain. This figure is administrative and is nonnegotiable, unless average daily gain can be calculated from actual certified weight tickets supplied by the lessee showing the turn in and take out weights of the yearling cattle.
* Midweight would be rounded up to the nearest 50-pound increment.

3. The conversion factors are shown Table I.1.

Table I.1 Conversion Factors	
Midweight	***Factor***
500	.60
550	.65
600	.70
650	.72
700	.75
750	.80
800	.85
850	.90
900	1.00

References

Ensminger, M.E., J.E. Oldfield, and W.W. Heinemann. 1990. Feeds and Nutrition Digest. The Ensminger Publishing Company. Clovis, CA.

Kearl, W. Gordon. 1978. Mountain Valley Ranching in Wyoming. Department of Agriculture Economics University Wyoming AE 78-13 p. 24.

Taylor, R.E., and T.G. Field. 1999. Beef Production and Management Decisions – Third Edition. Prentice Hall. Upper Saddle River, NJ.

Appendix J
Reclamation

Introduction

Reclamation will be required for surface-disturbing activities. Some activities/areas such as permanent roads/trails and open travel management areas would be exempt. Other such activities/areas will be reviewed for exemption during the site-specific environmental analysis. Reclamation is not the restoration of a site; instead, the long-term objective of reclamation is to set the course for eventual ecosystem restoration. A reclamation plan appropriate in detail and complexity and tailored to a specific surface-disturbing activity will be required and made a stipulation and/or condition of approval of any action/activity. The level of detail for the reclamation plan shall reflect the complexity of the project, the environmental concerns generated during project review, and the reclamation potential for the site. This appendix details the elements that need to be considered during predisturbance authorization of any surface-disturbing activity and the post-disturbance steps required to assure timely and proper reclamation of a site.

The reclamation plan will provide a framework to develop project-specific and site-specific reclamation actions and guide land management efforts toward a planned future condition for any surface-disturbing activity. Early coordination between Bureau of Land Management (BLM) and project proponents is necessary to produce the appropriate plan. The reclamation plan will serve as a binding agreement between a project proponent(s) and the BLM for the expected reclamation condition of the disturbed lands and must be periodically reviewed and modified as necessary to adjust to changing conditions or to correct for an oversight. The reclamation plan will include sufficient monitoring requirements, reports, and components to ensure the reclamation plan is current.

In preparing and reviewing reclamation plans, the BLM and the project proponent must set reasonable, achievable, and measurable reclamation goals/objectives that are consistent with the land use plan and are ecologically feasible. Achievable goals/objectives will ensure reclamation and encourage a project proponent(s) to conduct research on different aspects of reclamation for different environments. These goals/objectives should be based on available information and techniques, should offer incentives to both parties, and as a result, should generate useful information for future use.

Objectives

The short-term objective is to immediately stabilize disturbed areas and to provide the necessary conditions to achieve the long-term objective.

The long-term objective is to facilitate eventual ecosystem reconstruction for the purpose of maintaining a safe and stable landscape and meeting the desired outcomes.

Reclamation Requirements

The following reclamation requirements apply to all surface-disturbing activities, including BLM initiated activities, and must be addressed in each reclamation plan. These requirements also must be met prior to release of the bond and/or the reclamation liability. Where these reclamation requirements differ from other applicable federal, laws, rules, and regulations, those requirements supersede this policy. State and/or local statutes or regulations may also apply.

Manage all waste materials.

- Segregate, treat, remove, and/or bio-remediate contaminated soil material in accordance with applicable laws, regulations, and policy.

- Bury only authorized waste materials on site. Buried material must be covered with a minimum of three feet of suitable material or meet other program standards.
- Ensure all waste materials moved off-site are transported to an authorized disposal facility.

Ensure subsurface integrity, and eliminate sources of ground and surface water contamination.

- Properly plug all drill holes and other small openings.
- Stabilize, properly back fill, cap, and/or restrict from entry all open shafts, underground workings, and other openings.
- Control sources of contamination and implement best management practices to protect surface and ground water quality.

Ensure surface stability, re-establish slope stability, and desired topographic diversity.

- Evaluate erosion susceptibly prior to disturbance.
- Implement the appropriate erosion control and sediment containment measures/devices when and where needed (e.g., erosion control mats/blankets, mulch, waterbars, silt fences, straw wattles, surface roughening, etc.)
- Inspect and maintain all runoff and erosion control structures on a regular schedule and after major runoff event.
- Reconstruct the landscape to the approximate original contour. However, at the discretion of the authorized officer, if the disturbed area has stabilized and if returning the original contour will cause additional disturbance, then re-contouring may not be required.
- Maximize geomorphic stability and topographic diversity of the reclaimed topography.
- Eliminate highwalls, cut slopes, and/or topographic depressions on site, unless otherwise approved.
- Minimize sheet and small rill erosion on or adjacent to the reclaimed area. There shall be no evidence of mass wasting, head cutting, large rills or gullies, head or down cutting in drainages, or general slope instability on or adjacent to the reclaimed area.

Reconstruct and stabilize water courses and drainage features.

- Reconstruct drainage basins and reclaim impoundments to maintain the drainage pattern, profile, and dimension to approximate the natural features found in nearby naturally functioning basins.
- Reconstruct and stabilize stream channels, drainages, and impoundments to exhibit similar hydrologic characteristics found in stable naturally functioning systems.

Maintain the biological, chemical, and physical integrity of topsoil.

- Identify, delineate, and salvage topsoil based on a site-specific soil evaluation, including depth, chemical and physical properties.
- Protect all stored topsoil from erosion, degradation, noxious weed and invasive plant infestations, and contamination. Topsoil that is not re-spread within 30 days shall be covered with a tackifier, mulch, or other approved cover. Piling subsurface soil on top of topsoil will be prohibited.
- Maintain stored topsoil viability by incorporating into the disturbed landscape.
- Seed topsoil stored beyond one growing season with desired vegetation.

- Identify topsoil storage with appropriate signage.

Prepare site for revegetation.

- Redistribute topsoil and subsoil in a manner similar to the original vertical profile.
- Reduce compaction to an appropriate depth (generally below the root zone) prior to redistribution of topsoil, to accommodate desired plant species.
- Provide suitable surface and subsurface physical, chemical, and biological properties to support the long term establishment and viability of the desired plant community.
- Protect seed and seedling establishment (e.g., erosion control matting, mulching, hydro-seeding, surface roughening, fencing, etc.)
- Defer grazing until reclamation goals and objectives are met.

Establish a desired self-perpetuating native plant community.

- Determine appropriate species composition and cover based on information from the appropriate Ecological Site Descriptions (ESDs) and/or plant community descriptions.
- Establish species composition, diversity, structure, and total ground cover appropriate for the desired plant community as described in the appropriate Ecological Site Description.
- Enhance critical resource values (e.g., wildlife habitat), where appropriate, by augmenting plant community composition, diversity, and/or structure.
- Select genetically appropriate and locally adapted native plants based on the site characteristics and ecological setting that meet desired plant community objectives.
- Select non-native plants only as an approved short-term and non-persistent alternative to native plants. Ensure the non-natives will not hybridize, displace, impede, or offer long-term competition to the desired plant community outlined in the ESDs, and are designed to aid in the re-establishment of native plant communities.
- Do not apply nitrogen fertilizer when annual bromes are found on site or have the potential to invade the site from nearby infestations.

Reestablish a complementary visual composition

- Ensure the reclaimed landscape features blend into the adjacent area and conform to the land use plan decisions.
- Ensure the reclaimed landscape does not result in a change to the scenic quality of the area.

Manage Invasive Plants

- Inventory for and treat noxious weeds before initiating surface-disturbing activities. Inventory for and consider treating non-native and naturalized plants before initiating surface-disturbing activities.
- Develop an invasive plant management plan.
- Control invasive plants utilizing an integrated pest management approach.
- Monitor invasive plant treatments.

Develop and implement a reclamation monitoring and reporting strategy.

- Monitor for the success of the vegetation management objectives and reclamation goals.
- Conduct compliance and effectiveness monitoring in accordance with a BLM (or other surface management agency) approved monitoring protocol (e.g. Assessment, Inventory, and Monitoring (AIM) Strategy).
- Evaluate monitoring data for compliance with and success of the outlined goals and objectives written in the reclamation plan.
- Document and report monitoring data and recommend revised reclamation strategies.
- Implement revised reclamation strategies as needed.
- Repeat the process of monitoring, evaluating, documenting/reporting, and implementing, until reclamation goals and vegetation management objectives are achieved.

Seeding

Disturbed areas will be seeded. As much seeding as possible will be conducted during the fall before the ground freezes. Occasional seeding may occur in the spring as long as favorable conditions exist. Seeding will not be allowed in frozen or saturated soil conditions except for when approved by the authorized officer or winter seeding of sagebrush on snow. Reseeding will be required when a satisfactory stand is not obtained.

The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS) per acre. There shall be no invasive or non-native weed seeds in the mixture. Seed shall be tested for purity and germination and the viability testing shall be done in accordance with Montana State law(s). Tetrazolium test (TZ) will be allowed for germination testing. Test results will be made available for BLM review, if requested. Commercial seed shall be either State Certified or tested weed-free seed. The seed mixture container shall be tagged in accordance with State law(s) and available for inspection. The amount of seed planted will be enough so that upon germination, the soil is adequately covered.

Table J.1 lists approved species that could be included for a particular site, along with recommended seeding rates for a pure stand. The species listed are not all-inclusive as some sites may warrant other species. Approved species will be used on all BLM surface land and on private surface unless the landowner requests otherwise. Using species that are already present in an area increases the probability that the area will be revegetated successfully. Soil sampling may also be necessary to ensure that the species in the seed mix will establish on the site. After the vegetation survey and/or soil sampling has been completed, a mix should be developed using species listed in Table J.1; no monocultures (pure stand) will be allowed. The mixture should be diverse enough to show a variety of native desirable plants upon germination. The percentage of each species in the mixture will determine the percentage of that species' pure-stand seeding rate used. Forbs and shrubs may be included in the seed mixtures; however, they should not be included when herbicides are used to control invasive weeds. Cover or nurse crops may be used in certain situation, where warranted.

Table J.1
Recommended Species, Cultivars, and Pure Stand Seeding Rates

Plant Species	***Scientific Name***	***Recommended Cultivar[1]***	***Drill Seeding Rate[2,3] PLS lbs/acre[4]***
Grasses			
Bluebunch Wheatgrass	*Pseudoroegneria spicata*	Goldar	6
Green Needlegrass	*Nassella viridula*	Lodorm	5
Sandberg Bluegrass	*Poa secunda*	High Plains	2
Prairie Junegrass	*Koeleria macrantha*	NA	1
Blue Grama	*Bouteloua gracilis*	Bad River	2
Needle and Thread	*Hesperostipa comata*	NA	6
Indian Ricegrass	*Achnatherum hymenoides*	Rimrock	6
Prairie Sandreed	*Calamovilfa longifolia*	Goshen	4
Inland Saltgrass	*Distichlis spicata*	NA	5
Alkali Sacaton	*Sporobolus airoides*	NA	1
Western Wheatgrass	*Pascopyrum smithii*	Rosana	8
Forbs			
Dotted Gayfeather	*Liatris punctata*	NA	6.4
Western Yarrow	*Achillea millefolium*	Great Northern	0.5
Purple Prairie Clover *or* White Prairie Clover	*Dalea purpurea* *Dalea candida*	Bismark Antelope	3
Prairie Coneflower	*Ratibida columnifera*	NA	1.5
Shrubs			
Fourwing Saltbush	*Atriplex canescens*	Wytana	0.5
Silver Buffaloberry	*Shepherdia argenta*	Sakakawea	0.5 - 1
Wyoming Big Sagebrush[5]	*Artemisia tridentata*	NA	3
Silver Sagebrush[5]	*Artemisia cana*	NA	2
Wood's Rose	*Rosa woodsii*	NA	0.5 - 1
Winterfat[6]	*Krascheninnikovia lanata*	Open Range	<.5

[1] Other cultivars adapted to the area are acceptable.
[2] Seeding rates are given for 12-inch drill rows.
[3] When broadcast seeding, double the pounds per acre seeded.
[4] Pure Live Seed
[5] These shrubs should always be broadcast seeded; seeding rates listed are for broadcast seeding.
[6] These shrubs should always be broadcast seeded; seeding rates listed are for broadcast seeding.

Sources: NRCS Montana Technical Note, Plant Materials MT-46(Rev. 1); NRCS Montana Technical Note, Range MT-33; Granite Seed Company, Lehi, UT.

Appendix K
Areas of Critical Environmental Concern
Evaluation of Relevance and Importance Criteria
For Existing and Potential ACECs

Areas of Critical Environmental Concern (ACECs) are BLM lands where special management attention is needed to protect important and relevant values. "Special management attention" refers to management prescriptions developed during preparation of a resource management plan (RMP) or amendment expressly to protect the important and relevant values of an area from the potential effects of actions permitted by the RMP, including proposed actions deemed to be in conformance with the terms, conditions, and decisions of the RMP (BLM Manual 1613).

To be designated as an ACEC, a nominated area must meet the criteria of relevance and importance as outlined in 43 CFR 1610.7-2 and BLM Manual 1613. If the relevance and importance criteria are met, an area must be identified as a potential ACEC and considered for designation and management in the resource planning process. Designation is based on whether or not a potential ACEC requires special management attention in the selected plan alternative.

An area meets the "**relevance**" criteria if it contains one or more of the following relevance values:

- A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).
- A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species or habitat essential for maintaining species diversity).
- A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities, which are terrestrial, aquatic, or riparian; or rare geological features).
- Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the "**importance**" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

- Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource. [More than locally significant qualities]
- Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change. [Special qualities]
- Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA. [Warrants national priority/FLPMA protection]
- Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare. [Safety/public welfare concerns]
- Poses a significant threat to human life and safety or to property. [Poses a significant threat]

The planning area currently has seven designated ACECs:

- Azure Cave ACEC
- Big Bend of the Milk River ACEC
- Bitter Creek ACEC
- Mountain Plover ACEC
- Kevin Rim ACEC
- Prairie Dog Towns within the 7km Complex ACEC
- Sweet Grass Hills ACEC

Public comment received during the scoping period suggested that the existing Bitter Creek ACEC be expanded. Four areas were nominated as ACECs by cooperating agencies or BLM staff, including:

- Frenchman Breaks Area
- Malta Geological Area
- Woody Island Area
- Zortman/Landusky Mine Reclamation

The BLM received five ACEC nominations from the public that will be considered in the planning process:

- Black-tailed Prairie Dog and Black-footed Ferret
- Five Watersheds
- Grassland Bird/Greater Sage-Grouse
- Greater Sage-Grouse
- Mountain Plover

Three other ACEC nominations received prior to the commencement of this planning process were also considered:

- Little Rocky Mountains
- Old Scraggy
- Saddle Butte

This report presents the completed evaluation forms for all existing and nominated ACECs in the planning area (Tables K.1 through K.19). Areas that did not meet the relevance and importance criteria were dropped from further consideration for ACEC designation. Areas that met the relevance and importance criteria are included in the management alternatives analyzed in the RMP/EIS.

A summary of the relevance and importance evaluations for the existing and nominated ACECs is shown on the following page, followed by the individual evaluations. Maps K1 through K19 showing the locations of the existing and nominated ACECs are found following the individual evaluations.

Relevance and Importance Evaluation Summary

	Table No.	Page No.	Met Relevance Criteria	Met Importance Criteria	Included in Management Alternatives
Existing ACECs					
Azure Cave	K.1	1435	✓	✓	✓
Big Bend of the Milk River	K.2	1437	✓	✓	✓
Bitter Creek	K.3	1439	✓	✓	✓
Kevin Rim	K.4	1441	✓	✓	✓
Mountain Plover	K.5	1443	✓	✓	✓
Prairie Dog Towns within the 7km Complex	K.6	1445			
Sweet Grass Hills	K.7	1447	✓	✓	✓
Nominations Brought Forward During Scoping					
Frenchman Breaks	K.8	1449	✓	✓	✓
Malta Geological	K.9	1453	✓	✓	✓
Woody Island	K.10	1456	✓	✓	✓
Zortman/Landusky Mine Reclamation	K.11	1460	✓	✓	✓
Nominations Received During the Planning Process					
Black-tailed Prairie Dog and Black-footed Ferret	K.12	1462	✓		
Five Watersheds	K.13	1464	✓		
Grassland Bird/Greater Sage-Grouse	K.14	1466	✓	✓	✓
Greater Sage-Grouse	K.15	1469	✓	✓	✓
Mountain Plover	K.16	1471	✓		
Nominations Received Prior to the Commencement of the Planning Process					
Little Rocky Mountains	K.17	1473	✓	✓	✓
Old Scraggy	K.18	1477	✓		
Saddle Butte	K.19	1479			

Maps Showing Locations of Existing and Nominated ACECs

	Map No.	***Page No.***
Existing ACECs		
Azure Cave	K.1	1436
Big Bend of the Milk River	K.2	1438
Bitter Creek	K.3	1440
Kevin Rim	K.4	1442
Mountain Plover	K.5	1444
Prairie Dog Towns within the 7km Complex	K.6	1446
Sweet Grass Hills	K.7	1448
Nominations Brought Forward During Scoping		
Frenchman Breaks	K.8	1452
Malta Geological	K.9	1455
Woody Island	K.10	1459
Zortman/Landusky Mine Reclamation	K.11	1461
Nominations Received During the Planning Process		
Black-tailed Prairie Dog and Black-footed Ferret	K.12	1463
Five Watersheds	K.13	1465
Grassland Bird/Greater Sage-Grouse	K.14	1468
Greater Sage-Grouse	K.15	1470
Mountain Plover	K.16	1472
Nominations Received Prior to the Commencement of the Planning Process		
Little Rocky Mountains	K.17	1476
Old Scraggy	K.18	1478
Saddle Butte	K.19	1480

Existing ACECs

Table K.1 Azure Cave ACEC (Existing) Relevance and Importance Evaluation		
Area Considered:	Azure Cave	
General Location:	T. 25 N., R. 25 E.	
General Description:	Southeast Phillips County, Little Rocky Mountains South of Zortman, Montana	
Acreage:	143	
Values Considered:	Critical bat hibernaculum of national significance, and general hazard to public safety	
Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are high, but similar to those of many other areas in the Malta Field Office.
A fish and wildlife resource	Yes	Azure cave was described in detail by N. P. Campbell in a 1978 report (Campbell 1978). The cave was re-surveyed in 1979 (Chester, et. al. 1979). They identified this as one of two known caves in the Northwest that contains hibernating bats. Because of the cave importance as a hibernaculum the report also recommended that entry by the public take place only from June 15 to August 15 each year. Bat surveys at Azure Cave (Hendricks and Genter 1997) confirmed the presence of hibernating bats and also confirmed the presence of bat species of concern using the cave area. The cave is hazardous to the general public and only experienced cave explorers should be allowed in it (Chester, et al. 1979) by permit.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	Yes	The cave is hazardous to the general public and only experienced cave explorers should be allowed in it (Chester, et al. 1979) by permit.
Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	Yes	One of the largest known bat hibernaculums in the state with several hundred individuals present. The cave also has speleothems of exceptional size and extent.
Special qualities	Yes	Hibernating bats are exceptionally sensitive to disturbance and cave features are also can be destroyed easily.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	Yes	Unrestricted access to the cave may represent a hazard to people inexperienced with caves and cave features.
Poses a significant threat	No	Not a significant threat to human life and safety.

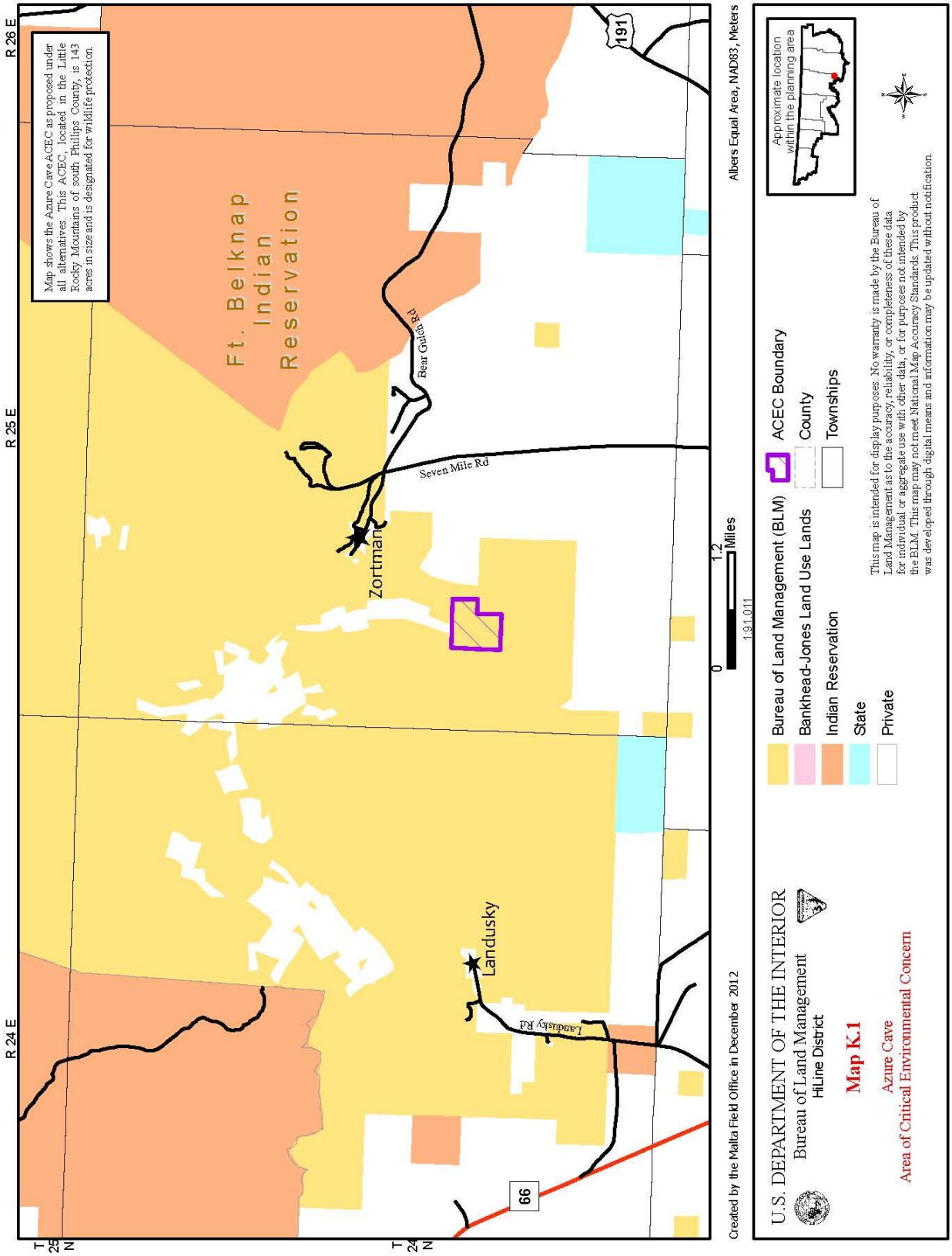
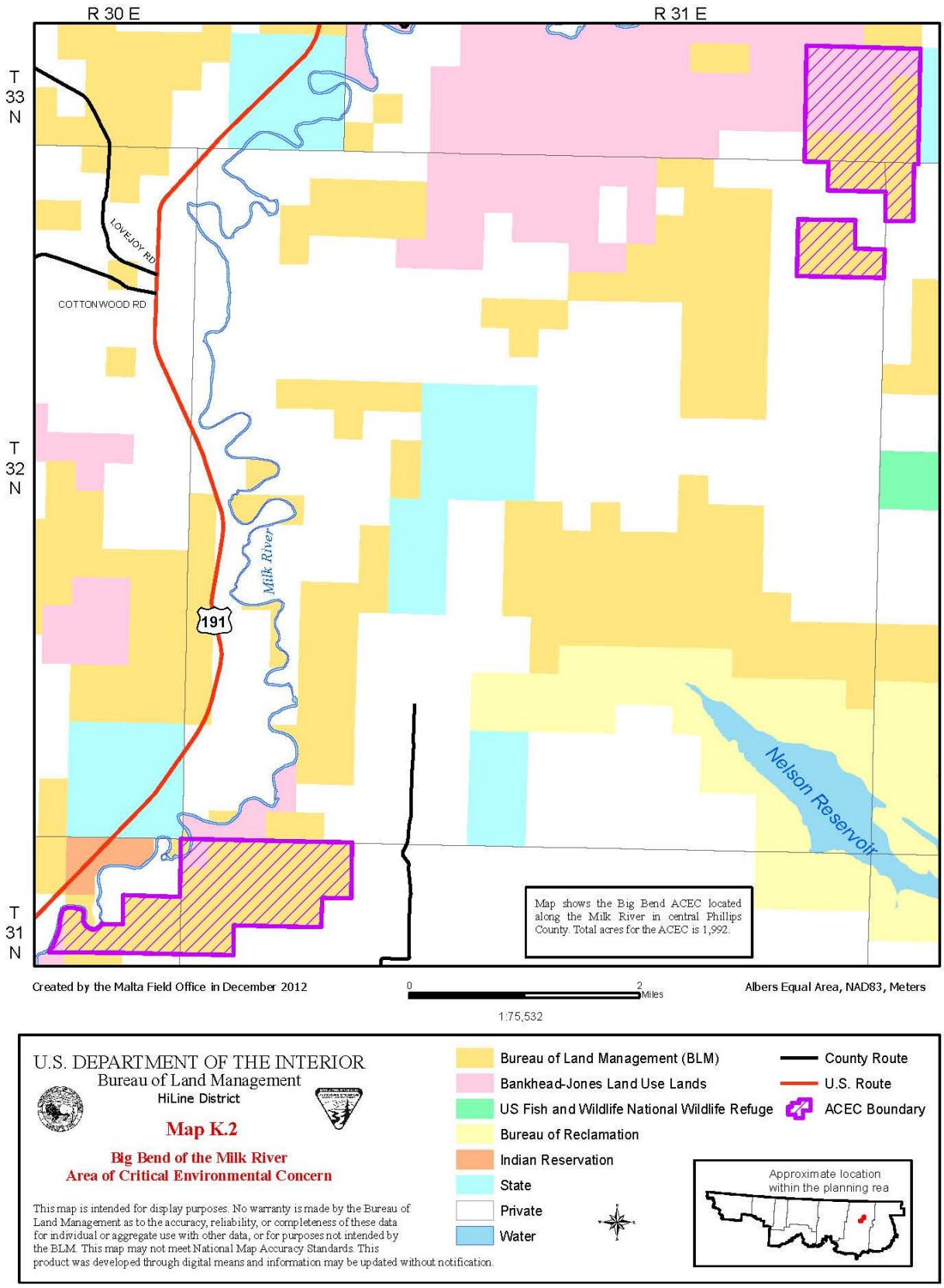

Map shows the Azure Cave ACEC as proposed under all alternatives. This ACEC, located in the Little Rocky Mountains of south Phillips County, is 143 acres in size and is designated for wildlife protection.
R 24 E
R 25 E
R 26 E
T 25 N
T 24 N
Ft. Belknap Indian Reservation
Bear Gulch Rd
Seven Mile Rd
Zortman
Landusky
Landusky Rd
66
191
0
1.2
Miles
1:91,011
Created by the Malta Field Office in December 2012
Albers Equal Area, NAD83, Meters
Approximate location within the planning area
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Indian Reservation
State
Private
ACEC Boundary
County
Townships
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.1
Azure Cave
Area of Critical Environmental Concern

Table K.2
Big Bend of the Milk River ACEC (Existing)
Relevance and Importance Evaluation

Area Considered:	Big Bend of the Milk River
General Location:	Portions of T. 33 N., R. 31 E.; T. 32 N., R. 31 and 32 E.; and a portion lying in T. 31 N., R. 30 and 31 E.
General Description:	Northeast of Malta, Montana
Acreage:	1,979
Values Considered:	Scientific/Interpretive archaeological. Contains rare and intact important archaeological sites

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	Yes	The Big Bend of the Milk River contains a broad range of archaeological resources representing the variety of manifestations indicative of the prehistoric occupations of the glaciated prairie of the Northwestern Plains. Included among these resources are the Henry Smith and Beaucoup sites which have been investigated professionally and determined eligible for the National Register of Historic Places.
A fish and wildlife resource	No	No habitat for endangered, sensitive, or threatened fish and wildlife species are known.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	Yes	The Big Bend has a high density of archaeological resources, many with rare or unique characteristics and scientific values at local, national and international levels. The cultural resources are between 1000 and 2000 years old and provide an exceptional opportunity for the study of relatively pristine sites encompassing a broad range of cultural functions and established during a short period of prehistory. Sites include prehistoric bison kills in the form of traps, jumps, and pounds with associated drive lines; prehistoric ceremonial and religious locales such as petroglyph boulders, medicine wheels, intaglios, and burials; and complex habitation and resource exploitation manifestations characterized by large numbers of stone circles and cairns. These sites are irreplaceable, vulnerable, and threatened by human impacts, primarily in the form of mineral development, and vandalism.
Special qualities	Yes	Cultural materials of value to scientific research, education, and public interpretation are fragile and deteriorate readily on exposure to the elements. Surface disturbance from other land uses can have a serious adverse impact on fossil deposits.
Warrants national priority/FLPMA protection	Yes	Satisfies the FLPMA mandate to protect scientific values.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.


R 30 E
R 31 E
T 33 N
T 32 N
T 31 N
LOVEJOY RD
COTTONWOOD RD
Milk River
191
Nelson Reservoir
Map shows the Big Bend ACEC located along the Milk River in central Phillips County. Total acres for the ACEC is 1,992.
Created by the Malta Field Office in December 2012
0
2
Miles
1:75,532
Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.2
Big Bend of the Milk River
Area of Critical Environmental Concern
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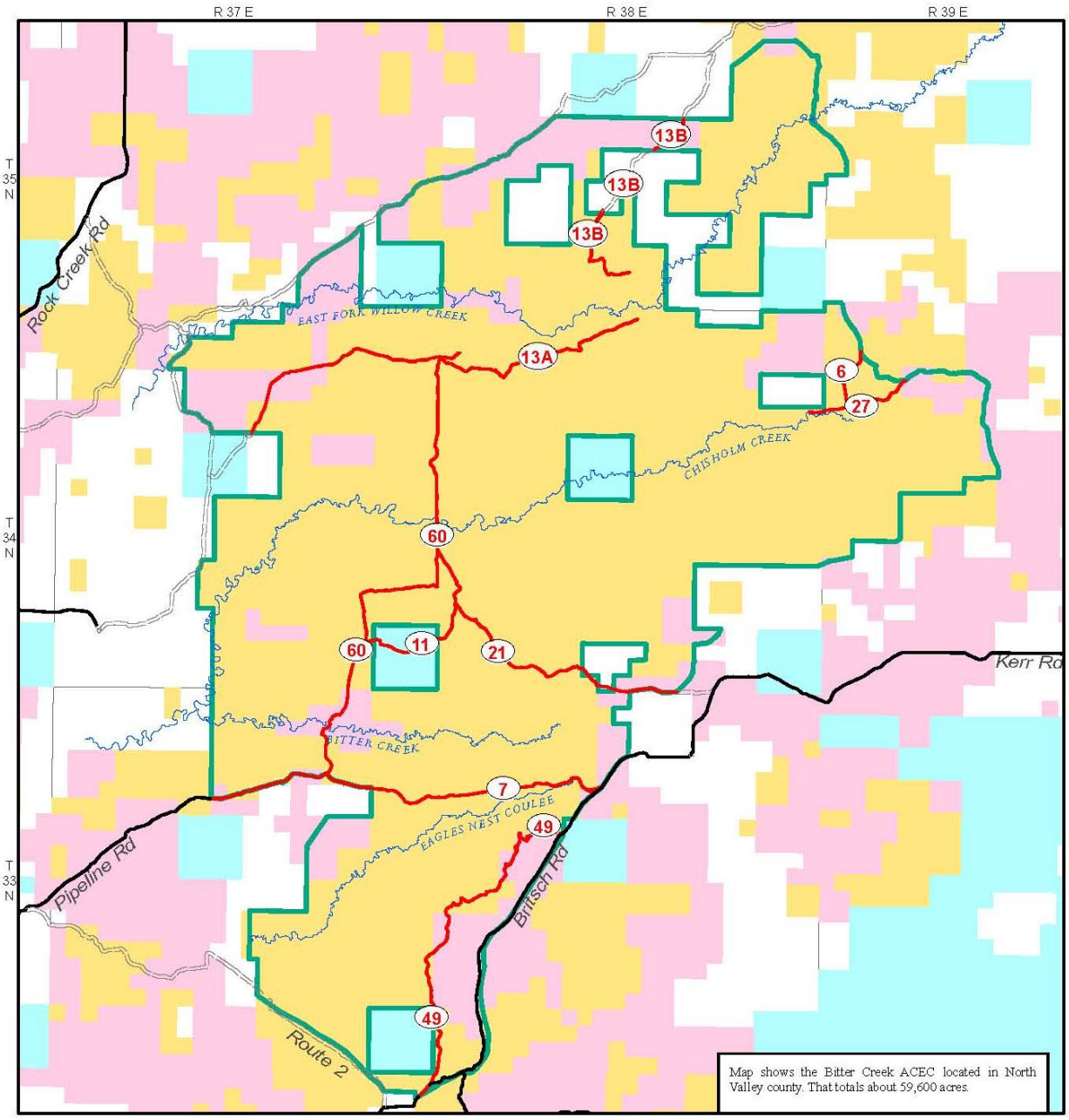
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
County Route
U.S. Route
ACEC Boundary
Approximate location within the planning rea

Table K.3
Bitter Creek ACEC (Existing)
Relevance and Importance Evaluation

Area Considered:	Bitter Creek ACEC
General Location:	Portions of T. 35 N., R. 37, 38 and 39 E.; Portions of T. 34 N., R. 37, 38 and 39 E.; Portions of T. 33 N., R. 37 and 38 E.; and Portions of T. 32 N., R. 38 E. (most central township is T. 34 N., R. 38 E.)
General Description:	Northcentral Valley County
Acreage:	60,701
Values Considered:	Significant scenic, wildlife and cultural values.

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	Yes	The area contains outstanding scenic views which are not compromised by visual intrusions or social imprints. The area is also known to contain sensitive archaeological resources.
A fish and wildlife resource	Yes	The area is valuable for wildlife due to the large, continuous, and contiguous amount of prairie under federal administration which provides a reservoir of grassland habitat.
A natural process or system	Yes	The area is valuable for wildlife due to the large, continuous, and contiguous amount of prairie under federal administration which provides a reservoir of grassland habitat.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	Yes	Outstanding scenic diversity and a variety of vegetation types and wildlife habitat.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.



Created by the Malta Field Office in December 2012

0 1 Miles
1:157,586

Albers Equal Area, NAD83, Meters

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District

Map K.3

Bitter Creek
Area of Critical Environmental Concern

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ACEC Boundary
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
State
Private
Water
Vehicle Way
Road
County Route
Streams

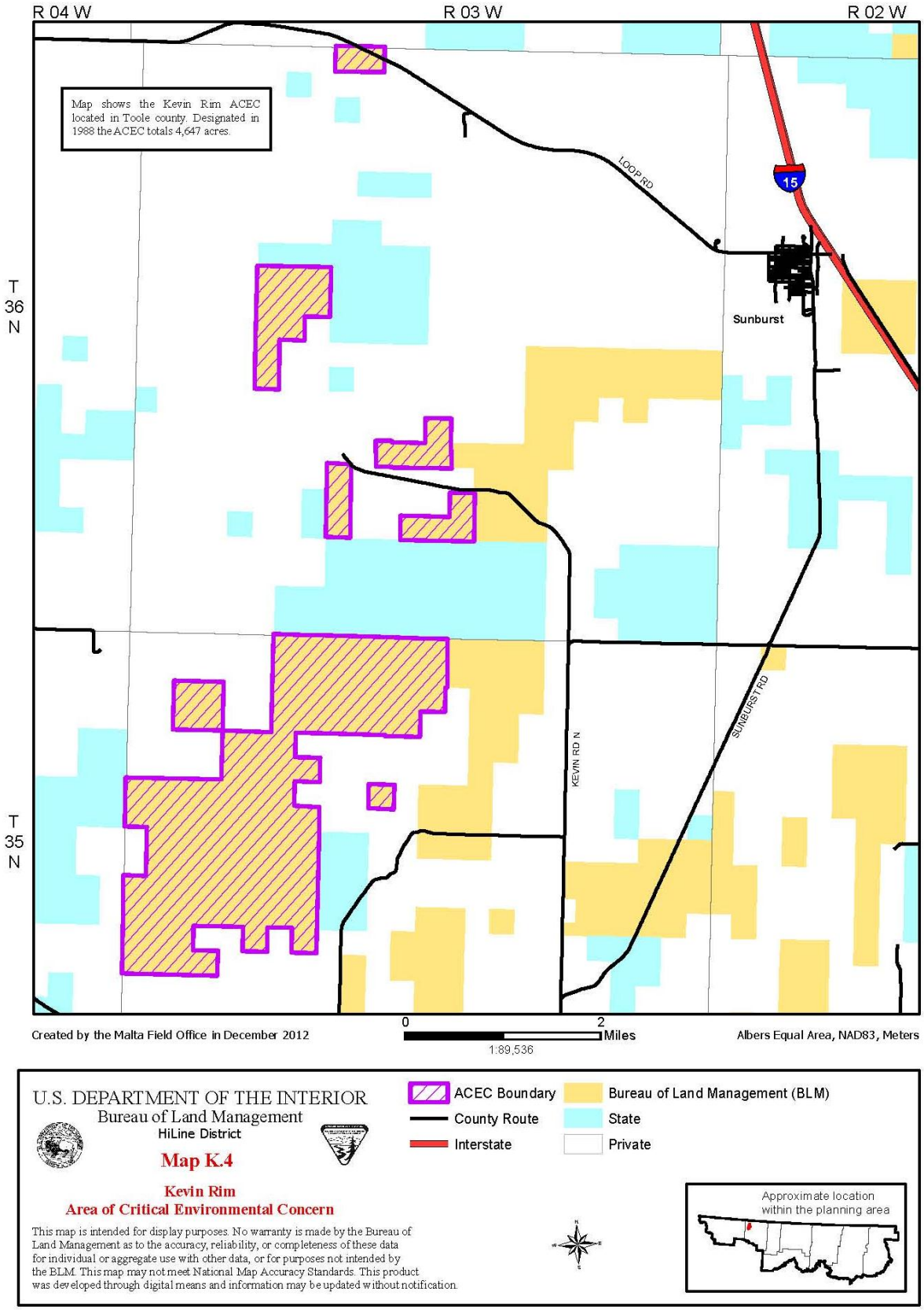
Approximate location within the planning area

Table K.4
Kevin Rim ACEC (Existing)
Relevance and Importance Evaluation

Area Considered:	Kevin Rim
General Location:	T. 36 N., R. 03 W.; and T. 35 N., R. 03 W.
General Description:	Northeast of Shelby, Montana
Acreage:	4,557
Values Considered:	Scientific/Interpretive archaeological. Contains rare and intact important archaeological sites. Essential breeding and nesting area for raptors.

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	Yes	Kevin Rim would be designated and managed to protect, maintain and/or enhance the cultural resources while encouraging other types of multiple use activities to the extent they are compatible with the ACEC designation (BLM 1988).
A fish and wildlife resource	Yes	Kevin Rim serves as a primary breeding and nesting area for a number of raptors including state sensitive species such as the golden eagle and ferruginous hawk. Other raptors using the rim include the prairie falcon and rough-legged hawk. The steep, south facing walls of the rim provide optimum habitat for raptor breeding and nesting and is an uncommon feature in this area of gently rolling plains. Yearlong raptor use of the rim also occurs. Kevin Rim also has potential high value habitat for peregrine falcons. No known use of the rim is presently occurring. However, peregrine falcons have used a nest site on Kevin Rim in the past. The rim has been identified as a reintroduction peregrine site. Most raptors, including those using the rim, are quite susceptible to disturbance. This is especially crucial during the breeding and nesting period and may be a significant factor limiting maximum raptor use of the rim.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	Yes	Kevin Rim serves as a primary breeding and nesting area for a number of raptors including state sensitive species such as the golden eagle and ferruginous hawk. Other raptors using the rim include the prairie falcon and rough-legged hawk. The steep, south facing walls of the rim provide optimum habitat for raptor breeding and nesting and is an uncommon feature in this area of gently rolling plains.
Special qualities	Yes	Cultural materials of value to scientific research, education, and public interpretation are fragile and surface disturbance from other land uses can have a serious adverse impact on them.
Warrants national priority/FLPMA protection	Yes	Satisfies the FLPMA mandate to protect scientific values.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.


R 04 W
R 03 W
R 02 W
T 36 N
T 35 N
Map shows the Kevin Rim ACEC located in Toole county. Designated in 1988 the ACEC totals 4,647 acres.
LOOP RD
15
Sunburst
KEVIN RD N
SUNBURST RD
Created by the Malta Field Office in December 2012
0
2
Miles
1:89,536
Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.4
Kevin Rim
Area of Critical Environmental Concern
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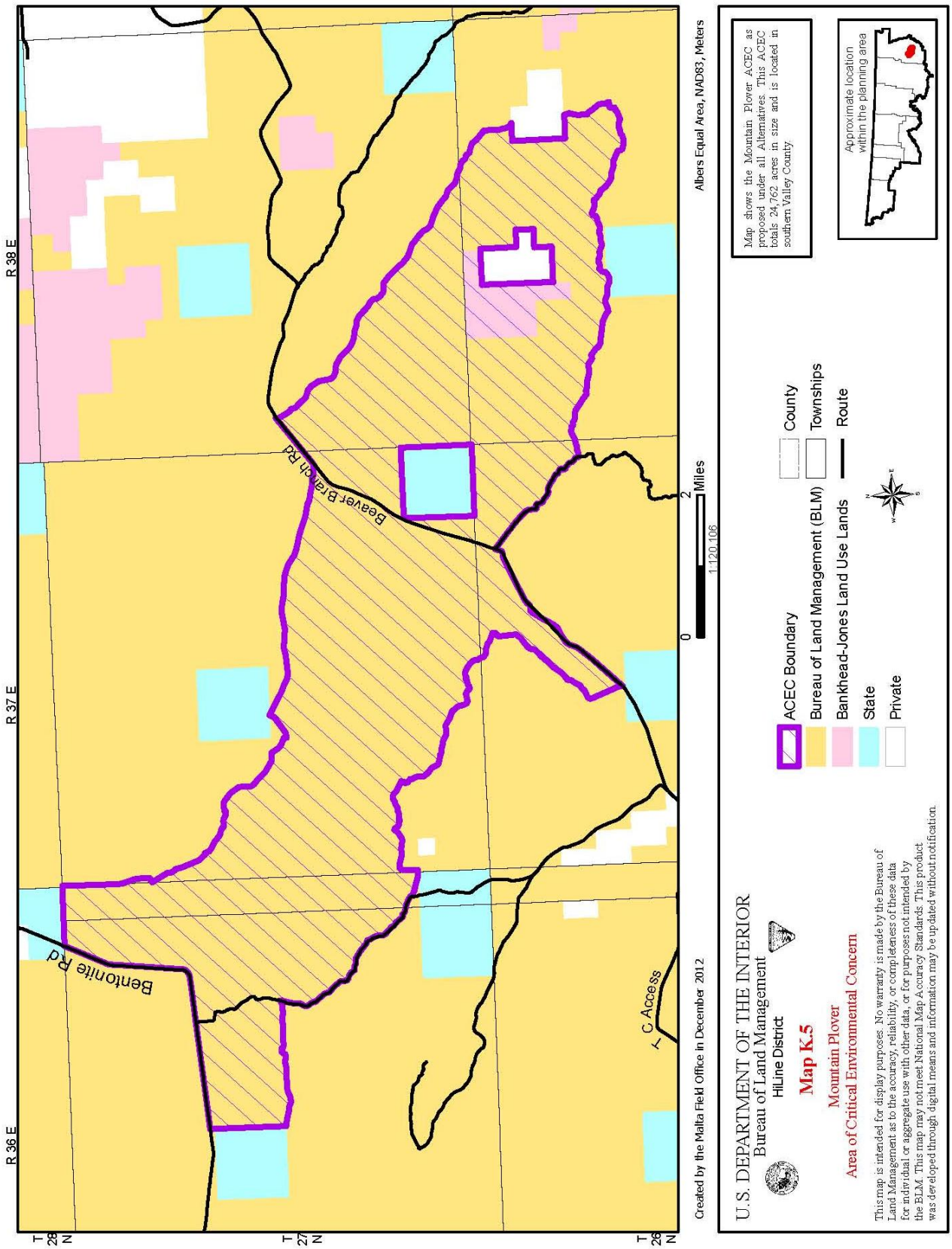
ACEC Boundary
County Route
Interstate
Bureau of Land Management (BLM)
State
Private
Approximate location within the planning area

Table K.5
Mountain Plover ACEC (Existing)
Relevance and Importance Evaluation

Area Considered:	Mountain Plover
General Location:	Portions lie in T. 27 N., R. 36, 36½, 37, and 38 E.; and T. 26 N., R. 37 and 38 E.
General Description:	Southcentral Valley County
Acreage:	24,762
Values Considered:	Essential breeding habitat for Mountain Plovers

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but very similar to those of many other areas in the Malta Field Office.
A fish and wildlife resource	Yes	This ACEC contains breeding habitat for mountain plovers. The area is unique because the hardpan areas along Beaver Creek provide habitat for mountain plovers away from traditional habitat association with prairie dogs. The area contains approximately 160 mountain plovers, which is greater than 1% of the global population of this species. The area is also recognized as a Globally Important Bird Area by the National Audubon Society because of the numbers of breeding Mountain Plovers in the area.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	Yes	The area is of global significance for the continued existence of Mountain Plovers because of the number of plovers breeding within the ACEC.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	Yes	The area would qualify under Section 102(a)(8) of FLPMA as an area to be managed that will protect the quality of scientific values and provide food and habitat for fish and wildlife.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.


R 36 E
R 37 E
R 38 E
T 28 N
T 27 N
T 26 N
Bentonite Rd
Beaver Branch Rd
C Access
0
2
Miles
1:120,106
Created by the Malta Field Office in December 2012
Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.5
Mountain Plover
Area of Critical Environmental Concern
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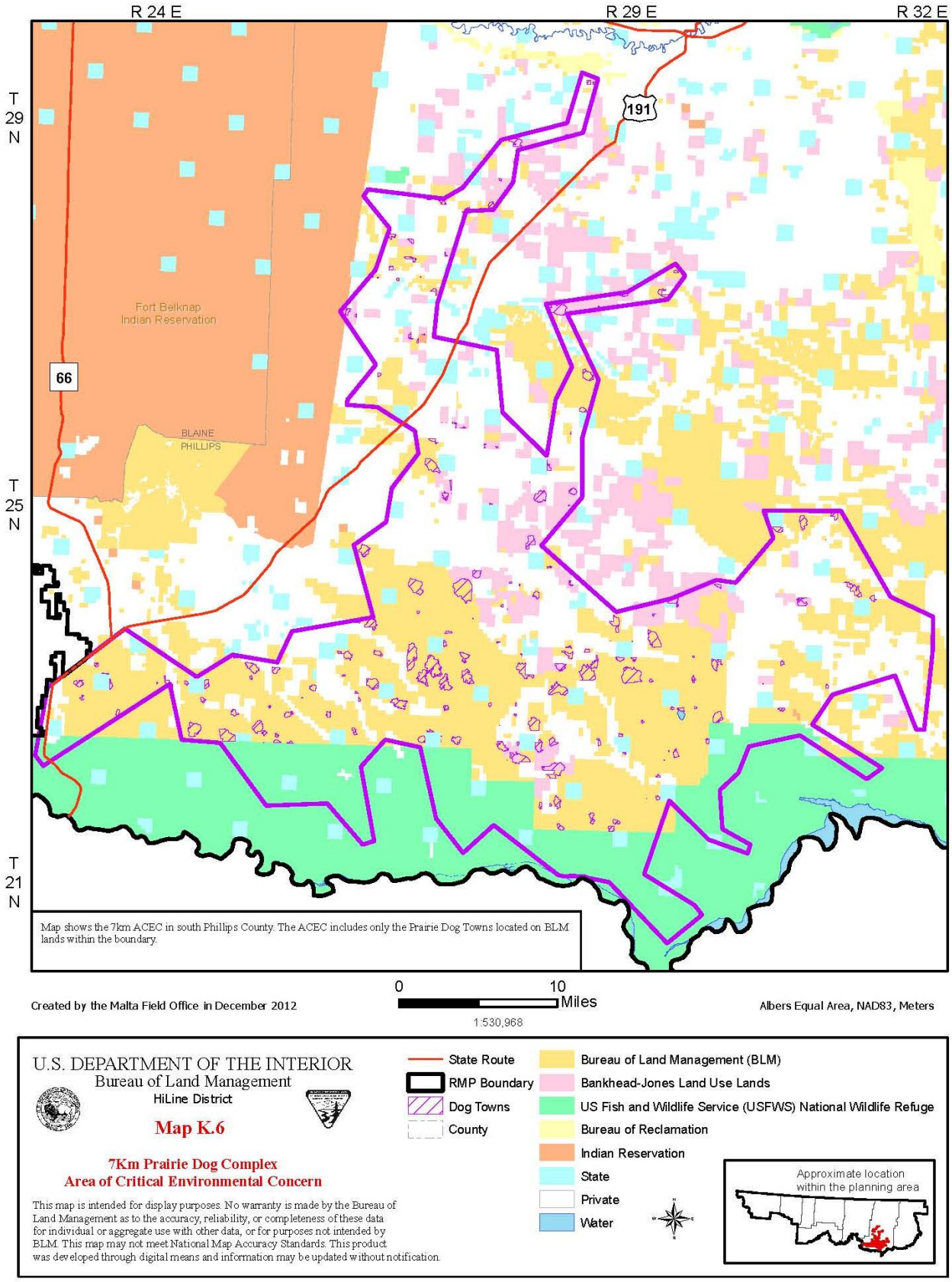
ACEC Boundary
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
State
Private
County
Townships
Route
Map shows the Mountain Plover ACEC as proposed under all Alternatives. This ACEC totals 24,762 acres in size and is located in southern Valley County.
Approximate location within the planning area

Table K.6
Prairie Dog Towns within the 7km Complex ACEC (Existing)
Relevance and Importance Evaluation

Area Considered:	7km Prairie Dog Town Area
General Location:	Central T. 23 N., R. 29 E.
General Description:	Southcentral Phillips County
Acreage:	12,346
Values Considered:	Essential Habitat for Black Foot Ferret Recovery and Prairie Dog Town Conservation Areas

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but very similar to those of many other areas in the Malta Field Office.
A fish and wildlife resource	No	The boundary of this ACEC originally contained many acres of prairie dog towns. Although the area still contains many acres of prairie dogs, the boundary of this ACEC is no longer relevant to black-footed ferret recovery or prairie dog conservation.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	Although the area still contains many acres of prairie dogs, it is no longer relevant to black-footed ferret recovery or prairie dog conservation.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.


R 24 E
R 29 E
R 32 E
T 29 N
T 25 N
T 21 N
191
66
Fort Belknap Indian Reservation
BLAINE
PHILLIPS
Map shows the 7km ACEC in south Phillips County. The ACEC includes only the Prairie Dog Towns located on BLM lands within the boundary.
Created by the Malta Field Office in December 2012
0
10
Miles
1:530,968
Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.6
7Km Prairie Dog Complex
Area of Critical Environmental Concern
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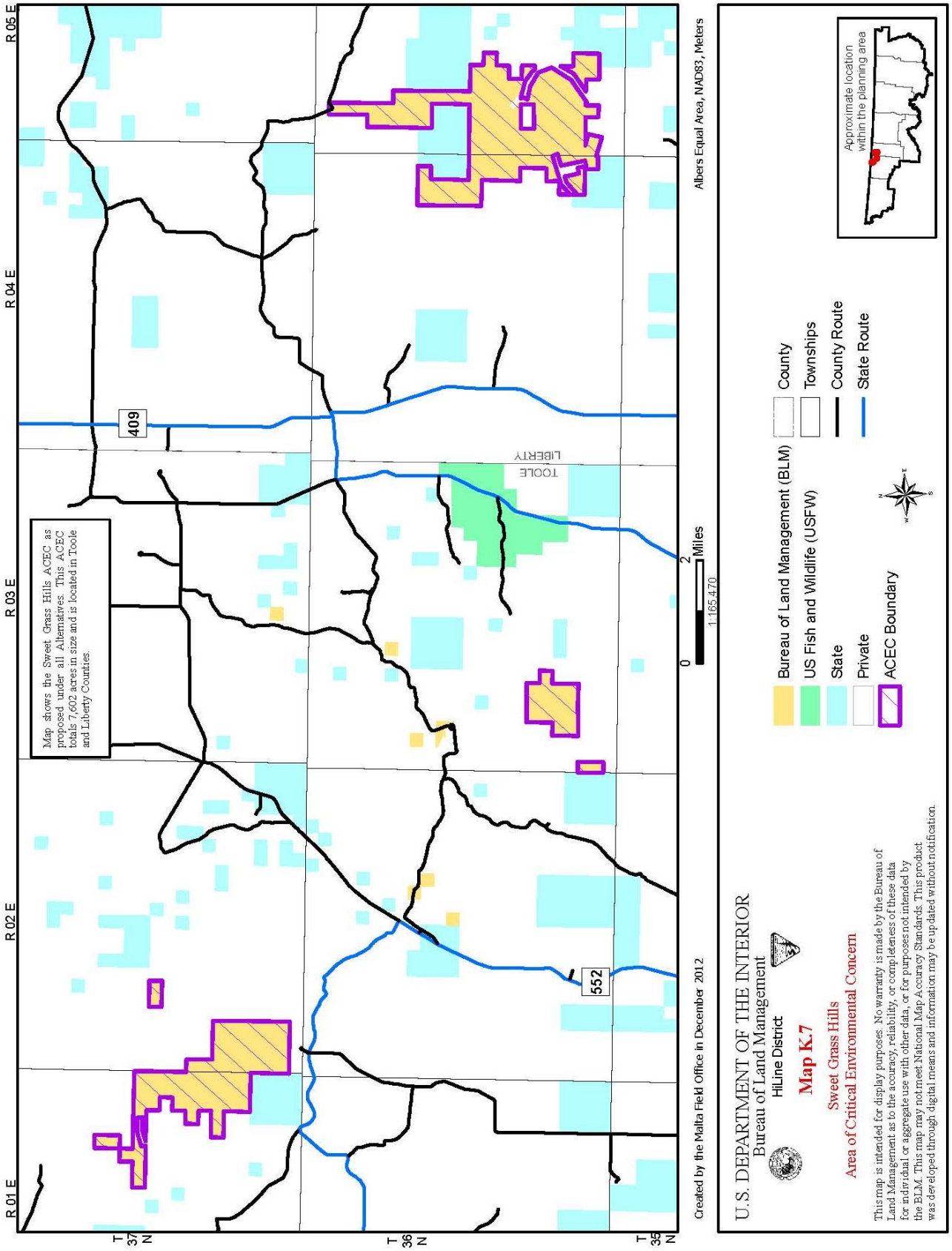
State Route
RMP Boundary
Dog Towns
County
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife Service (USFWS) National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
Approximate location within the planning area

Table K.7
Sweet Grass Hills ACEC (Existing)
Relevance and Importance Evaluation

Area Considered:	Sweet Grass Hills
General Location:	T. 37 N., R. 01 and 02 E.; T. 36 N., R. 03, 04 and 05 E.
General Description:	Northwest of Havre, Montana in Toole and Liberty Counties
Acreage:	7,429 acres
Values Considered:	Scientific/Interpretive archaeological. Contains rare and intact important archaeological sites

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	Yes	The Sweet Grass Hills have been identified by Native American traditionalists as an important location for traditional religious practices (BLM 1987). In traditional Plains Indian culture, spiritual life is integral to daily life. Fasting and vision questing are important elements to this spirituality. Vision questing is practiced by all of the groups known to have ranged into the Sweet Grass Hills.
A fish and wildlife resource	No	No habitat for endangered, sensitive, or threatened fish and wildlife species are known.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	Similar sites and values can be found in other areas of Montana.
Special qualities	Yes	Cultural materials of value to American Indian spirituality are fragile and irreplaceable. Surface disturbance from other land uses can have a serious adverse impact on Traditional Cultural Properties.
Warrants national priority/FLPMA protection	Yes	Satisfies the FLPMA mandate to protect scientific values.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.


R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 37 N
T 36 N
T 35 N
409
552
TOOLE
LIBERTY
Map shows the Sweet Grass Hills ACEC as proposed under all Alternatives. This ACEC totals 7,602 acres in size and is located in Toole and Liberty Counties.
0
2
Miles
1:165,470
Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.7
Sweet Grass Hills
Area of Critical Environmental Concern
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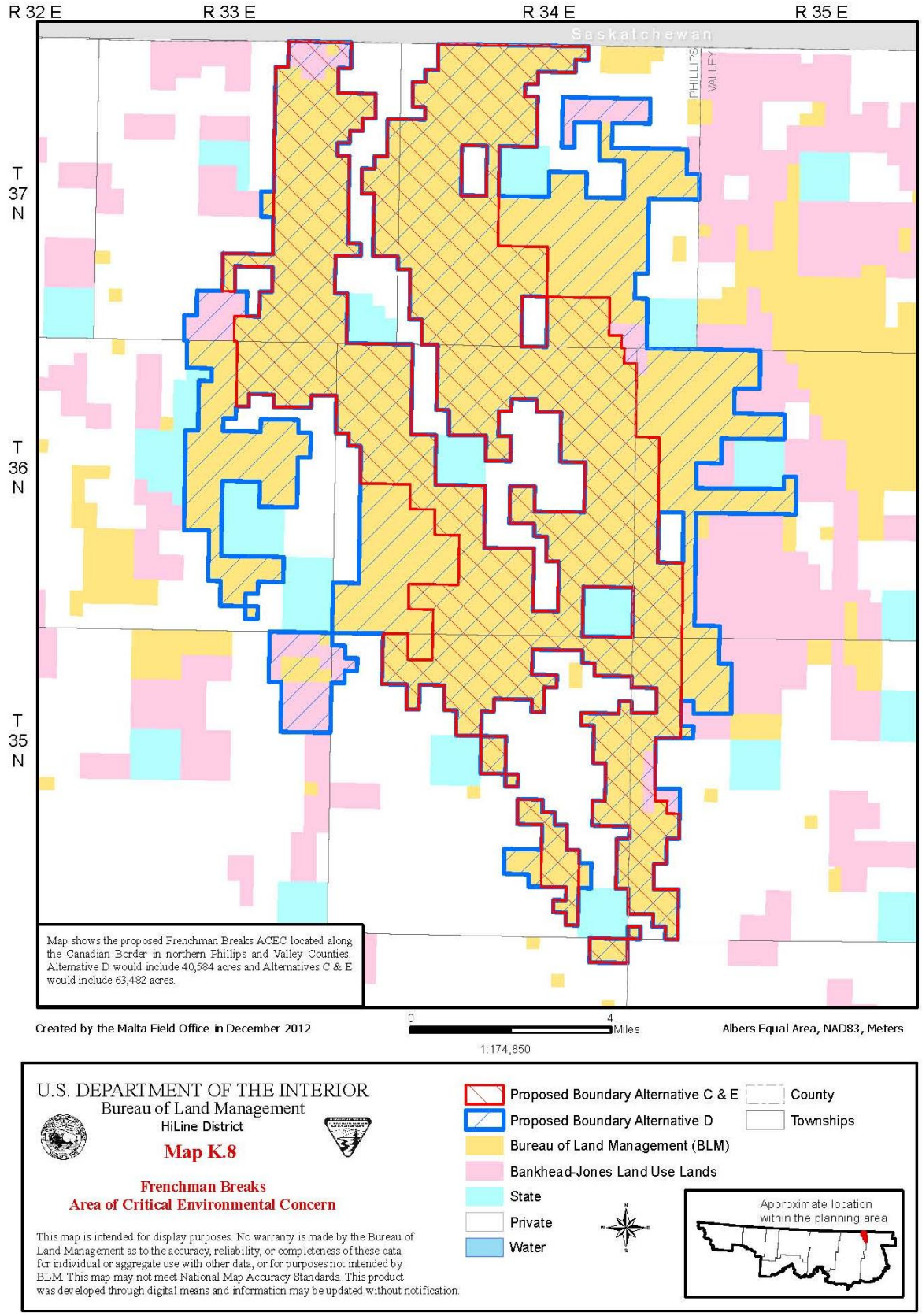
Bureau of Land Management (BLM)
US Fish and Wildlife (USFW)
State
Private
ACEC Boundary
County
Townships
County Route
State Route
Approximate location within the planning area

Nominations Brought Forward During Scoping

Table K.8 Frenchman Breaks ACEC Relevance and Importance Evaluation		
Area Considered:	Frenchman Breaks Area	
General Location:	T. 37 N., R. 33 and 34 E.; T. 36 N., R. 33, 34 and 35 E.; T. 35 N., R. 34 and 35 E.; T. 34 N., R. 34 E.	
General Description:	Northeast Phillips County	
Acreage:	42,020	
Values Considered:	Scenic, fish and wildlife resources (crucial mule deer winter range, diversity of wildlife and native fish), and an unfragmented fragile landscape.	
Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	Yes	The majority of the area contains outstanding scenic views which are not compromised by visual intrusions or human imprints.
A fish and wildlife resource	Yes	The Frenchman Breaks provide important winter habitat for several big game species. As many as 1,609 mule deer have been observed there during severe winters, the bulk of them probably migrating to the area from Canada. The large number of Canadian mule deer migrating to the area was the reason for identifying this winter habitat as crucial. The lack of humans during winter contributes to a higher dependence of mule deer on native shrubs for browse rather than being attracted to hay stacks as in other breaks habitats in Phillips and Valley Counties where ranches are more abundant. Several hundred pronghorn antelope also winter in sagebrush habitat found in drainage areas and fans protected from cold winds by the steep breaks topography. Elk could be found in the breaks habitat at any time of the year, but the hunted population is quite small. Moose have become more prevalent in the area in recent years, and the Creek bottom (mostly on private land) has been identified as one of the ten best places in North America for growing trophy white-tailed deer. The Frenchman Breaks provide habitat for a variety of wildlife species. It is located less than two miles from Frenchman Reservoir, a private irrigation reservoir that supports nesting colonies of eared grebe, great blue heron, and double-crested cormorant. Fish populations in Frenchman Creek provide food for these colonial nesters as well as for non-breeding concentrations of American white pelican during summer. There are nearly 20 known sharp-tailed grouse dancing grounds on federal land within the nominated ACEC, and one known greater sage-grouse strutting ground on a boundary with private land just northwest of Frenchman Reservoir. The Frenchman Creek bottom supports a significant population of ring-necked pheasants, but few upland game birds ever see a hunter in this remote area. Unique aspen stands on the east side of the ACEC probably support unknown concentrations of warblers and other passerines searching for deciduous tree habitat during their spring migration when few or no humans are present to observe and identify them. The Frenchman Breaks area is home to many BLM Sensitive Species, and upland grassland areas between areas of steep topography can also support additional sensitive grassland bird species. Sensitive wildlife species include greater short-horned lizard, northern leopard frog, ferruginous hawk, golden eagle, Swainson's hawk, greater sage-grouse, loggerhead shrike, and swift fox. The four grassland birds on grassy bench tops are the Baird's sparrow, McCown's longspur, chestnut-collared longspur, and Sprague's pipit. The area

		has habitat for bald eagle, peregrine falcon, Brewer's sparrow, northern goshawk, red-headed woodpecker, willet, marbled godwit, long-billed curlew, and Wilson's phalarope. All are sensitive species, but few or no records exist for the area. The swift fox occurs primarily on the western side of the nominated ACEC. Few records exist for the greater short-horned lizard due to their secretive nature. The greater short-horned lizard, or horny toad, does occur in the Frenchman Breaks area near sandstone ledges and rocky slopes. The remoteness of the area has allowed populations of the lizard to persist with little or no human disturbance. The northern leopard frog probably occurs in Frenchman Creek and in reservoirs and stock ponds, but little work has been done on this species. Frenchman Creek does have the BLM Sensitive Pearl Dace and sauger. Also present is the northern redbelly dace. Although not a sensitive species itself, its hybrid with the finescale dace is a Sensitive Species and the two are very difficult to tell apart.
A natural process or system	Yes	The Frenchman Breaks, located mostly in extreme northeastern Phillips County and partially in northwestern Valley County, is a remote and mostly roadless area of badlands and breaks topography stretching for miles. The area is relatively unfragmented from human presences. The Frenchman Breaks are fragile due to exposed bedrock and soils with severe erosion hazards, developed from acid shales, shallow to very shallow depth, low available water holding capacity, and sparse vegetative ground cover. The aspen stands in the central portion of the ACEC on the east side of Frenchman Creek appear to be remnants of the Aspen Parklands found farther north in Canada. This area is rarely visited by humans, except during the fall big game hunting season, and it probably supports unique plant species in addition to the passerine bird community during spring and summer. This little-studied area needs detailed plant and animal surveys to determine its full potential as an ACEC. The unique geology of the Frenchman Breaks was a key factor in the prior designation of the area as a VRM Class 2 landscape. The International Boundary with Canada not only separates the Frenchman River in Canada from Frenchman Creek in the United States, but also separates the extensive Frenchman grasslands in Canada from the rugged, incised topography on the United States side. The few roads on the edges of the area are not maintained and most of the area is inaccessible during all but the driest times of the year. The rugged topography has prevented all but the most primitive jeep trails from invading the area. Any development of the area would face challenging obstacles on the steep slopes, soils with severe erosion hazards, and in weather extremes.
Natural hazards	No	No natural hazards are known.
Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	Yes	The various sensitive wildlife species are found at many other locations in Montana, but the large diversity in this one geographic area is quite unique. The designation of the mule deer winter range in the Frenchman Breaks as crucial is unique because of the large number of mule deer (1609 in 1982) that migrated into the area during a period of deep snow. Other breaks habitats along Cottonwood and Assiniboine Creeks can support several hundred mule deer, but they apparently do not attract large herds from Canada as Frenchman does. The eastern short-horned lizard population is significant due to the fact that there is

		little human disturbance and the population has a large habitat base with no development and little human activity. The aspen groves on the east side of the unit are very unique and undoubtedly attract many migrant passerines in spring and fall, but is little studied or disturbed due to the remoteness and lack of roads. These aspen remnants are not found in other locations in the Planning Area to any large degree, and are more typically found in aspen parkland regions farther north in Canada.
Special qualities	Yes	Within the nominated ACEC boundary are approximately 34,396 acres (82% of the ACEC) of soils with a severe water erosion hazard and 6,800 acres with a severe wind erosion hazard . Active geologic erosion is obvious throughout the uplands. Increased sediment delivery to Frenchman Creek would be a concern if soil erosion is accelerated by surface disturbing activities. Increased sediment in Frenchman Creek could lead to scouring of the channel banks and an additional silt load in Frenchman Reservoir. The Frenchman Breaks are mostly road less and that helps maintain their rugged, unique, and unfragmented characteristics. That does not mean, however, that the area is without threats to the integrity of its natural systems and processes. All-terrain vehicles (ATV) continue to be a growing problem during the hunting season, with more and more people driving off roads each year, especially on the east side. Many of these new trails are on steep slopes and/or soils with severe erosion hazard. It is rare to find an area where there still remains a chance to get off-road vehicle use under control. The JVP describes the area as having moderate potential for natural gas development. Much of the private land in the Frenchman Breaks area has been leased since November 2004. Federal Lands were temporarily suspended from leasing due to wildlife habitat protests of previous planning documents. Gas development in the Frenchman Breaks would damage most of the unique and unfragmented characteristics mentioned above. Big game populations would be disturbed or displaced during severe winters, and the wildlife diversity could be reduced by increased human disturbance and resource development. Geologic features and soils would be affected by associated facilities such as access roads, pipelines, and power lines. Well houses and pump jacks would severely impact the scenic beauty of the area and disturb wildlife as well as detract from the area's wild characteristics.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.


R 32 E
R 33 E
R 34 E
R 35 E
Saskatchewan
PHILLIPS
VALLEY
T 37 N
T 36 N
T 35 N
Map shows the proposed Frenchman Breaks ACEC located along the Canadian Border in northern Phillips and Valley Counties. Alternative D would include 40,584 acres and Alternatives C & E would include 63,482 acres.
Created by the Malta Field Office in December 2012
0
4
Miles
1:174,850
Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.8
Frenchman Breaks
Area of Critical Environmental Concern
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Proposed Boundary Alternative C & E
Proposed Boundary Alternative D
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
State
Private
Water
County
Townships
Approximate location within the planning area

Table K.9
Malta Geological ACEC
Relevance and Importance Evaluation

Area Considered:	Malta Geological Area
General Location:	T. 33 N., R. 29 and 30 E.; T. 32 N., R. 29 and 30 E.
General Description:	Northern Phillips County
Acreage:	6,153
Values Considered:	Nationally significant paleontological area.

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but very similar to those of many other areas in the Malta Field Office.
A fish and wildlife resource	No	No habitat for endangered, sensitive, or threatened fish and wildlife species are known.
A natural process or system	Yes	The area is known in the local paleontological community, as well as nationally and internationally, for producing some of the more unique vertebrate specimens. In fact, the first mummified dinosaur remains were recovered from the same geologic unit and in the vicinity of the Malta Geological area. This mummified specimen is the only one like it in the world. Other dinosaur fossils have been recovered from the area, several of which are also considered to be one of a kind. If these specimens remain in public ownership, they may become designated as "type specimens." A type specimen is the specimen all other fossils are compared and is the basis for a new species designation.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	Yes	The Malta Geological Area is characterized by geologic units which have a high likelihood for containing rare and scientifically significant vertebrate and non-vertebrate fossil remains. The first mummified dinosaur remains were recovered from this geologic unit, which is in the vicinity of the Malta Geological ACEC. The mummified dinosaur remains represent only one of the several internationally significant fossils recovered from the area.
Special qualities	Yes	Phillips County has the greatest number of known paleontological localities across the HiLine on both public and private lands. According to the paleontological distribution statistics prepared by Hanna (2007), 75% of the paleontological localities on the HiLine occur within the Cretaceous Judith River Formation. The Judith River formation is one of three Class 5 geologic units that are located within the planning area. The other two geologic units are Hell Creek and Two Medicine; however the Judith River formation is the most prevalent of the three in the planning area. All three units are considered to be highly fossiliferous and have yielded trace, plant, vertebrate, fish, amphibian, reptile, dinosaur, and mammal fossils (Hanna 2007). Management concern for impacting paleontological resources is high to very high. Potential threats to paleontological resources include illegal collection, ground disturbance, and natural erosion.

		The most difficult threat to manage in the Malta Geological ACEC area is theft and vandalism. Due to the high black market value placed on vertebrate fossil remains and the national/international significance of the area, the Malta Geological ACEC Area has been and is currently being threatened by illegal collection. There have been recent reports of paleontological thefts both on public land and adjoining private lands. Much of the illegal collecting occurs generally during the hours and days when federal employees are not working (after hours, weekends, and holidays). The illicit removal of these specimens negatively impacts the scientific record and prohibits the public from experiencing and learning from these fossils. For example, geologic studies often rely upon invertebrate fossils to determine stratigraphic position and make lateral correlations. Fossilized plants allow for inference of forage available for coexistent herbivores and reveal climatic conditions. The fossil record also elucidates the processes of evolution and extinction. However theft and vandalism are not the only threats to the Malta Geological ACEC area. All-terrain vehicles (ATV) continue to be a growing problem during the hunting season, with more and more people driving off roads each year. Many new trails are on steep slopes and/or soils with severe erosion hazard. Many of the prime fossil locations are on these steep, erosional slopes and can be negatively impacted by unauthorized off road use. The likelihood for inadvertent discovery and potential for theft/damage increases exponentially with the influx of people. The RFD prepared for the HiLine RMP describes the ACEC area as having both very low and moderate potential for natural gas development. Much of the public land in the Malta Geological ACEC area has been leased since November 1987. Geologic/paleontological features and soils would be impacted by associated facilities such as access roads, pipelines, and power lines.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.

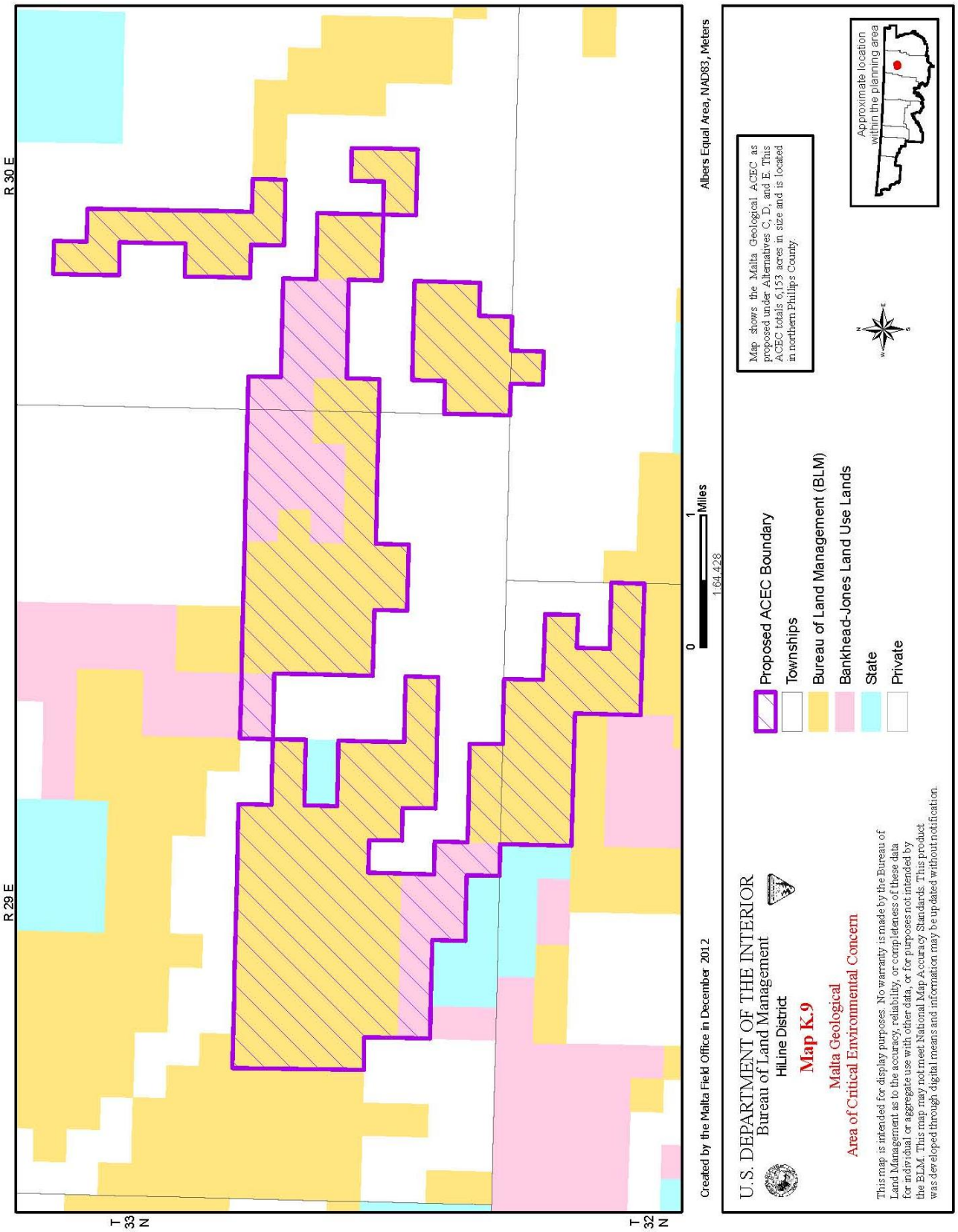
R 29 E
R 30 E
T 33 N
T 32 N
Created by the Malta Field Office in December 2012
0
1
Miles
1:64,428
Albers Equal Area, NAD83, Meters
Proposed ACEC Boundary
Townships
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
State
Private
Map shows the Malta Geological ACEC as proposed under Alternatives C, D, and E. This ACEC totals 6,153 acres in size and is located in northern Phillips County.
Approximate location within the planning area
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.9
Malta Geological
Area of Critical Environmental Concern
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Table K.10
Woody Island ACEC
Relevance and Importance Evaluation

Area Considered:	Woody Island Area (Blaine County and Phillips County parcels)
General Location:	T. 37 N., R. 23, 24, 25, 26 and 27 E.
General Description:	Northeast Blaine County and Northwest Phillips County
Acreage:	32,869
Values Considered:	Essential habitat for Grassland Birds, and Unique Landscape

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	Yes	No significant historic or cultural values are known. The area has a distinct topography which resulted from downwasting of stagnant glacial ice about ten thousand years ago. Accumulated glacial debris deposited from this process formed an undulating landscape of many small hills with moderately steep to steep slopes and enclosed depression, best described as a hummocky moraine. This area differs from the glacial landscape found to the south that escaped severe glacial scouring, resulting in smoother relief.~~.~~
A fish and wildlife resource	Yes	The Northwest Woody Island ablation moraine is a block of intact grassland habitat and entirely public land (22,411 acres) which is located in north Blaine County and bordered by Canada to the north. This area is valuable, intact, habitat for grassland-associated birds. Some of these species are Montana/Dakotas BLM Sensitive Species and endemic to the Northern Great Plains: Ferruginous Hawk, Long-billed Curlew, Willet, Marbled Godwit, Sprague's Pipit, Baird's Sparrow, McCown's Longspur and Chestnut-collared Longspur. There are also a number of other Special Status Species throughout the area including the swift fox Populations of grassland associated birds have exhibited the steepest declines of any suite of bird species in North America over the past several decades. Loss of habitat throughout North America, resulting from conversion of native prairie to agricultural production, has been identified as the primary cause of current grassland bird declines. Large blocks of intact prairie lands remaining in Montana, therefore, provide critically important breeding habitat for many grassland bird species. Of the 41 bird species documented for the Northwest Woody Island Coulee ablation moraine in the Montana Natural Heritage Program Point Observation Database, 22 have displayed some evidence of breeding; Fourteen are listed as State of Montana Species of Concern. Five of the ten most abundant species recorded during 2008 are State of Montana Species of Concern as well as Montana/Dakotas BLM Sensitive Species. All are endemic Great Plains prairie birds. The present diversity and abundance of prairie endemic bird species at Northwest Woody Island Coulee indicates a variety of habitat elements is available on this unique BLM parcel. The relative abundance of McCown's Longspurs, a species which requires sparse short grass and bare ground (With 1994), compared with other grassland areas in the state, suggests Woody Island Coulee is an area of short-stature grasses. The abundance of Chestnut-collared Longspurs, and to a lesser extent, Sprague's Pipits, both of which show a preference for areas with

		moderate grass cover and litter, (Hill and Gould 1997, Robbins and Dale 1999) indicates the presence of mid-level grass. Also present, however, are Baird's Sparrows, which require denser grass and litter (Green, et al. 2002), suggesting the presence of a taller, more complex structure. Woody Island Coulee provides important habitat for prairie endemic species of a different composition than those found in Valley County, an area in which the Heritage Program has been conducting annual point counts since 2001. The total percent of points on which Chestnut-collared Longspurs were detected at Woody Island Coulee was 99% (compared to the average yearly percent of points for years 2001-2006 for this species in Valley County at 81-87%). McCown's Longspur, present in much greater abundance at Woody Island Coulee, was recorded on 69% of the point counts during 2008 (the average Valley County is only between 14% and 31% for years 2001-2006). Detection rates for Baird's Sparrow and Long-billed Curlew were similar to those in Valley County. Current management activities at Northwest Woody Island Coulee allows for a unique composition of Northern Great Plains native grassland bird species. The property contains the highest concentration of McCown's Longspurs for any area surveyed by the Montana Natural Heritage Program, and possibly for any public lands site in Montana. The diversity and abundance of the endemic grassland bird State of Montana Species of Concern documented at Woody Island Coulee warrants continued and enhanced protection for this unique BLM property. Northwest Woody Island Coulee is critical to the conservation of Montana's grassland bird species. Similar things can be said for the Northeast Woody Island Coulee end moraine in northwest Phillips County and eastern Blaine County. It is comprised of 10,440 acres of public land and is separated from the Northwest Woody Island Coulee unit by several miles of mostly cultivated private land. It is located two miles south of Canada. Modified Emlen (1977) transects completed by the BLM and the FWS on the north edge of the unit during 1980, 1995-2002, and 2003-2009 found the most abundant grassland birds to be (in decreasing order) the Chestnut-collared Longspur, Baird's Sparrow, McCown's Longspur, and Sprague's Pipit. Baird's Sparrow numbers remained high at a time when it was listed as endangered in Canada just a few miles away. Other BLM Sensitive Species found on the unit included Marbled Godwit, Long-billed Curlew, Willet, Wilson's Phalarope, Ferruginous Hawk, Swainson's Hawk, Franklin's Gull and Golden Eagle. A variety of waterfowl and shorebird species are present in wet years due to the abundance of natural potholes. The density of potholes is so great that the observer performing the Emlen transects has to use a compass to stay on course and avoid getting lost.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.
Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	Similar sites and values can be found in other areas.
Special qualities	Yes	The North Woody Island ablation moraine is a unique landscape comprised of hills and depressions that do not form into surface watershed unlike the rest of

		the glaciated plains which have "scraped off" and cut watershed landscapes. The Blaine County moraine (northwest) is an island of relatively contiguous, public land habitat surrounded by private land to the west, south and east, with the International Line forming the northern boundary. Farming is common in the surrounding private land. The Phillips County moraine (northeast) is also a contiguous block of public land surrounded by a mix of public, state and private land on all sides. The private land is either farmed or in the Conservation Reserve Program. The landscape is virtually untouched with only a few livestock pits, windmills and two-track vehicle trails which for the most part are relatively unnoticed and do not detract from the visual character of the landscape. This landscape is vulnerable to change from off-road travel mainly associated with hunting, but also the steep, hilly terrain may be subject to recreational illegal off-road use in the future. Though the entire area is classified as low potential for gas development and is currently not leased in Blaine County, many parcels within the nominated ACEC were nominated prior to a voluntary moratorium by BLM for new leases within the West HiLine RMP until a Land Use Plan has been finalized. There are concerns that the currently un-fragmented wildlife habitat could be at risk if gas development occurs in this unique and rare landscape. Much of the Phillips County portion has been leased, but no development has occurred. It is administered by the Judith-Valley-Phillips RMP. The grassland bird assemblage, although found in other locations, is at a high density and includes a high proportion of McCown's Longspurs not found at other locations. The pothole habitat obtains some, to much runoff each year which replenishes subsurface soil moisture necessary for maintaining proper nest humidity for ground-nesting birds. Species such as the Baird's Sparrow and Sprague's Pipit can be nomadic resulting in shifts away from other locations that remain completely dry during drought periods. Nest humidity appears to be adequate in the Woody Island Coulee area to retain birds in all years. Data from Emlen (1977) transects in Phillips County indicate that high numbers of grassland birds are present each year regardless of persistent drought periods. The cacophony of bird sound at dawn during the breeding season would be difficult to duplicate at other locations.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.

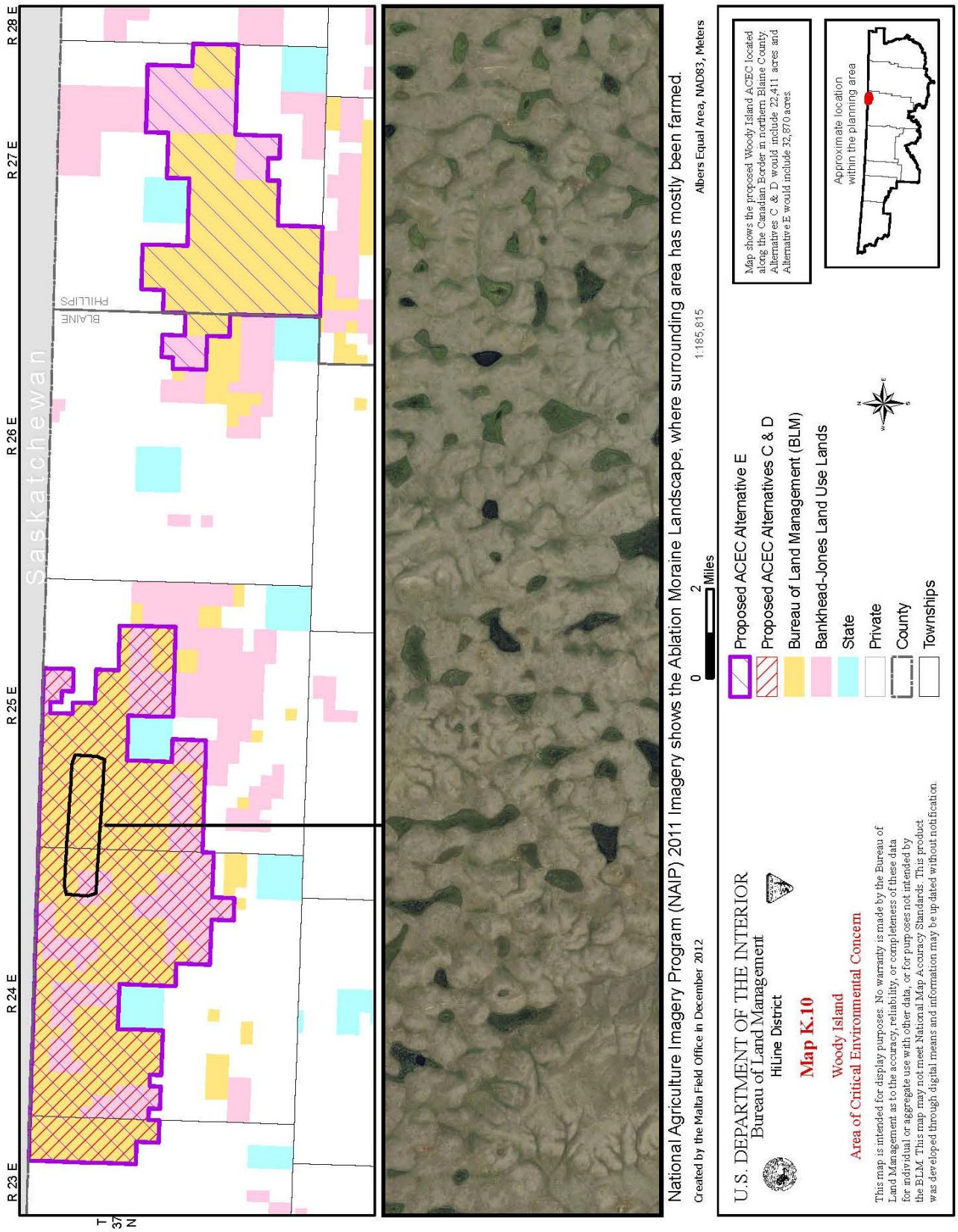
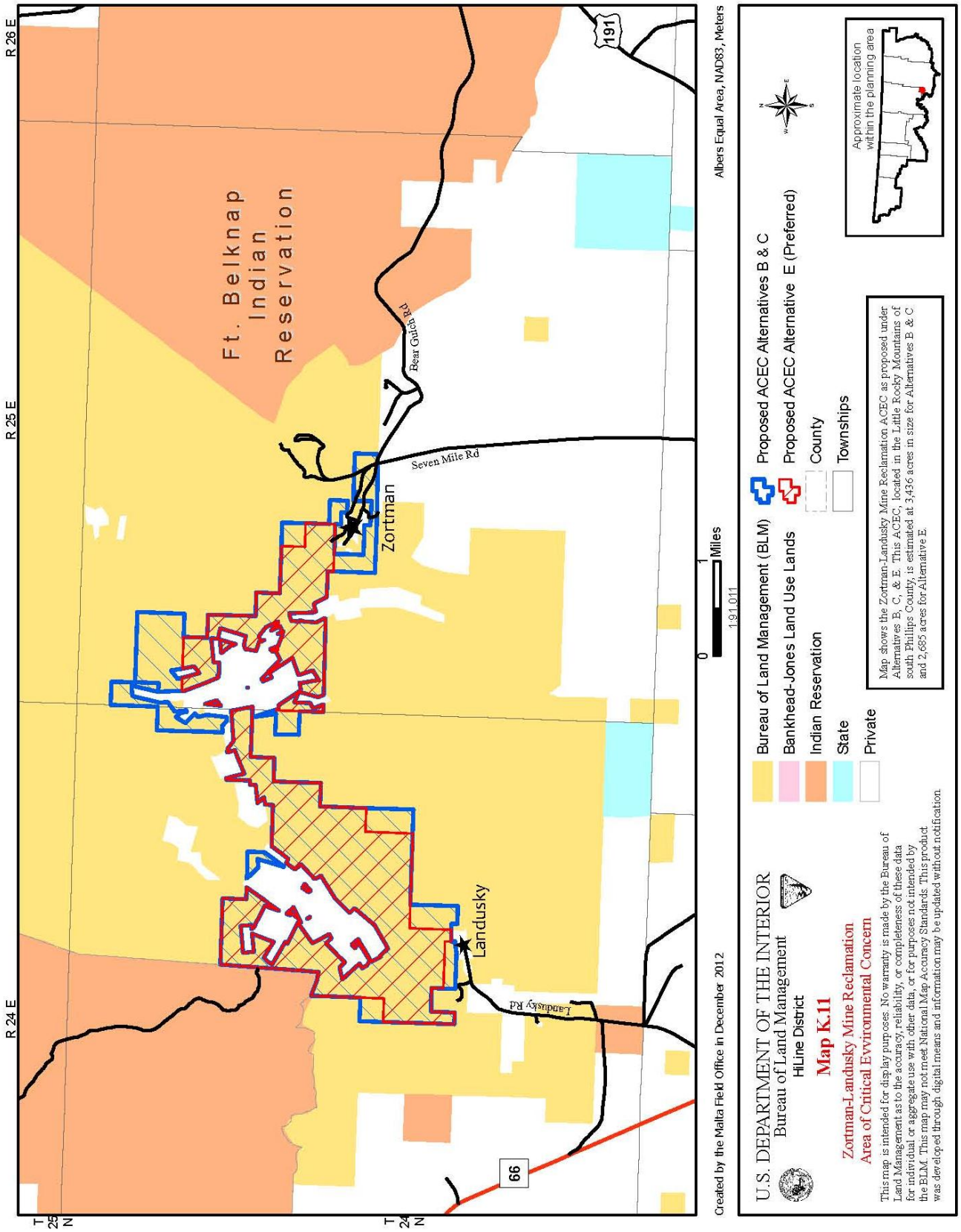

R 23 E
R 24 E
R 25 E
R 26 E
R 27 E
R 28 E
T 37 N
Saskatchewan
BLAINE
PHILLIPS
National Agriculture Imagery Program (NAIP) 2011 Imagery shows the Ablation Moraine Landscape, where surrounding area has mostly been farmed.
Created by the Malta Field Office in December 2012
0 2 Miles
1:185,815
Albers Equal Area, NAD83, Meters
Map shows the proposed Woody Island ACEC located along the Canadian Border in northern Blaine County. Alternatives C & D would include 22,411 acres and Alternative E would include 32,870 acres.
Approximate location within the planning area
Proposed ACEC Alternative E
Proposed ACEC Alternatives C & D
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
State
Private
County
Townships
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.10
Woody Island
Area of Critical Environmental Concern
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.

Table K.11
Zortman/Landusky Mine Reclamation ACEC
Relevance and Importance Evaluation

Area Considered:	Zortman/Landusky Mine, Little Rocky Mountains
General Location:	T. 25 N., R. 24 E.; T. 25 N., R. 25 E.
General Description:	Southeast Phillips County
Acreage:	3,575
Values Considered:	Natural Hazards

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but are similar to those of many other areas in the Malta Field Office.
A fish and wildlife resource	No	No habitat for endangered, sensitive, or threatened fish and wildlife species are known.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	Yes	The Zortman/Landusky mine reclamation site consists of several large engineered slopes with thin and sensitive soils that are prone to severe erosion. The site also contains hazardously steep highwalls exposed along the edge of many of the reclaimed open pits.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	Natural resources present are similar to other areas within Montana.
Special qualities	Yes	The Zortman/Landusky mine reclamation site consists of several large engineered slopes with thin and sensitive soils that are prone to severe erosion. The site also contains hazardously steep highwalls exposed along the edge of many of the reclaimed open pits.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	Yes	As part of the reclamation, several facilities for water quality treatment are present within the mine reclamation area. If the public is allowed access to these structures and facilities, it would create a concern for human safety, as well as potentially interrupting the water treatment process.
Poses a significant threat	Yes	Engineered slopes within the site are susceptible to severe erosion and instability early in the reclamation process. Exposed highwalls around the open pit areas also pose similar risks to the public with increased potential rock fall and hazardously steep surfaces. This sort of risk threatens human life and safety or property if the public is allowed any activity on or around the slopes and highwalls within the nominated ACEC.


R 24 E
R 25 E
R 26 E
T 25 N
T 24 N
Ft. Belknap Indian Reservation
Bear Gulch Rd
Seven Mile Rd
Zortman
Landusky
Landusky Rd
191
66
Created by the Malta Field Office in December 2012
0
1
Miles
1:91,011
Albers Equal Area, NAD83, Meters
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Indian Reservation
State
Private
Proposed ACEC Alternatives B & C
Proposed ACEC Alternative E (Preferred)
County
Townships
Approximate location within the planning area
Map shows the Zortman-Landusky Mine Reclamation ACEC as proposed under Alternatives B, C, & E. This ACEC, located in the Little Rocky Mountains of south Phillips County, is estimated at 3,436 acres in size for Alternatives B & C and 2,685 acres for Alternative E.
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.11
Zortman-Landusky Mine Reclamation
Area of Critical Evvironmental Concern
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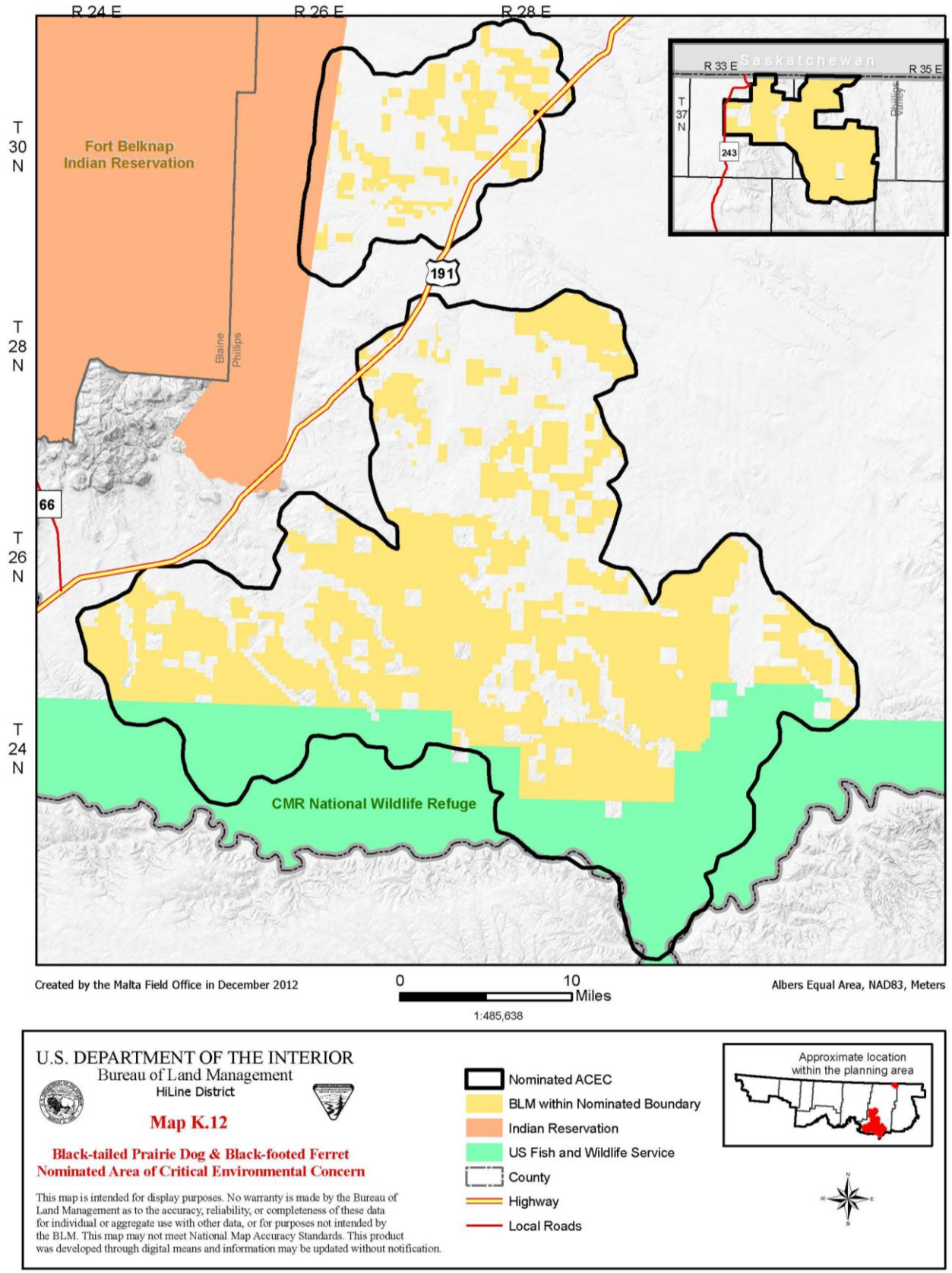
Nominations Received During the Planning Process

Table K.12 Black-tailed Prairie Dog and Black-footed Ferret Habitat Relevance and Importance Evaluation		
Area Considered:	Phillips County	
General Location:		
General Description:	Mostly southern Phillips County and a small area in northern Phillips County	
Acreage:	268,563	
Values Considered:	Black-tailed prairie dogs and black-footed ferret habitat.	
Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but are similar to those of many other areas in the planning area
A fish and wildlife resource	Yes	The southern portion of the nominated area meets the relevance criterion for wildlife resources. This area provides habitat for prairie dogs as noted by the MFWP Region 6 Prairie Dog Abundance and Distribution Objectives Plan (2006). Prairie dogs are a BLM sensitive species. However, the portion of the nominated area in north Phillips County does not meet the relevance criterion because there are no prairie dogs or black-footed ferrets currently in this area and this area has little potential for prairie dogs due to the steep slopes and rugged nature of the area.
A natural process or system	Yes	The southern portion of the nominated area also meets the criterion for a natural system or process because prairie dog towns in the nomination area also provide habitat for a broad suite of wildlife species, including many BLM special status species because of the unique habitat features they create by burrowing and grazing. The northern portion does not meet the criterion.
Natural hazards	No	No natural hazards are known.
Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	The nomination does not meet the importance criteria. Although important to black-tailed prairie dog and black-footed ferret conservation as noted in the nomination material, the area is not significantly unique or more important than other habitat areas throughout the range of these species.
Special qualities	No	Prairie dog complexes of various sizes occur throughout much of the former range of the black-tailed prairie dog.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.


R 24 E
R 26 E
R 28 E
T 30 N
T 28 N
T 26 N
T 24 N
Fort Belknap Indian Reservation
Blaine
Phillips
191
66
CMR National Wildlife Refuge
Saskatchewan
R 33 E
R 35 E
T 37 N
243
Phillips Valley
Created by the Malta Field Office in December 2012
0
10
Miles
1:485,638
Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.12
Black-tailed Prairie Dog & Black-footed Ferret
Nominated Area of Critical Environmental Concern
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Nominated ACEC
BLM within Nominated Boundary
Indian Reservation
US Fish and Wildlife Service
County
Highway
Local Roads
Approximate location within the planning area

Table K.13
Five Watersheds
Relevance and Importance Evaluation

Area Considered:	Blaine, Phillips and Valley Counties
General Location:	
General Description:	Five watersheds in Blaine, Phillips and Valley Counties
Acreage:	487,871
Values Considered:	Streams and Fisheries

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but are similar to those of many other areas in the planning area
A fish and wildlife resource	Yes	The nomination meets the relevance value for wildlife resources. Small prairie streams within the HiLine District planning area provide habitat for the BLM sensitive species pearl dace and northern redbelly x finescale dace hybrid. Little is known of these fish species and populations could be rather low. Several of the small streams are spring-fed and pool levels are dependent upon protection of the source springs, especially during periods of extended drought.
A natural process or system	Yes	The nomination also meets the relevance value for a natural system or process. Prairie streams in these watersheds are part of the hydrologic cycle and exist in the Missouri River Watershed. The five watersheds include aquatic habitat that supports a variety of sensitive fish species.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	The five watershed areas are not significantly unique or more important than other watersheds in the HiLine District planning area. Although the five watersheds most likely have fish, the BLM has limited or no data on native minnow populations or species diversity for them. Warm Creek does have significant populations of minnows in pools near road culverts, but Telegraph Creek is usually dry with limited pool habitat. A survey of Rock Creek in Valley County in 1979 found longnose dace, but not the sensitive dace species.
Special qualities	No	There are small prairie streams within the planning area that have records of the sensitive dace species, so the nominated streams are in no way unique, rare or exemplary. The BLM has records of the sensitive dace species in Phillips County from Whitewater Creek, Cottonwood Creek, and Garland Creek. Assiniboine Creek also supports a fish population, but species composition has not been studied.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.

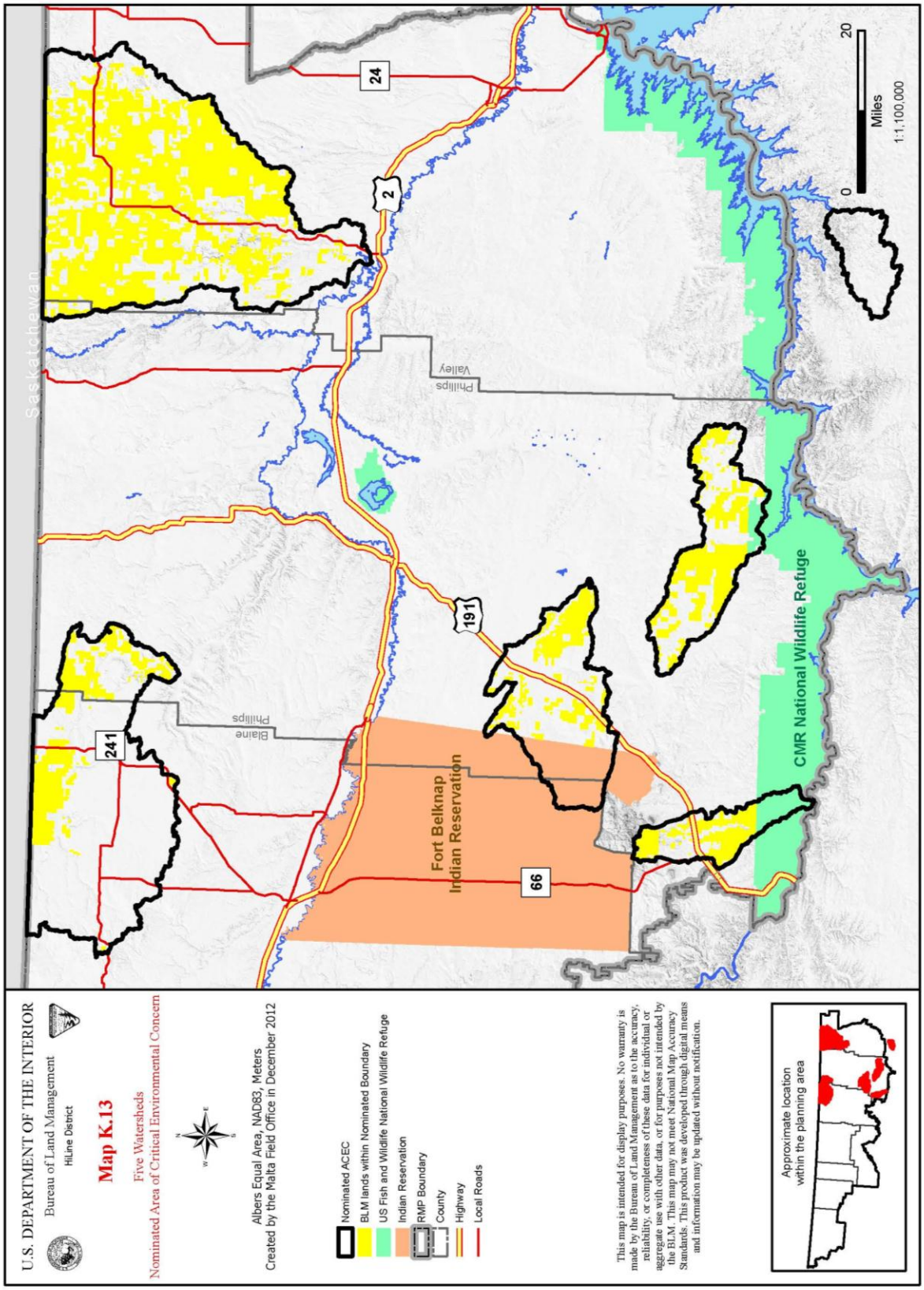
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.13
Five Watersheds
Nominated Area of Critical Environmental Concern
Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012
Nominated ACEC
BLM lands within Nominated Boundary
US Fish and Wildlife National Wildlife Refuge
Indian Reservation
RMP Boundary
County
Highway
Local Roads
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.
Approximate location within the planning area
Saskatchewan
Blaine
Phillips
Phillips
Valley
241
24
2
191
66
Fort Belknap Indian Reservation
CMR National Wildlife Refuge
0
20
Miles
1:1,100,000

Table K.14
Grassland Bird/Greater Sage-Grouse
Relevance and Importance Evaluation

Area Considered:	Valley County
General Location:	
General Description:	Northern Valley County
Acreage:	341,468
Values Considered:	Grassland bird and greater sage-grouse habitat

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but are similar to those of many other areas in the planning area
A fish and wildlife resource	Yes	The nomination meets the relevance criterion for wildlife resources. The nominated area provides habitat for greater sage-grouse (310,806 acres) as well as a suite of grassland birds including BLM sensitive species long-billed curlew, Sprague's pipit, Baird's sparrow, McCown's longspur and chestnut-collared longspur.
A natural process or system	Yes	The nomination also meets the criterion for a natural system or process because of the condition of the grassland habitat in the nomination area. Large blocks of native grasslands provide quality habitat for grassland birds.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	Although the area contains habitat for greater sage-grouse and grassland bird conservation as noted in the nomination material, the area is not significantly unique or more important than other habitat areas in this region. Greater sage-grouse are distributed throughout the western United States. The portion of the distribution in Montana, Wyoming, North Dakota, South Dakota, Alberta, and Saskatchewan are designated as Management Zone I (Stiver, et al. 2006). Management zones are delineations of greater sage-grouse populations and sub-populations within floristic zones with similar management issues. Within Management Zone I in Montana, Montana Fish, Wildlife and Parks (MFWP) has designated core areas (MFWP 2009) and Wyoming Game and Fish has also designated core areas in Wyoming (Wyoming Game and Fish 2009). In addition, Montana Audubon has also designated five important bird areas for sage-steppe associated birds, including greater sage-grouse, in Montana, most of which are contained within the MFWP core areas. All of these areas are considered important to greater sage-grouse conservation. In addition, greater sage-grouse habitat in these core areas is owned by a number of different entities and habitat on BLM lands is not distinct from habitat managed by other ownership. Results of modeling for grassland bird distribution suggests that much of the planning area provides habitat for a suite of grassland birds of conservation concern (Hendricks, et al. 2008). The nominated lands are not significantly unique or more important than other lands depicted in the modeling effort. All of

		these areas are important to grassland bird conservation. In addition, grassland bird habitat in the area is owned by a number of different entities and habitat on BLM land is not distinct from habitat managed by other ownership.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	Yes	The initiative to conserve, enhance, and restore greater sage-grouse habitat is the result of the March 2010, US Fish and Wildlife Service (USFWS) 12-Month Finding for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered. In that finding, the USFWS concluded that greater sage-grouse was "warranted, but precluded" for listing as a threatened or endangered species. Over 50% of the greater sage-grouse habitat is located on BLM-managed lands. In its "warranted, but precluded" listing decision, USFWS concluded that existing regulatory mechanisms, defined as "specific direction regarding sage-grouse habitat, conservation, or management" in the BLM's Land Use Plans, were inadequate to protect the species. The USFWS is scheduled to make a new listing decision in Fiscal Year 2015.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.

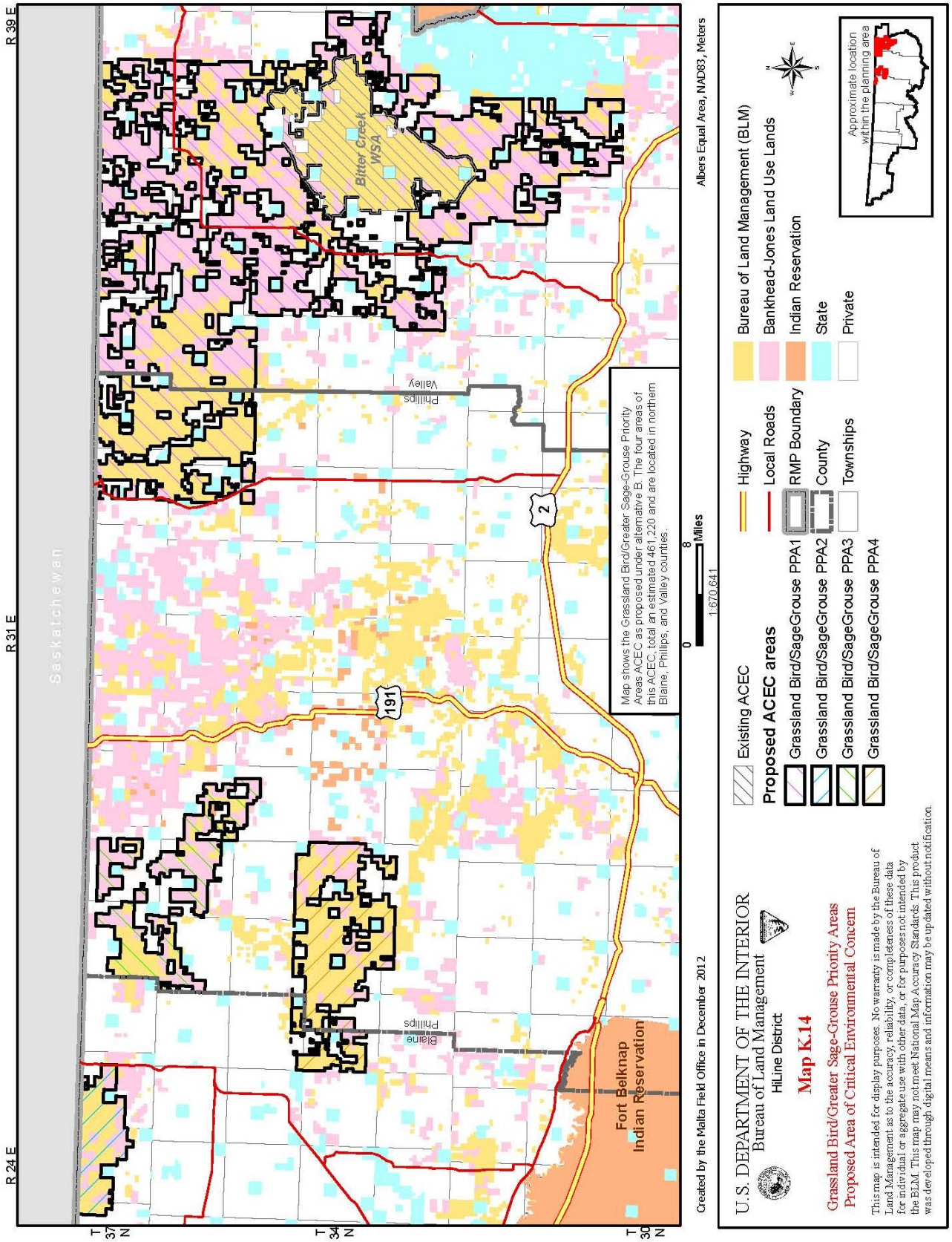
R 24 E
R 31 E
R 39 E
T 37 N
T 34 N
T 30 N
Saskatchewan
Bitter Creek WSA
Phillips
Valley
Blaine
Phillips
Fort Belknap Indian Reservation
191
2
Map shows the Grassland Bird/Greater Sage-Grouse Priority Areas ACEC as proposed under alternative B. The four areas of this ACEC, total an estimated 461,220 and are located in northern Blaine, Phillips, and Valley counties.
0
8
Miles
1:670,641
Created by the Malta Field Office in December 2012
Albers Equal Area, NAD83, Meters
Existing ACEC
Proposed ACEC areas
Grassland Bird/SageGrouse PPA1
Grassland Bird/SageGrouse PPA2
Grassland Bird/SageGrouse PPA3
Grassland Bird/SageGrouse PPA4
Highway
Local Roads
RMP Boundary
County
Townships
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Indian Reservation
State
Private
Approximate location within the planning area
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.14
Grassland Bird/Greater Sage-Grouse Priority Areas
Proposed Area of Critical Environmental Concern
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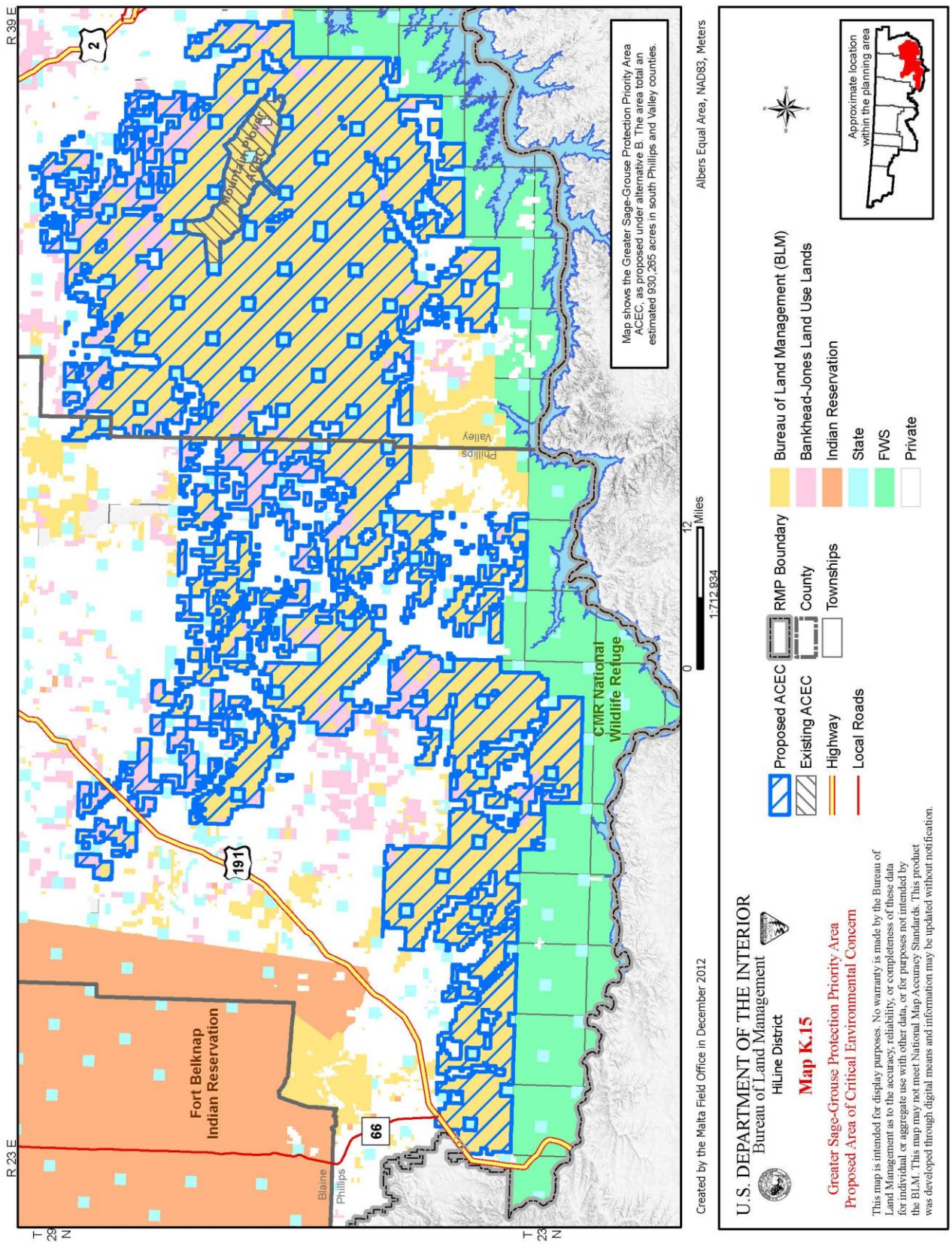
Table K.15
Greater Sage-Grouse
Relevance and Importance Evaluation

Area Considered:	Phillips and Valley Counties
General Location:	
General Description:	Southern Phillips and Valley Counties
Acreage:	885,399
Values Considered:	Greater sage-grouse habitat

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but are similar to those of many other areas in the planning area
A fish and wildlife resource	Yes	The nomination meets the relevance criterion for wildlife resources. The nominated area provides habitat for greater sage-grouse (839,659 acres), a BLM sensitive species, and the area has also been identified as a core area by MFWP.
A natural process or system	Yes	The nomination also meets the criterion for a natural system or process because of the condition of the sagebrush habitat in the nomination area.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	The nomination does not meet the importance criteria. Although the area contains habitat for greater sage-grouse and grassland bird conservation as noted in the nomination material, the area is not significantly unique or more important than other habitat areas in this region. See the discussion for greater sage-grouse under the grassland bird/greater sage-grouse nomination.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	Yes	The initiative to conserve, enhance, and restore greater sage-grouse habitat is the result of the March 2010, US Fish and Wildlife Service (USFWS) 12-Month Finding for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered. In that finding, the USFWS concluded that greater sage-grouse was “warranted, but precluded” for listing as a threatened or endangered species. Over 50% of the greater sage-grouse habitat is located on BLM-managed lands. In its “warranted, but precluded” listing decision, USFWS concluded that existing regulatory mechanisms, defined as “specific direction regarding sage-grouse habitat, conservation, or management” in the BLM’s Land Use Plans, were inadequate to protect the species. The USFWS is scheduled to make a new listing decision in Fiscal Year 2015.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.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Fort Belknap Indian Reservation
Blaine
Phillips
Phillips Valley
Montana Poplar ACEC
CMR National Wildlife Refuge
Map shows the Greater Sage-Grouse Protection Priority Area ACEC, as proposed under alternative B. The area total an estimated 930,265 acres in south Phillips and Valley counties.
0
12
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Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.15
Greater Sage-Grouse Protection Priority Area
Proposed Area of Critical Environmental Concern
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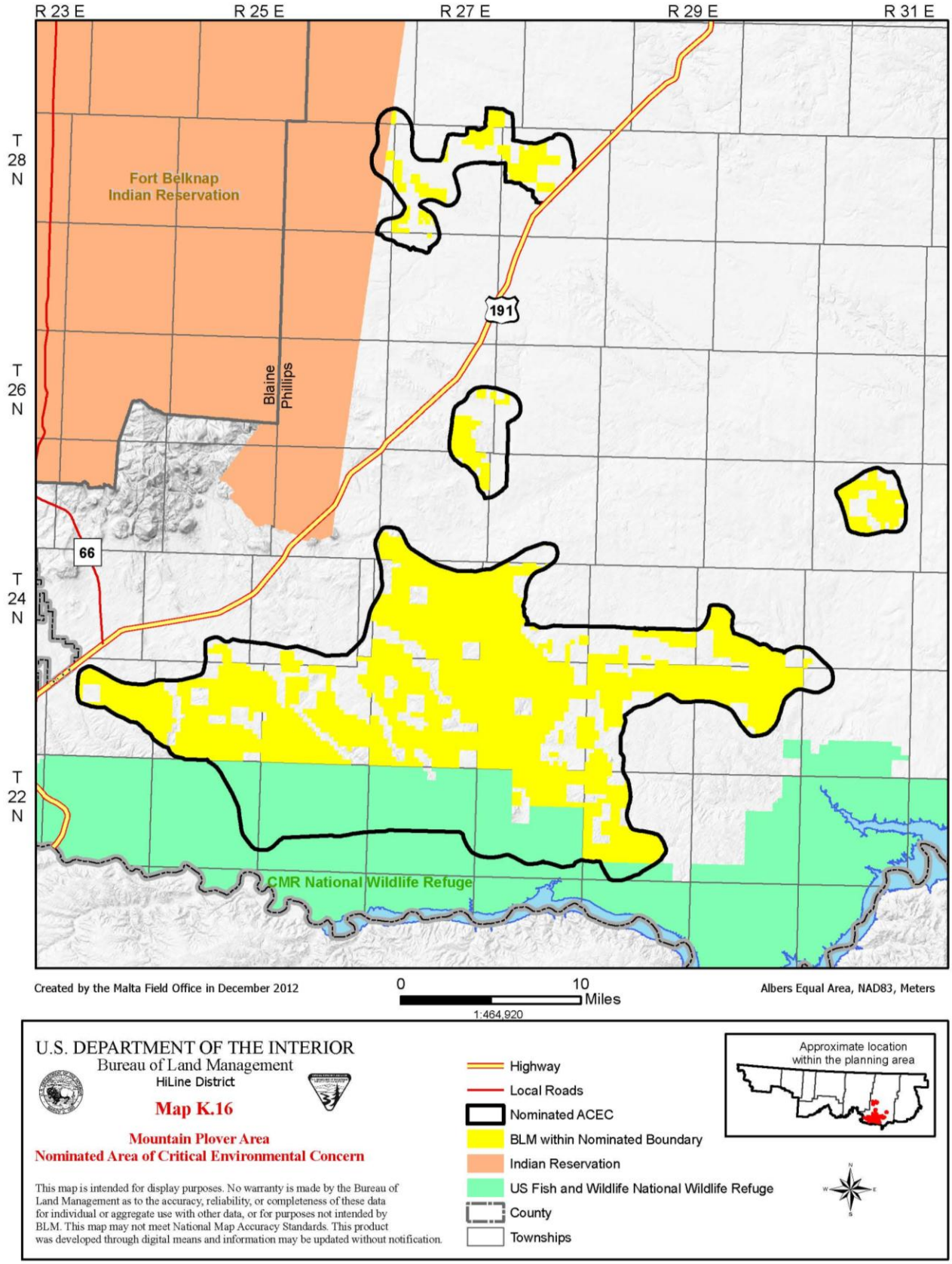
Proposed ACEC
Existing ACEC
Highway
Local Roads
RMP Boundary
County
Townships
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Indian Reservation
State
FWS
Private
Approximate location within the planning area

Table K.16
Mountain Plover
Relevance and Importance Evaluation

Area Considered:	Phillips County
General Location:	
General Description:	South Phillips County
Acreage:	148,425
Values Considered:	Mountain plover habitat

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but are similar to those of many other areas in the planning area
A fish and wildlife resource	Yes	The nomination meets the relevance criterion for wildlife resources. The nominated area provides habitat for mountain plovers (134,111 acres), a BLM species of concern and currently petitioned for listing under the Endangered Species Act and will be a proposed species by July 31, 2010.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	The nomination does not meet the importance criteria. Although this area is important to mountain plover conservation as noted in the nomination material, the area is not significantly unique or more important than other habitat areas throughout the range of the mountain plover. Mountain plovers breeding distribution in North America is confined to the northern Great Plains (Knopf and Wunder 2006) and is associated with areas of short grass, often created by prairie dogs. The Mountain Plover Conservation Plan (Andres and Stone 2009) describes a number of important breeding sites throughout the species range and states that of the three states where most breeding occurs, Colorado has the greatest number of breeding plovers (11,000) followed by Wyoming (3,400) and then Montana (1,600). The nomination is located in the Northern Prairie Region of breeding mountain plovers (Andres and Stone 2009), and is considered a key area and an area of highest abundance of mountain plovers in the state, along with Blaine and Valley Counties (Andres and Stone 2009).
Special qualities	No	The nominated area for mountain plovers is habitat associated with black-tailed prairie dog towns as noted in the nomination material. Much of the breeding distribution in Valley County is currently designated a Mountain Plover ACEC (BLM 2000) because of the unique nature of the breeding habitat which is not associated with prairie dogs. In addition, modeling of mountain plover distribution in Montana suggests that the area along the south side of the Snowy Mountains in Wheatland and Golden Valley Counties is also an area of importance of mountain plovers in Montana.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.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Fort Belknap Indian Reservation
Blaine
Phillips
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CMR National Wildlife Refuge
Created by the Malta Field Office in December 2012
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Miles
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Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.16
Mountain Plover Area
Nominated Area of Critical Environmental Concern
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Highway
Local Roads
Nominated ACEC
BLM within Nominated Boundary
Indian Reservation
US Fish and Wildlife National Wildlife Refuge
County
Townships
Approximate location within the planning area

Nominations Received Prior to the Commencement of the Planning Process

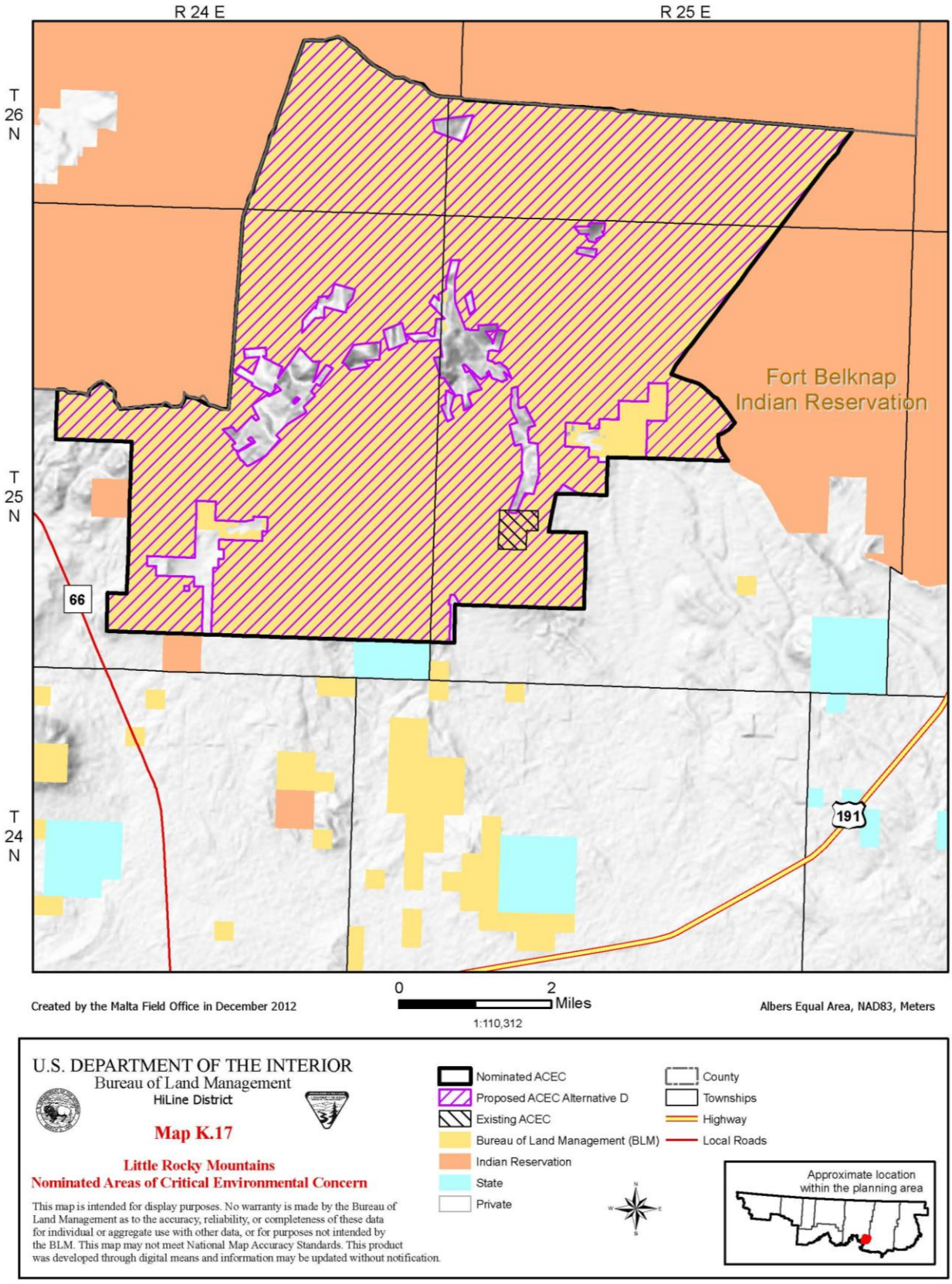
Table K.17
Little Rocky Mountains ACEC
Relevance and Importance Evaluation

Area Considered:	Little Rocky Mountains
General Location:	
General Description:	South Phillips County
Acreage:	25,000
Values Considered:	Prehistoric and historic archaeological resources and spiritual and traditional resources

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	Yes	Cultural resources consist of both prehistoric and historic archaeological resources and spiritual and traditional resources. The Little Rocky Mountains contain prehistoric and historic archaeological resources and also resources of cultural and religious importance to tribes. Prehistoric archaeological resources in the Little Rocky Mountains mostly comprise of vision questing sites, lithic debris, and rock art sites. Historic archaeological resources in the Little Rocky Mountains consist of mining complexes, mills, cabins, dumps, a ranger station, jail and school (Deaver and Kooistra 1992). The Little Rocky Mountains have been used by indigenous tribal groups throughout the prehistoric and historic periods and are still used today by tribal groups for ceremonial and religious purposes. Once called the Fur Cap Mountains by the Gros Ventre and the Island Mountains by the Assiniboine, the Little Rocky Mountains have many oral histories surrounding them, which have been passed down many generations and are still discussed today. There are several places in the mountain range, which were used for spiritual ceremonies such as vision questing, burials, offerings, and ceremonial dances and are still being used for those purposes today. Particularly seven main peaks were used as fasting altars. On one of those peaks Lame Bull noted that one of her tribe's two sacred pipes was received, just like Moses getting the Ten Commandments (Strahn 1992). The Little Rocky Mountains are considered spiritually sacred by the Assiniboine, Gros Ventre, Blackfeet, Chippewa/Cree and also Native Americans in Canada (Deaver and Kooistra 1992). Because the power of life was apparently more concentrated there, the Little Rockies were perceived as a place in which the Creator was more abundantly manifested (Strahn 1992). The Little Rocky Mountains are littered with limestone caves and in a few is evidence that tribal groups have visited and lived for long periods of time. Three of these caves, Lookout, Two Hands and Grouse Gulch have unique rock art. Lookout Cave is located on the south side of the Little Rockies and has at least 35 individual pictograph images located mostly in an outer chamber but an inner chamber contains a couple as well. The images appear to have been placed there over an extended period of time. In addition to the rock art at Lookout Cave it was studied and excavated in the 1960s and due to the remoteness and dry climate of the cave a series of organic artifacts were recovered. Of the organic material 65 arrowshafts, sinew, trimmed feathers, bone beads, a turtle shell ornament, fossils, a claw, shells, and a wooden flute with insects engraved on it

		were recovered. One arrowshaft was radiocarbon dated to AD 1510-1590. In addition, 46 projectile points dating from the Late Prehistoric Period were collected from the surface of the cave floor and several other points were excavated and date from the Middle Archaic Period (3000 to 4000 years ago). Lookout Cave is located well into the range suggesting use of not only the cave but the Little Rockies over an extended period of time. Grouse Gulch and Two Hands Cave have rock art only and no excavations or surface collections have been conducted. Heart Cave, which has no rock art is approximately 500' west of Two Hands Cave has had various animal bones recovered from the surface of the cave floor. 24PH2886 or the King site is a lithic scatter site with both surface debris and buried material located on the reservation. The King Site has been excavated and projectile points ranging in age from Pelican Lake to the Late Plains Side-Notched were recovered. The dating of this site further proves that the Little Rockies have been used by tribal groups over an extended period of time. In conclusion the Little Rocky Mountains meet the Relevance Criterion 1 as a rare or sensitive area of religious and cultural importance to tribes. The Little Rocky Mountains are an integral part of tribal religious identity and contribute significantly to the traditional life way of the tribes in the region.
A fish and wildlife resource	No	No habitat for endangered, sensitive, or threatened fish and wildlife species are known.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.
Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	Similar sites and values can be found in other areas of Montana.
Special qualities	Yes	There are several prehistoric archaeological sites, such as vision quest sites, which are direct evidence of past religious use in the Little Rocky Mountains such as vision quest sites. Today cloth offerings can be found in many places in the Little Rocky Mountains, particularly the mountain peaks, however for local traditionalists, all aspects of the Little Rocky Mountains have sacred/holy/spiritual qualities. The mountains, plants, rocks, paints, fossils and animals all have spiritual characteristics (Deaver and Kooistra 1992). Group religious ceremonies and individual religious ceremonies for both Assiniboine and Gros Ventre have been performed in the Little Rocky Mountains. Group ceremonies for the Gros Ventre are the Feathered and Flat Pipe ceremonies and Sacrifice Lodge. As late as 1946, the Gros Ventre held a pipe bundle ceremony (Deaver and Kooistra 1992). Individual ceremonies for the Gros Ventre are vision quests. The individual vision quest is a way to get supernatural power/medicine. The supernatural power is obtained by fasting/questing (Deaver and Kooistra 1992). The Assiniboine group ceremonies were the Sundance and the Horse Dance. The last known Sundance performed by Assiniboine was 1935 (Deaver and Kooistra 1992). Individual Assiniboine ceremonies also include the vision quest which is usually done in an isolated spot in the mountains (Deaver and Kooistra 1992). Assiniboine and Gros Ventre both have oral stories, which relate to the spiritual values of the Little Rocky Mountains. Oral stories are stories told from

		generation to generation as a tool to teach the young people about tribal culture, ethics and in particular tribal religion. One example of oral tradition and its use in religion practiced in the Little Rocky Mountains is defined by Dan Flemmer (1991): The plant resources can only be used to the fullest advantage when a specific level of understanding is attained via cognitive and spiritual education into, first, the proper physical use of the resources, and second, the spiritual understanding the individual must attain before physical application is most advantageous. A common phrase used to describe this combined attainment of pharmacological and spiritual knowledge is referenced as in a good or respectful way (2/13 and 14/1991, personal communication with the author). The process of enabling individuals to use the natural plant resources of the area in this way can only be fully realized by ceremonial use, within the complete education process, of the areas specific to the perception of the individual who seeks to use this combination of physical and spiritual resources. Archaeological evidence on the surrounding plains suggests that tribes used it differently than the Little Rocky Mountains. Unlike the spiritual sites discussed above in the Little Rocky Mountains, the surrounding plains mostly contain sites associated with habitation, subsistence and hunting. These types of land uses culminate in archaeological sites such as tipi ring sites, drive lines, and kill sites. These are the predominant site types on the northern plains. Although these site types are found in the Little Rocky Mountains they are rare. Spiritual sites such as vision quest sites found in the Little Rocky Mountains are even rarer on the plains. There are no caves like those found in the Little Rocky Mountains located on the surrounding plains. Although the plains are no longer used by tribes as they were traditionally used for such as habitation camps and hunting grounds, the Little Rocky Mountains are still used today for the same spiritual purposes as they have been for generations. The Little Rocky Mountains meet Criterion 2 for Importance. The sensitive resources within the Little Rocky Mountains are vulnerable to loss by damage and/or destruction from other resource uses. These sensitive resources are directly linked to the spiritual and cultural lifeway of the tribal peoples who use them. If these sensitive resources are damaged or removed the tribal people's link to that spiritual and cultural lifeway is dramatically hindered. Their ability to practice their religious beliefs would be jeopardized. The sensitive resources utilized by the tribes in the Little Rocky Mountains are resources which are inherently non-renewable in nature, particularly archaeological sites like vision quest and fasting structures. These resources have been used for generations and several physical attributes are still standing and used today. In conclusion, the Little Rocky Mountains meet criterion 1 for Relevance and criterion 2 for Importance.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.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Fort Belknap Indian Reservation
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Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.17
Little Rocky Mountains
Nominated Areas of Critical Environmental Concern
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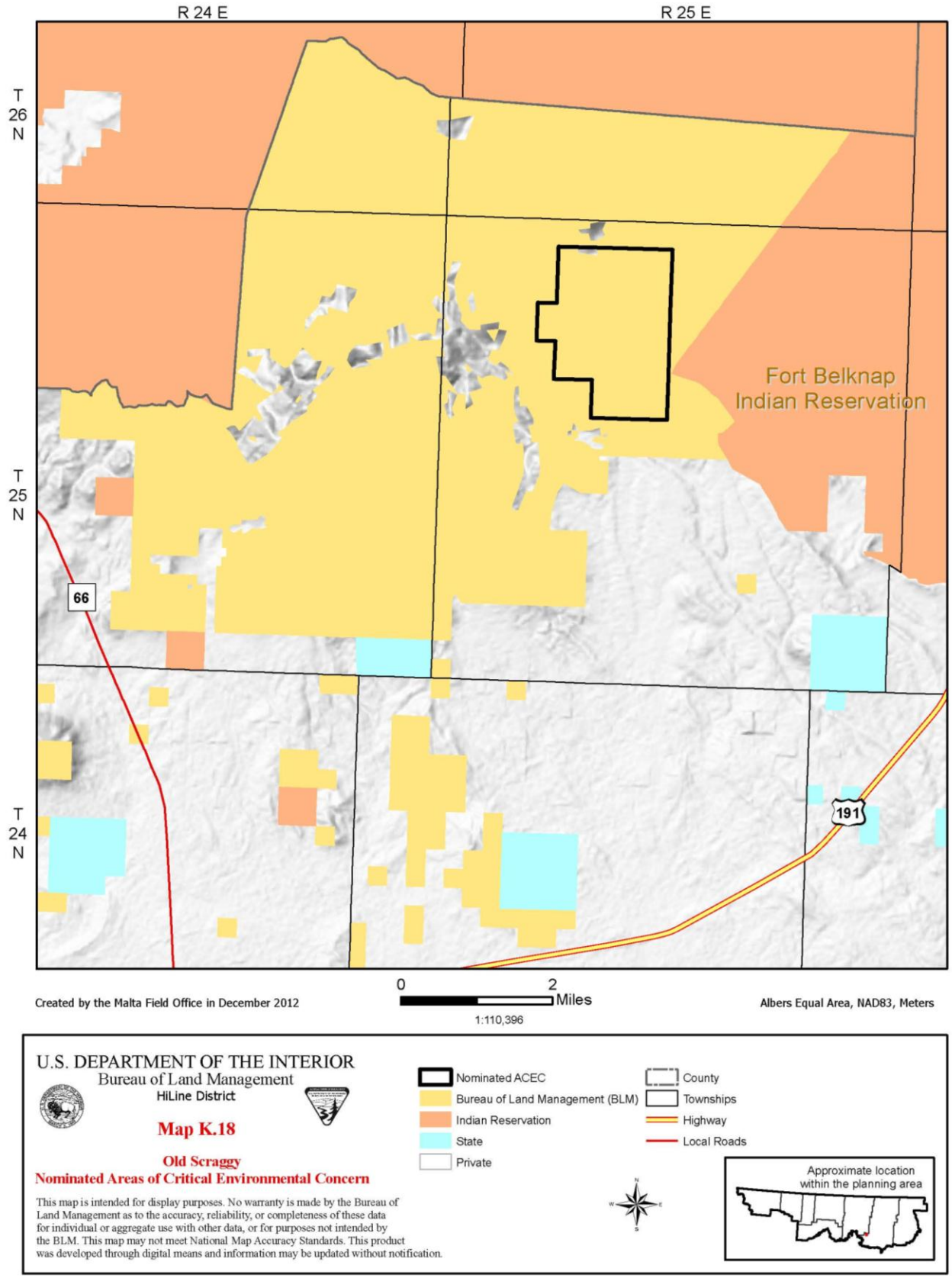
Nominated ACEC
Proposed ACEC Alternative D
Existing ACEC
Bureau of Land Management (BLM)
Indian Reservation
State
Private
County
Townships
Highway
Local Roads
Approximate location within the planning area

Table K.18
Old Scraggy
Relevance and Importance Evaluation

Area Considered:	Little Rocky Mountains
General Location:	
General Description:	South Phillips County
Acreage:	2,080
Values Considered:	Cultural resources

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	Yes	Old Scraggy contains vision questing sites used for religious purposes and landmark. Old Scraggy is the highest peak in the Little Rockies range with an elevation of 5708 ft.
A fish and wildlife resource	No	No habitat for endangered, sensitive, or threatened fish and wildlife species are known.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	Many peaks in the Little Rockies were and are used for vision questing, offerings, fasting, and plant/herb collecting. Although Old Scraggy is viewed as an important location spiritually to local Native Americans, it is viewed with the same importance as other peaks in the Little Rockies and in some cases surrounding island mountain ranges as well.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.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Fort Belknap Indian Reservation
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U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.18
Old Scraggy
Nominated Areas of Critical Environmental Concern
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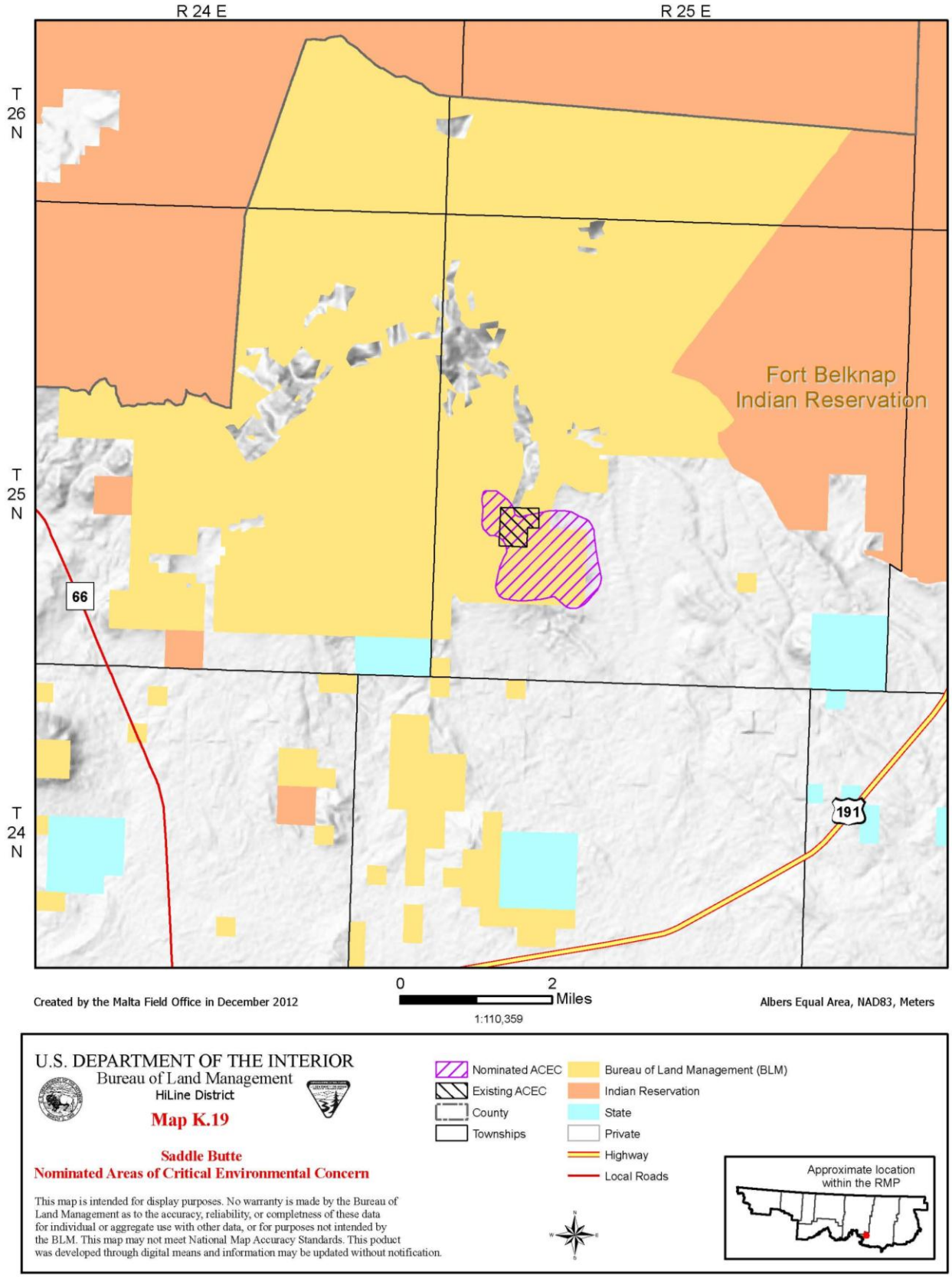
Nominated ACEC
Bureau of Land Management (BLM)
Indian Reservation
State
Private
County
Townships
Highway
Local Roads
Approximate location within the planning area

Table K.19
Saddle Butte
Relevance and Importance Evaluation

Area Considered:	Little Rocky Mountains
General Location:	
General Description:	South Phillips County
Acreage:	1,000
Values Considered:	Unique vegetation type

Relevance Value	***Yes/No***	***Rationale for Determination***
A significant historic, cultural, or scenic value	No	The plant community for which the area was nominated does not occur except as a seral stage of a common community. A subsequent site visit did not find the Douglas fir/little bluestem site. As a seral stage of the common Douglas fir/bluebunch wheatgrass or Douglas fir/Idaho fescue community, proposed vegetation management in the planning area will adequately protect the vegetation resource and manage for the natural range of seral stages.
A fish and wildlife resource	No	No habitat for endangered, sensitive, or threatened fish and wildlife species are known.
A natural process or system	No	No threatened, endangered, or otherwise rare plants are known.
Natural hazards	No	No natural hazards are known.

Importance Value	***Yes/No***	***Rationale for Determination***
More than locally significant qualities	No	The area is not locally or regionally significant.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority/FLPMA protection	No	No national priority concerns are known.
Safety/public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.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Fort Belknap Indian Reservation
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Created by the Malta Field Office in December 2012
Albers Equal Area, NAD83, Meters
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map K.19
Saddle Butte
Nominated Areas of Critical Environmental Concern
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Nominated ACEC
Existing ACEC
County
Townships
Bureau of Land Management (BLM)
Indian Reservation
State
Private
Highway
Local Roads
Approximate location within the RMP

Appendix L
Wild and Scenic Rivers Report
Eligibility and Suitability Determinations

Bureau of Land Management
HiLine Resource Management Plan
HiLine District, Montana

May 2011

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Wild and Scenic River Eligibility and Suitability Determinations

Executive Summary

As part of the land use planning process for the HiLine Resource Management Plan (RMP), an interdisciplinary team analyzed all river and stream segments in the HiLine District planning area that might be eligible for inclusion in the National Wild and Scenic Rivers System (NWSRS). This included screening all planning area rivers to identify those with BLM surface ownership. These initial screening and identification efforts resulted in a list of 160 rivers or river segments for further consideration in the inventory process.

Additional review focused on whether these 160 segments meet free-flowing criteria and contain any outstandingly remarkable values (ORVs), as defined in the Wild and Scenic Rivers Act of 1968. Of the 160 river segments, only one segment of the Marias River from State Highway 87 near Loma downstream to the confluence of the Missouri River met the eligibility criteria.

Introduction

Section 5(d)(1) of the Wild and Scenic Rivers (WSR) Act directs Federal agencies to consider potential wild and scenic rivers in their land and water planning processes. To fulfill this requirement, whenever the BLM undertakes a land use planning effort (e.g., an RMP), it analyzes river and stream segments that might be eligible for inclusion in the NWSRS.

This report is a record of the wild and scenic river study that is being conducted concurrently with the HiLine RMP. This report documents BLM's examination of river segments in the planning area as they relate to eligibility, suitability, and classification criteria in the WSR Act.

The BLM HiLine District planning area is in northern Montana (Figure L.1). Within the planning area, the BLM administers about 2.4 million acres of public land and 3.5 million acres of Federal mineral estate in Blaine, Chouteau, Glacier, Hill, Liberty, Phillips, Toole, and Valley counties.

What is a Wild and Scenic River?

Congress enacted the WSR Act to provide a national policy for preserving and protecting selected rivers and river segments in their free-flowing condition for the benefit and enjoyment of present and future generations. The WSR Act provides criteria that must be considered during the analysis. The eligibility process is depicted in Figure L.2. No rivers in the planning area are currently managed under the WSR Act.

Steps in the Wild and Scenic Rivers Study Process

The wild and scenic river study process is comprised of two main components: the inventory phase and the study phase. The inventory phase includes identifying eligible river and stream segments, assigning tentative classification (wild, scenic, or recreational), and describing protective management for the eligible segments. The study phase includes determining the suitability of eligible segments for inclusion in the NWSRS and describing interim management measures. The inventory is conducted during the data-gathering stage of an RMP, and the study phase is done during formulation of the Draft RMP and Proposed RMP.

Figure L.1 HiLine RMP Planning Area

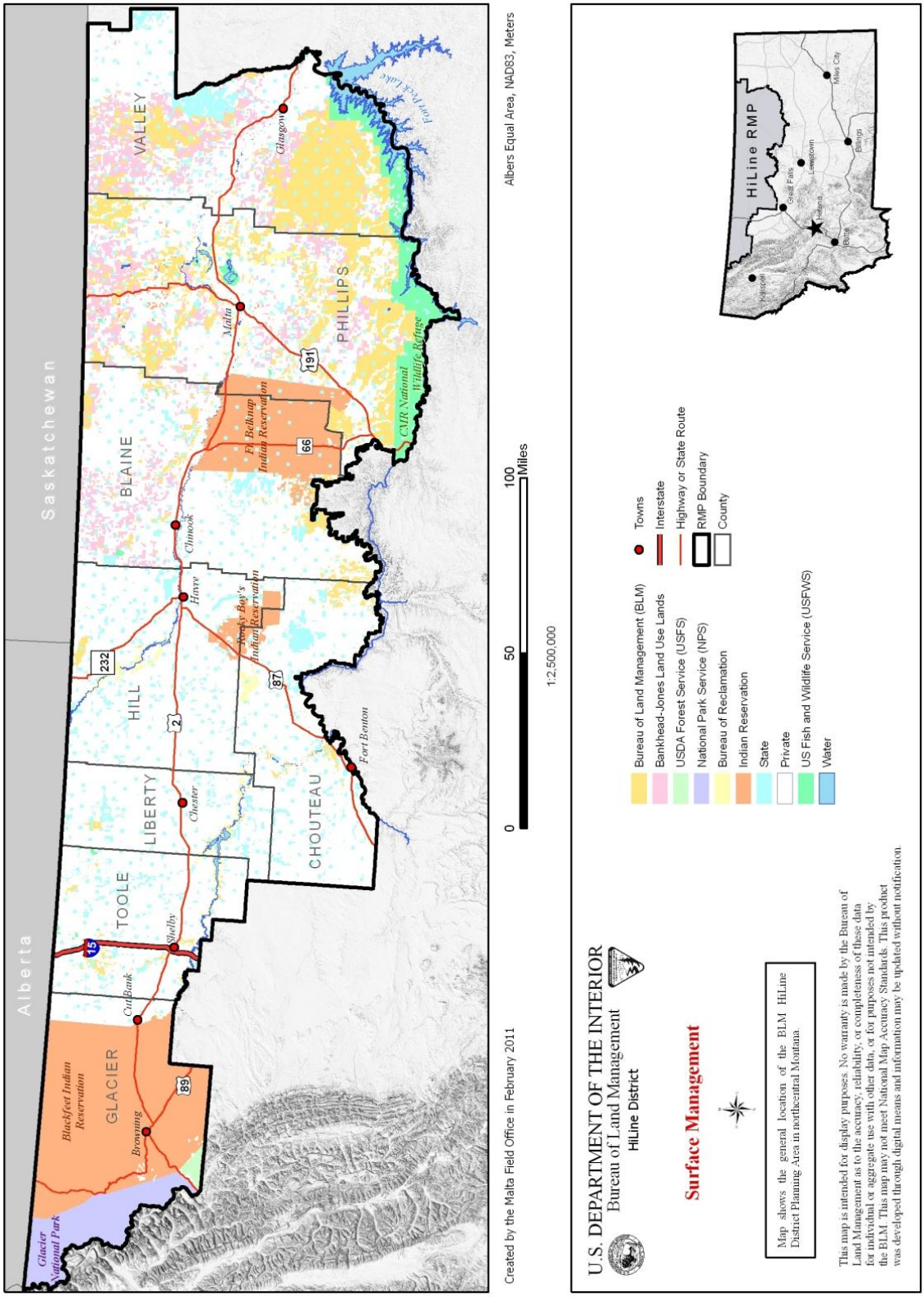
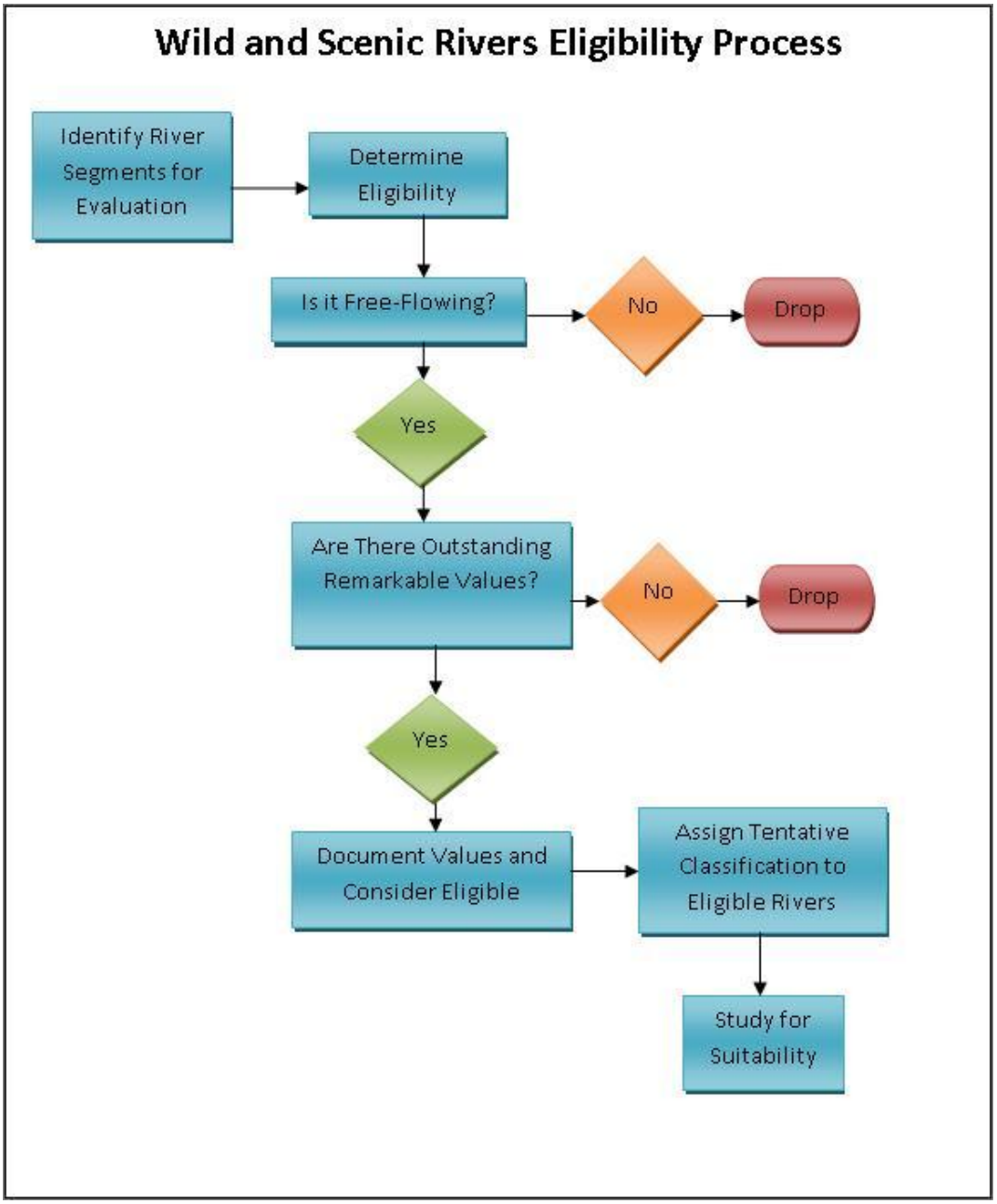


Figure L.2 Eligibility Process



Inventory Phase

The purpose of the inventory is to identify eligible rivers and river segments in the planning area and to assign them a tentative classification. The WSR Act directs agencies to consider a wide variety of internal and external sources to identify potentially eligible rivers. The goal is to avoid overlooking river segments that could be included in the NWSRS. In cases where a particular river segment is predominantly non-federal in ownership and contains interspersed BLM land, the BLM shall evaluate only its segment as to eligibility and defer to the state or private landowners' discretion as to their determination of eligibility (BLM 2003e).

Identification of Eligible River Segments

The BLM applies standard criteria to identified river segments to determine eligibility. To be eligible, a river segment must be free-flowing and must possess at least one river-related value considered outstandingly remarkable. The specific criteria for free-flowing and outstandingly remarkable values are listed in Appendix L.1.

Several sources are generally used to identify potentially eligible rivers, as follows:

- *The Outstanding Rivers List* (Huntington and Echeverria 1991). This was compiled by the American Rivers Organization as a comprehensive nationwide compilation of rivers that possess some outstanding ecological, recreational, natural, cultural, or scenic values. Rivers protected by legislation and rivers currently unprotected are included. The list includes more than 15,000 outstanding United States river segments, roughly 300,000 river miles. Some of this information is redundant with the Nationwide Rivers Inventory, which is included within the Outstanding Rivers List, but much of it is additional information.

- *The Nationwide Rivers Inventory* (NPS 2004). This inventory was initially completed in 1982 and is maintained and periodically updated by the National Park Service. Additions have been made as a result of BLM and U.S. Forest Service (USFS) inventories, done as part of their land use planning processes. It is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance.

- *Montana Fish, Wildlife, and Parks' Class One Streams List* (MFWP 2004). This lists Class I streams, which are blue ribbon fisheries, throughout Montana.

- *River segments identified in public scoping during the RMP revision process*. No river segments were identified by the public during the scoping process.

Listing on any of these sources does not represent an official determination of eligibility and, conversely, absence from these sources does not indicate a river's non eligibility.

Tentative Classification

Once a river segment is considered eligible, it is assigned a tentative classification. There are three classes for rivers designated under the WSR Act: Wild, Scenic, and Recreational. The criteria for classification are defined in Section 2(b) of the WSR Act. Classes are based on the type and degree of human development and access associated with the river and adjacent lands at the time of the inventory.

The classification does not reflect the types of values present along a river segment. The classification assigned during the inventory phase is tentative. Final classification is a congressional legislative determination, along with designation of a river segment as part of the NWSRS.

Interim Protective Management of Eligible Rivers

Rivers or river segments determined eligible must be managed to protect the free flow, outstandingly remarkable values, and tentative classification until a suitability study of the segment has been completed. Management guidelines to protect eligible candidate rivers are detailed in BLM manual 8351, *Interim Protection for Candidate Wild and Scenic Rivers*.

During the interim phase, any proposed action that could adversely affect or be inconsistent with wild and scenic river values would require management decisions based on a National Environmental Policy Act analysis and Section 202 of the Federal Land Policy and Management Act of 1976 (FLPMA), as follows:

- Any proposed action that may be inconsistent with or adversely affect identified wild and scenic river values would require a site-specific environmental assessment (EA), opportunity for public involvement, and at least a

30-day public comment period. The decision record for the EA (involving these types of actions) would be conducted and signed at the field office level. However, before the decision record is signed, a copy of supporting documentation would be forwarded to the State Director for review and concurrence.

- If the preparers of the EA determine that the proposal could have a major action significantly affecting the environment, a separate environmental impact statement (EIS) apart from the BLM RMP/EIS would be required.

- Should the preparers of the EA or EIS determine that the action as proposed, or with appropriate mitigation or an acceptable alternative, would not have irreversible or irretrievable adverse impacts and would maintain or enhance identified wild and scenic river values, such action may be approved.

- If the preparers of the EA or EIS determine that the action as proposed would have irreversible or irretrievable adverse impacts to identified wild and scenic river values, the decision on the action would be held temporarily in suspension until wild and scenic river evaluations are address and resolved through the BLM planning process.

Suitability Study Phase

The purpose of the study phase is to determine whether eligible river segments are suitable or unsuitable for inclusion in the NWSRS, per WSR Act criteria. The suitability evaluation does not result in actual designation but only a suitability determination for designation. Only Congress can designate a wild and scenic river. In some instances, the Secretary of the Interior may designate a wild and scenic river when the governor of a state, under certain conditions, petitions for a river to be designated. Congress would ultimately choose the legislative language if any suitable segments are presented to them. Water-protection strategies and measures to meet the purposes of the WSR Act would be the responsibility of Congress in any legislation proposed.

Rivers found unsuitable would be dropped from further consideration and would be managed according to the objectives outlined in the RMP.

The preliminary suitability evaluation is completed as the Draft RMP is prepared. Impacts that would occur from designation and non-designation of the eligible river segments then would be analyzed in the EIS associated with the RMP. Public review and comment on preliminary suitability determinations included in the Draft RMP/EIS would be considered before the BLM makes final suitability determinations in the proposed RMP.

Suitability Criteria

The following 13 factors, identified in BLM Manual Section 8351 (BLM 1992d), are applied to each eligible river segment when completing the suitability study:

1. Characteristics that do or do not make the river a worthy addition to the NWSRS.

2. The status of land ownership, minerals, use in the area, including the amount of private land involved, and associated or incompatible uses. Jurisdictional consideration must be taken into account to the extent that management would be affected.

3. Reasonably foreseeable potential uses of the land and related waters that would be enhanced, foreclosed, or curtailed if the area were included in the NWSRS and values that would be foreclosed or diminished if the area were not protected as part of the NWSRS.

4. Federal or state agency that will administer the river should it be added to the NWSRS.

5. Federal, state, tribal, local, public, or others with an interest in designation or non-designation of the river, including the extent to which the agency proposes that administration of the river, including the costs thereof, be shared by state, local, or other agencies and individuals.

6. Estimated cost to the United States of acquiring necessary lands, interests in lands, and administering the area should it be added to the NWSRS.

7. A determination of the degree to which the state or its political subdivision(s) might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.

8. The Federal agency's ability or other mechanisms to protect and manage the identified river-related values other than designation into the NWSRS.

9. An evaluation of the adequacy of local zoning and other land use controls in protecting the river's outstandingly remarkable values by preventing incompatible development.

10. Support or opposition to designation.

11. Historical or existing rights that could be adversely affected with designation.

12. The consistency of designation with other agency plans, programs, or policies in meeting regional objectives.

13. The contribution to a river system, watershed, or basin integrity.

Interim Management of Suitable Segments

The WSR Act requires that interim management measures be developed to protect the free flowing nature, outstandingly remarkable values, and recommended classification of suitable segments until Congressional action regarding designation is taken. Guidelines for interim management are described within BLM manual 8351.

Inventory Phase for the HiLine RMP

Various resource personnel from the BLM's HiLine District were consulted to conduct the wild and scenic rivers inventory in support of the RMP. The interdisciplinary team was composed of BLM staff specialists in lands and realty, wildlife/fisheries/riparian biology, range/riparian resources, recreation, visual resources, cultural resources, minerals, and geology.

Identification of Eligible River Segments

To avoid overlooking potentially eligible river segments, a combination of sources were used. The primary source was the BLM's geographic information system (GIS) rivers and streams layer (BLM 2004), which is a comprehensive list of potentially free-flowing water bodies within the planning area. The GIS was cross-referenced with additional sources, including the Outstanding Rivers List (Huntington and Echeverria 1991), Nationwide Rivers Inventory (NPS 2004), and Montana Fish, Wildlife, and Parks' (MFWP) Class One Streams List (MFWP 2004).

From these sources, the BLM interdisciplinary team compiled an inventory of all rivers on BLM lands in the planning area. The BLM limited the inventory to the lands it administers, per recent changes to BLM Manual 8351, *Wild and Scenic Rivers—Policy and Program Direction for Identification, Evaluation, and Management.* The manual revision states that "In cases where a particular river segment is predominantly non-Federal in ownership and contains interspersed BLM-administered lands, BLM shall evaluate only its segment as to eligibility and defer to the State or to the private landowners' discretion as to their determination of eligibility" (BLM 2003e). As part of the initial screening process, all planning area rivers were divided into multiple segments based on BLM surface ownership.

Initial screening resulted in a list of 160 river and stream segments on BLM land for further consideration (Table L.1). Additional review focused on whether any of these 160 segments met free-flowing criteria and contained any outstandingly remarkable values, as defined in the WSR Act. Members of the BLM interdisciplinary team conducted this review for each of their areas of expertise, using their knowledge of the area and consulting available inventory information. This information was considered against the outstandingly remarkable values criteria provided in

Appendix L.1. Based on their findings, team members found 158 rivers and streams free flowing, but only one river segment (Marias River) with outstandingly remarkable values.

Supplemental Identification of an Eligible Marias River Segment

During development of the Upper Missouri River Breaks National Monument RMP, a BLM interdisciplinary team determined that a 1/2 mile segment of the Marias River just above its confluence with the Missouri River was eligible for further study because it was free flowing and contained outstandingly remarkable values.

The suitability of this segment of the Marias River is addressed in Appendix L.2.

Table L.1
HiLine Planning Area Rivers Considered in Wild and Scenic Rivers Inventory Process

Field Office	*Stream Name*	*Township*	*Range*	*Section*	*Total Miles*	*BLM Miles*	*% BLM*	*Free Flow*	*ORVs*
Glasgow	Antelope Creek	29N	35E	34	13	1	8	Y	N
Glasgow	Brazil Creek	28N	36E	20	19	6.7	35	Y	N
Glasgow	Buggy Creek	31N	38E	2	21.3	4.3	20	Y	N
Glasgow	Cherry Creek	30N	39E	15	18.8	1.8	10	Y	N
Glasgow	Eagles Nest Coulee	33N	37E	20	11	7	64	Y	N
Glasgow	Frenchman Creek	35N	35E	31	2	0.2	10	Y	N
Glasgow	Larb Creek	28N	34E	25	35	11	31	Y	N
Glasgow	Milk River	29N	38E	14	110	1	1	N	N
Glasgow	Poplar River	36N	42E	2	12	0.3	3	Y	N
Glasgow	Porcupine Creek	30N	41E	21	43	1	2	Y	N
Glasgow	Rock Creek	35N	36E	27	55	18.7	34	Y	N
Glasgow	Willow Creek	26N	37E	36	38.5	25.5	66	Y	N
Malta	Albert Coulee	27N	33E	35	7.9	2.7	34	Y	N
Malta	Alder Creek	25N	34E	13	15.6	3.7	24	Y	N
Malta	Alkali Coulee	28N	30E	33	5.4	3.1	58	Y	N
Malta	Alkali Creek	25N	29E	1	18.4	2.9	16	Y	N
Malta	Antelope creek	24N	23E	27	7.2	7	97	Y	N
Malta	Armstrong-Millar-Coulee	27N	31E	9	9	5	56	Y	N
Malta	Assiniboine Creek	32N	27E	1	19.3	5.8	30	Y	N
Malta	Austin Coulee	34N	30E	1	13.6	1.1	8	Y	N
Malta	Badland Coulee	25N	33E	30	3.9	3.9	100	Y	N
Malta	Bear Gulch	25N	26E	26	6.2	1.7	27	Y	N
Malta	Beauchamp Creek	25N	26E	32	20.5	3.6	18	Y	N
Malta	Beaver Creek	25N	25E	5	144	46.6	31	N	N
Malta	Big Cottonwood Creek	34N	27E	3	43.9	6.5	15	Y	N
Malta	Big Coulee	37N	30E	8	4.7	3.6	77	Y	N

Table L.1
HiLine Planning Area Rivers Considered in Wild and Scenic Rivers Inventory Process

Field Office	*Stream Name*	*Township*	*Range*	*Section*	*Total Miles*	*BLM Miles*	*% BLM*	*Free Flow*	*ORVs*
Malta	Big Warm Spring Creek	26N	26E	2	31.5	0	0	Y	N
Malta	Black Coulee	29N	31E	8	11.3	11.2	0	Y	N
Malta	Black Coulee	39N	27E	24	6.5	4	63	Y	N
Malta	Bowen Coulee	37N	30E	35	4.5	3.7	82	Y	N
Malta	Box Elder Creek	23N	23E	20	10.5	2.4	23	Y	N
Malta	Box Elder Spring Coulee	26N	33E	27	8	3.1	39	Y	N
Malta	Bull Creek	25N	24E	19	13.8	7.2	52	Y	N
Malta	Button Butte Coulee	27N	29E	3	7.8	3.5	45	Y	N
Malta	Cabin Creek	25N	23E	23	9.5	2.2	23	Y	N
Malta	Camp Creek	25N	25E	19	21.4	3.8	18	Y	N
Malta	Clark Coulee	34N	32E	10	5.4	2.6	48	Y	N
Malta	Coal Butte Creek	25N	25E	35	8.7	0.44	5	Y	N
Malta	Corral Coulee	35N	33E	2	12	2.1	18	Y	N
Malta	Cottonwood Coulee	28N	32E	30	6.6	6.5	98	Y	N
Malta	Cottonwood Creek	36N	33E	3	13.1	7	53	Y	N
Malta	Cow (Crow) Creek	30N	27E	32	5.2	0	0	Y	N
Malta	Cowie Coulee	35N	28E	5	4.5	0	0	Y	N
Malta	Crooks Coulee	30N	33E	19	4.4	0.6	14	Y	N
Malta	Crow Creek	37N	34E	1	3.4	0.3	9	Y	N
Malta	Cyprian Creek	23N	24E	17	5	5	100	Y	N
Malta	Dead Horse Creek	30N	33E	22	2.7	0.3	11	Y	N
Malta	Dibble Coulee	36N	29E	23	5.3	1.2	23	Y	N
Malta	Dick Thomas Coulee	34N	30E	1	10	0.4	4	Y	N
Malta	Dodson Creek	32N	27E	1	13.7	0.4	3	Y	N
Malta	Dog Creek	24N	32E	17	7.6	3.1	41	Y	N
Malta	Dogtown Coulee	23N	33E	19	5.2	0.3	6	Y	N
Malta	Dry Fork Beauchamp Creek	24N	27E	4	23.1	16.8	73	Y	N
Malta	Dunhan Coulee	37N	33E	29	9.6	7	73	Y	N
Malta	Duvall Creek	24N	23E	36	6.7	3.3	49	Y	N
Malta	East Fork Stinky Creek	36N	33E	33	13.5	1.2	9	Y	N
Malta	East Fork Whitewater Creek	36N	32E	5	31.5	7.9	37	Y	N
Malta	Exeter Creek	31N	28E	15	9	1.8	20	Y	N

Table L.1
HiLine Planning Area Rivers Considered in Wild and Scenic Rivers Inventory Process

Field Office	*Stream Name*	*Township*	*Range*	*Section*	*Total Miles*	*BLM Miles*	*% BLM*	*Free Flow*	*ORVs*
Malta	Fenhman Creek	37N	33E	1	51.7	2.3	4	Y	N
Malta	First Coulee	22N	29E	8	4.3	3.3	77	Y	N
Malta	First Creek	25N	29E	15	137	4.2	31	Y	N
Malta	First Creek	31N	33E	21	8.4	2.1	25	Y	N
Malta	Flat Creek	26N	31E	29	10.8	4.9	45	Y	N
Malta	Four Mile Coulee	28N	28E	7	7.7	2.8	36	Y	N
Malta	Fourchette Creek	24N	28E	24	18.2	2	11	Y	N
Malta	Fourth Creek	30N	33E	29	8.2	0.5	2	Y	N
Malta	Garey Coulee	24N	28E	5	4	2.4	60	Y	N
Malta	Garland Creek	32N	28E	35	7.5	1.6	21	Y	N
Malta	Gloyn Coulee	35N	28E	8	4.3	0.9	21	Y	N
Malta	Grouse Creek	25N	25E	30	6	0.3	5	Y	N
Malta	Grove Coulee	26N	33E	22	6.4	4.9	77	Y	N
Malta	Half-way Coulee	29N	28E	23	6.4	2	31	Y	N
Malta	Hawley Coulee	22N	29E	23	8.4	1	12	Y	N
Malta	Hay Coulee	31N	28E	20	5	0	0	Y	N
Malta	Horseshoe Coulee	36N	27E	33	2.7	0	0	Y	N
Malta	Joe Bell Coulee	34N	32E	26	4.9	1.9	39	Y	N
Malta	Joiner Coulee	33N	27E	5	6.5	4.6	71	Y	N
Malta	Killed Woman Creek	23N	32E	36	2.6	2.5	96	Y	N
Malta	Lake Coulee	36N	29E	27	5.2	3.69	69	Y	N
Malta	Lambing Shed Coulee	35N	28E	27	11.3	5.6	50	Y	N
Malta	Larb Creek	30N	34E	34	9.5	0	0	Y	N
Malta	Lavelle Creek	24N	24E	36	6	3.7	62	Y	N
Malta	Lenoir Coulee	29N	31E	8	6.9	0	0	Y	N
Malta	Lind Coulee	24N	22E	12	6	5	83	Y	N
Malta	Little Cottonwood Creek	23N	24E	9	6.4	5.5	86	Y	N
Malta	Little Cottonwood Creek	35N	28E	24	22.4	2.5	11	Y	N
Malta	Little Jewel Coulee	35N	27E	35	8.5	5.2	61	Y	N
Malta	Little Warm Spring Creek	26N	26E	26	14.5	0	0	Y	N
Malta	Lone Tree Coulee	25N	33E	16	3.3	3.3	100	Y	N
Malta	Lone Tree Coulee	35N	32E	4	5.3	2.2	45	Y	N
Malta	Lonesome Coulee	26N	28E	23	4.4	0.3	7	Y	N

Table L.1
HiLine Planning Area Rivers Considered in Wild and Scenic Rivers Inventory Process

Field Office	*Stream Name*	*Township*	*Range*	*Section*	*Total Miles*	*BLM Miles*	*% BLM*	*Free Flow*	*ORVs*
Malta	Long (Tank) Coulee	24N	29E	12	6.5	6.4	98	Y	N
Malta	Martin Coulee	35N	28E	1	3.8	0.5	13	Y	N
Malta	Martin's Coulee	34N	30E	24	7.6	3	39	Y	N
Malta	McCoy Coulee	23N	33E	16	4.9	0	0	Y	N
Malta	Middle Fork Wildhorse	28N	26E	36	9.9	2.6	23	Y	N
Malta	Milk River	31N	26E	26	113.9	4.9	4	Y	N
Malta	Moss Coulee	28N	33E	25	9.2	1.4	15	Y	N
Malta	Mud Creek	25N	24E	29	6.2	0	0	Y	N
Malta	Murray Coulee	27N	33E	12	5.7	4.3	75	Y	N
Malta	North Fork	34N	26E	27	3.2	0	0	Y	N
Malta	North Fork DHS Creek	28N	31E	17	12.6	1.8	14	Y	N
Malta	North Fork Whitewater Creek	37N	31E	6	3.2	0	0	Y	N
Malta	North Fork Wildhorse	28N	27E	18	8.7	2.9	33	Y	N
Malta	North Fourchette Creek	23N	29E	4	7.1	1.1	16	Y	N
Malta	Overflow Coulee	27N	30E	6	5.6	3.7	66	Y	N
Malta	Parrot Coulee	25N	27E	3	5.4	1.1	20	Y	N
Malta	Peck Coulee	37N	34E	32	5	3.1	62	Y	N
Malta	Plum Patch Coulee	24N	33E	21	4.8	0	0	Y	N
Malta	Provost Coulee	35N	32E	15	4.5	0.3	7	Y	N
Malta	Rattlesnake Coulee	35N	34E	30	6.6	0	0	Y	N
Malta	Red Mud Creek	37N	34E	9	10.3	8.8	85	Y	N
Malta	Rock Creek	24N	25E	8	12.3	3.7	30	Y	N
Malta	Rudolph Coulee	28N	28E	24	9.8	2.8	29	Y	N
Malta	Sage Creek	25N	32E	36	11.2	5	45	Y	N
Malta	Second Creek	24N	28E	11	13.63	3.9	29	Y	N
Malta	Second Creek	31N	33E	28	8.6	1.1	13	Y	N
Malta	Seven Mile Coulee	26N	27E	33	8	3.5	44	Y	N
Malta	Seven Mile Creek	23N	25E	10	6	4	67	Y	N
Malta	Seven Mile Creek	26N	30E	1	9.6	4	42	Y	N
Malta	Seven Mile Creek	29N	31E	28	9.5	0.9	9	Y	N
Malta	Shotgun Coulee	24N	33E	7	4.2	0.09	21	Y	N
Malta	Shotgun Coulee	33N	32E	2	5.7	3.2	56	Y	N
Malta	Snake Creek	37N	34E	3	6.5	3.2	19	Y	N

Table L.1
HiLine Planning Area Rivers Considered in Wild and Scenic Rivers Inventory Process

Field Office	*Stream Name*	*Township*	*Range*	*Section*	*Total Miles*	*BLM Miles*	*% BLM*	*Free Flow*	*ORVs*
Malta	South Fork Telegraph Creek	23N	32E	15	6.5	1	15	Y	N
Malta	Spline Coulee	27N	26E	13	10.8	1.7	16	Y	N
Malta	Spring Coulee	31N	29E	15	5.6	2.2	39	Y	N
Malta	Spring Creek	23N	26E	14	6.2	0.4	6	Y	N
Malta	Spring Creek	31N	27E	1	8.3	0.4	5	Y	N
Malta	Sugar Creek	25N	23E	23	9	0.3	3	Y	N
Malta	Tallow Creek	25N	33E	9	10.1	2.2	22	Y	N
Malta	Telegraph Creek	24N	32E	24	20.6	2.1	10	Y	N
Malta	Third Creek	23N	30E	18	6.7	4.9	73	Y	N
Malta	Third Creek	24N	29E	18	15.4	3.7	24	Y	N
Malta	Third Creek	30N	33E	16	7.9	0.3	4	Y	N
Malta	Tin Roof	28N	27E	11	5.9	0.7	12	Y	N
Malta	Tom Davidson Coulee	29N	28E	17	7.2	1.9	26	Y	N
Malta	Tressler Coulee	28N	27E	7	6.2	0	0	Y	N
Malta	Trine Creek	23N	26E	1	5.6	4.4	79	Y	N
Malta	Trueblood Coulee	27N	33E	35	6.9	4.2	61	Y	N
Malta	Valentine Creek	22N	30E	19	2.4	2.4	100	Y	N
Malta	Wagner Coulee	31N	28E	28	3.4	0.3	9	Y	N
Malta	West Alkali Creek	28N	27E	2	17.9	3.2	21	Y	N
Malta	West Fork Stinky Creek	35N	33E	30	25.7	7.8	7	Y	N
Malta	Whiterock Coulee	26N	28E	2	9.5	5.6	59	Y	N
Malta	Whitewater Creek	37N	28E	11	57.4	28.6	50	Y	N
Malta	Woody Island Coulee	36N	27E	6	6.7	3.1	46	Y	N
Malta	Yadley Creek	31N	29E	21	7.4	1.9	26	Y	N
Havre	Battle Creek	37N	18E	6	70.11	5.01	7	Y	N
Havre	Birch Creek	27N	16E	13	45.93	4.57	10	Y	N
Havre	Cow Creek	27N	19E	18	22.88	1.19	5	Y	N
Havre	Cut Bank Creek	33N	12W	26	79.01	3.06	4	Y	N
Havre	Marias River (lower)	30N	05E	7	79.97	2.5	3	Y	N
Havre	Marias River (upper)	32N	5W	34	57.8	1.84	3	Y	N
Havre/ Lewistown	Marias River	25N	10E	18	.75	.5	67	Y	Y

Table L.1
HiLine Planning Area Rivers Considered in Wild and Scenic Rivers Inventory Process

Field Office	*Stream Name*	*Township*	*Range*	*Section*	*Total Miles*	*BLM Miles*	*% BLM*	*Free Flow*	*ORVs*
Havre	Milk River	33N	14E	19	163.11	3	2	Y	N
Havre	Milk River (Headwaters)	36N	10W	11	34.13	0	0	Y	N
Havre	Milk River (Hill)	37N	09E	3	59.94	0	0	Y	N
Havre	Teton River	25N	03E	18	74.48	0.745	1	Y	N
Havre	Woody Island	36N	23E	5	35	5.122	15	Y	N

Appendix L.1
Eligibility Criteria

Introduction

For the purpose of classification, a river area may be divided into segments. For example, changes in river character, such as the presence of dams and reservoirs, significant changes in types or amounts of development, significant changes in physiographic character, tributaries, or features, and/or significant changes in land status, should be considered in identifying river segments for evaluation. Management strategies necessary to administer the entire river area should also be taken into account. As such, excessive segmentation should be avoided. Each segment, considered as a whole, needs to conform to either the Wild, Scenic, or Recreational classification. There are no specific requirements for segment length. Congress has designated a segment as short as four miles. A river segment is of sufficient length if a specific outstandingly remarkable value or values can be protected (a factor in the suitability determination, not eligibility determination), should the segment be designated. An entire stream could be one segment.

Each identified river segment in the RMP planning area must be evaluated to determine whether or not it is eligible for inclusion in the NWSRS. To be eligible, a river segment must be "free-flowing" and must possess at least one "outstandingly remarkable" value. Free flowing means "existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the water." Please note the following:

- A river below a dam or impoundment can still be eligible;
- A river need not be navigable by water craft in order to be eligible; and
- There are no specific requirements concerning the flow of an eligible river segment. Flows are sufficient if they sustain or complement the outstandingly remarkable values for which the segment would be designated. As such, intermittent and ephemeral streams can be eligible.

Outstandingly Remarkable Values

The determination of whether a river area contains "outstandingly remarkable" values is a professional judgment and needs to be documented in the study report. In order to be considered as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. While the spectrum of resources that may be considered is broad, all values should be directly river related. That is, they should have the following characteristics:

- Be located in the river or on its immediate shore lands (for the purposes of this study, the preliminary boundary is 0.25 mile on either side of the river);
- Contribute substantially to the functioning of the river ecosystem; or
- Owe their location or existence to the presence of the river.

The following are general guidelines for the outstandingly remarkable values for which river segments can be eligible. Only one such value is needed for eligibility.

Scenic

The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features or attractions. When analyzing scenic values, additional factors, such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed, may be considered. Scenery and visual attractions may be highly diverse over most of the river or river segment.

Recreational

Recreational opportunities are or have the potential to be popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region.

Visitors are willing to travel long distances to use the river resources for recreational purposes. River-related opportunities could include, but are not limited to, sightseeing, wildlife observation, camping, photography, hiking, fishing and boating.

- Interpretive opportunities may be exceptional and may attract or have the potential to attract visitors from outside the region of comparison.
- The river may provide or have the potential to provide settings for national or regional usage or competitive events.

Geological

The river, or the area within the river corridor, contains one or more examples of a geologic feature, process, or phenomenon that are unique or rare within the region of comparison. The features may be in an unusually active stage of development, represent a textbook example, or represent a unique or rare combination of geologic features (erosional, volcanic, glacial, or other geologic structures).

Fish

Fish values may be judged on the relative merits of either fish populations or habitat or a combination of the following river-related conditions:

- *Populations:* The river is nationally or regionally one of the top producers of resident, indigenous, or anadromous fish species. Of particular significance may be the presence of wild or unique stocks or populations of state- or US-listed or candidate threatened and endangered species.
- *Habitat:* The river provides exceptionally high quality habitat for fish species indigenous to the region. Of particular significance is habitat for state- or US-listed or candidate threatened and endangered species.

Wildlife

Wildlife values may be judged on the relative merits of either wildlife populations or habitat, or a combination of the following conditions:

- *Populations:* The river or area within the river corridor contains nationally or regionally important populations of resident or indigenous wildlife species dependent on the river environment. Of particular significance may be species considered to be unique or populations of state- or US-listed or candidate threatened and endangered species.
- *Habitat*: The river or area within the river corridor provides exceptionally high quality habitat for wildlife of national or regional significance or may provide unique habitat or a critical link in habitat conditions for state- or US-listed or candidate threatened and endangered species. Contiguous habitat conditions are such that the biological needs of the species are met.

Cultural

The river or area within the river corridor contains a site or sites where there is evidence of occupation or use by Native Americans. Sites must be rare or must have unusual characteristics or exceptional human-interest values. Sites may have national or regional importance for interpreting prehistory; may be rare; may represent an area where culture or a cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or may have been used by cultural groups for rare or sacred purposes.

Historic

The river or area within the river corridor contains a site or sites or feature or features associated with a significant event, an important person, or a cultural activity of the past that was rare or unusual in the region. A historic site or feature in most cases is 50 years old or older. Sites or features listed in or eligible for inclusion in the National Register of Historic Places may be of particular significance.

Other Similar Values

While no specific evaluation guidelines have been developed for the other similar values category, additional values deemed relevant to the eligibility of the river segment should be considered in a manner consistent with the foregoing guidance, including, but not limited to, hydrologic, ecologic/biologic diversity, paleontologic, botanic, and scientific study opportunities.

Appendix L.2
Marias River
Wild and Scenic River Eligibility and Suitability Report

Eligible Stream

The Marias River from State Highway 87 near Loma downstream to the confluence of the Missouri River was found to be free-flowing and possess one or more outstandingly remarkable values.

Marias River

Stream Segment: 0.75 miles
Miles on BLM Land: 0.5

Fisheries Values: The .75 mile section of the Marias River that forms a portion of the boundary of the Upper Missouri River Breaks National Monument provides a very important area for staging fish. The confluence of the Marias River with the Missouri River provides an important habitat for the spawning and rearing of fish. This section of river falls within the recovery areas for the federally listed, endangered pallid sturgeon fish. There have been approximately 40 different species of fish recorded in this section, including 5 species of concern (Paddlefish, Pallid Sturgeon, Sauger, Blue Sucker, and Sturgeon Chub) (Tews, Anne and Bill Gardner; Fisheries Biologist, Montana Fish Wildlife and Parks, 2004).

Historical Values: The confluence of the Marias River and the Missouri River became known as decision point when Lewis and Clark's expedition was forced to make a crucial decision about which stream was actually the Missouri River. Lewis wrote, "to mistake the stream at this period of the season . . . would not only loose us the whole of this season but would probably so dishearten the party that it might defeat the expedition altogether." (Monahan and Biggs 2001). This quote emphasizes the importance of the decision the expedition was faced with. Both Lewis and Clark felt the Southerly fork was indeed the Missouri, but most of the men disagreed. Lewis spent several days exploring and camping along the Marias River, and determined correctly to continue along the Missouri River.

Classification

After eligibility is determined the second step is "potential classification based on the condition of the river and the adjacent lands." Section 2(b) of the Act specifies three classification categories (wild, scenic, and/or recreational) for eligible rivers. Classifying a river as either wild, scenic and/or recreational provides a general administrative categorization tool for interim management. Once a river segment is determined eligible and the appropriate classification determined, it must be afforded adequate protection until a final decision is reached on suitability and designation. Final classification is a Congressional legislative determination along with designation of a river segment as part of the NWSRS.

Potential Classification

The Act and Interagency Guidelines provide the following direction for establishing preliminary classifications for eligible rivers:

Wild Rivers (W): Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic Rivers (S): Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational Rivers (R): Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Table L.2 lists the classification determinations for the eligible stream.

Table L.2
Classification Determinations for the Marias River

Stream	***Classification***	***Reason***
Marias River	Recreation	This segment of the Marias River is readily accessible by road and has some development along the shoreline including a boat ramp, parking area, and fishing access.

Rivers or river segments determined eligible must be managed to protect the free-flowing, outstandingly remarkable values, and tentative classification. This protective management is in place until a river or river segment is determined suitable or nonsuitable for recommendation. During this interim protection any proposed action which may adversely impact or be inconsistent with wild and scenic river values would require management decisions based on National Environmental Policy Act (NEPA) analysis and Section 202 of the Federal Land Policy and Management Act (FLPMA).

- Any proposed action which may be inconsistent with or adversely impact identified wild and scenic river (WSR) values would require a site-specific environmental assessment (EA), opportunity for public involvement, and at least a 30-day public comment period. The decision notice record for the EA (involving these types of actions) would be conducted and signed at the field office level. However, prior to signature a copy of supporting documentation would be forwarded to the State Director for review and concurrence.

- If the EA determined that the proposal could have a major action significantly affecting the environment, a separate environmental impact statement (EIS) apart from the BLM RMP/EIS would be required.

- Should the EA or EIS determine that the action as proposed, or with appropriate mitigation, or an acceptable alternative, would not have irreversible or irretrievable adverse impacts and would maintain or enhance identified WSR values, such action may be approved.

- If the EA or EIS determined that the action as proposed would have irreversible or irretrievable adverse impacts to identified WSR values, the decision on the action would be held temporarily in suspension until WSR evaluations are addressed and resolved through the BLM planning process.

Suitability

Once river segments have been evaluated and determined eligible for further study, agencies conduct an evaluation to determine if the segments are “suitable” or “nonsuitable” for WSR designation within their resource management planning processes (Section 5(d)(1)). In this process, river values and their potential for designation are analyzed along with other resource values, issues and alternatives.

Suitability represents an assessment or determination as to whether or not eligible river segments should be recommended for inclusion in the NWSRS by Congress. Characteristics which do or do not make the area a worthy addition to the NWSRS are described.

Marias River

1. **Characteristics that do or do not make the river a worthy addition to the NWSRS.**

   This segment includes BLM land that is located within the Upper Missouri River Breaks National Monument. Management of the area already provides protection for the values along this segment of the Marias River.

2. **The current status of land ownership, minerals (surface and subsurface), use in the area, including the amount of private land involved and associated or incompatible uses. Jurisdictional consideration must be taken into account to the extent that management would be affected.**

   The BLM land along this segment is primarily used for recreation including a fishing access site and the Decision Point Interpretative Trail. Private land in the area is primarily used for livestock grazing and farming.

3. **Reasonably foreseeable potential uses of the land and related waters that would be enhanced, foreclosed, or curtailed if the area were included in the NWSRS and values that would be foreclosed or diminished if the area were not protected as part of the NWSRS.**

   The area is currently used for cattle grazing and farming in some areas above the Marias on private land. The only use reasonably foreseeable that could potentially be enhanced by a SWR designation is enhanced recreational use. The BLM owns very little land in the 1/4 mile river segment and access to the river is limited, therefore increasing recreational use on BLM is not practical, especially given the private land owners in the area are not supportive of increased recreation use. Again, enhanced recreational activities would most likely be the only value foreclosed by not designating Marias a WSR. There is some recreational use of the Marias at this time and BLM is not aware of the public's need for greater access to the river.

4. **Federal or state agency that will administer the river should it be added to the NWSRS.**

   Bureau of Land Management.

5. **Federal, state, tribal, local, public, or others with an interest in designation or non-designation of the river, including the extent to which the agency proposes that administration of the river, including the costs thereof, be shared by state, local, or other agencies and individuals.**

   The National Park Service may be interested in participating to the extent of recognition of the Lewis and Clark National Historic Trail, but beyond that it is unlikely.

6. **The Estimated cost to the United States of acquiring necessary lands, interests in lands, and administering the area should it be added to the NWSRS.**

   There are approximately 83 acres of BLM land and 165 acres of private land within 1/4 mile of this segment of the Marias River. The estimated cost is $2,000 per acre based on a recent (2008) appraisal along the Missouri River. The total cost of acquiring necessary lands would be approximately $330,000.

7. **A determination of the degree to which the state or its political subdivision(s) might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.**

   It is not anticipated that the state or local governments would participate.

8. **The Federal agency's ability or other mechanisms to protect and manage the identified river-related values other than designation into the NWSRS.**

   The public land adjacent to this segment of the Marias River is part of the Upper Missouri River Breaks National Monument.

9. **An evaluation of the adequacy of local zoning and other land use controls in protecting the river's outstandingly remarkable values by preventing incompatible development.**

   Chouteau County does not have any zoning limitations on the Maris River.

10. Support or opposition to designation.

There is general opposition by local governmental interests, believing that the designation currently in place is more than enough for adequate protection. Local support is unlikely. No known other interest.

11. Historical or existing rights that could be adversely affected with designation.

There are water claims on Marias River for various uses along its entire length. It does not appear that there is a reserve water right to maintain a minimum flow. There are active grazing permits for the BLM land and grazing and farming is the historic use of the private land along the Maris River.

12. The consistency of designation with other agency plans, programs, or policies in meeting regional objectives.

Designation would effectively be redundant of current designations.

Other agency plans do not assert management on Maris River. Water rights through the Montana Department of Natural Resources and Conservation will adjudicate claims for water in the Marias River at some time in the future.

13. The contribution to a river system, watershed, or basin integrity.

The Marias River does flow into the Missouri River, which is designated a WSR. However, the headwaters of the Marias River and its tributaries are mostly private land. From a practical standpoint it is not likely that a total system management strategy can be pursued with a focus on the total watershed.

Recommendation: This segment of the Marias River is not suitable for designation because of the lack of BLM land ownership, the BLM land is included in the Upper Missouri River Breaks National Monument, and management of the area already provides protection for the values along this segment of the Marias River.

Appendix M
Greater Sage-Grouse

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Greater Sage-Grouse Photo by Craig Miller

Greater Sage-Grouse Photo by Craig Miller

Appendix M.1

Mitigation Measures and Conservation Actions For Greater Sage-Grouse Habitat

Introduction

These Mitigation Measures and Conservation Actions for Greater Sage-Grouse Habitat are a compilation of management strategies and project design features employed by the Bureau of Land Management (BLM) to mitigate impacts from surface disturbance in priority and general sage-grouse habitat in order to meet the goals and objectives set forth in the BLM National Sage-grouse Conservation Strategy and in individual land use plans. They apply to activities such as road or pipeline construction, range improvements, and permitted land uses or recreation activities. These guidelines are presented as an appendix for easy reference as they apply to many resources and were derived from many laws and other guidelines such as the Management Plan and Conservation Strategies for Sage-grouse in Montana, the BLM National Technical Team Report (WO IM No. 2012-044, BLM National Greater Sage-Grouse Land Use Planning Strategy), Western Association of Fish and Wildlife Agencies (WAFWA), Conservation Strategy for Greater Sage-grouse, and others. These Mitigation Measures and Conservations Actions must be used in accordance with the "no net unmitigated loss" standard enunciated in Chapter 2, and in Appendix M.4, Greater Sage-Grouse Mitigation.

The guidelines are primarily included to provide consistency within the Montana/Dakotas BLM in how management practices and requirements are identified and applied to avoid and mitigate environmental impacts and resource and land use conflicts in Greater Sage-Grouse habitat. Consistency in this sense does not mean that identical requirements would be applied for all similar types of land use activities, nor does it mean that the requirements or guidelines for a single land use activity would be identical in all areas.

There are two ways the mitigation guidelines are used in the RMP and EIS process: (1) as part of the planning criteria in developing the RMP alternatives; and (2) in the analytical processes of both developing the alternatives and analyzing the impacts of the alternatives. In the first case, an assumption is made that any one or more of the mitigation measures or conservation actions will be appropriately included as conditions of relevant actions being proposed or considered in each alternative. In the second case, the mitigations are used (1) to develop a baseline for measuring and comparing impacts among the alternatives; (2) to identify other actions and alternatives that should be considered; and (3) to help determine whether more stringent or less stringent mitigations should be considered.

The EIS for the RMP does not decide or dictate the exact wording or inclusion of these guidelines. Rather, the guidelines are used in the RMP and EIS process as a tool to help develop the RMP alternatives and to provide a baseline for comparative impact analysis in arriving at RMP decisions. These guidelines will be used in the same manner in analyzing activity plans and other site-specific proposals. These guidelines and their wording are matters of policy. As such, specific wording is subject to change primarily through administrative review, not through the RMP and EIS process. Any further changes that may be made in the continuing refinement of these guidelines and any development of program-specific standard stipulations will be handled in another forum, including appropriate public involvement and input.

Purpose

The purpose of these mitigation measures and conservation actions is to mitigate impacts from surface disturbance in priority and general sage-grouse habitat in order to meet the goals and objectives set forward in the BLM National Sage-grouse Conservation Strategy and in individual land use plans. Application of mitigation measures and conservation actions will reserve for the BLM the right to modify the operations of surface-disturbing and/or disruptive activities as

part of the statutory requirements for environmental protection. Those measures selected for implementation will be identified in the Record of Decision (ROD) or Decision Record (DR) for those activities and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM lands and minerals. These measures have been written in a format that will allow for either their direct use as stipulations or operating standards and/or in addition to specific or specialized mitigation following the submission of a detailed development plan or other project proposal and an environmental analysis. These operating standards are given as acceptable methods for mitigating anticipated effects and achieving the desired plan outcomes but are not prescribed as the only method for achieving the outcomes.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation measures and conservation actions for Greater Sage-Grouse as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program. Resource activities or programs with a standardized set of permit or operation stipulations will also use Mitigation Measures and Conservation Actions for Greater Sage-Grouse Habitat.

These mitigation measures and conservation actions are primarily written for priority sage-grouse habitats. Within general habitat the mitigation measures and conservation actions applied are determined at a project-by-project level and may be similar in many cases to the priority habitat measures. A selection of mitigation measures and conservation actions for general habitat is also included for some programs. At the project level, in order to prioritize certain general habitat areas over marginal or substandard sage-grouse habitat areas, consideration should be given to:

- The capability of the habitat to provide connectivity among priority areas.
- Habitats occupied by sage-grouse where enhancing general sage-grouse habitat can offset losses to habitat and/or populations elsewhere within the habitat.
- The potential to replace lost priority habitat or needed changes in total priority habitat due to perturbations and/or disturbances, providing connectivity between priority areas, and restoring historical habitat functionality to support meeting objectives to maintain or enhance connectivity.

Threats to Greater Sage-Grouse and Their Habitat

A number of threats and risks to Greater Sage-Grouse and their habitat have been identified during conservation planning efforts and assessments. Range wide issues were covered in listing decisions made by the U.S. Fish and Wildlife Service in 2007 and 2010. In addition, the BLM National Technical Team Report (WO IM No. 2012-044) covered BLM program areas with the potential to impact Greater Sage-Grouse populations. The 2005 Management Plan and Conservation Strategies for Sage-Grouse in Montana - Final identified twelve major issues:

- *Fire Management*
- *Grazing Management*
- *Harvest Management*
- *Noxious Weed Management*
- *Mining and Energy Development*
- *Outreach and Education*
- *Power Lines and Generation Facilities*
- *Predation*
- *Recreational Disturbance*
- *Roads and Motorized Vehicles*
- *Vegetation*
- *Managing Other Wildlife in Sage-Grouse Habitats*

Conservation Actions

These mitigation measures and conservation actions for Greater Sage-Grouse would be implemented on a project-specific basis in sage-grouse priority habitat, depending on the specific characteristics of the project area and the types of disturbance being proposed. They may not be appropriate to implement in all cases. The mitigation would be

requirements, procedures, management practices, or design features that the BLM, through issuance of the Record of Decision (ROD), would adopt as operational requirements. The BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Because mitigation measures change or are modified based on new information, the guidelines will be updated periodically.

In the very early stages of the development of siting and design plans, project developers shall coordinate with appropriate federal, state, and local agencies that regulate activities that affect Greater Sage-Grouse and their habitats to determine what expected level of mitigation will be needed to ensure the RMP goals and objectives can be met within the proposed action. An environmental review shall demonstrate how the mitigation measures and conservation actions being applied to the project lead to impacts (direct, indirect, and cumulative) that do not cause the BLM to authorize actions that would exceed habitat level thresholds causing goals and objectives for the priority area to not be met. This will analyze at the project level at least two considerations to examine functionality of sage-steppe systems and thresholds where populations are known to be impacted:

- At the landscape scale, priority areas should be maintained with enough land cover composed of adequate sagebrush habitat to provide Greater Sage-Grouse needs to meet priority habitat objectives. This is measured using broad-scale habitat classification to determine the amount of potential habitat based on ecological sites against habitat lost to permanent to short-term habitat loss from disturbances such as agricultural tillage, fire, etc.

- At the local population scale discrete anthropogenic disturbances should be avoided, minimized, or mitigated to maintain the highest quality habitat. The actual impact to sage-grouse will depend on the amount of direct disturbance, the level of activity associated with the direct disturbance that leads to indirect disturbance, and the cumulative effects of the disturbance level, habitat loss and habitat degradation.

In analyzing the impact from a project, consideration should be given to the type of activity, the amount of anthropogenic disturbance to seasonal Greater Sage-Grouse habitat utilized by the local population, and the landscape context. The BLM will analyze and disclose how permitted actions, including included mitigation measures and conservation actions, affect the ability of priority area goals and objectives to be met and ensure permitted activities are in conformance with the RMP.

Priority Habitat

Travel Management

Travel management should evaluate, during site-specific travel planning, the need for permanent or seasonal road or area closures to protect Greater Sage-Grouse priority habitat areas.

Use existing roads or realignments to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then any new roads would be constructed to the absolute minimum standard necessary.

Allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal or beneficial impacts on Greater Sage-Grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road.

Reclaim roads, primitive roads and trails not designated in travel management plans. This also includes primitive route/roads that were not designated in Wilderness Study Areas and within lands with wilderness characteristics that have been selected for protection.

When reclaiming roads, primitive roads and trails, use appropriate seed mixes and consider the use of transplanted sagebrush.

Evaluate impacts of existing roads, including two-tracks, in relation to known lek locations and Greater Sage-Grouse winter ranges.

Consider the use of speed bumps where appropriate to reduce vehicle speeds near leks, such as during oil and gas development.

Manage on-road travel and OHV use in sage-grouse habitat to avoid disturbance during critical times such as winter, breeding and nesting periods.

Plan or permit organized events to avoid impacts to Greater Sage-Grouse.

Manage motorized and mechanized travel to minimize impacts to Greater Sage-Grouse and their habitat by developing standards for future roads to give to BLM, FS, BIA, state, county, and private parties.

Manage motorized and mechanized travel to minimize impacts to Greater Sage-Grouse by enforcement of existing OHV and travel management plans.

Provide educational opportunities for users of OHVs dealing with the possible effects they may have on Greater Sage-Grouse.

Develop a transportation management plan across ownership boundaries in Greater Sage-Grouse habitats.

Participate in travel planning efforts and educate the general public about the impacts of roads on Greater Sage-Grouse and their habitat.

Consider buffers, removal, realignment, or seasonal closures where appropriate to avoid degradation of habitat.

Reclaim closed roads with locally adapted native plant species beneficial to sage-grouse.

Close and reclaim travel ways in sage-grouse habitat where appropriate.

Recreation

Document leks where recreational viewing is occurring.

Provide educational materials to the public describing effects of concentrated recreational activities and the importance of seasonal ranges to Greater Sage-Grouse.

Issue special use permits for certain activities with distance and timing restrictions to maintain the integrity of breeding, nesting and winter habitat.

Lands and Realty

Within designated ROW corridors encumbered by existing ROW authorizations, new ROWs should be co-located to the extent practical and feasible with the entire footprint of the proposed project within the existing disturbance associated with the authorized ROWs.

Subject to valid, existing rights, where new ROWs associated with valid existing rights are required, co-locate new ROWs within existing ROWs or where it best minimizes Greater Sage-Grouse impacts. Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road constructed to the absolute minimum standard necessary.

Upon project completion, roads used for commercial access on public lands would be reclaimed unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.

For powerlines:

- Document the segment(s) of line detrimental to Greater Sage-Grouse.
- Determine by cooperative action – agencies, utilities, and landowners – whether or not modification of poles to limit perching will prevent electrocution of raptors and decrease predation on Greater Sage-Grouse.
- Emphasize the following if perch prevention modifications do not work to protect Greater Sage-Grouse and sagebrush habitat:
    - reroute the line using distance, topography, or vegetative cover; or
    - bury the line.
- Explore opportunities for technical assistance and funding.
- Remove power line when use is completed.
- Encourage the use of off-grid systems such as solar, natural gas micro-turbines, and wind power where feasible in sage-grouse habitats.
- Use the best available information for siting power lines on important breeding, brood-rearing, and winter habitat in an appropriate vicinity of the proposed line.
- Initiate collision prevention measures using guidelines (Avian Power Line Action Committee 1994) on identified segments. Measures are subject to restriction or modification for wind and ice loading or other engineering concerns, or updated collision prevention information.
- Remove power lines that traverse sage-grouse habitats when facilities being serviced are no longer in use or when projects are completed.

Livestock Grazing

Conducting Land Health Assessments and Permit Renewals in Priority Greater Sage-Grouse Habitat

Land Health Assessments

When conducting land health assessments:

- Prioritize allotments that have the best opportunities for conserving, enhancing or restoring habitat for sage-grouse.
- Include (at a minimum) indicators and measurements of structure/condition/composition of vegetation specific to achieving sage-grouse habitat objectives (Doherty, et al. 2011). If local/state seasonal habitat objectives are not available, use sage-grouse habitat recommendations from Connelly, et al. (2000b) and Hagen, et al. 2007.

Permit Renewals

When conducting permit renewals:

- If an effective grazing system that meets sage-grouse habitat requirements is not already in place, analyze at least one alternative that conserves, restores or enhances sage-grouse habitat in the NEPA document prepared for the permit renewal if the size of the allotment and/or cooperative opportunities warrant it.
- Work cooperatively on integrated ranch planning within sage-grouse habitat so ranch operations with deeded BLM allotments can be planned as single units.
- Analyze springs, seeps and associated pipelines to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within priority sage-grouse habitats. Make modifications where necessary, considering impacts to other water uses when such considerations are neutral or beneficial to sage-grouse. Only authorize new spring or seep developments where the impacts to sage-grouse would be neutral or beneficial.
- Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to priority sage-grouse habitats to determine if they should be restored to sagebrush steppe for sage-grouse. If these seedings are part of an AMP/Conservation Plan or if they provide value in conserving or enhancing the rest of the priority habitats, then no restoration would be necessary. Assess the compatibility of

these seedings for sage-grouse habitat or as a component of a grazing system during the land health assessments (Davies, et al. 2011).

- Evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance or restore sage-grouse habitat.
    - This includes evaluating methods to reduce outright sage-grouse strikes and mortality, through removing, modifying or marking fences in high risk areas within priority sage-grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009, Stevens 2011).
- Monitor for, and treat invasive species associated with existing range improvements (Gelbard and Belnap 2003 and Bergquist, et al. 2007).

Include terms and conditions on grazing permits and leases that assure plant growth requirements are met, and residual forage remains available for Greater Sage-Grouse hiding cover. Utilize techniques appropriate for uplands vs. riparian/meadow areas and enhancement vs. reclamation/restoration. Across all these types of projects consider singly, or in combination, changes as necessary:

- Season or timing of use;
- Numbers of livestock (includes temporary non-use or livestock removal);
- Distribution of livestock use;
- Intensity of use (utilization or stubble height objectives)
- Kind of livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats)
- Class of livestock (e.g., yearlings versus cow calf pairs)

Within riparian areas specifically, consider practices such as:

- Within priority sage-grouse habitat, reduce hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Utilize fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by sage-grouse in the hot season (summer).
- Ensure the sustainability of desired soil conditions and ecological processes within upland plant communities following implementation of strategies to protect riparian areas. This can be achieved by:
    - protecting natural wet meadows and springs from over-use while developing water for livestock, and
    - planning the location, design, and construction of new fences to minimize impacts on Greater Sage-Grouse.

Range Management Mitigation Measures and Conservation Actions

Design any new structural range improvement and location of supplements (salt or protein blocks) to conserve, enhance, or sage-grouse habitat through an improved grazing management system relative to sage-grouse objectives. Structural range improvements in this context include, but are not limited to: cattleguards, fences, exclosures, corrals, or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels, and spring developments.

Discourage concentration of livestock on sage-grouse leks and winter habitat.

If portions of existing fences are found to pose a threat to Greater Sage-Grouse, mitigate through moving or modifying posts, increasing the visibility of the fences by flagging, or by designing “take-down” fences.

Pesticides and Herbicides Use

- Evaluate ecological consequences of using pesticides to control grasshoppers or other insects.
- Evaluate ecological consequences of broadcast herbicide use on forbs and other important sage-grouse foods.
- Minimize use of pesticides and herbicides in Greater Sage-Grouse nesting, breeding and brood-rearing habitat.

Noxious Weed Management

- Promote measures that prevent the introduction and spread of weed seeds and other reproducing plant parts.

- Develop and implement management techniques that minimize the risk of infestation.
- Where feasible, isolate livestock from known infestations and avoid vehicle movement through infested areas.
- Use weed-free seed for reestablishment of vegetation.
- Eliminate unnecessary soil disturbance and vehicle access/movement into occupied Greater Sage-Grouse habitat.
- Limit vehicle use to established roads only.
- Regularly monitor access points and roads for weed establishment.
- Develop partnerships with regional public and private land management units.
- Establish goals and set priorities that encompass the needs of both livestock and wildlife managers so all parties are working under a similar plan.
- Conduct monitoring and develop follow-up procedures for treated areas.
- Educate all field personnel on weed identification, the manner in which weeds spread, and methods of treating weed infestations.
- Employ integrated weed management treatment methods such as a combination of biological and cultural, such as grazing, mowing, or seeding treatments in conjunction with herbicides to manage weeds in Greater Sage-Grouse habitat.
- Use the most selective herbicides where chemical treatment is appropriate, to minimize loss of non-target plant species.
- Restore plant communities with desired species adapted to the site, using proven management techniques where biologically feasible. A restoration program may be necessary if conditions prevent natural plant species.

Fluid Minerals

In cases where federal oil and gas leases have been issued without adequate stipulations for the protection of Greater Sage-Grouse or their habitats being provided in the applicable RMP decision, as revised or amended, include mitigation measures and conservation actions as permit conditions of approval (COAs) when approving exploration and development activities through completion of the environmental record of review or an environmental assessment, as appropriate (43 CFR 3162.5).

General or typical COAs are mitigation measures that may be required when processing Applications for Permits to Drill (APDs), Sundry Notice Drilling Plans, and Surface Use Plans when they are: 1) not specifically addressed in those plans or existing lease stipulations; and 2) needed to mitigate impacts to resource values identified at the onsite inspection or during review of the plans. The use of COAs is intended to reduce, mitigate, or minimize impacts from development but they do not necessarily avoid or preclude resulting significant impacts from the project.

The COAs also allow the BLM to prescribe resource protection measures for lands that were previously leased with varying sets of lease stipulations. However, for lands that are already leased, BLM restrictions on development, not required to comply with existing laws, must be reasonable and consistent with existing lease rights. The COAs must not constrain or restrict development beyond the measures anticipated or authorized by the lease terms or regulations and/or interfere with the lessee's opportunity to economically recover the oil and gas resources, considering the lease as a whole.

Evaluation of these COAs will consider during the NEPA process:

- Whether the conservation measure is "reasonable" (43 CFR 3101.1-2) and consistent with valid existing rights;
- Whether the action is in conformance with the approved RMP; and
- The effectiveness of the mitigation measures proposed.

When incorporated into BLM's program in the Record of Decision (ROD), mitigation approaches and conservation practices detailed in the Surface Use Plan of Operations (see 43CFR 3162-1(f)) shall address, at a minimum, the proposed project's anticipated noise, density and amount of disturbance, mechanical movement (e.g., pumpjacks), permanent and temporary facilities, traffic, phases of development over time, offsite mitigation, and expected periods of use. Following larger-scale considerations for minimizing impacts to Greater Sage-Grouse this section contains BMPs that will be included, as applicable, as COAs to address to categories of concern. Due to site-specific circumstances, some categories may not apply to some projects and/or may require slight variations from the approach described. It is

anticipated the applicability and/or variation in approach will be limited to project siting and configuration. Additional mitigation measures may be identified and required during individual planning. Applicants will be required to discuss any proposed variations with BLM staff. All variations will require appropriate analysis and disclosure as part of future project authorizations. Those design features that do not apply to a given project will need to be described as part of the project file along with an appropriate rationale.

The following hierarchical approach and guidelines should be followed during project development to address these and other areas of concern for Greater Sage-Grouse:

Density and Amount of Disturbance

Do not allow new surface occupancy on Federal leases within priority habitat areas, including winter concentration areas during any time of the year (Doherty, et al. 2008, Carpenter, et al. 2010). Where this is not possible due to valid existing rights and development requirements for the specific geologic and fluid mineral resources, consider the following disturbance and surface occupancy limits to the extent practicable:

If the lease is partially or entirely within priority habitat areas:

- Subject to topographic and other environmental constraints, require any development within priority habitat to be placed in the area least harmful to sage-grouse based on vegetation, topography, or other habitat features.
- To the extent possible and consistent with valid existing rights, limit disturbances to an average of one site per 640 acres on average, with no more than 3% direct surface disturbance in the analysis area.
- When additional mitigation is necessary, conduct it in the impacted priority sage-grouse habitat areas when possible or, if that is not possible, in general sage-grouse habitat with the ability to increase sage-grouse populations tied to the impacted priority area(s).

Breeding and Nesting Habitat

To limit impacts to breeding and nesting habitat, surface-disturbing and disruptive activities shall be prohibited or restricted within 2 miles of a lek consistent with valid existing rights. If the entire lease is entirely within the 2-mile perimeter of a lek, require any development to be placed at the part of the lease farthest from the lek, or based depending on topography and other habitat features, in an area demonstrably the least harmful to sage-grouse.

To ensure comprehensive planning relative to sage-grouse conflicts, complete Master Development Plans or PODS during planning and review of projects involving multiple proposed disturbances within a logical geographic area, with an exception for individual wildcat (exploratory) wells.

Encourage unitization when deemed necessary for proper development and operation of an area or to facilitate more orderly (e.g., phased and/or clustered) development as a means of minimizing adverse impacts to sage-grouse (see Federal Lease Form, 3100-11, Sections 4 and 6).

Brood-Rearing Habitat

Apply a seasonal timing restriction on exploratory drilling that avoids construction, drilling, completion, and reclamation surface-disturbing activities during the nesting and early brood-rearing seasons in all priority sage-grouse habitats for this period.

Best Management Practices for Fluid Mineral Development

Prioritize pad development based on suitability of habitat; construct pads that are in less suitable habitat (i.e., along existing roadways or within degraded habitats) during the breeding season, and construct pads located in more suitable habitat prior to or after the critical breeding season.

Avoid sagebrush, but if disturbance is necessary, interim reclamation should include sage plantings/seedings and/or the use of minimum disturbance practices to protect sage on well pads and pipelines.

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Corridor power, flow, and small pipelines under or immediately adjacent to roads.
- Design or site permanent structures which create movement (e.g., a pumpjack) to minimize impacts to Greater Sage-Grouse.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce Greater Sage-Grouse mortality.
- Equip tanks and other above-ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (e.g., by washing vehicles and equipment)
- Mitigate pit and impoundment construction to reduce or eliminate threats from West Nile virus.
- Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli, et al. 2010; Blickley, et al. *In preparation*).
- Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
- Clean up refuse.

Reclamation

- Include objectives for ensuring habitat restoration to meet Greater Sage-Grouse habitat needs in reclamation practices/sites. Address post-reclamation management in reclamation plan such that goals and objectives are to protect and improve Greater Sage-Grouse habitat needs.

- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

Solid Minerals

Recommend minimization of surface-disturbing or disrupting activities (including operations and maintenance) where needed to reduce the impacts of human activities on Greater Sage-Grouse habitats. Apply these measures during activity level planning.

Encourage development in incremental stages to stagger disturbance; design schedules that include long-term strategies to localize disturbance and recovery within established zones over a staggered timeframe.

Use off-site mitigation or purchase conservation easements with industry dollars to offset habitat losses.

Remove facilities and infrastructure when use is completed.

Allow no surface use in nesting habitat from March 1 through June 15.

Restrict maintenance and related activities in Greater Sage-Grouse breeding/nesting complexes – March 1 through June 15 – between the hours of 4:00 – 8:00 a.m. and 7:00 – 10:00 p.m.

Allow no surface use activities within Greater Sage-Grouse wintering areas from December 1 through March 31.

Use minimal surface disturbance to install roads and pipelines and reclaim site of abandoned wells to natural communities.

Locate storage facilities, generators, and holding tanks outside the line of sight and sound of breeding habitat.

See conservation actions related to preventing the spread of weeds and controlling infestations of noxious weeds.

Engage industry as a partner to develop and establish new sources of seed of native plant species for restoration of sites disturbed by development.

Design impoundments and manage discharge so as not to degrade or inundate leks, nesting sites, and wintering sites.

Protect natural springs from any source of disturbance or degradation from energy-related activities.

Provide for long-term monitoring of siting requirements to examine effects of current and future development on sage-grouse.

Set up a schedule for reviewing and revising siting and use criteria with industry.

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.

- Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce Greater Sage-Grouse mortality.
- Equip tanks and other above-ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003; Bergquist, et al. 2007).
- Mitigate pit and impoundment construction to reduce or eliminate threats from West Nile virus
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, limit favorable mosquito habitat through reservoir design.
- Require Greater Sage-Grouse-safe fences around sumps.
- Clean up refuse.

Reclamation

- Include restoration objectives to meet Greater Sage-Grouse habitat needs in reclamation practices/sites. Address post-reclamation management in reclamation plan such that goals and objectives are to protect and improve Greater Sage-Grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

Wildfire Suppression, Fuels Management and Fire Rehabilitation

Wildfire Suppression

In Greater Sage-Grouse habitat areas, prioritize suppression, immediately after life and property, to conserve the habitat. The BLM will protect sage-grouse habitat during wildfire suppression activities as described in the National Fire Suppression Guidelines and the current fire management plan.

Apply Fire Management BMPs (see WO-IM-2011-138) as appropriate.

Fire Management Best Management Practices for Sage-Grouse Conservation

1. Develop state-specific sage-grouse toolboxes containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.

2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.

3. Assign a sage-grouse resource advisor to all extended attack fires in or near key sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.

4. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.

5. During periods of multiple fires, ensure line officers are involved in setting priorities.

6. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.

7. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and ATVs prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.

8. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.

9. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.

10. Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.

11. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

Fuels Management

Design and implement fuels treatments with an emphasis on protecting existing sagebrush ecosystems.

- Do not reduce the existing sagebrush canopy cover unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of priority Greater Sage-Grouse habitat and conserve habitat quality for the species. Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in an environmental analysis.
- Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in a priority area.
- Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk or enhance habitat around or in the winter range and will maintain habitat quality.
- Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species). However, if as a last resort and after all other treatment opportunities have been explored and site-specific variables allow, the use of prescribed fire for fuel breaks that would disrupt the fuel continuity across the landscape could be considered, in stands where cheatgrass is a very minor component in the understory.
- Monitor and control invasive vegetation post-treatment.
- Require use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success. Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat objectives.
- Design post-fuels management projects to ensure long-term persistence of seeded or pre-treatment native plants. This may require temporary or long-term changes in livestock grazing management, wild horse and burro management, travel management, or other activities to achieve and maintain the desired condition of the fuels management project.
- Design fuels management projects in priority Greater Sage-Grouse habitat to strategically and effectively reduce wildfire threats in the greatest area. This may require fuels treatments implemented in a more linear versus block design.
- For the project to be approved the authorizing official should consider:

  - biological and physical limitations of the site and the impact on Greater Sage-Grouse;
  - management objectives for the site, including those for wildlife, are clearly defined;
  - potential for weed invasion and successional trends are well understood;
  - capability exists to manage the post-burn site properly, including a funded monitoring schedule, to achieve a healthy sagebrush community.

Develop local or regional guidelines or consider the following guidelines if fire is used as a tool:

- Analyze cumulative effects of sagebrush treatment by considering ecological units, evaluate the degree of fragmentation, and maintain a good representation of mature sagebrush.
- Predict effects for the length of time necessary for sagebrush to return to desired condition for determine treatment types and intervals.
- Identify suitable patch size based on site-specific characteristics of the natural community and treat patches in a mosaic pattern that provides sagebrush cover for snow capture, hiding cover, and a seed source.
- Use available literature to research the effects of fire on sagebrush communities.
- Use caution in reducing sagebrush cover in and following drought periods.

During fuels management project design, consider the utility of using livestock to strategically reduce fine fuels, and implement grazing management that will accomplish this objective.

Consult with ecologists to minimize impacts to native perennial grasses.

Develop criteria for managing fuels and other risks to Greater Sage-Grouse habitat.

Identify all Greater Sage-Grouse habitats and prioritize on the basis of risk of loss to wildfire.

Develop appropriate actions on a site by site basis, such as using existing roads as fire breaks.

Develop treatments to improve habitats over the long term if sagebrush stands do not meet objectives for Greater Sage-Grouse, such as confining treatments to small patches.

Consider mechanical treatment as the primary method and prescribed fire as a secondary method to remove conifers that encroach on Greater Sage-Grouse habitat, except where forested habitat is limited.

Avoid treatments to Greater Sage-Grouse habitat in areas that are susceptible to invasion by cheatgrass or other invasive plant species. Treatment will be accompanied by restoration, and reseeding if necessary, to re-establish native vegetation.

Protect sagebrush along riparian zones, meadows, lakebeds, and farmlands that include Greater Sage-Grouse habitat.

Wash vehicles and heavy equipment for fires prior to arrival at a new location to avoid introduction for noxious weeds.

Apply Fuels Management BMPs (see WO IM 2011-138) as appropriate.

Fuels Management Best Management Practices for Sage-Grouse Conservation

1. Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patters which most benefit sage-grouse habitat.

2. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.

3. Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).

4. Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and /or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.

5. Where appropriate, ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (Connelly, et al. 2000).

6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.

7. Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.

8. Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to key and restoration habitats.

9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by sage-grouse key habitats. Annual grasslands are second priority for restoration when the sites not adjacent to key habitat, but within 2 miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites beyond 2 miles of key habitat. The intent is to focus restoration outward from existing, intact habitat.

10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.

11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.

12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch sites for avian predators, as appropriate, and resources permit.

13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.

14. Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.

15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to ail in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

Fire Rehabilitation

Emergency Stabilization and Rehabilitation (ES&R)

Prioritize native seed allocation for use in Greater Sage-Grouse habitat in years when preferred native seed is in short supply. This may require reallocation of native seed from ES&R projects outside of priority Greater Sage-Grouse habitat to those inside it. Use of native plant seeds for ES&R seedings is required based on availability, adaptation (site potential), and probability of success (Richards, et al. 1998). Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet Greater Sage-Grouse habitat conservation objectives (Pyke 2011). Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential, shall be the highest priority for rehabilitation efforts.

Design post-ES&R management to ensure long term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horse and burro, and travel management, etc. to achieve and maintain the desired condition of ES&R projects to benefit Greater Sage-Grouse.

Consider potential changes in climate when proposing post-fire seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed.

Assure that long-term wildfire rehabilitation objectives are consistent with the desired natural plant community.

Revegetate burned sites in Greater Sage-Grouse habitat within one year unless natural recovery of the native plant community is expected. Areas disturbed by heavy equipment will be given priority consideration.

Emphasize native plant species adapted to the site that are readily available and economically and biologically feasible.

Monitor the site and treat for noxious weeds.

Restoration

Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit Greater Sage-Grouse.

Prioritize restoration in seasonal habitats that are thought to be limiting sage-grouse distribution and/or abundance.

Include sage-grouse habitat parameters as defined by Connelly, et al. (2000); Hagen, et al. (2007) or, if available, state sage-grouse conservation plans and appropriate local information in habitat restoration objectives.

Require use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success. Where probability of success or adapted seed availability is low, non-native seeds may be used as long as they support Greater Sage-Grouse habitat objectives.

Design post-restoration management to ensure long term persistence. This could include changes in livestock grazing management, wild horse and burro management and travel management, etc. to achieve and maintain the desired condition of the restoration effort that benefits Greater Sage-Grouse.

Consider potential changes in climate when proposing restoration seedings when using native plants. Consider collection from the warmer component of the species current range when selecting native species.

Restore native plants and create landscape patterns which most benefit Greater Sage-Grouse.

Make re-establishment of sagebrush cover and desirable understory plants (relative to ecological site potential) the highest priority for restoration efforts.

In fire prone areas where sagebrush seed is required for Greater Sage-Grouse habitat restoration, consider establishing seed harvest areas that are managed for seed production and are a priority for protection from outside disturbances.

Map and inventory areas believed to be impacted by conifer expansion. If conifer encroachment is a concern, options for treatment include:

- Prescribed fires when and where feasible,
- Remove trees mechanically when feasible, and
- Apply herbicides when and where feasible.

Evaluate the site potential and desired condition, and develop specific objectives accordingly within specific landscapes.

If sagebrush is lacking:

- Develop and implement grazing practices that influence sagebrush growth,
- Inter-seed historical breeding and winter habitats with the appropriate sagebrush species,
- Identify and promote seed sources for habitat restoration efforts,
- Reclaim and/or re-seed areas disturbed by treatments when necessary, and
- Promote sage plantings, where appropriate, on project areas occurring within Greater Sage-Grouse habitats.

If mature sagebrush dominates with suppressed herbaceous understory:

- Identify areas of dense mature cover that do not appear to be serving as quality habitat and analyze these areas within the context of a larger landscape,
- Design sagebrush treatments to be compatible with Greater Sage-Grouse needs,
- Develop specific objectives for Greater Sage-Grouse in breeding or winter habitats, and
- If treatment is deemed appropriated, interrupt seral stages within the appropriate patch size using the appropriate method, such as brush beating, chaining, chemical means, prescribed fire, etc. that is compatible with local conditions.

If residual understory is lacking in sagebrush stands:

- Manage grazing by domestic livestock and wild herbivores to retain and promote adequate residual cover in all breeding habitats with an emphasis on nesting areas.
- Ensure that grazing allotment plans include objectives for Greater Sage-Grouse in sage-grouse habitats.
- Monitor allotment plans and regulations, and make changes where necessary.
- Include native grasses in all reclamation and restoration activities.

Other Wildlife

Initiate studies to better understand Greater Sage-Grouse mortality rates, the factors that influence these rates and the effectiveness of management actions to change them. These studies should determine the relationships between predation, habitat fragmentation, and habitat condition.

Implement actions to improve the structure and composition of sagebrush communities to meet desired conditions for Greater Sage-Grouse seasonal habitats.

Maintain and restore sagebrush communities where appropriate for Greater Sage-Grouse populations.

Reduce man-made issues and conifer encroachment in Greater Sage-Grouse breeding, nesting, and wintering habitats.

- Reduce the availability of predator “subsidies” such as human-made den sites (nonfunctioning culverts, old foundations, wood piles) and supplemental food sources (garbage dumps, spilled grains, etc.) that contribute to increased predator numbers.
- Placement of power poles should follow prescription detailed in the discussion transmission lines.
- Placement of fences should follow prescriptions detailed in the discussion of grazing management, and
- Treatment of conifer encroachment should be implemented in ways to minimize loss of sagebrush habitats.

General Habitat

Within general habitat mitigation measures and conservation actions will mirror management actions in the selected alternative. Mitigation measures would be applied during activity level planning if an evaluation of the project area indicates the presence of important wildlife species seasonal wildlife habitat or other resource concern. Exceptions may be granted by the authorized officer if an environmental review demonstrates that effects could be mitigated to an acceptable level, habitat for the species is not present, or portions of the area can be occupied without affecting a particular species. Exceptions may also be granted where the short-term effects are mitigated by the long-term benefits (e.g., prescribed fire or forest health treatments).

In addition to actions below and in Chapter 2, best management practices for all resources may be found in Appendix C, and will help form the COAs applied to specific projects. These practices would be implemented at the discretion of the appropriate Field Office on a project-specific basis in general habitat, depending on the specific characteristics of the project area and the types of disturbance being proposed. They may not be appropriate to implement in all cases and in many cases may mirror those for priority habitat. Mitigation of surface-disturbing or disruptive activities would be applied where needed to minimize impacts and could be applied consistent with the oil and gas stipulations outlined in the Fluid Minerals section of Chapter 2. The mitigation would be requirements, procedures, management practices or

design features that the BLM, through issuance of the Record of Decision, would adopt as operational requirements. The BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through consultation with other federal, state, and local regulatory and resource agencies.

Greater Sage-Grouse Leks

Surface-disturbing and disruptive activities would be avoided within 0.6 miles of Greater Sage-Grouse leks.

Greater Sage-Grouse Nesting Habitat

Surface-disturbing or disruptive activities may be restricted or prohibited within 2 miles of active leks.

Prioritize activities based on suitability of habitat; construct projects that are in less suitable habitat (i.e., along existing roadways or within degraded habitats) during the breeding season, and construct projects located in more suitable habitat prior to or after the critical breeding season.

Avoid sagebrush, but if disturbance is necessary, interim reclamation should include sage plantings/seedings and/or the use of minimum disturbance practices to protect sage on well pads, pipelines, and other disturbances.

Manage produced water to reduce the spread of West Nile virus within Greater Sage-Grouse habitat areas.

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Do not issue ROWs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Establish speed limits to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Clean up refuse.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce Greater Sage-Grouse mortality.
- Equip tanks and other above-ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
- Control the spread and effects from non-native plant species. (e.g., by washing vehicles and equipment.)
- Mitigate pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus.

Include restoration objectives to meet Greater Sage-Grouse habitat needs in reclamation practices/sites. Address post-reclamation management in reclamation plans such that goals and objectives are to enhance or restore Greater Sage-Grouse habitat.

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Appendix M
Greater Sage-Grouse

M.2: The Greater Sage-Grouse Monitoring Framework

Developed by the Interagency Greater Sage-Grouse
Disturbance and Monitoring Subteam
May 30, 2014

THE GREATER SAGE-GROUSE MONITORING FRAMEWORK

Bureau of Land Management
U.S. Forest Service

Developed by the Interagency Greater Sage-Grouse Disturbance and Monitoring Subteam

May 30, 2014

The Greater Sage-Grouse Monitoring Framework

Developed by the Interagency Greater Sage-Grouse Disturbance and Monitoring Subteam

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INTRODUCTION

The purpose of this U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS) Greater Sage-Grouse Monitoring Framework (hereafter, monitoring framework) is to describe the methods to monitor habitats and evaluate the implementation and effectiveness of the BLM's national planning strategy (attachment to BLM Instruction Memorandum 2012-044), the BLM resource management plans (RMPs), and the USFS's land management plans (LMPs) to conserve the species and its habitat. The regulations for the BLM (43 CFR 1610.4-9) and the USFS (36 CFR part 209, published July 1, 2010) require that land use plans establish intervals and standards, as appropriate, for monitoring and evaluations based on the sensitivity of the resource to the decisions involved. Therefore, the BLM and the USFS will use the methods described herein to collect monitoring data and to evaluate implementation and effectiveness of the Greater Sage-Grouse (GRSG) (hereafter, sage-grouse) planning strategy and the conservation measures contained in their respective land use plans (LUPs). A monitoring plan specific to the Environmental Impact Statement, land use plan, or field office will be developed after the Record of Decision is signed. For a summary of the frequency of reporting, see Attachment A, An Overview of Monitoring Commitments. Adaptive management will be informed by data collected at any and all scales.

To ensure that the BLM and the USFS are able to make consistent assessments about sage-grouse habitats across the range of the species, this framework lays out the methodology—at multiple scales—for monitoring of implementation and disturbance and for evaluating the effectiveness of BLM and USFS actions to conserve the species and its habitat. Monitoring efforts will include data for measurable quantitative indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions. Implementation monitoring results will allow the BLM and the USFS to evaluate the extent that decisions from their LUPs to conserve sage-grouse and their habitat have been implemented. State fish and wildlife agencies will collect population monitoring information, which will be incorporated into effectiveness monitoring as it is made available.

This multiscale monitoring approach is necessary, as sage-grouse are a landscape species and conservation is scale-dependent to the extent that conservation actions are implemented within seasonal habitats to benefit populations. The four orders of habitat selection (Johnson 1980) used in this monitoring framework are described by Connelly et al. (2003) and were applied specifically to the scales of sage-grouse habitat selection by Stiver et al. (*in press)* as first order (broad scale), second order (mid scale), third order (fine scale), and fourth order (site scale). Habitat selection and habitat use by sage-grouse occur at multiple scales and are driven by multiple environmental and behavioral factors. Managing and monitoring sage-grouse habitats are complicated by the differences in habitat selection across the range and habitat use by individual birds within a given season. Therefore, the tendency to look at a single indicator of habitat suitability or only one scale limits managers' ability to identify the threats to sage-grouse

and to respond at the appropriate scale. For descriptions of these habitat suitability indicators for each scale, see "Sage-Grouse Habitat Assessment Framework: Multiscale Habitat Assessment Tool" (HAF; Stiver et al. *in press*).

Monitoring methods and indicators in this monitoring framework are derived from the current peer-reviewed science. Rangewide, best available datasets for broad- and mid-scale monitoring will be acquired. If these existing datasets are not readily available or are inadequate, but they are necessary to inform the indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions, the BLM and the USFS will strive to develop datasets or obtain information to fill these data gaps. Datasets that are not readily available to inform the fine- and site-scale indicators will be developed. These data will be used to generate monitoring reports at the appropriate and applicable geographic scales, boundaries, and analysis units: across the range of sage-grouse as defined by Schroeder et al. (2004), and clipped by Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) (Stiver et al. 2006) boundaries and other areas as appropriate for size (e.g., populations based on Connelly et al. 2004). (See Figure 1, Map of Greater Sage-Grouse range, populations, subpopulations, and Priority Areas for Conservation as of 2013.) This broad- and mid-scale monitoring data and analysis will provide context for RMP/LMP areas; states; GRSG Priority Habitat, General Habitat, and other sage-grouse designated management areas; and Priority Areas for Conservation (PACs), as defined in "Greater Sage-grouse *(Centrocercus urophasianus)* Conservation Objectives: Final Report" (Conservation Objectives Team [COT] 2013). Hereafter, all of these areas will be referred to as "sage-grouse areas."

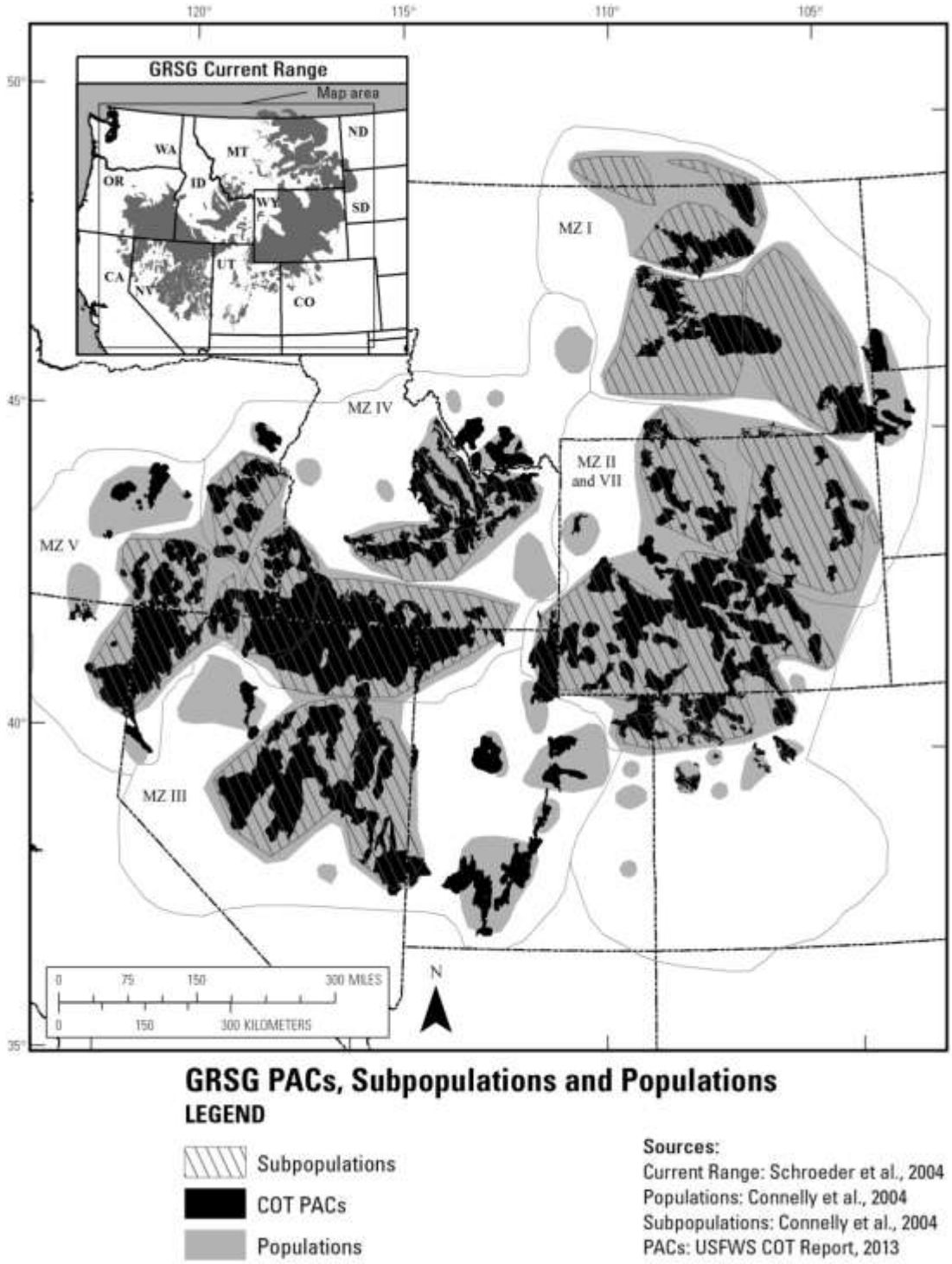

Figure 1. Map of Greater Sage-Grouse range, populations, subpopulations, and Priority Areas for Conservation as of 2013.

This monitoring framework is divided into two sections. The broad- and mid-scale methods, described in Section I, provide a consistent approach across the range of the species to monitor implementation decisions and actions, mid-scale habitat attributes (e.g., sagebrush availability and habitat degradation), and population changes to determine the effectiveness of the planning strategy and management decisions. (See Table 1, Indicators for monitoring implementation of the national planning strategy, RMP/LMP decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid scales.) For sage-grouse habitat at the fine and site scales, described in Section II, this monitoring framework describes a consistent approach (e.g., indicators and methods) for monitoring sage-grouse seasonal habitats. Funding, support, and dedicated personnel for broad- and mid-scale monitoring will be renewed annually through the normal budget process. For an overview of BLM and USFS multiscale monitoring commitments, see Attachment A.

Table 1. Indicators for monitoring implementation of the national planning strategy, RMP/LMP decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid scales.

	Implementation	Habitat		Population (State Wildlife Agencies)
Geographic Scales		Availability	Degradation	Demographics
Broad Scale: From the range of sage-grouse to WAFWA Management Zones	BLM/USFS National planning strategy goal and objectives	Distribution and amount of sagebrush within the range	Distribution and amount of energy, mining, and infrastructure facilities	WAFWA Management Zone population trend
Mid Scale: From WAFWA Management Zone to populations; PACs	RMP/LMP decisions	Mid-scale habitat indicators (HAF; Table 2 herein, e.g., percent of sagebrush per unit area)	Distribution and amount of energy, mining, and infrastructure facilities (Table 2 herein)	Individual population trend

I. BROAD AND MID SCALES

First-order habitat selection, the broad scale, describes the physical or geographical range of a species. The first-order habitat of the sage-grouse is defined by populations of sage-grouse associated with sagebrush landscapes, based on Schroeder et al. 2004, and Connelly et al. 2004, and on population or habitat surveys since 2004. An intermediate scale between the broad and mid scales was delineated by WAFWA from floristic provinces within which similar environmental factors influence vegetation communities. This scale is referred to as the WAFWA Sage-Grouse Management Zones (MZs). Although no indicators are specific to this scale, these MZs are biologically meaningful as reporting units.

Second-order habitat selection, the mid-scale, includes sage-grouse populations and PACs. The second order includes at least 40 discrete populations and subpopulations (Connelly et al. 2004). Populations range in area from 150 to 60,000 mi^2 and are nested within MZs. PACs range from 20 to 20,400 mi^2 and are nested within population areas.

Other mid-scale landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*) will also be assessed. The methods used to calculate these metrics will be derived from existing literature (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011).

A. Implementation (Decision) Monitoring

Implementation monitoring is the process of tracking and documenting the implementation (or the progress toward implementation) of RMP/LMP decisions. The BLM and the USFS will monitor implementation of project-level and/or site-specific actions and authorizations, with their associated conditions of approval/stipulations for sage-grouse, spatially (as appropriate) within Priority Habitat, General Habitat, and other sage-grouse designated management areas, at a minimum, for the planning area. These actions and authorizations, as well as progress toward completing and implementing activity-level plans, will be monitored consistently across all planning units and will be reported to BLM and USFS headquarters annually, with a summary report every 5 years, for the planning area. A national-level GRSG Land Use Plan Decision Monitoring and Reporting Tool is being developed to describe how the BLM and the USFS will consistently and systematically monitor and report implementation-level activity plans and implementation actions for all plans within the range of sage-grouse. A description of this tool for collection and reporting of tabular and spatially explicit data will be included in the Record of Decision or approved plan. The BLM and the USFS will provide data that can be integrated with other conservation efforts conducted by state and federal partners.

B. Habitat Monitoring

The U.S. Fish and Wildlife Service (USFWS), in its 2010 listing decision for the sage-grouse, identified 18 threats contributing to the destruction, modification, or curtailment of sage-grouse habitat or range (75 FR 13910 2010). The BLM and the USFS will, therefore, monitor the relative extent of these threats that remove sagebrush, both spatially and temporally, on all lands within an analysis area, and will report on amount, pattern, and condition at the appropriate and applicable geographic scales and boundaries. These 18 threats have been aggregated into three broad- and mid-scale measures to account for whether the threat predominantly removes sagebrush or degrades habitat. (See Table 2, Relationship between the 18 threats and the three habitat disturbance measures for monitoring.) The three measures are:

Measure 1: Sagebrush Availability (percent of sagebrush per unit area)

Measure 2: Habitat Degradation (percent of human activity per unit area)

Measure 3: Energy and Mining Density (facilities and locations per unit area)

These three habitat disturbance measures will evaluate disturbance on all lands, regardless of land ownership. The direct area of influence will be assessed with the goal of accounting for actual removal of sagebrush on which sage-grouse depend (Connelly et al. 2000) and for habitat degradation as a surrogate for human activity. Measure 1 (sagebrush availability) examines where disturbances have removed plant communities that support sagebrush (or have broadly removed sagebrush from the landscape). Measure 1, therefore, monitors the change in sagebrush availability—or, specifically, where and how much of the sagebrush community is available within the range of sage-grouse. The sagebrush community is defined as the ecological systems that have the capability of supporting sagebrush vegetation and seasonal sage-grouse habitats within the range of sage-grouse (see Section I.B.1., Sagebrush Availability). Measure 2 (see Section I.B.2., Habitat Degradation Monitoring) and Measure 3 (see Section I.B.3., Energy and Mining Density) focus on where habitat degradation is occurring by using the footprint/area of direct disturbance and the number of facilities at the mid scale to identify the relative amount of degradation per geographic area of interest and in areas that have the capability of supporting sagebrush and seasonal sage-grouse use. Measure 2 (habitat degradation) not only quantifies footprint/area of direct disturbance but also establishes a surrogate for those threats most likely to have ongoing activity. Because energy development and mining activities are typically the most intensive activities in sagebrush habitat, Measure 3 (the density of active energy development, production, and mining sites) will help identify areas of particular concern for such factors as noise, dust, traffic, etc. that degrade sage-grouse habitat.

Table 2. Relationship between the 18 threats and the three habitat disturbance measures for monitoring**.**

Note: Data availability may preclude specific analysis of individual layers. See the detailed methodology for more information.

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

The methods to monitor disturbance found herein differ slightly from methods used in Manier et al. 2013, which provided a baseline environmental report (BER) of datasets of disturbance across jurisdictions. One difference is that, for some threats, the BER data were for federal lands only. In addition, threats were assessed individually, using different assumptions from those in this monitoring framework about how to quantify the location and magnitude of threats. The methodology herein builds on the BER methodology and identifies datasets and procedures to use the best available data across the range of the sage-grouse and to formulate a consistent approach to quantify impact of the threats through time. This methodology also describes an approach to combine the threats and calculate each of the three habitat disturbance measures.

B.1. Sagebrush Availability (Measure 1)

Sage-grouse populations have been found to be more resilient where a percentage of the landscape is maintained in sagebrush (Knick and Connelly 2011), which will be determined by sagebrush availability. Measure 1 has been divided into two submeasures to describe sagebrush availability on the landscape:

> Measure 1a: the current amount of sagebrush on the geographic area of interest, and
>
> Measure 1b: the amount of sagebrush on the geographic area of interest compared with the amount of sagebrush the landscape of interest could ecologically support.

Measure 1a (the current amount of sagebrush on the landscape) will be calculated using this formula: [the existing updated sagebrush layer] divided by [the geographic area of interest]. The appropriate geographic areas of interest for sagebrush availability include the species' range, WAFWA MZs, populations, and PACs. In some cases these sage-grouse areas will need to be aggregated to provide an estimate of sagebrush availability with an acceptable level of accuracy.

Measure 1b (the amount of sagebrush for context within the geographic area of interest) will be calculated using this formula: [existing sagebrush divided by [pre-EuroAmerican settlement geographic extent of lands that could have supported sagebrush]. This measure will provide information to set the context for a given geographic area of interest during evaluations of monitoring data. The information could also be used to inform management options for restoration or mitigation and to inform effectiveness monitoring.

The sagebrush base layer for Measure 1 will be based on geospatial vegetation data adjusted for the threats listed in Table 2. The following subsections of this monitoring framework describe the methodology for determining both the current availability of sagebrush on the landscape and the context of the amount of sagebrush on the landscape at the broad and mid scales.

a. Establishing the Sagebrush Base Layer

The current geographic extent of sagebrush vegetation within the rangewide distribution of sage-grouse populations will be ascertained using the most recent version of the Existing Vegetation Type (EVT) layer in LANDFIRE (2013). LANDFIRE EVT was selected to serve as the sagebrush base layer for five reasons: 1) it is the only nationally consistent vegetation layer that has been updated multiple times since 2001; 2) the ecological systems classification within LANDFIRE EVT includes multiple sagebrush type classes that, when aggregated, provide a more accurate (compared with individual classes) and seamless sagebrush base layer across jurisdictional boundaries; 3) LANDFIRE performed a rigorous accuracy assessment from which to derive the rangewide uncertainty of the sagebrush base layer; 4) LANDFIRE is consistently used in several recent analyses of sagebrush habitats (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011); and 5) LANDFIRE EVT can be compared against the geographic extent of lands that are believed to have had the capability of supporting sagebrush vegetation pre-EuroAmerican settlement [LANDFIRE Biophysical Setting (BpS)]. This fifth reason provides a reference point for understanding how much sagebrush currently remains in a defined geographic area of interest compared with how much sagebrush existed historically (Measure 1b). Therefore, the BLM and the USFS have determined that LANDFIRE provides the best available data at broad and mid scales to serve as a sagebrush base layer for monitoring changes in the geographic extent of sagebrush. The BLM and the USFS, in addition to aggregating the sagebrush types into the sagebrush base layer, will aggregate the accuracy assessment reports from LANDFIRE to document the cumulative accuracy for the sagebrush base layer. The BLM—through its Assessment, Inventory, and Monitoring (AIM) program and, specifically, the BLM's landscape monitoring framework (Taylor et al. 2014)—will provide field data to the LANDFIRE program to support continuous quality improvements of the LANDFIRE EVT layer. The sagebrush layer based on LANDFIRE EVT will allow for the mid-scale estimation of the existing percent of sagebrush across a variety of reporting units. This sagebrush base layer will be adjusted by changes in land cover and successful restoration for future calculations of sagebrush availability (Measures 1a and 1b).

This layer will also be used to determine the trend in other landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*). In the future, changes in sagebrush availability, generated annually, will be included in the sagebrush base layer. The landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. This information will be included in effectiveness monitoring (See Section I.D., Effectiveness Monitoring).

Within the USFS and the BLM, forest-wide and field office–wide existing vegetation classification mapping and inventories are available that provide a much finer level of data than what is provided through LANDFIRE. Where available, these finer-scale products will be useful for additional and complementary mid-scale indicators and local-scale analyses (see Section II,

Fine and Site Scales). The fact that these products are not available everywhere limits their utility for monitoring at the broad and mid scale, where consistency of data products is necessary across broader geographies.

Data Sources for Establishing and Monitoring Sagebrush Availability

There were three criteria for selecting the datasets for establishing and monitoring the change in sagebrush availability (Measure 1):

- Nationally consistent dataset available across the range
- Known level of confidence or accuracy in the dataset
- Continual maintenance of dataset and known update interval

Datasets meeting these criteria are listed in Table 3, Datasets for establishing and monitoring changes in sagebrush availability.

LANDFIRE Existing Vegetation Type (EVT) Version 1.2

LANDFIRE EVT represents existing vegetation types on the landscape derived from remote sensing data. Initial mapping was conducted using imagery collected in approximately 2001. Since the initial mapping there have been two update efforts: version 1.1 represents changes before 2008, and version 1.2 reflects changes on the landscape before 2010. Version 1.2 will be used as the starting point to develop the sagebrush base layer.

Sage-grouse subject matter experts determined which of the ecological systems from the LANDFIRE EVT to use in the sagebrush base layer by identifying the ecological systems that have the capability of supporting sagebrush vegetation and that could provide suitable seasonal habitat for the sage-grouse. (See Table 4, Ecological systems in BpS and EVT capable of supporting sagebrush vegetation and capable of providing suitable seasonal habitat for Greater Sage-Grouse.) Two additional vegetation types that are not ecological systems were added to the EVT: *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance. These alliances have species composition directly related to the Rocky Mountain Lower Montane-Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system, both of which are ecological systems in LANDFIRE BpS. In LANDFIRE EVT, however, in some map zones, the Rocky Mountain Lower Montane-Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system were named *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance, respectively.

Table 3. Datasets for establishing and monitoring changes in sagebrush availability.

Dataset	Source	Update Interval	Most Recent Version Year	Use
BioPhysical Setting v1.1	LANDFIRE	Static	2008	Denominator for sagebrush availability
Existing Vegetation Type v1.2	LANDFIRE	Static	2010	Numerator for sagebrush availability
Cropland Data Layer	National Agricultural Statistics Service	Annual	2012	Agricultural updates; removes existing sagebrush from numerator of sagebrush availability
National Land Cover Dataset Percent Imperviousness	Multi-Resolution Land Characteristics Consortium (MRLC)	5-Year	2011 (next available in 2016)	Urban area updates; removes existing sagebrush from numerator of sagebrush availability
Fire Perimeters	GeoMac	Annual	2013	< 1,000-acre fire updates; removes existing sagebrush from numerator of sagebrush availability
Burn Severity	Monitoring Trends in Burn Severity	Annual	2012 (2-year delay in data availability)	> 1,000-acre fire updates; removes existing sagebrush from numerator of sagebrush availability except for unburned sagebrush islands

Table 4. Ecological systems in BpS and EVT capable of supporting sagebrush vegetation and capable of providing suitable seasonal habitat for Greater Sage-Grouse.

Ecological System	Sagebrush Vegetation that the Ecological System has the Capability of Producing
Colorado Plateau Mixed Low Sagebrush Shrubland	*Artemisia arbuscula* ssp. *longiloba* *Artemisia bigelovii* *Artemisia nova* *Artemisia frigida* *Artemisia tridentata* ssp. *wyomingensis*
Columbia Plateau Low Sagebrush Steppe	*Artemisia arbuscula* *Artemisia arbuscula* ssp. *longiloba* *Artemisia nova*

Columbia Plateau Scabland Shrubland	*Artemisia rigida*
Columbia Plateau Steppe and Grassland	*Artemisia* spp.
Great Basin Xeric Mixed Sagebrush Shrubland	*Artemisia arbuscula* ssp. *longicaulis* *Artemisia arbuscula* ssp. *longiloba* *Artemisia nova* *Artemisia tridentata* ssp. *wyomingensis*
Inter-Mountain Basins Big Sagebrush Shrubland	*Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *xericensis* *Artemisia tridentata* ssp. *vaseyana* *Artemisia tridentata* ssp. *wyomingensis*
Inter-Mountain Basins Big Sagebrush Steppe	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *xericensis* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tripartita* ssp. *tripartita* *Artemisia frigida*
Inter-Mountain Basins Curl-Leaf Mountain Mahogany Woodland and Shrubland	*Artemisia tridentata* ssp. *vaseyana* *Artemisia arbuscula* *Artemisia tridentata*
Inter-Mountain Basins Mixed Salt Desert Scrub	*Artemisia tridentata* ssp. *wyomingensis* *Artemisia spinescens*
Inter-Mountain Basins Montane Sagebrush Steppe	*Artemisia tridentata* ssp. *vaseyana* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia nova* *Artemisia arbuscula* *Artemisia tridentata* ssp. *spiciformis*
Inter-Mountain Basins Semi-Desert Shrub-Steppe	*Artemisia tridentata* *Artemisia bigelovii* *Artemisia tridentata* ssp. *wyomingensis*
Northwestern Great Plains Mixed Grass Prairie	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *vaseyana* *Artemisia frigida*
Northwestern Great Plains Shrubland	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *wyomingensis*
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	*Artemisia tridentata*
Rocky Mountain Lower Montane-Foothill Shrubland	*Artemisia nova* *Artemisia tridentata* *Artemisia frigida*
Western Great Plains Floodplain Systems	*Artemisia cana* ssp. *cana*
Western Great Plains Sand Prairie	*Artemisia cana* ssp. *cana*
Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	*Artemisia arbuscula* ssp. *longiloba* *Artemisia nova* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tripartita* ssp. *rupicola*
Artemisia tridentata ssp. *vaseyana* Shrubland Alliance (EVT only)	*Artemisia tridentata* ssp. *vaseyana*
Quercus gambelii Shrubland Alliance (EVT only)	*Artemisia tridentata*

Accuracy and Appropriate Use of LANDFIRE Datasets

Because of concerns over the thematic accuracy of individual classes mapped by LANDFIRE, all ecological systems listed in Table 4 will be merged into one value that represents the sagebrush base layer. With all ecological systems aggregated, the combined accuracy of the sagebrush base layer (EVT) will be much greater than if all categories were treated separately.

LANDFIRE performed the original accuracy assessment of its EVT product on a map zone basis. There are 20 LANDFIRE map zones that cover the historical range of sage-grouse as defined by Schroeder (2004). (See Attachment B, User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones.) The aggregated sagebrush base layer for monitoring had user accuracies ranging from 57.1% to 85.7% and producer accuracies ranging from 56.7% to 100%.

LANDFIRE EVT data are not designed to be used at a local level. In reports of the percent sagebrush statistic for the various reporting units (Measure 1a), the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the 30m pixel level (900m^2 resolution of raster data) for any reporting. The smallest geographic extent for using the data to determine percent sagebrush is at the PAC level; for the smallest PACs, the initial percent sagebrush estimate will have greater uncertainties compared with the much larger PACs.

Agricultural Adjustments for the Sagebrush Base Layer

The dataset for the geographic extent of agricultural lands will come from the National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL) (http://www.nass.usda.gov/research/Cropland/Release/index.htm). CDL data are generated annually, with estimated producer accuracies for "large area row crops ranging from the mid 80% to mid-90%," depending on the state (http://www.nass.usda.gov/research/Cropland/sarsfaqs2.htm#Section3_18.0). Specific information on accuracy may be found on the NASS metadata website (http://www.nass.usda.gov/research/Cropland/metadata/meta.htm). CDL provided the only dataset that matches the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in this monitoring framework and represents the best available agricultural lands mapping product.

The CDL data contain both agricultural classes and nonagricultural classes. For this effort, and in the baseline environmental report (Manier et al. 2013), nonagricultural classes were removed from the original dataset. The excluded classes are:

> Barren (65 & 131), Deciduous Forest (141), Developed/High Intensity (124), Developed/Low Intensity (122), Developed/Med Intensity (123), Developed/Open Space (121), Evergreen Forest (142), Grassland Herbaceous (171), Herbaceous Wetlands (195), Mixed Forest (143), Open

Water (83 & 111), Other Hay/Non Alfalfa (37), Pasture/Hay (181), Pasture/Grass (62), Perennial Ice/Snow (112), Shrubland (64 & 152), Woody Wetlands (190).

The rule set for adjusting the sagebrush base layer for agricultural lands (and for updating the base layer for agricultural lands in the future) is that once an area is classified as agriculture in any year of the CDL, those pixels will remain out of the sagebrush base layer even if a new version of the CDL classifies that pixel as one of the nonagricultural classes listed above. The assumption is that even though individual pixels may be classified as a nonagricultural class in any given year, the pixel has not necessarily been restored to a natural sagebrush community that would be included in Table 4. A further assumption is that once an area has moved into agricultural use, it is unlikely that the area would be restored to sagebrush. Should that occur, however, the method and criteria for adding pixels back into the sagebrush base layer would follow those found in the sagebrush restoration monitoring section of this monitoring framework (see Section I.B.1.b., Monitoring Sagebrush Availability).

Urban Adjustments for the Sagebrush Base Layer

The National Land Cover Database (NLCD) (Fry et al. 2011) includes a percent imperviousness dataset that was selected as the best available dataset to be used for urban adjustments and monitoring. These data are generated on a 5-year cycle and are specifically designed to support monitoring efforts. Other datasets were evaluated and lacked the spatial specificity that was captured in the NLCD product. Any new impervious pixel in NLCD will be removed from the sagebrush base layer through the monitoring process. Although the impervious surface layer includes a number of impervious pixels outside of urban areas, this is acceptable for the adjustment and monitoring for two reasons. First, an evaluation of national urban area datasets did not reveal a layer that could be confidently used in conjunction with the NLCD product to screen impervious pixels outside of urban zones. This is because unincorporated urban areas were not being included, thus leaving large chunks of urban pixels unaccounted for in this rule set. Second, experimentation with setting a threshold on the percent imperviousness layer that would isolate rural features proved to be unsuccessful. No combination of values could be identified that would result in the consistent ability to limit impervious pixels outside urban areas. Therefore, to ensure consistency in the monitoring estimates, all impervious pixels will be used.

Fire Adjustments for the Sagebrush Base Layer

Two datasets were selected for performing fire adjustments and updates: GeoMac fire perimeters and Monitoring Trends in Burn Severity (MTBS). An existing data standard in the BLM requires that all fires of more than 10 acres are to be reported to GeoMac; therefore, there will be many small fires of less than 10 acres that will not be accounted for in the adjustment and monitoring attributable to fire. Using fire perimeters from GeoMac, all sagebrush pixels falling

within the perimeter of fires less than 1,000 acres will be used to adjust and monitor the sagebrush base layer.

For fires greater than 1,000 acres, MTBS was selected as a means to account for unburned sagebrush islands during the update process of the sagebrush base layer. The MTBS program (http://www.mtbs.gov) is an ongoing, multiyear project to map fire severity and fire perimeters consistently across the United States. One of the burn severity classes within MTBS is an unburned to low-severity class. This burn severity class will be used to represent unburned islands of sagebrush within the fire perimeter for the sagebrush base layer. Areas within the other severity classes within the fire perimeter will be removed from the base sagebrush layer during the update process. Not all wildfires, however, have the same impacts on the recovery of sagebrush habitat, depending largely on soil moisture and temperature regimes. For example, cooler, moister sagebrush habitat has a higher potential for recovery or, if needed, restoration than does the warmer, dryer sagebrush habitat. These cooler, moister areas will likely be detected as sagebrush in future updates to LANDFIRE.

Conifer Encroachment Adjustment for the Sagebrush Base Layer

Conifer encroachment into sagebrush vegetation reduces the spatial extent of sage-grouse habitat (Davies et al. 2011, Baruch-Mordo et al. 2013). Conifer species that show propensity for encroaching into sagebrush vegetation resulting in sage-grouse habitat loss include various juniper species, such as Utah juniper *(Juniperus osteosperma)*, western juniper *(Juniperus occidentalis)*, Rocky Mountain juniper *(Juniperus scopulorum)*, pinyon species, including singleleaf pinyon *(Pinus monophylla)* and pinyon pine *(Pinus edulis)*, ponderosa pine *(Pinus ponderosa)*, lodgepole pine *(Pinus contorta)*, and Douglas fir *(Pseudotsuga menziesii)* (Gruell et al. 1986, Grove et al. 2005, Davies et al. 2011).

A rule set for conifer encroachment was developed to adjust the sagebrush base layer. To capture the geographic extent of sagebrush that is likely to experience conifer encroachment, ecological systems within LANDFIRE EVT version 1.2 (NatureServe 2011) were identified if they had the capability of supporting both the conifer species (listed above) and sagebrush vegetation. Those ecological systems were deemed to be the plant communities with conifers most likely to encroach into sagebrush vegetation. (See Table 5, Ecological systems with conifers most likely to encroach into sagebrush vegetation.) Sagebrush vegetation was defined as including sagebrush species or subspecies that provide habitat for the Greater Sage-Grouse and that are included in the HAF. (See Attachment C, Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers.) An adjacency analysis was conducted to identify all sagebrush pixels that were directly adjacent to these conifer ecological systems, and these pixels were removed from the sagebrush base layer.

Table 5. Ecological systems with conifers most likely to encroach into sagebrush vegetation.

EVT Ecological Systems	Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability of Producing
Colorado Plateau Pinyon-Juniper Woodland	*Pinus edulis* *Juniperus osteosperma* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia nova* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tridentata* ssp. *vaseyana* *Artemisia bigelovii* *Artemisia pygmaea*
Columbia Plateau Western Juniper Woodland and Savanna	*Juniperus occidentalis* *Pinus ponderosa* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia rigida* *Artemisia tridentata* ssp. *vaseyana*
East Cascades Oak-Ponderosa Pine Forest and Woodland	*Pinus ponderosa* *Pseudotsuga menziesii* *Artemisia tridentata* *Artemisia nova*
Great Basin Pinyon-Juniper Woodland	*Pinus monophylla* *Juniperus osteosperma* *Artemisia arbuscula* *Artemisia nova* *Artemisia tridentata* *Artemisia tridentata* ssp. *vaseyana*
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	*Pinus ponderosa* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia tridentata* ssp. *vaseyana*
Rocky Mountain Foothill Limber Pine-Juniper Woodland	*Juniperus osteosperma* *Juniperus scopulorum* *Artemisia nova* *Artemisia tridentata*
Rocky Mountain Poor-Site Lodgepole Pine Forest	*Pinus contorta* *Pseudotsuga menziesii* *Pinus ponderosa* *Artemisia tridentata*
Southern Rocky Mountain Pinyon-Juniper Woodland	*Pinus edulis* *Juniperus monosperma* *Artemisia bigelovii* *Artemisia tridentata* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tridentata* ssp. *vaseyana*
Southern Rocky Mountain Ponderosa Pine Woodland	*Pinus ponderosa* *Pseudotsuga menziesii*

	Pinus edulis *Pinus contorta* *Juniperus* spp. *Artemisia nova* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia tridentata* ssp. *vaseyana*

Invasive Annual Grasses Adjustments for the Sagebrush Base Layer

There are no invasive species datasets from 2010 to the present (beyond the LANDFIRE data) that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in the determination of the sagebrush base layer. For a description of how invasive species land cover will be incorporated in the sagebrush base layer in the future, see Section I.B.1.b., Monitoring Sagebrush Availability.

Sagebrush Restoration Adjustments for the Sagebrush Base Layer

There are no datasets from 2010 to the present that could provide additions to the sagebrush base layer from restoration treatments that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated); therefore, no adjustments were made to the sagebrush base layer calculated from the LANDFIRE EVT (version 1.2) attributable to restoration activities since 2010. Successful restoration treatments before 2010 are assumed to have been captured in the LANDFIRE refresh.

b. Monitoring Sagebrush Availability

Monitoring Sagebrush Availability

Sagebrush availability will be updated annually by incorporating changes to the sagebrush base layer attributable to agriculture, urbanization, and wildfire. The monitoring schedule for the existing sagebrush base layer updates is as follows:

> ***2010 Existing Sagebrush Base Layer*** = [Sagebrush EVT] minus [2006 Imperviousness Layer] minus [2009 and 2010 CDL] minus [2009/10 GeoMac Fires that are less than 1,000 acres] minus [2009/10 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter] minus [Conifer Encroachment Layer]
>
> ***2012 Existing Sagebrush Update*** = [2010 Existing Sagebrush Base Layer] minus [2011 Imperviousness Layer] minus [2011 and 2012 CDL] minus [2011/12 GeoMac Fires < 1,000 acres] minus [2011/12 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter]
>
> ***Monitoring Existing Sagebrush post 2012*** = [Previous Existing Sagebrush Update Layer] minus [Imperviousness Layer (if new data are available)] minus [Next 2 years of CDL] minus [Next 2 years of GeoMac Fires < 1,000 acres] minus [Next 2 years of MTBS Fires that are greater than

1,000 acres, excluding unburned sagebrush islands within the perimeter] plus [restoration/monitoring data provided by the field]

Monitoring Sagebrush Restoration

Restoration after fire, after agricultural conversion, after seedings of introduced grasses, or after treatments of pinyon pine and/or juniper are examples of updates to the sagebrush base layer that can add sagebrush vegetation back into sagebrush availability in the landscape. When restoration has been determined to be successful through rangewide, consistent, interagency fine- and site-scale monitoring, the polygonal data will be used to add sagebrush pixels back into the broad- and mid-scale sagebrush base layer.

Measure 1b: Context for Monitoring the Amount of Sagebrush in a Geographic Area of Interest

Measure 1b describes the amount of sagebrush on the landscape of interest compared with the amount of sagebrush the landscape of interest could ecologically support. Areas with the potential to support sagebrush were derived from the BpS data layer that describes sagebrush pre-EuroAmerican settlement (v1.2 of LANDFIRE).

The identification and spatial locations of natural plant communities (vegetation) that are believed to have existed on the landscape (BpS) were constructed based on an approximation of the historical (pre-EuroAmerican settlement) disturbance regime and how the historical disturbance regime operated on the current biophysical environment. BpS is composed of map units that are based on NatureServe (2011) terrestrial ecological systems classification.

The ecological systems within BpS used for this monitoring framework are those ecological systems that are capable of supporting sagebrush vegetation and of providing seasonal habitat for sage-grouse (Table 4). Ecological systems selected included sagebrush species or subspecies that are included in the HAF and listed in Attachment C.

The BpS layer does not have an associated accuracy assessment, given the lack of any reference data. Visual inspection of the BpS data, however, reveals inconsistencies in the labeling of pixels among LANDFIRE map zones. The reason for these inconsistencies is that the rule sets used to map a given ecological system will vary among map zones based on different physical, biological, disturbance, and atmospheric regimes of the region. These variances can result in artificial edges in the map. Metrics will be calculated, however, at broad spatial scales using BpS potential vegetation type, not small groupings or individual pixels. Therefore, the magnitude of these observable errors in the BpS layer will be minor compared with the size of the reporting units. Since BpS will be used to identify broad landscape patterns of dominant vegetation, these inconsistencies will have only a minor impact on the percent sagebrush availability calculation. *As with the LANDFIRE EVT, LANDFIRE BpS data are not designed to be used at a local level*. LANDFIRE data should never be used at the 30m pixel level for reporting.

In conclusion, sagebrush availability data will be used to inform effectiveness monitoring and initiate adaptive management actions as necessary. The 2010 estimate of sagebrush availability will serve as the base year, and an updated estimate for 2012 will be reported in 2014 after all datasets become available. The 2012 estimate will capture changes attributable to wildfire, agriculture, and urban development. Subsequent updates will always include new fire and agricultural data and new urban data when available. Restoration data that meet the criteria for adding sagebrush areas back into the sagebrush base layer will be factored in as data allow. Given data availability, there will be a 2-year lag (approximately) between when the estimate is generated and when the data used for the estimate become available (e.g., the 2014 sagebrush availability will be included in the 2016 estimate).

Future Plans

Geospatial data used to generate the sagebrush base layer will be available through the BLM's EGIS web portal and geospatial gateway or through the authoritative data source. Legacy datasets will be preserved so that trends may be calculated. Additionally, accuracy assessment data for all source datasets will be provided on the portal either spatially, where applicable, or through the metadata. Accuracy assessment information was deemed vital to help users understand the limitation of the sagebrush estimates; it will be summarized spatially by map zone and will be included in the portal.

LANDFIRE plans to begin a remapping effort in 2015. This remapping has the potential to improve the overall quality of data products greatly, primarily through the use of higher-quality remote sensing datasets. Additionally, the BLM and the Multi-Resolution Land Characteristics Consortium (MRLC) are working to improve the accuracy of vegetation map products for broad- and mid-scale analyses through the Grass/Shrub mapping effort. The Grass/Shrub mapping effort applies the Wyoming multiscale sagebrush habitat methodology (Homer et al. 2009) to depict spatially the fractional percent cover estimates for five components rangewide and West-wide. These five components are percent cover of sagebrush vegetation, percent bare ground, percent herbaceous vegetation (grass and forbs combined), annual vegetation, and percent shrubs. A benefit of the design of these fractional cover maps is that they facilitate monitoring "within" class variation (e.g., examination of declining trend in sagebrush cover for individual pixels). This "within" class variation can serve as one indicator of sagebrush quality that cannot be derived from LANDFIRE's EVT information. The Grass/Shrub mapping effort is not a substitute for fine-scale monitoring but will leverage fine-scale data to support the validation of the mapping products. An evaluation will be conducted to determine if either dataset is of great enough quality to warrant replacing the existing sagebrush layers. At the earliest, this evaluation will occur in 2018 or 2019, depending on data availability.

B.2. Habitat Degradation Monitoring (Measure 2)

The measure of habitat degradation will be calculated by combining the footprints of threats identified in Table 2. The footprint is defined as the direct area of influence of "active" energy and infrastructure; it is used as a surrogate for human activity. Although these analyses will try to summarize results at the aforementioned meaningful geographic areas of interest, some may be too small to report the metrics appropriately and may be combined (smaller populations, PACs within a population, etc.). Data sources for each threat are found in Table 6, Geospatial data sources for habitat degradation. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and to calculate trends in habitat degradation to inform adaptive management. A 5-year summary report will be provided to the USFWS.

a. Habitat Degradation Datasets and Assumptions

Energy (oil and gas wells and development facilities)

This dataset will compile information from three oil and gas databases: the proprietary IHS Enerdeq database, the BLM Automated Fluid Minerals Support System (AFMSS) database, and the proprietary Platts (a McGraw-Hill Financial Company) GIS Custom Data (hereafter, Platts) database of power plants. Point data from wells active within the last 10 years from IHS and producing wells from AFMSS will be considered as a 5-acre (2.0ha) direct area of influence centered on the well point, as recommended by the BLM WO-300 (Minerals and Realty Management). Plugged and abandoned wells will be removed if the date of well abandonment was before the first day of the reporting year (i.e., for the 2015 reporting year, a well must have been plugged and abandoned by 12/31/2014 to be removed). Platts oil and gas power plants data (subset to operational power plants) will also be included as a 5-acre (2.0ha) direct area of influence.

> ***Additional Measure: Reclaimed Energy-related Degradation.*** This dataset will include those wells that have been plugged and abandoned. This measure thereby attempts to measure energy-related degradation that has been reclaimed but not necessarily fully restored to sage-grouse habitat. This measure will establish a baseline by using wells that have been plugged and abandoned within the last 10 years from the IHS and AFMSS datasets. Time lags for lek attendance in response to infrastructure have been documented to be delayed 2–10 years from energy development activities (Harju et al. 2010). Reclamation actions may require 2 or more years from the Final Abandonment Notice. Sagebrush seedling establishment may take 6 or more years from the point of seeding, depending on such variables as annual precipitation, annual temperature, and soil type and depth (Pyke 2011). This 10-year period is conservative and assumes some level of habitat improvement 10 years after plugging. Research by Hemstrom et al. (2002), however,

proposes an even longer period—more than 100 years—for recovery of sagebrush habitats, even with active restoration approaches. Direct area of influence will be considered 3 acres (1.2ha) (J. Perry, personal communication, February 12, 2014). This additional layer/measure could be used at the broad and mid scale to identify areas where sagebrush habitat and/or potential sagebrush habitat is likely still degraded. This layer/measure could also be used where further investigation at the fine or site scale would be warranted to: 1) quantify the level of reclamation already conducted, and 2) evaluate the amount of restoration still required for sagebrush habitat recovery. At a particular level (e.g., population, PACs), these areas and the reclamation efforts/success could be used to inform reclamation standards associated with future developments. Once these areas have transitioned from reclamation standards to meeting *restoration* standards, they can be added back into the sagebrush availability layer using the same methodology as described for adding restoration treatment areas lost to wildfire and agriculture conversion (see Monitoring Sagebrush Restoration in Section I.B.1.b., Monitoring Sagebrush Availability). This dataset will be updated annually from the IHS dataset.

Energy (coal mines)

Currently, there is no comprehensive dataset available that identifies the footprint of active coal mining across all jurisdictions. Therefore, point and polygon datasets will be used each year to identify coal mining locations. Data sources will be identified and evaluated annually and will include at a minimum: BLM coal lease polygons, U.S. Energy Information Administration mine occurrence points, U.S. Office of Surface Mining Reclamation and Enforcement coal mining permit polygons (as available), and U.S. Geological Survey (USGS) Mineral Resources Data System mine occurrence points. These data will inform where active coal mining may be occurring. Additionally, coal power plant data from Platts power plants database (subset to operational power plants) will be included. Aerial imagery will then be used to digitize manually the active coal mining and coal power plants surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active coal mine and power plant direct area of influence. Coal mine location data source and imagery date will be documented for each digitized coal polygon at the time of creation. Subsurface facility locations (polygon or point location as available) will also be collected if available, included in density calculations, and added to the active surface activity layer as appropriate (if an actual direct area of influence can be located).

Energy (wind energy facilities)

This dataset will be a subset of the Federal Aviation Administration (FAA) Digital Obstacles point file. Points where “Type_” = “WINDMILL” will be included. Direct area of influence of these point features will be measured by converting to a polygon dataset as a direct area of

influence of 3 acres (1.2ha) centered on each tower point. See the BLM's "Wind Energy Development Programmatic Environmental Impact Statement" (BLM 2005). Additionally, Platts power plants database will be used for transformer stations associated with wind energy sites (subset to operational power plants), also with a 3-acre (1.2ha) direct area of influence.

Energy (solar energy facilities)

This dataset will include solar plants as compiled with the Platts power plants database (subset to operational power plants). This database includes an attribute that indicates the operational capacity of each solar power plant. Total capacity at the power plant was based on ratings of the in-service unit(s), in megawatts. Direct area of influence polygons will be centered over each point feature representing 7.3ac (3.0ha) per megawatt of the stated operational capacity, per the report of the National Renewable Energy Laboratory (NREL), "Land-Use Requirements for Solar Power Plants in the United States" (Ong et al. 2013).

Energy (geothermal energy facilities)

This dataset will include geothermal wells in existence or under construction as compiled with the IHS wells database and power plants as compiled with the Platts database (subset to operational power plants). Direct area of influence of these point features will be measured by converting to a polygon dataset of 3 acres (1.2ha) centered on each well or power plant point.

Mining (active developments; locatable, leasable, saleable)

This dataset will include active locatable mining locations as compiled with the proprietary InfoMine database. Aerial imagery will then be used to digitize manually the active mining surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active mine direct area of influence. Mine location data source and imagery date will be documented for each digitized polygon at the time of creation. Currently, there are no known compressive databases available for leasable or saleable mining sites beyond coal mines. Other data sources will be evaluated and used as they are identified or as they become available. Point data may be converted to polygons to represent direct area of influence unless actual surface disturbance is available.

Infrastructure (roads)

This dataset will be compiled from the proprietary Esri StreetMap Premium for ArcGIS. Dataset features that will be used are: Interstate Highways, Major Roads, and Surface Streets to capture most paved and "crowned and ditched" roads while not including "two-track" and 4-wheel-drive routes. These minor roads, while not included in the broad- and mid-scale monitoring, may support a volume of traffic that can have deleterious effects on sage-grouse leks. It may be

appropriate to consider the frequency and type of use of roads in a NEPA analysis for a proposed project. This fine- and site-scale analysis will require more site-specific data than is identified in this monitoring framework. The direct area of influence for roads will be represented by 240.2ft, 84.0ft, and 40.7ft (73.2m, 25.6m, and 12.4m) total widths centered on the line feature for Interstate Highways, Major Roads, and Surface Streets, respectively (Knick et al. 2011). The most current dataset will be used for each monitoring update. *Note: This is a related but different dataset than what was used in BER (Manier et al. 2013). Individual BLM/USFS planning units may use different road layers for fine- and site-scale monitoring.*

Infrastructure (railroads)

This dataset will be a compilation from the Federal Railroad Administration Rail Lines of the USA dataset. Non-abandoned rail lines will be used; abandoned rail lines will not be used. The direct are of influence for railroads will be represented by a 30.8ft (9.4m) total width (Knick et al. 2011) centered on the non-abandoned railroad line feature.

Infrastructure (power lines)

This line dataset will be derived from the proprietary Platts transmission lines database. Linear features in the dataset attributed as "buried" will be removed from the disturbance calculation. Only "In Service" lines will be used; "Proposed" lines will not be used. Direct area of influence will be determined by the kV designation: 1–199 kV (100ft/30.5m), 200–399 kV (150ft/45.7m), 400–699 kV (200ft/61.0m), and 700-or greater kV (250ft/76.2m) based on average right-of-way and structure widths, according to BLM WO-300 (Minerals and Realty Management).

Infrastructure (communication towers)

This point dataset will be compiled from the Federal Communications Commission (FCC) communication towers point file; all duplicate points will be removed. It will be converted to a polygon dataset by using a direct area of influence of 2.5 acres (1.0ha) centered on each communication tower point (Knick et al. 2011).

Infrastructure (other vertical structures)

This point dataset will be compiled from the FAA's Digital Obstacles point file. Points where "Type_" = "WINDMILL" will be removed. Duplicate points from the FCC communication towers point file will be removed. Remaining features will be converted to a polygon dataset using a direct area of influence of 2.5 acres (1.0ha) centered on each vertical structure point (Knick et al. 2011).

Other Developed Rights-of-Way

Currently, no additional data sources for other rights-of-way have been identified; roads, power lines, railroads, pipelines, and other known linear features are represented in the categories

described above. The newly purchased IHS data do contain pipeline information; however, this database does not currently distinguish between above-ground and underground pipelines. If additional features representing human activities are identified, they will be added to monitoring reports using similar assumptions to those used with the threats described above.

b. Habitat Degradation Threat Combination and Calculation

The threats targeted for measuring human activity (Table 2) will be converted to direct area of influence polygons as described for each threat above. These threat polygon layers will be combined and features dissolved to create one overall polygon layer representing footprints of active human activity in the range of sage-grouse. Individual datasets, however, will be preserved to indicate which types of threats may be contributing to overall habitat degradation.

This measure has been divided into three submeasures to describe habitat degradation on the landscape. Percentages will be calculated as follows:

> Measure 2a. Footprint by geographic area of interest: Divide area of the active/direct footprint by the total area of the geographic area of interest (% disturbance in geographic area of interest).
>
> Measure 2b. Active/direct footprint by historical sagebrush potential: Divide area of the active footprint that coincides with areas with historical sagebrush potential (BpS calculation from habitat availability) within a given geographic area of interest by the total area with sagebrush potential within the geographic area of interest (% disturbance on potential historical sagebrush in geographic area of interest).
>
> Measure 2c. Active/direct footprint by current sagebrush: Divide area of the active footprint that coincides with areas of existing sagebrush (EVT calculation from habitat availability) within a given geographic area of interest by the total area that is current sagebrush within the geographic area of interest (% disturbance on current sagebrush in geographic area of interest).

B.3. Energy and Mining Density (Measure 3)

The measure of density of energy and mining will be calculated by combining the locations of energy and mining threats identified in Table 2. This measure will provide an estimate of the intensity of human activity or the intensity of habitat degradation. The number of energy facilities and mining locations will be summed and divided by the area of meaningful geographic areas of interest to calculate density of these activities. Data sources for each threat are found in Table 6. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed

below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and 5-year (or longer) trends in habitat degradation.

Table 6. Geospatial data sources for habitat degradation (Measure 2).

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/ Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

a. Energy and Mining Density Datasets and Assumptions

Energy (oil and gas wells and development facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (coal mines)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (wind energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (solar energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (geothermal energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Mining (active developments; locatable, leasable, saleable)

(See Section I.B.2., Habitat Degradation Monitoring.)

b. Energy and Mining Density Threat Combination and Calculation

Datasets for energy and mining will be collected in two primary forms: point locations (e.g., wells) and polygon areas (e.g., surface coal mining). The following rule set will be used to calculate density for meaningful geographic areas of interest including standard grids and per polygon:

1) Point locations will be preserved; no additional points will be removed beyond the methodology described above. Energy facilities in close proximity (an oil well close to a wind tower) will be retained.
2) Polygons will not be merged, or features further dissolved. Thus, overlapping facilities will be retained, such that each individual threat will be a separate polygon data input for the density calculation.
3) The analysis unit (polygon or 640-acre section in a grid) will be the basis for counting the number of mining or energy facilities per unit area. Within the analysis unit, all point features will be summed, and any individual polygons will be counted as one (e.g., a coal mine will be counted as one facility within population). Where polygon features overlap multiple units (polygons or pixels), the facility will be counted as one in each unit where the polygon occurs (e.g., a polygon crossing multiple 640-acre

sections would be counted as one in each 640-acre section for a density per 640-acre-section calculation).

4) In methodologies with different-sized units (e.g., MZs, populations, etc.) raw facility counts will be converted to densities by dividing the raw facility counts by the total area of the unit. Typically this will be measured as facilities per 640 acres.
5) For uniform grids, raw facility counts will be reported. Typically this number will also be converted to facilities per 640 acres.
6) Reporting may include summaries beyond the simple ones above. Zonal statistics may be used to smooth smaller grids to help display and convey information about areas within meaningful geographic areas of interest that have high levels of energy and/or mining activity.
7) Additional statistics for each defined unit may also include adjusting the area to include only the area with the historical potential for sagebrush (BpS) or areas currently sagebrush (EVT).

Individual datasets and threat combination datasets for habitat degradation will be available through the BLM's EGIS web portal and geospatial gateway. Legacy datasets will be preserved so that trends may be calculated.

C. Population (Demographics) Monitoring

State wildlife management agencies are responsible for monitoring sage-grouse populations within their respective states. WAFWA will coordinate this collection of annual population data by state agencies. These data will be made available to the BLM according to the terms of the forthcoming Greater Sage-Grouse Population Monitoring Memorandum of Understanding (MOU) (2014) between WAFWA and the BLM. The MOU outlines a process, timeline, and responsibilities for regular data sharing of sage-grouse population and/or habitat information for the purposes of implementing sage-grouse LUPs/amendments and subsequent effectiveness monitoring. Population areas were refined from the "Greater Sage-grouse *(Centrocercus urophasianus)* Conservation Objectives: Final Report" (COT 2013) by individual state wildlife agencies to create a consistent naming nomenclature for future data analyses. These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions and to inform the adaptive management responses.

D. Effectiveness Monitoring

Effectiveness monitoring will provide the data needed to evaluate BLM and USFS actions toward reaching the objective of the national planning strategy (BLM IM 2012-044)—to conserve sage-grouse populations and their habitat—and the objectives for the land use planning

area. Effectiveness monitoring methods described here will encompass multiple larger scales, from areas as large as the WAFWA MZ to the scale of this LUP. Effectiveness data used for these larger-scale evaluations will include all lands in the area of interest, regardless of surface ownership/management, and will help inform where finer-scale evaluations are needed, such as population areas smaller than an LUP or PACs within an LUP (described in Section II, Fine and Site Scales). Data will also include the trend of disturbance within these areas of interest to inform the need to initiate adaptive management responses as described in the land use plan.

Effectiveness monitoring reported for these larger areas provides the context to conduct effectiveness monitoring at finer scales. This approach also helps focus scarce resources to areas experiencing habitat loss, degradation, or population declines, without excluding the possibility of concurrent, finer-scale evaluations as needed where habitat or population anomalies have been identified through some other means.

To determine the effectiveness of the sage-grouse national planning strategy, the BLM and the USFS will evaluate the answers to the following questions and prepare a broad- and mid-scale effectiveness report:

1) Sagebrush Availability and Condition:
    a. What is the amount of sagebrush availability and the change in the amount and condition of sagebrush?
    b. What is the existing amount of sagebrush on the landscape and the change in the amount relative to the pre-EuroAmerican historical distribution of sagebrush (BpS)?
    c. What is the trend and condition of the indicators describing sagebrush characteristics important to sage-grouse?
2) Habitat Degradation and Intensity of Activities:
    a. What is the amount of habitat degradation and the change in that amount?
    b. What is the intensity of activities and the change in the intensity?
    c. What is the amount of reclaimed energy-related degradation and the change in the amount?
3) What is the population estimation of sage-grouse and the change in the population estimation?
4) How are the BLM and the USFS contributing to changes in the amount of sagebrush?
5) How are the BLM and the USFS contributing to disturbance?

The compilation of broad- and mid-scale data (and population trends as available) into an effectiveness monitoring report will occur on a 5-year reporting schedule (see Attachment A), which may be accelerated to respond to critical emerging issues (in consultation with the USFWS and state wildlife agencies). In addition, effectiveness monitoring results will be used to identify emerging issues and research needs and inform the BLM and the USFS adaptive

management strategy (see the adaptive management section of this Environmental Impact Statement).

To determine the effectiveness of the sage-grouse objectives of the land use plan, the BLM and the USFS will evaluate the answers to the following questions and prepare a plan effectiveness report:

1) Is this plan meeting the sage-grouse habitat objectives?
2) Are sage-grouse areas within the LUP meeting, or making progress toward meeting, land health standards, including the Special Status Species/wildlife habitat standard?
3) Is the plan meeting the disturbance objective(s) within sage-grouse areas?
4) Are the sage-grouse populations within this plan boundary and within the sage-grouse areas increasing, stable, or declining?

The effectiveness monitoring report for this LUP will occur on a 5-year reporting schedule (see Attachment A) or more often if habitat or population anomalies indicate the need for an evaluation to facilitate adaptive management or respond to critical emerging issues. Data will be made available through the BLM's EGIS web portal and the geospatial gateway.

Methods

At the broad and mid scales (PACs and above) the BLM and the USFS will summarize the vegetation, disturbance, and (when available) population data. Although the analysis will try to summarize results for PACs within each sage-grouse population, some populations may be too small to report the metrics appropriately and may need to be combined to provide an estimate with an acceptable level of accuracy. Otherwise, they will be flagged for more intensive monitoring by the appropriate landowner or agency. The BLM and the USFS will then analyze monitoring data to detect the trend in the amount of sagebrush; the condition of the vegetation in the sage-grouse areas (MacKinnon et al. 2011); the trend in the amount of disturbance; the change in disturbed areas owing to successful restoration; and the amount of new disturbance the BLM and/or the USFS has permitted. These data could be supplemented with population data (when available) to inform an understanding of the correlation between habitat and PACs within a population. This overall effectiveness evaluation must consider the lag effect response of populations to habitat changes (Garton et al. 2011).

Calculating Question 1, National Planning Strategy Effectiveness: The amount of sagebrush available in the large area of interest will use the information from Measure 1a (I.B.1., Sagebrush Availability) and calculate the change from the 2012 baseline to the end date of the reporting period. To calculate the change in the amount of sagebrush on the landscape to compare with the historical areas with potential to support sagebrush, the information from Measure 1b (I.B.1., Sagebrush Availability) will be used. To calculate the trend in the condition of sagebrush at the mid scale, three sources of data will be used: the BLM's Grass/Shrub mapping effort (Future Plans in Section I.B.1., Sagebrush Availability); the results from the calculation of the landscape

indicators, such as patch size (described below); and the BLM's Landscape Monitoring Framework (LMF) and sage-grouse intensification effort (also described below). The LMF and sage-grouse intensification effort data are collected in a statistical sampling framework that allows calculation of indicator values at multiple scales.

Beyond the importance of sagebrush availability to sage-grouse, the mix of sagebrush patches on the landscape at the broad and mid scale provides the life requisite of space for sage-grouse dispersal needs (see the HAF). The configuration of sagebrush habitat patches and the land cover or land use between the habitat patches at the broad and mid scales also defines suitability. There are three significant habitat indicators that influence habitat use, dispersal, and movement across populations: the size and number of habitat patches, the connectivity of habitat patches (linkage areas), and habitat fragmentation (scope of unsuitable and non-habitats between habitat patches). The most appropriate commercial software to measure patch dynamics, connectivity, and fragmentation at the broad and mid scales will be used, along with the same data layers derived for sagebrush availability.

The BLM initiated the LMF in 2011 in cooperation with the Natural Resources Conservation Service (NRCS). The objective of the LMF effort is to provide unbiased estimates of vegetation and soil condition and trend using a statistically balanced sample design across BLM lands. Recognizing that sage-grouse populations are more resilient where the sagebrush plant community has certain characteristics unique to a particular life stage of sage-grouse (Knick and Connelly 2011, Stiver et al. *in press*), a group of sage-grouse habitat and sagebrush plant community subject matter experts identified those vegetation indicators collected at LMF sampling points that inform sage-grouse habitat needs. The experts represented the Agricultural Research Service, BLM, NRCS, USFWS, WAFWA, state wildlife agencies, and academia. The common indicators identified include: species composition, foliar cover, height of the tallest sagebrush and herbaceous plant, intercanopy gap, percent of invasive species, sagebrush shape, and bare ground. To increase the precision of estimates of sagebrush conditions within the range of sage-grouse, additional plot locations in occupied sage-grouse habitat (Sage-Grouse Intensification) were added in 2013. The common indicators are also collected on sampling locations in the NRCS National Resources Inventory Rangeland Resource Assessment (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/nri/?&cid=stelprdb1041620).

The sage-grouse intensification baseline data will be collected over a 5-year period, and an annual sage-grouse intensification report will be prepared describing the status of the indicators. Beginning in year 6, the annual status report will be accompanied with a trend report, which will be available on an annual basis thereafter, contingent on continuation of the current monitoring budget. This information, in combination with the Grass/Shrub mapping information, the mid-scale habitat suitability indicator measures, and the sagebrush availability information will be used to answer Question 1 of the National Planning Strategy Effectiveness Report.

Calculating Question 2, National Planning Strategy Effectiveness: Evaluations of the amount of habitat degradation and the intensity of the activities in the area of interest will use the information from Measure 2 (Section I.B.2., Habitat Degradation Monitoring) and Measure 3 (Section I.B.3., Energy and Mining Density). The field office will collect data on the amount of reclaimed energy-related degradation on plugged and abandoned and oil/gas well sites. The data are expected to demonstrate that the reclaimed sites have yet to meet the habitat restoration objectives for sage-grouse habitat. This information, in combination with the amount of habitat degradation, will be used to answer Question 2 of the National Planning Strategy Effectiveness Report.

Calculating Question 3, National Planning Strategy Effectiveness: The change in sage-grouse estimated populations will be calculated from data provided by the state wildlife agencies, when available. This population data (Section I.C., Population [Demographics] Monitoring) will be used to answer Question 3 of the National Planning Strategy Effectiveness Report.

Calculating Question 4, National Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of sagebrush in the area of interest will use the information from Measure 1a (Section I.B.1., Sagebrush Availability). This measure is derived from the national datasets that remove sagebrush (Table 3). To determine the relative contribution of BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for this measure in the geographic areas of interest. This information will be used to answer Question 4 of the National Planning Strategy Effectiveness Report.

Calculating Question 5, National Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of disturbance in the area of interest will use the information from Measure 2a (Section I.B.2., Monitoring Habitat Degradation) and Measure 3 (Section I.B.3., Energy and Mining Density). These measures are all derived from the national disturbance datasets that degrade habitat (Table 6). To determine the relative contribution of BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for these two measures in the geographic areas of interest. This information will be used to answer Question 5 of the National Planning Strategy Effectiveness Report.

Answers to the five questions for determining the effectiveness of the national planning strategy will identify areas that appear to be meeting the objectives of the strategy and will facilitate identification of population areas for more detailed analysis. Conceptually, if the broad-scale monitoring identifies increasing sagebrush availability and improving vegetation conditions, decreasing disturbance, and a stable or increasing population for the area of interest, there is evidence that the objectives of the national planning strategy to maintain populations and their habitats have been met. Conversely, where information indicates that sagebrush is decreasing and vegetation conditions are degrading, disturbance in sage-grouse areas is increasing, and/or

populations are declining relative to the baseline, there is evidence that the objectives of the national planning strategy are not being achieved. Such a determination would likely result in a more detailed analysis and could be the basis for implementing more restrictive adaptive management measures.

With respect to the land use plan area, the BLM and the USFS will summarize the vegetation, disturbance, and population data to determine if the LUP is meeting the plan objectives. Effectiveness information used for these evaluations includes BLM/USFS surface management areas and will help inform where finer-scale evaluations are needed, such as seasonal habitats, corridors, or linkage areas. Data will also include the trend of disturbance within the sage-grouse areas, which will inform the need to initiate adaptive management responses as described in the land use plan.

Calculating Question 1, Land Use Plan Effectiveness: The condition of vegetation and the allotments meeting land health standards (as articulated in "BLM Handbook 4180-1, Rangeland Health Standards") in sage-grouse areas will be used to determine the LUP's effectiveness in meeting the vegetation objectives for sage-grouse habitat set forth in the plan. The field office/ranger district will be responsible for collecting this data. In order for this data to be consistent and comparable, common indicators, consistent methods, and an unbiased sampling framework will be implemented following the principles in the BLM's AIM strategy (Taylor et al. 2014; Toevs et al. 2011; MacKinnon et al. 2011), in the BLM's Technical Reference "Interpreting Indicators of Rangeland Health" (Pellant et al. 2005), and in the HAF (Stiver et al. *in press*) or other approved WAFWA MZ–consistent guidance to measure and monitor sage-grouse habitats. This information will be used to answer Question 1 of the Land Use Plan Effectiveness Report.

Calculating Question 2, Land Use Plan Effectiveness: Sage-grouse areas within the LUP that are achieving land health stands (or, if trend data are available, that are making progress toward achieving them)—particularly the Special Status Species/wildlife habitat land health standard—will be used to determine the LUP's effectiveness in achieving the habitat objectives set forth in the plan. Field offices will follow directions in "BLM Handbook 4180-1, Rangeland Health Standards," to ascertain if sage-grouse areas are achieving or making progress toward achieving land health standards. One of the recommended criteria for evaluating this land health standard is the HAF indicators.

Calculating Question 3, Land Use Plan Effectiveness: The amount of habitat disturbance in sage-grouse areas identified in this LUP will be used to determine the LUP's effectiveness in meeting the plan's disturbance objectives. National datasets can be used to calculate the amount of disturbance, but field office data will likely increase the accuracy of this estimate. This information will be used to answer Question 3 of the Land Use Plan Effectiveness Report.

Calculating Question 4, Land Use Plan Effectiveness: The change in estimated sage-grouse populations will be calculated from data provided by the state wildlife agencies, when available, and will be used to determine LUP effectiveness. This population data (Section I.C., Population [Demographics] Monitoring) will be used to answer Question 4 of the Land Use Plan Effectiveness Report.

Results of the effectiveness monitoring process for the LUP will be used to inform the need for finer-scale investigations, initiate adaptive management actions as described in the land use plan, initiate causation determination, and/or determine if changes to management decisions are warranted. The measures used at the broad and mid scales will provide a suite of characteristics for evaluating the effectiveness of the adaptive management strategy.

II. FINE AND SITE SCALES

Fine-scale (third-order) habitat selected by sage-grouse is described as the physical and geographic area within home ranges during breeding, summer, and winter periods. At this level, habitat suitability monitoring should address factors that affect sage-grouse use of, and movements between, seasonal use areas. The habitat monitoring at the fine and site scale (fourth order) should focus on indicators to describe seasonal home ranges for sage-grouse associated with a lek or lek group within a population or subpopulation area. Fine- and site-scale monitoring will inform LUP effectiveness monitoring (see Section I.D., Effectiveness Monitoring) and the hard and soft triggers identified in the LUP's adaptive management section.

Site-scale habitat selected by sage-grouse is described as the more detailed vegetation characteristics of seasonal habitats. Habitat suitability characteristics include canopy cover and height of sagebrush and the associated understory vegetation. They also include vegetation associated with riparian areas, wet meadows, and other mesic habitats adjacent to sagebrush that may support sage-grouse habitat needs during different stages in their annual cycle.

As described in the Conclusion (Section III), details and application of monitoring at the fine and site scales will be described in the implementation-level monitoring plan for the land use plan. The need for fine- and site-scale-specific habitat monitoring will vary by area, depending on proposed projects, existing conditions, habitat variability, threats, and land health. Examples of fine- and site-scale monitoring include: habitat vegetation monitoring to assess current habitat conditions; monitoring and evaluation of the success of projects targeting sage-grouse habitat enhancement and/or restoration; and habitat disturbance monitoring to provide localized disturbance measures to inform proposed project review and potential mitigation for project impacts. Monitoring plans should incorporate the principles outlined in the BLM's AIM strategy (Toevs et al. 2011) and in "AIM-Monitoring: A Component of the Assessment, Inventory, and Monitoring Strategy" (Taylor et al. 2014). Approved monitoring methods are:

- "BLM Core Terrestrial Indicators and Methods" (MacKinnon et al. 2011);
- The BLM's Technical Reference "Interpreting Indicators of Rangeland Health" (Pellant et al. 2005); and,
- "Sage-Grouse Habitat Assessment Framework: Multiscale Assessment Tool" (Stiver et al. *in press*).

Other state-specific disturbance tracking models include: the BLM's Wyoming Density and Disturbance Calculation Tool (http://ddct.wygisc.org/) and the BLM's White River Data Management System in development with the USGS. Population monitoring data (in cooperation with state wildlife agencies) should be included during evaluation of the effectiveness of actions taken at the fine and site scales.

Fine- and site-scale sage-grouse habitat suitability indicators for seasonal habitats are identified in the HAF. The HAF has incorporated the Connelly et al. (2000) sage-grouse guidelines as well as many of the core indicators in the AIM strategy (Toevs et al. 2011). There may be a need to develop adjustments to height and cover or other site suitability values described in the HAF; any such adjustments should be ecologically defensible. To foster consistency, however, adjustments to site suitability values at the local scale should be avoided unless there is strong, scientific justification for making those adjustments. That justification should be provided. WAFWA MZ adjustments must be supported by regional plant productivity and habitat data for the floristic province. If adjustments are made to the site-scale indicators, they must be made using data from the appropriate seasonal habitat designation (breeding/nesting, brood-rearing, winter) collected from sage-grouse studies found in the relevant area and peer-reviewed by the appropriate wildlife management agency(ies) and researchers.

When conducting land heath assessments, the BLM should follow, at a minimum, "Interpreting Indicators of Rangeland Health" (Pellant et. al. 2005) and the "BLM Core Terrestrial Indicators and Methods" (MacKinnon et al. 2011). For assessments being conducted in sage-grouse designated management areas, the BLM should collect additional data to inform the HAF indicators that have not been collected using the above methods. Implementation of the principles outlined in the AIM strategy will allow the data to be used to generate unbiased estimates of condition across the area of interest; facilitate consistent data collection and rollup analysis among management units; help provide consistent data to inform the classification and interpretation of imagery; and provide condition and trend of the indicators describing sagebrush characteristics important to sage-grouse habitat (see Section I.D., Effectiveness Monitoring).

III. CONCLUSION

This Greater Sage-Grouse Monitoring Framework was developed for all of the Final Environmental Impact Statements involved in the sage-grouse planning effort. As such, it describes the monitoring activities at the broad and mid scales and provides a guide for the BLM and the USFS to collaborate with partners/other agencies to develop the land use plan- specific monitoring plan.

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Attachment A. An Overview of Monitoring Commitments

	Broad and Mid Scales					Fine and Site Scales
	Implementation	**Sagebrush Availability**	**Habitat Degradation**	**Population**	**Effectiveness**	
How will the data be used?	Track and document implementation of land use plan decisions and inform adaptive management	Track changes in land cover (sagebrush) and inform adaptive management	Track changes in disturbance (threats) to sage-grouse habitat and inform adaptive management	Track trends in sage-grouse populations (and/or leks; as determined by state wildlife agencies) and inform adaptive management	Characterize the relationship among disturbance, implementation actions, and sagebrush metrics and inform adaptive management	Measure seasonal habitat, connectivity at the fine scale, and habitat conditions at the site scale, calculate disturbance, and inform adaptive management
Who is collecting the data?	BLM FO and USFS Forest	NOC and NIFC	National datasets (NOC), BLM FOs, and USFS Forests as applicable	State wildlife agencies through WAFWA	Comes from other broad- and mid-scale monitoring types, analyzed by the NOC	BLM FO and SO, USFS Forests and RO (with partners)
How often are the data collected, reported, and made available to USFWS?	Collected and reported annually; summary report every 5 years	Updated and changes reported annually; summary report every 5 years	Collected and changes reported annually; summary report every 5 years	State data reported annually per WAFWA MOU; summary report every 5 years	Collected and reported every 5 years (coincident with LUP evaluations)	Collection and trend analysis ongoing, reported every 5 years or as needed to inform adaptive management
What is the spatial scale?	Summarized by LUP with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by MZ and LUP with flexibility for reporting by other units (e.g., PAC)	Variable (e.g., projects and seasonal habitats)
What are the potential personnel and budget impacts?	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	At a minimum, current skills and capacity must be maintained; data management costs are TBD	At a minimum, current skills and capacity must be maintained; data management and data layer purchase cost are TBD	No additional personnel or budget impacts for the BLM or the USFS	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment

Who has primary and secondary responsi-bilities for reporting?	1) BLM FO & SO; USFS Forest & RO 2) BLM & USFS Planning	1) NOC 2) WO	1) NOC 2) BLM SO, USFS RO, & appropriate programs	1) WAFWA & state wildlife agencies 2) BLM SO, USFS RO, NOC	1) Broad and mid scale at the NOC, LUP at BLM SO, USFS RO	1) BLM FO & USFS Forests 2) BLM SO & USFS RO
What new processes/ tools are needed?	National implementation datasets and analysis tools	Updates to national land cover data	Data standards and rollup methods for these data	Standards in population monitoring (WAFWA)	Reporting methodologies	Data standards data storage; and reporting

FO (field office); NIFC (National Interagency Fire Center); NOC (National Operations Center); RO (regional office); SO (state office); TBD (to be determined); WO (Washington Office)

Attachment B. User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones

LANDFIRE Map Zone Name	User Accuracy	Producer Accuracy	% of Map Zone within Historical Schroeder
Wyoming Basin	76.9%	90.9%	98.5%
Snake River Plain	68.8%	85.2%	98.4%
Missouri River Plateau	57.7%	100.0%	91.3%
Grand Coulee Basin of the Columbia Plateau	80.0%	80.0%	89.3%
Wyoming Highlands	75.3%	85.9%	88.1%
Western Great Basin	69.3%	75.4%	72.9%
Blue Mountain Region of the Columbia Plateau	85.7%	88.7%	72.7%
Eastern Great Basin	62.7%	80.0%	62.8%
Northwestern Great Plains	76.5%	92.9%	46.3%
Northern Rocky Mountains	72.5%	89.2%	42.5%
Utah High Plateaus	81.8%	78.3%	41.5%
Colorado Plateau	65.3%	76.2%	28.8%
Middle Rocky Mountains	78.6%	73.3%	26.4%
Cascade Mountain Range	57.1%	88.9%	17.3%
Sierra Nevada Mountain Range	0.0%	0.0%	12.3%
Northwestern Rocky Mountains	66.7%	60.0%	7.3%
Southern Rocky Mountains	58.6%	56.7%	7.0%
Northern Cascades	75.0%	75.0%	2.6%
Mogollon Rim	66.7%	100.0%	1.7%
Death Valley Basin	0.0%	0.0%	1.2%

There are two anomalous map zones with 0% user and producer accuracies, attributable to no available reference data for the ecological systems of interest.

User accuracy is a map-based accuracy that is computed by looking at the reference data for a class and determining the percentage of correct predictions for these samples. For example, if I select any sagebrush pixel on the classified map, what is the probability that I'll be standing in a sagebrush stand when I visit that pixel location in the field? ***Commission Error*** equates to including a pixel in a class when it should have been excluded (i.e., commission error = 1 – user's accuracy).

Producer accuracy is a reference-based accuracy that is computed by looking at the predictions produced for a class and determining the percentage of correct predictions. In other words, if I know that a particular area is sagebrush (I've been out on the ground to check), what is the probability that the digital map will correctly identify that pixel as sagebrush? ***Omission Error*** equates to excluding a pixel that should have been included in the class (i.e., omission error = 1 – producer's accuracy).

Attachment C. Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers

- *Artemisia arbuscula* subspecies *longicaulis*
- *Artemisia arbuscula* subspecies *longiloba*
- *Artemisia bigelovii*
- *Artemisia nova*
- *Artemisia papposa*
- *Artemisia pygmaea*
- *Artemisia rigida*
- *Artemisia spinescens*
- *Artemisia tripartita* subspecies *rupicola*
- *Artemisia tripartita* subspecies *tripartita*
- *Tanacetum nuttallii*
- *Artemisia cana* subspecies *bolanderi*
- *Artemisia cana* subspecies *cana*
- *Artemisia cana* subspecies *viscidula*
- *Artemisia tridentata* subspecies *wyomingensis*
- *Artemisia tridentata* subspecies *tridentata*
- *Artemisia tridentata* subspecies *vaseyana*
- *Artemisia tridentata* subspecies *spiciformis*
- *Artemisia tridentata* subspecies *xericensis*
- *Artemisia tridentata* variety *pauciflora*
- *Artemisia frigida*
- *Artemisia pedatifida*

Appendix M
Greater Sage-Grouse

M.3: Proposed RMP (Alternative E) Consistency with U.S. Fish and Wildlife Service Conservation Objectives Team (COT) Report Recommendations for Sage-Grouse

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
Fire Present, but localized	Retain and restore healthy native sagebrush plant communities within the range of GSG	Restrict or contain fire within the normal range of fire activity, including size and frequency as define by the best science available.	• Use best management practices to design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which benefit sage-grouse habitat.
		Eliminate intentional fires in sagebrush habitats, including prescribed burning of breeding and winter habitats.	• Fire will not be used to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species). However, if as a last resort and after all other treatment opportunities have been explored and site-specific variables allow, the use of prescribed fire for fuel breaks that would disrupt the fuel continuity across the landscape could be considered, in stands where cheatgrass is a very minor component in the understory.
		Design and implement restoration of burned sagebrush habitats to allow for natural succession to healthy native sagebrush plant communities. This will necessitate an intensive and well-funded monitoring system. To be considered successful, restoration must also result in returning or increasing sage-grouse populations with burned areas.	• Treatment will be accompanied by restoration, and reseeding if necessary, to re-establish native vegetation. • Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit Greater Sage-Grouse. • Prioritize restoration in seasonal habitats that are thought to be limiting sage-grouse distribution and/or abundance. • Include sage-grouse habitat parameters as defined by Connelly, et al. (2000); Hagen, et al. (2007) or, if available, state sage-grouse conservation plans and appropriate local information in habitat restoration objectives. • Require use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success. Where probability of success or adapted seed availability is low, non-native seeds may be used as long as they support Greater Sage-Grouse habitat objectives.

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
			• Design post-restoration management to ensure long term persistence. • Restore native plants and create landscape patterns which most benefit Greater Sage-Grouse. • Make re-establishment of sagebrush cover and desirable understory plants (relative to ecological site potential) the highest priority for restoration efforts. • In fire prone areas where sagebrush seed is required for Greater Sage-Grouse habitat restoration, consider establishing seed harvest areas that are managed for seed production and are a priority for protection from outside disturbances.
		Implement monitoring programs for restoration activities. To ensure success, monitoring must continue until restoration is complete with sufficient commitments to make adequate corrections to management efforts if needed.	• Monitor the site and treat for noxious weeds. • Monitor treatments and activities for up to three years from date of fire containment. • After three years, the long-term monitoring of an Emergency Stabilization and Rehabilitation (ES&R) project will be officially transferred to a designated resource program. • Long-term responsibility for tracking the ES&R investment should be identified early in the ES&R planning process through an interdisciplinary team. • The resource program is encouraged to conduct an evaluation at the five-year interval to identify management changes needed to ensure project success in reaching the intended objectives.
		Immediately suppress fire in all sagebrush habitats. Where resources are limited, these actions should first focus on PACs and any identified connectivity corridors between PAC's	• In Greater Sage-Grouse habitat areas, prioritize suppression, immediately after life and property, to conserve the habitat. • Protect sage-grouse habitat during wildfire suppression activities as described in the National Fire Suppression Guidelines and the current fire management plan.
Non-native, Invasive Plants Present, but localized	Maintain and restore healthy, native sagebrush plant communities	Retain all remaining large intact sagebrush patches, particularly at low elevations.	• Retain lands with high resource values and adjust land ownership to improve land pattern and management efficiency, enhance public access and resource values, and/or meet public and community needs. • **Grassland Bird/Greater Sage-Grouse Priority Areas**: To minimize habitat fragmentation, two areas with BLM surface ownership would be managed to retain intact blocks of native vegetation. One of these areas is also a sage-grouse core area identified by MFWP. • **Greater Sage-Grouse Protection Priority Area**: To minimize wildlife habitat

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
			fragmentation, an area with BLM surface ownership greater than 50% would be managed to retain intact blocks of native vegetation where contiguous acreage of greater than 10,000 acres is present.
		Reduce or eliminate disturbances that promote the spread of these invasive species.	• At the local population scale discrete anthropogenic disturbances should be avoided, minimized, or mitigated to maintain the highest quality habitat. • Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats. • Mitigation of surface-disturbing or disruptive activities would be applied where needed to minimize impacts and could be applied consistent with the oil and gas stipulations outlined in the Fluid Minerals section of Chapter 2. • The mitigation would be requirements, procedures, management practices or design features that the BLM, through issuance of the Record of Decision, would adopt as operational requirements. • Prioritize wildlife habitat improvement projects such as restoration of sagebrush communities through invasive species removal and native shrub reestablishment.
		Monitor and control invasive vegetation post-wildfire for at least three years.	• Monitor the site and treat for noxious weeds. • Monitor treatments and activities for up to three years from date of fire containment. • After three years, the long-term monitoring of an ES&R project will be officially transferred to a designated resource program. • Long-term responsibility for tracking the ES&R investment should be identified early in the ES&R planning process through an interdisciplinary team. • The resource program is encouraged to conduct an evaluation at the five-year interval to identify management changes needed to ensure project success in reaching the intended objectives.
		Require best management practices for construction project in and adjacent to sagebrush habitats to prevent invasion.	• Prioritize pad development based on suitability of habitat; construct pads that are in less suitable habitat (i.e., along existing roadways or within degraded habitats) during the breeding season, and construct pads located in more suitable habitat prior to or after the critical breeding season.
		Restore altered ecosystems such that non-native invasive	• Inventory for and treat noxious weeds before initiating surface-disturbing activities.

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
		plants are reduced to levels that do not put the area at risk of conversion if a catastrophic even were to occur.	• Inventory for and consider treating non-native and naturalized plants before initiating surface-disturbing activities. • Develop an invasive plant management plan. • Control invasive plants utilizing an integrated pest management approach. • Monitor invasive plant treatments.
Energy Development Present and widespread	Energy development should be designed to ensure that it will not impinge upon stable or increasing GSG population trends	Avoid energy development in PACs. Identify areas where leasing is not acceptable, or not acceptable without stipulations for surface occupancy that maintains SG habitats	• **No Surface Occupancy**: A fluid minerals leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the area.
		If avoidance is not possible in PACs due to pre-existing valid rights, adjacent development, or split estate issues, development should only occur in non-habitat areas, including all appurtenant structures, with an adequate buffer that is sufficient to preclude impacts to sage-grouse habitat from noise, and other human activities.	• A lessee shall have the right to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource in a leasehold subject to: Stipulations attached to the lease; restrictions deriving from specific, nondiscretionary statutes; and such reasonable measures as may be required by the authorized officer to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations at the time operations are proposed. • To the extent consistent with lease rights granted, such reasonable measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. • At a minimum, measures shall be deemed consistent with lease rights granted provided that they do not: require relocation of proposed operations by more than 200 meters; require that operations be sited off the leasehold; or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year.
		Reduce and maintain the density of energy structures below which there are not impacts to the function of the sage-grouse habitats (as measured by no declines in sage-grouse use), or do not result in declines in sage-grouse populations within PACs.	• **No Surface Occupancy**: A fluid minerals leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the area.
		Design development outside	• **No Surface Occupancy**: A fluid minerals

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
		PACs to maintain populations within adjacent PACs and allow for connectivity among PACs.	leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the area.
		Reclamation of disturbances resulting from a proposed project should only be considered as mitigation for those impacts, not portrayed as minimization.	• Reclamation for Energy Development is comprehensive in the RMP and is addressed in Appendix E Oil and Gas Operations and Appendix J Reclamation.
		Design development to minimize tall structures (turbines, powerlines), or other features associated with the development (e.g., noise from drilling or ongoing operations; Blickley, et al. 2012).	• PACs are an exclusion area for wind energy development. • New right-of-way facilities will be located within or adjacent to existing rights-of-way, or corridors, to the extent practical, in order to minimize adverse environmental impacts and the proliferation of separate rights-of-way. • New rights-of-way would include appropriate BMPs and mitigation. • The latest version of Reducing Avian Collisions with Power Lines: The State of the Art in 2012 (APLIC 2012) and the BMPs established by the BLM Wind Energy Development Programmatic EIS and Record of Decision (BLM 2006c) would be implemented in the construction and operation of right-of-way facilities. • **Greater Sage-grouse General Habitat** - New distribution power lines on BLM land within 1 mile of Greater Sage-Grouse leks would be buried. • PACs are an Avoidance Area for rights-of-way. • Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli, et al. 2010; Blickley, et al. In preparation). • Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season. • Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
Sagebrush Removal Present, but localized	Avoid sagebrush removal or manipulation in GSG breeding or winter		• Fire will not be used to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species). However, if as a last resort and after all other treatment opportunities have been explored and site-specific variables allow, the use of prescribed fire for fuel breaks that would disrupt

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
	habitats. Appropriate regulatory and incentive-based mechanisms must be implemented to preclude sagebrush removal and manipulation for all other purposes.		the fuel continuity across the landscape could be considered, in stands where cheat grass is a very minor component in the understory.
Improper Grazing Present and widespread	Conduct grazing management for all ungulates in a manner consistent with local ecological conditions that maintains or restores healthy sagebrush shrub and native perennial grass and forb communities and conserves the essential habitat components for GSG (e.g. shrub cover, nesting cover). Areas which do not currently meet this standard should be managed to	Ensure that allotments meet ecological potential and wildlife habitat requirements; and, ensure that the health and diversity of the native perennial grass community is consistent with the ecological site.	**BLM Standards for Rangeland Health** • Standard #1: Uplands are in proper functioning condition. • Standard #2: Riparian and wetland areas are in proper functioning condition. • Standard #5: Habitats are provided to maintain healthy, productive and diverse populations of native plant and animal species, including special status species (federally threatened, endangered, candidate or Montana species of special concern as defined in BLM Manual 6840, Special Status Species Management).
		Inform and educate affected grazing permittees regarding sage-grouse habitat needs and conservation measures.	• Coordinate with MFWP or other interested parties to highlight special status species information and BLM management of habitats for special status species. • Also provide outreach materials for the general public. • The RMP does not specifically addressed educating and informing permittees regarding sage-grouse need and conservation measures.
		Incorporate sage-grouse habitat needs or habitat characteristics into relevant resource and allotment management plans, including the desired conditions with the understanding that these desired conditions may not be fully achievable; (a) due to the existing ecological conditions, ecological potential or the existing vegetation; or (b) due to casual events unrelated to existing livestock grazing.	• Include (at a minimum) indicators and measurements of structure/condition/ composition of vegetation specific to achieving sage-grouse habitat objectives (Doherty, et al. 2011). • If local/state seasonal habitat objectives are not available, use sage-grouse habitat recommendations from Connelly, et al. (2000b) and Hagen, et al. 2007.

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
	restore these components. Adequate monitoring of grazing strategies and their results, with necessary changes in strategies, is essential to ensuring that desired ecological conditions and GSG response are achieved.	Conduct habitat assessment and, where necessary, determine factors causing any failure to achieve the habitat characteristics. Make adjustments as appropriate.	
		Given limited agency resources, priority should be given to PACs and then sage-grouse habitats adjacent to PACs.	• Prioritize allotments that have the best opportunities for conserving, enhancing or restoring habitat for sage-grouse.
Range Management Structures Present, but localized	Avoid or reduce the impact of range management structures on GSG.	Range management structures should be designed and placed to be neutral or beneficial to sage-grouse	• Analyze springs, seeps and associated pipelines to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within priority sage-grouse habitats. • Make modifications where necessary, considering impacts to other water uses when such considerations are neutral or beneficial to sage-grouse. • Only authorize new spring or seep developments where the impacts to sage-grouse would be neutral or beneficial.
		Structures that are currently contributing to negative impacts to either sage-grouse or their habitats should be removed or modified to remove the threat.	• Evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance or restore sage-grouse habitat. • Evaluate methods to reduce outright sage-grouse strikes and mortality, through removing, modifying or marking fences in high risk areas within priority sage-grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009, Stevens 2011). • Monitor for, and treat invasive species associated with existing range improvements (Gelbard and Belnap 2003 and Bergquist, et al. 2007).
Agricultural Conversion Present, but localized	Avoid further loss of sagebrush habitat for agricultural	Revise Farm Bill policies and commodity programs that facilitate ongoing conversion of native habitats to marginal croplands (e.g., through the	• These are all beyond the scope of the RMP.

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
	activities (both plant and animal production) and prioritize restoration. In areas where taking agricultural lands out of production has benefited GSG, the programs supporting these actions should be targeted and continued (e.g. CRP/SAFE). Threat amelioration activities should, at a minimum, be prioritized within PACs, but should be considered in all GSG habitats.	addition of a 'Sodsaver' provision), to support conservation of remaining sagebrush-steppe habitats.	
		Continue and expand incentive programs that encourage the maintenance of sagebrush habitats.	
		Develop criteria for set-aside programs which stop negative habitat impacts and promote the quality and quantity sage-grouse habitat.	
		If lands that provide seasonal habitats for sage-grouse are taken out of a voluntary program, such as CRP or SAFE, precautions should be taken to ensure withdrawal of the lands minimizes the risk of direct take of sage-grouse (e.g., timing to avoid nesting season). Voluntary incentives should be implemented to increase the amount of sage-grouse habitats enrolled in these programs.	
Recreation Present, but localized	In areas subjected to recreational activities, maintain healthy native sagebrush communities based on local ecological conditions and with consideration of drought conditions, and manage direct and	Close important sage-grouse use areas to off-road vehicle use.	• The use of motorized vehicles, including OHVs, to retrieve game off road would not be allowed, regardless of individual possession of a Montana Disabled Hunting License, in limited or closed areas unless designated through travel management planning. Options for off-road game retrieval could include designating the types of vehicles that may be used, times of day, limited motorized off-road travel or motorized travel on closed roads and would apply to all individuals with a legally taken game animal. • Site-specific travel planning within the Grassland Bird/Greater Sage-Grouse Priority Areas and Greater Sage-Grouse Protection Priority Area would be completed within a five (5) year period after the ROD is signed. • Travel management should evaluate, during site-specific travel planning, the need for permanent or seasonal road or area closures to protect

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
	indirect human disturbance (including noise) to avoid interruption of normal GSG behavior. Threat amelioration for recreation should be implemented in PACs, but considered in all GSG habitats.		Greater Sage-Grouse priority habitat areas. • Evaluate impacts of existing roads, including two-tracks, in relation to known lek locations and Greater Sage-Grouse winter ranges. • Manage on-road travel and OHV use in sage-grouse habitat to avoid disturbance during critical times such as winter, breeding and nesting periods. • Plan or permit organized events to avoid impacts to Greater Sage-Grouse. • Manage motorized and mechanized travel to minimize impacts to Greater Sage-Grouse and their habitat by developing standards for future roads to give to BLM, FS, BIA, state, county, and private parties. • Manage motorized and mechanized travel to minimize impacts to Greater Sage-Grouse by enforcement of existing OHV and travel management plans. • Provide educational opportunities for users of OHVs dealing with the possible effects they may have on Greater Sage-Grouse. • Develop a transportation management plan across ownership boundaries in Greater Sage-Grouse habitats. • Participate in travel planning efforts and educate the general public about the impacts of roads on Greater Sage-Grouse and their habitat.
		Avoid development of recreational facilities (e.g., new roads and trails, campgrounds) in sage-grouse habitats.	• Campgrounds were not specifically addressed in the RMP. • Travel management should evaluate, during site-specific travel planning, the need for permanent or seasonal road or area closures to protect Greater Sage-Grouse priority habitat areas. • Use existing roads or realignments to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then any new roads would be constructed to the absolute minimum standard necessary. • Allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal or beneficial impacts on Greater Sage-Grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road. • Manage on-road travel and OHV use in sage-grouse habitat to avoid disturbance during critical times such as winter, breeding and nesting periods.

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
			• Manage motorized and mechanized travel to minimize impacts to Greater Sage-Grouse by enforcement of existing OHV and travel management plans. • Develop a transportation management plan across ownership boundaries in Greater Sage-Grouse habitats. • Participate in travel planning efforts and educate the general public about the impacts of roads on Greater Sage-Grouse and their habitat. • Consider buffers, removal, realignment, or seasonal closures where appropriate to avoid degradation of habitat.
Infrastructure Present and widespread	Avoid development of infrastructure within PACs.	Avoid construction of these features in sage-grouse habitat, both within and outside of PACs.	• **Greater Sage-Grouse Priority Habitat - Avoidance Area for Rights-of-Ways**. Avoidance Areas: Areas to be avoided but may be available for location of rights-of-way with special stipulations.
		Power transmission corridors which cannot avoid PACs should be buried (if technically feasible) and disturbed habitat should be restored.	• Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors. • Bury power lines.
		Infrastructure corridors should be designed and maintained to preclude introduction of invasive plant species.	• Prevention, early detection and rapid response for all noxious weed species. • Control noxious weeds by various methods that include cultural, physical, biological, and chemical controls or other land practices.
		Restrictions limiting use of roads should be enforced.	• Travel Management will occur after the Record of Decision is signed. • Guidance for removal or decommission of roads is located in Appendix M and was also addressed above under "Recreation."
		Remove transmission lines and roads that are duplicative or are not functional.	• Consider opportunities to remove, bury, or modify existing power lines (e.g., burying, anti-perching devices or line location). • Remove power line when use is completed.
		Transmission line towers should be constructed to severely reduce or eliminate nesting and perching by avian predators, most notably ravens, thereby reducing anthropogenic subsidies to those species.	• Power lines and substations constructed on BLM land would comply with the most current raptor protection standards (currently Reducing Avian Collisions with Power Lines: The State of the Art in 2012 (APLIC 2012)). • Existing power lines that have been identified as having problems with collision or electrocution of wildlife and do not meet APLIC standards will be corrected and modified to prevent future wildlife collision threats or electrocution. • Powerlines that are in good working order will

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
			be maintained and upgraded as deemed necessary.
		Avoid installation of compressor stations in PACs or other sage-grouse habitats where sage-grouse would be affected by noise and operation activities.	• Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
		All commercial pipelines should be buried and habitat that is disturbed needs to be reclaimed with current and future emphasis placed on suppression of non-native invasive plant species.	• Reclamation for Energy Development is comprehensive in the RMP and is addressed in Appendix E Oil and Gas Operations and Appendix J Reclamation.
		Mitigate impacts to habitat from development of these features.	Mitigation from Infrastructure impacts are comprehensive and can be found in • Appendix C Best Management Practices, • Appendix E.2 Best Management Practices and Conditions of Approval for Energy Development, • Appendix J Reclamation, and • Appendix M Mitigation for the Conservation of Greater Sage-grouse.
		Remove (or decommission) non-designated roads within sagebrush habitats.	• Travel Management will occur after the Record of Decision is signed. • Guidance for removal or decommission of roads is located in Appendix M.
Fences Present, but localized	Minimize the impact of fences on GSG populations.	Mark fences that are in high risk areas for collision (Stevens et al. 2012) with permanent flagging or other suitable device to reduce sage-grouse collisions on flat to gently rolling terrain in areas of moderate to high fence densities (i.e., more than 1 km of fence per km2) located within 2 kms of occupied leks.	• Evaluate existing structural range improvements. This includes evaluating methods to reduce outright sage-grouse strikes and mortality, through removing, modifying or marking fences in high risk areas within priority sage-grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009, Stevens 2011). • If portions of existing fences are found to pose a threat to Greater Sage-Grouse, mitigate through moving or modifying posts, increasing the visibility of the fences by flagging, or by designing “take-down” fences.
		Identify and remove unnecessary fences.	• Fences identified as potential barriers to wildlife movement or representing significant hazards for wildlife on BLM land would be inventoried. • Prioritized fences for replacement or modification to maintain resource values including wildlife movements.

USFWS COT Report Recommendations			BLM Proposed Management
Threats	***Conservation Objectives***	***Conservation Measures***	***Assessment of Strategy Consistency with Conservation Objectives***
		Placement of new fences and livestock management facilities (including corrals, loading facilities, water tanks and windmills) should consider their impact on sage-grouse and, to the extent practicable, be placed at least 1 km from occupied leks (Stevens et al. 2012).	• New fences would follow BLM specifications to allow for wildlife passage, except for fences built specifically to keep wildlife out of an area. • Fences would also be placed and marked, or modified, to reduce wildlife collisions or entanglements.

Appendix M
Greater Sage-Grouse

M.4: Greater Sage-Grouse Mitigation

General

In undertaking BLM management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. Reference should be made to Appendix M.1, Mitigation Measures and Conservation Actions for Greater Sage-Grouse Habitat, as well as the other appendices in the M-series for more details in this regard. Actions which result in habitat loss and degradation include those identified as threats which contribute to Greater Sage-Grouse disturbance as identified by the U.S. Fish and Wildlife Service in its 2010 listing decision (75 FR 13910) and shown in Table 2 in the Monitoring Framework (Appendix M.2). Mitigation will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g. avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM management actions and authorized third-party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e., residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species. Any compensatory mitigation will be durable, timely, and in addition to that which would have resulted without the compensatory mitigation (see Glossary).

The BLM, via the Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy that will inform the NEPA decision making process including the application of the mitigation hierarchy for BLM management actions and third-party actions that result in habitat loss and degradation. A robust and transparent Regional Mitigation Strategy will contribute to greater sage-grouse habitat conservation by reducing, eliminating, or minimizing threats and compensating for residual impacts to Greater Sage-Grouse and its habitat.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. The following sections provide additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

Developing a WAFWA Management Zone Regional Mitigation Strategy

The BLM, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy for BLM/USFS management actions and third party actions that result in habitat loss and degradation. The Strategy should consider any state-level Greater Sage-Grouse mitigation guidance that is consistent with the requirements identified in this Appendix. The Regional Mitigation Strategy should be developed in a transparent manner, based on the best science available and standardized metrics.

As described in Chapter 2, the BLM will establish a WAFWA Management Zone Greater Sage-Grouse Conservation Team (hereafter Team) to help guide the conservation of Greater Sage-Grouse, within 90 days of the issuance of the Record of Decision. The Strategy will be developed within one year of the issuance of the Record of Decision.

The Regional Mitigation Strategy should include mitigation guidance on avoidance, minimization, and compensation, as follows:

- Avoidance
    - Include avoidance areas (e.g., right-of-way avoidance/exclusion areas, no surface occupancy areas) already included in laws, regulations, policies, and/or land use plans (e.g., Resource Management Plans, Forest Plans, State Plans); and,
    - Include any potential, additional avoidance actions (e.g., additional avoidance best management practices) with regard to Greater Sage-Grouse conservation.
- Minimization
    - Include minimization actions (e.g. required design features, best management practices) already included in laws, regulations, policies, land use plans, and/or land-use authorizations; and,
    - Include any potential, additional minimization actions (e.g., additional minimization best management practices) with regard to Greater Sage-Grouse conservation.
- Compensation
    - Include discussion of impact/project valuation, compensatory mitigation options, siting, compensatory project types and costs, monitoring, reporting, and program administration. Each of these topics is discussed in more detail below.
        - Residual Impact and Compensatory Mitigation Project Valuation Guidance
            - A common standardized method should be identified for estimating the value of the residual impacts and value of the compensatory mitigation projects, including accounting for any uncertainty associated with the effectiveness of the projects.
            - This method should consider the quality of habitat, scarcity of the habitat, and the size of the impact/project.
            - For compensatory mitigation projects, consideration of durability (see Glossary), timeliness (see Glossary), and the potential for failure (e.g., uncertainty associated with effectiveness) may require an upward adjustment of the valuation.
            - The resultant compensatory mitigation project will, after application of the above guidance, result in proactive conservation measures for Greater Sage-Grouse (consistent with BLM Manual 6840 – Special Status Species Management, section .02).
        - Compensatory Mitigation Options
            - Options for implementing compensatory mitigation should be identified, such as:
                - Utilizing certified mitigation/conservation bank or credit exchanges.
                - Contributing to an existing mitigation/conservation fund.
                - Authorized-user conducted mitigation projects.
            - For any compensatory mitigation project, the investment must be additional (i.e. additionality: the conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project).
        - Compensatory Mitigation Siting
            - Sites should be in areas that have the potential to yield a net conservation gain to the Greater Sage-Grouse, regardless of land ownership.
            - Sites should be durable (see Glossary).
            - Sites identified by existing plans and strategies (e.g., fire restoration plans, invasive species strategies, healthy land focal areas) should be considered, if those sites have the potential to yield a net conservation gain to greater sage-grouse and are durable.
        - Compensatory Mitigation Project Types and Costs
            - Project types should be identified that help reduce threats to Greater Sage-Grouse (e.g., protection, conservation, and restoration projects).
            - Each project type should have a goal and measurable objectives.
            - Each project type should have associated monitoring and maintenance requirements, for the duration of the impact.
            - To inform contributions to a mitigation/conservation fund, expected costs for these project types (and their monitoring and maintenance), within the WAFWA Management Zone, should be identified.
        - Compensatory Mitigation Compliance and Monitoring
            - Mitigation projects should be inspected to ensure they are implemented as designed, and if not, there should be methods to enforce compliance.
            - Mitigation projects should be monitored to ensure that the goals and objectives are met and that the benefits are effective for the duration of the impact.

- Compensatory Mitigation Reporting
  - Standardized, transparent, scalable, and scientifically-defensible reporting requirements should be identified for mitigation projects.
  - Reports should be compiled, summarized, and reviewed in the WAFWA Management Zone in order to determine if Greater Sage-Grouse conservation has been achieved and/or to support adaptive management recommendations.
- Compensatory Mitigation Program Implementation Guidelines
  - Guidelines for implementing the State-level compensatory mitigation program should include holding and applying compensatory mitigation funds, operating a transparent and credible accounting system, certifying mitigation credits, and managing reporting requirements.

Incorporating the Regional Mitigation Strategy into NEPA Analyses

The BLM will include the avoidance, minimization, and compensatory recommendations from the Regional Mitigation Strategy in one or more of the NEPA analysis alternatives for BLM management actions and third-party actions that result in habitat loss and degradation and the appropriate mitigation actions will be carried forward into the decision.

Implementing a Compensatory Mitigation Program

The BLM needs to ensure that compensatory mitigation is strategically implemented to provide a net conservation gain to the species, as identified in the Regional Mitigation Strategy. In order to align with existing compensatory mitigation efforts, this compensatory mitigation program will be managed at a State level (as opposed to a WAFWA Management Zone, a Field Office, or a Forest), in collaboration with our partners (e.g. federal, tribal, and state agencies).

To ensure transparent and effective management of the compensatory mitigation funds, the BLM will enter into a contract or agreement with a third party to help manage the State-level compensatory mitigation funds, within one year of the issuance of the Record of Decision. The selection of the third-party compensatory mitigation administrator will conform to all relevant laws, regulations, and policies. The BLM will remain responsible for making decisions that affect federal lands.

Glossary Terms

Additionality: The conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project. (adopted and modified from BLM Manual Section 1794).

Avoidance mitigation: Avoiding the impact altogether by not taking a certain action or parts of an action. (40 CFR 1508.20(a)) (e.g., may also include avoiding the impact by moving the proposed action to a different time or location.)

Compensatory mitigation: Compensating for the (residual) impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Compensatory mitigation projects: The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g., chemical vegetation treatments, land acquisitions, conservation easements). (adopted and modified from BLM Manual Section 1794).

Compensatory mitigation sites: The durable areas where compensatory mitigation projects will occur. (adopted and modified from BLM Manual Section 1794).

Durability (protective and ecological): The maintenance of the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations. (adopted and modified from BLM Manual Section 1794).

Minimization mitigation: Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (40 CFR 1508.20 (b))

Residual impacts: Impacts that remain after applying avoidance and minimization mitigation; also referred to as unavoidable impacts.

Timeliness: The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives (BLM Manual Section 1794).

Appendix M
Greater Sage-Grouse

M.5: Applying Lek Buffer Distances when Approving Actions

Buffer Distances and Evaluation of Impacts to Leks

The BLM will evaluate impacts to leks from actions requiring NEPA analysis. In addition to any other relevant information determined to be appropriate (e.g., state wildlife agency plans), the BLM will assess and address impacts from the following activities using the lek buffer-distances as identified in the USGS Report *Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review* (Open File Report 2014-1239). The BLM will apply the lek buffer-distances specified as the lower end of the interpreted range in the report unless justifiable departures are determined to be appropriate (see below). The lower end of the interpreted range of the lek buffer-distances is as follows:

- linear features (roads) within 3.1 miles of leks
- infrastructure related to energy development within 3.1 miles of leks.
- tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks.
- low structures (e.g., fences, rangeland structures) within 1.2 miles of leks.
- surface disturbance (continuing human activities that alter or remove the natural vegetation) within 3.1 miles of leks.
- noise and related disruptive activities including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks.

Justifiable departures to decrease or increase from these distances, based on local data, best available science, landscape features, and other existing protections (e.g., land use allocations, state regulations) may be appropriate for determining activity impacts. The USGS report recognizes that "because of variation in populations, habitats, development patterns, social context, and other factors, for a particular disturbance type, there is no single distance that is an appropriate buffer for all populations and habitats across the sage-grouse range." The USGS report also states that "various protection measures have been developed and implemented… [which have] the ability (alone or in concert with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands." All variations in lek buffer-distances will require appropriate analysis and disclosure as part of activity authorization.

In determining lek locations, the BLM will use the most recent active or occupied lek data available from the state wildlife agency.

For Actions in General Habitat Management Area (GHMA)

The BLM will apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis.

- Impacts should first be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.
- The BLM may approve actions in GHMA that are within the applicable lek buffer distance identified above only if:
  - Based on best available science, landscape features, and other existing protections, (e.g., land use allocations, state regulations), the BLM determines that a lek buffer-distance other than the applicable distance identified above offers the same or a greater level of protection to Greater Sage-Grouse and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area; or
  - The BLM determines that impacts to Greater Sage-Grouse and its habitat are minimized such that the project will cause minor or no new disturbance (ex. co-location with existing authorizations); and
  - Any residual impacts within the lek buffer-distances are addressed through compensatory mitigation measures sufficient to ensure a net conservation gain, as outlined in the Mitigation Strategy (Appendix M.4).

For Actions in Priority Habitat Management Area (PHMA)

The BLM will apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis. Impacts should be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

The BLM may approve actions in PHMA that are within the applicable lek buffer distance identified above only if:

- The BLM, with input from the state fish and wildlife agency, determines, based on best available science, landscape features, and other existing protections, that a buffer distance other than the distance identified above offers the same or greater level of protection to Greater Sage-Grouse and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area.

Range improvements which do not impact Greater Sage-Grouse, or range improvements which provide a conservation benefit to Greater Sage-Grouse such as fences for protecting important seasonal habitats, meet the lek buffer requirement.

The BLM will explain its justification for determining the approved buffer distances meet these conditions in its project decision.

Appendix M
Greater Sage-Grouse

M.6: Required Design Features for Greater Sage-Grouse Habitat

Required Design Features (RDFs) are required for certain activities in all Greater Sage-Grouse (GRSG) habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat;
- A specific RDF will provide no additional protection to GRSG or its habitat.

Required Design Features for how to make a pond that won't produce mosquitoes that transmit West Nile virus (from Doherty [2007])

1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtmann, et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight, et al. 2003).

2. Build steep shorelines to reduce shallow water (>60 centimeters [cm]) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight, et al. 2003).

3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer Culex mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).

4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight, et al. 2003).

5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.

6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.

7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

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Required Design Features for Fluid Mineral Development

Priority Habitat Management Areas (PHMA)

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among right-of-way (ROW) holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.

- Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui, et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Corridor power, flow, and small pipelines under or immediately adjacent to roads.
- Design or site permanent structures which create movement (e.g., a pump jack) to minimize impacts to sage-grouse.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (e.g., by washing vehicles and equipment).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
  - Construct dams or impoundments that restrict down slope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- The BLM would work with proponents to limit project-related noise where it would be expected to reduce functionality of habitats that support GRSG populations. The BLM would evaluate the potential for limitation of new noise sources on a case-by-case basis as appropriate.
- As additional research and information emerges, specific new limitations appropriate to the type of projects being considered would be evaluated, and appropriate limitations would be implemented where necessary to minimize potential for noise impacts on GRSG population behavioral cycles.
- As new research is completed, new specific limitations would be coordinated with MFWP and partners. Limit noise to less than 10 decibels above ambient measures (20-26 dBA) at sunrise at the perimeter of the lek during active lek season (Patricelli, et al. 2010; Blickley, et al. In preparation).
- Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require sage-grouse-safe fences.
- Locate new compressor stations outside Priority Habitat Management Areas (PHMA) and design them to reduce noise that may be directed towards PHMA.
- Clean up refuse.
- Locate man camps outside of PHMA.

Reclamation

- Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post-reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

General Sage-Grouse Habitat Management Areas (GHMA)

Make applicable BMPs mandatory as Conditions of Approval (COA) within General Habitat Management Areas (GHMA). BMPs are continuously improving as new science and technology become available and therefore are subject to change. At a minimum include the following BMPs:

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Use directional and horizontal drilling to reduce surface disturbance.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003; Bergquist, et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Doherty 2007).
- Clean up refuse.

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites. Address post-reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.

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Required Design Features for Fire and Fuels

Fuels Management

1. Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.

2. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.

3. Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).

4. Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and/or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.

5. Where appropriate, ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (See Connelly, et al. 2000)

6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.

7. Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.

8. Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to key and restoration habitats.

9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by sage-grouse key habitats. Annual grasslands are second priority for restoration when the sites are not adjacent to key habitat, but within two miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites beyond two miles of key habitat. The intent is to focus restoration outward from existing, intact habitat.

10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.

11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.

12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch sites for avian predators, as appropriate, and resources permit.

13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.

14. Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green strips) paralleling road rights-of-way.

15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to aid in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

Fire Management

1. Develop state-specific sage-grouse toolboxes containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.

2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.

3. Assign a sage-grouse resource advisor to all extended attack fires in or near key sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.

4. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.

5. During periods of multiple fires, ensure line officers are involved in setting priorities.

6. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.

7. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.

8. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.

9. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.

10. Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.

11. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

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Required Design Features for Solid Mineral Development

The following measures would be applied as RDFs for all solid minerals. They would also apply to locatable minerals consistent with applicable law. The RDFs or BMPs would be applied as appropriate in PHMA and GHMA, and to the extent allowable by law (i.e., to prevent unnecessary and undue degradation).

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e.g., use signing, gates, etc.).
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
    - Overbuild size of ponds for muddy and non-vegetated shorelines.
    - Build steep shorelines to decrease vegetation and increase wave actions.
    - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
    - Construct dams or impoundments that restrict down slope seepage or overflow.
    - Line the channel where discharge water flows into the pond with crushed rock.
    - Construct spillway with steep sides and line it with crushed rock.
    - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
    - Require sage-grouse-safe fences around sumps.
- Clean up refuse (Bui, et al. 2010).
- Locate man camps outside of PHMA.

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites.
- Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

Literature Cited

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Appendix M
Greater Sage-Grouse

M.7: Greater Sage-Grouse Effects Analysis Process

The BLM will ensure that any activities or projects in Greater Sage-Grouse habitats would: 1) only occur in compliance with HiLine Resource Management Plan (RMP) Greater Sage-Grouse goals and objectives for Priority and General Habitat Management Areas; and 2) maintain neutral or positive Greater Sage-Grouse population trends and habitat by avoiding, minimizing, and offsetting unavoidable impacts to assure a conservation gain at the scale of this land use plan and within Greater Sage-Grouse population areas, State boundaries, and Western Association of Fish and Wildlife Agencies (WAFWA) Management Zones through the application of mitigation for implementation-level decisions. The mitigation process will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g., avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy, while also following Secretary of the Interior Order 3330 and consulting BLM, USFWS and other current and appropriate mitigation guidance. If it is determined that residual impacts to Greater Sage-Grouse from implementation-level actions would remain after applying avoidance and minimization measures to the extent possible, then compensatory mitigation projects will be used to offset residual impacts, or the project may be deferred or denied if necessary to achieve the goals and objectives for Priority and General Habitat Management Areas in the HiLine RMP.

To ensure that impacts from activities proposed in Greater Sage-Grouse Priority and General Habitat Management Areas (PHMA and GHMA) are appropriately mitigated, the BLM will apply mitigation measures and conservation actions and potentially modify the location, design, construction, and/or operation of proposed land uses or activities to comply with statutory requirements for environmental protection. The mitigation measures and conservation actions (Appendices C, M.1 and M.6) for proposed projects or activities in these areas will be identified as part of the National Environmental Policy Act (NEPA) environmental review process, through interdisciplinary analysis involving resource specialists, project proponents, government entities, landowners or other Surface Management Agencies. Those measures selected for implementation will be identified in the Record of Decision (ROD) or Decision Record (DR) for those authorizations and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals to mitigate, per the mitigation hierarchy referenced above, impacts from the activity or project such that Greater Sage-Grouse goals and objectives are met. Because these actions create a clear obligation for the BLM to ensure any proposed mitigation action adopted in the environmental review process is performed, there is assurance that mitigation will lead to a reduction of environmental impacts in the implementation stage and include binding mechanisms for enforcement (CEQ Memorandum for Heads of Federal Departments and Agencies 2011).

To achieve the goals and objectives for PHMA and GHMA in the HiLine RMP, the BLM will assess all proposed land uses or activities such as road, pipeline, communication tower, or powerline construction, fluid and solid mineral development, range improvements, and recreational activities proposed for location in Greater Sage-Grouse PHMA and GHMA in a step-wise manner. The following steps identify a screening process for review of proposed activities or projects in these areas. This process will provide a consistent approach and ensure that authorization of these projects, if granted, will appropriately mitigate impacts and be consistent with the RMP goals and objectives for Greater Sage-Grouse. The following steps provide for a sequential screening of proposals. However, Steps 2-6 can be done concurrently.

Step 1 – Determine Proposal Adequacy

This screening process is initiated upon formal submittal of a proposal for authorization for use of BLM lands. The actual documentation of the proposal would include at a minimum a description of the location, scale of the project and timing of the disturbance. The acceptance of the proposal(s) for review would be consistent with existing protocol and procedures for each type of use.

Step 2 – Evaluate Proposal Consistency with the HiLine RMP

This initial review should evaluate whether the proposal would be allowed as prescribed in the RMP. For example, some activities or types of development are prohibited in PHMA or GHMA. Evaluation of projects will also include an assessment of the current state of the Adaptive Management hard and soft triggers. If the proposal is for an activity that is specifically prohibited, the applicant should be informed that the application is being rejected since it would not be allowed, regardless of the design of the project.

Step 3 – Determine Proposal Consistency with Density and Disturbance Limitations

If the proposed activity occurs within a PHMA, evaluate whether the disturbance from the activity exceeds the limit on the amount of disturbance allowed within the activity or project area (Density and Disturbance Calculation Tool [DDCT] process). If current disturbance within the activity area or the anticipated disturbance from the proposed activity exceeds this threshold, the project would be deferred until such time as the amount of disturbance within the area has been reduced below the threshold, redesigned so as to not result in any additional surface disturbance (collocation), or redesigned to move it outside of PHMA.

Step 4 – Determine Projected Greater Sage-Grouse Population and Habitat Impacts

Determine if the project will have a direct or indirect impact on Greater Sage-Grouse populations or habitat within PHMA or GHMA. This will include:

- Reviewing Greater Sage-Grouse Habitat delineation maps to initially assess potential impacts to sage-grouse.

  Use of the *USGS report Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review* to assess potential project impacts based upon the distance to the nearest lek, using the most recent active lek data available from the state wildlife agency. This assessment will be based upon the direction in Appendix M.5:

  - Review and application of current science recommendations.
  - Reviewing the 'Base Line Environment Report' (USGS) which identifies areas of direct and indirect effect for various anthropogenic activities.
  - Consultation with agency or State Wildlife Agency biologist.
  - Evaluating consistency with (at a minimum) State sage-grouse regulations
  - Or other methods needed to provide an accurate assessment of impacts.

If the proposal will not have a direct or indirect impact on either the habitat or population, document the findings in the NEPA analysis and proceed with the appropriate process for review, decision and implementation of the project.

Step 5 – Apply Avoidance and Minimization Measures to Comply with Greater Sage-Grouse Goals and Objectives

If the project can be relocated so as to not have an impact on Greater Sage-Grouse and still achieve objectives of the proposal and the disturbance limitations, relocate the proposed activity and proceed with the appropriate process for review, decision and implementation (NEPA analysis and Decision Record). This Step does not consider redesign of the project to reduce or eliminate direct and indirect impacts, but rather authorization of the project in a physical location that will not impact Greater Sage-Grouse. If the preliminary review of the proposal concludes that there may be adverse impacts to Greater Sage-Grouse habitat or populations in Step 4 and the project cannot be effectively relocated to avoid these impacts, proceed with the appropriate process for review, decision and implementation (NEPA analysis and Decision Record) with the inclusion of appropriate mitigation requirements to further reduce or eliminate impacts to Greater Sage-Grouse habitat and populations and achieve compliance with Greater Sage-Grouse objectives. Mitigation measures could include disturbance buffer limits, timing of disturbance limits, noise restrictions, design modifications of the proposal, site disturbance restoration, post-project reclamation, etc. (see Mitigation Measures and Conservation Actions Appendix M.1 for a more complete list of measures). Compensatory or offsite mitigation may be required (Step 6) in situations where residual impacts remain after application of all avoidance and minimization measures.

Step 6 – Apply Compensatory Mitigation or Reject/Defer Proposal

If screening of the proposal (Steps 1-5) has determined that direct and indirect impacts cannot be eliminated through avoidance or minimization, evaluate the proposal to determine if compensatory mitigation can be used to offset the remaining adverse impacts and achieve sage-grouse goals and objectives. If the impacts cannot be effectively mitigated, reject or defer the proposal. The criteria for determining this situation could include but are not limited to:

- The current trend within the Priority Habitat is down and additional impacts, whether mitigated or not, could lead to further decline of the species or habitat.
- The proposed mitigation is inadequate in scope or duration, has proven to be ineffective or is unproven is terms of science based approach.
- The project would impact habitat that has been determined to be a limiting factor for species sustainability.
- Other site-specific information and analysis that determined the project would lead to a downward change of the current species population or habitat and not comply with sage-grouse goals and objectives.

If, following application of available impact avoidance and minimization measures, the project can be mitigated to fully offset impacts and assure conservation gain to the species and comply with Greater Sage-Grouse goals and objectives, proceed with the appropriate process for review, decision and implementation (NEPA analysis and Decision Record).

The BLM, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy to address Greater Sage-Grouse impacts within that Zone. The WAFWA Management Zone Regional Mitigation Strategy will be applicable to the States/Field Offices/Forests within the Zone's boundaries. Subsequently, the BLM HiLine District NEPA analyses for implementation-level decisions, which have the potential to impact Greater Sage-Grouse, will include analysis of mitigation recommendations from the relevant WAFWA Management Zone Regional Mitigation Strategy(ies).

Implementation of the Regional Mitigation Strategy may involve managing compensatory mitigation funds, implementing compensatory mitigation projects, certifying mitigation/conservation banks, and reporting on the effectiveness of those projects. These types of mitigation implementation actions may be most effectively managed at the State-level, in collaboration with partners. The BLM State Office/ may find it most effective to enter into an agreement with a State-level program administrator (e.g., a NGO, a State-level entity) to help manage these aspects of mitigation. The BLM will remain responsible for making decisions that affect Federal lands.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. Appendix M.4 provides additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

Appendix M
Greater Sage-Grouse

M.8: Disturbance Caps

In the USFWS's 2010 listing decision for sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010. The 18 threats have been aggregated into three measures:

Sagebrush Availability (percent of sagebrush per unit area)
Habitat Degradation (percent of human activity per unit area)
Density of Energy and Mining (facilities and locations per unit area)

Habitat Degradation and Density of Energy and Mining will be evaluated under the Disturbance Cap and Density Cap respectively and are further described in this appendix. The three measures, in conjunction with other information, will be considered during the NEPA process for projects authorized or undertaken by the BLM.

<u>Disturbance Cap</u>:

This land use plan has incorporated a 3% anthropogenic disturbance cap within Greater Sage-Grouse (GRSG) Priority Habitat Management Areas (PHMAs) and the subsequent land use planning actions if the cap is met:

> *If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG PHMAs in any given Biologically Significant Unit, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) would be permitted by the BLM within GRSG PHMAs in any given Biologically Significant Unit until the disturbance has been reduced to less than the cap.*
>
> *If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5% within a project analysis area in PHMAs, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) will be permitted by BLM within PHMA in a project analysis area until the disturbance has been reduced to less than the cap. If the BLM determines that the State of Montana has adopted a GRSG Habitat Conservation Program that contains comparable components to those found in the State of Wyoming's Core Area Strategy including an all lands approach for calculating anthropogenic disturbances, a clear methodology for measuring the density of operations, and a fully operational Density Disturbance Calculation Tool, the 3% disturbance cap will be converted to a 5% cap for all sources of habitat alteration within a project analysis area.*

The disturbance cap applies to the PHMA within both the Biologically Significant Units (BSU) and at the project authorization scale. For the BSUs, west-wide habitat degradation (disturbance) data layers (Table 1) will be used at a minimum to calculate the amount of disturbance and to determine if the disturbance cap has been exceeded as the land use plans (LUP) are being implemented. Locally collected disturbance data will be used to determine if the disturbance cap has been exceeded for project authorizations, and may also be used to calculate the amount of disturbance in the BSUs.

Although locatable mine sites are included in the degradation calculation, mining activities under the 1872 mining law may not be subject to the 3% disturbance cap. Details about locatable mining activities will be fully disclosed and analyzed in the NEPA process to assess impacts to sage-grouse and their habitat as well as to BLM goals and objectives, and other BLM programs and activities.

Formulas for calculations of the amount of disturbance in the PHMA in a BSU and or in a proposed project area are as follows:

- For the BSUs:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1]) ÷ (acres of all lands within the PHMAs in a BSU) x 100.

- For the Project Analysis Area:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1] plus the 7 site scale threats[2] and acres of habitat loss1) ÷ (acres of all lands within the PHMA in the project analysis area) x 100.

[1] see Table 1. [2] see Table 2

The denominator in the disturbance calculation formula consists of all acres of lands classified as PHMA within the analysis area (BSU or project area). Areas that are not sage-grouse seasonal habitats, or are not currently supporting sagebrush cover (e.g., due to wildfire), are not excluded from the acres of PHMA in the denominator of the formula. Information regarding sage-grouse seasonal habitats, sagebrush availability, and areas with the potential to support sage-grouse populations will be considered along with other local conditions that may affect sage-grouse during the analysis of the proposed project area.

Density Cap:

This land use plan has also incorporated a cap on the density of energy and mining facilities at an average of one facility per 640 acres in the PHMA in a project authorization area. If the disturbance density in the PHMA in a proposed project area is on average less than 1 facility per 640 acres, the analysis will proceed through the NEPA process incorporating mitigation measures into an alternative. If the disturbance density is greater than an average of 1 facility per 640 acres, the proposed project will either be deferred until the density of energy and mining facilities is less than the cap or co-located it into existing disturbed area (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.). Facilities included in the density calculation (Table 3) are:

- Energy (oil and gas wells and development facilities)
- Energy (coal mines)
- Energy (wind towers)
- Energy (solar fields)
- Energy (geothermal)
- Mining (active locatable, leasable, and saleable developments)

Project Analysis Area Method for Permitting Surface Disturbance Activities:

- Determine potentially affected occupied leks by placing a four mile boundary around the proposed area of physical disturbance related to the project. All occupied leks located within the four mile project boundary and within PHMA will be considered affected by the project.
- Next, place a four mile boundary around each of the affected occupied leks.
- The PHMA within the four mile lek boundary and the four mile project boundary creates the project analysis area for each individual project. If there are no occupied leks within the four-mile project boundary, the project analysis area will be that portion of the four-mile project boundary within the PHMA.
- Digitize all existing anthropogenic disturbances identified in Table 1, the 7 additional features that are considered threats to sage-grouse (Table 2), and areas of sagebrush loss. Using 1 meter resolution NAIP imagery is recommended. Use existing local data if available.
- Calculate percent existing disturbance using the formula above. If existing disturbance is less than 3% anthropogenic disturbance or 5% total disturbance, proceed to next step. If existing disturbance is greater than 3% anthropogenic disturbance or 5% total disturbance, defer the project.

- Add proposed project disturbance footprint area and recalculate the percent disturbance. If disturbance is less than 3% anthropogenic disturbance or 5% total disturbance, proceed to next step. If disturbance is greater than 3% anthropogenic disturbance or 5% total disturbance, defer project.
- Calculate the disturbance density of energy and mining facilities (listed above). If the disturbance density is less than 1 facility per 640 acres, averaged across project analysis area, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is greater than 1 facility per 640 acres, averaged across the project analysis area, either defer the proposed project or co-locate it into existing disturbed area.
- If a project that would exceed the degradation cap or density cap cannot be deferred due to valid existing rights or other existing laws and regulations, fully disclose the local and regional impacts of the proposed action in the associated NEPA.

Table 1. Anthropogenic disturbance types for disturbance calculations. Data sources are described for the west-wide habitat degradation estimates (Table copied from the GRSG Monitoring Framework)

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/ Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

Table 2. The seven site scale features considered threats to sage-grouse included in the disturbance calculation for project authorizations

1. Coalbed Methane Ponds
2. Meteorological Towers
3. Nuclear Energy Facilities
4. Airport Facilities and Infrastructure
5. Military Range Facilities & Infrastructure
6. Hydroelectric Plants
7. Recreation Areas Facilities and Infrastructure

Definitions:

1. Coalbed Methane and other Energy-related Retention Ponds – The footprint boundary will follow the fenceline and includes the area within the fenceline surrounding the impoundment. If the pond is not fenced, the impoundment itself is the footprint. Other infrastructure associated with the containment ponds (roads, well pads, etc.) will be captured in other disturbance categories.

2. Meteorological Towers – This feature includes long-term weather monitoring and temporary meteorological towers associated with short-term wind testing. The footprint boundary includes the area underneath the guy wires.

3. Nuclear Energy Facilities – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.

4. Airport Facilities and Infrastructure (public and private) –The footprint boundary of will follow the boundary of the airport or heliport and includes mowed areas, parking lots, hangers, taxiways, driveways, terminals, maintenance facilities, beacons and related features. Indicators of the boundary, such as distinct land cover changes, fences and perimeter roads, will be used to encompass the entire airport or heliport.

5. Military Range Facilities & Infrastructure – The footprint boundary will follow the outer edge of the disturbed areas around buildings and includes undisturbed areas within the facility's perimeter.

6. Hydroelectric Plants – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.

7. Recreation Areas & Facilities – This feature includes all sites/facilities larger than 0.25 acres in size. The footprint boundary will include any undisturbed areas within the site/facility.

Table 3. Relationship between the 18 threats and the three habitat disturbance measures for monitoring and disturbance calculations

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X

Infrastructure (roads)	X
Infrastructure (railroads)	X
Infrastructure (power lines)	X
Infrastructure (communication towers)	X
Infrastructure (other vertical structures)	X
Other developed rights-of-way	X

Appendix M
Greater Sage-Grouse

M.9: Cumulative Effects Analysis – Management Zone I

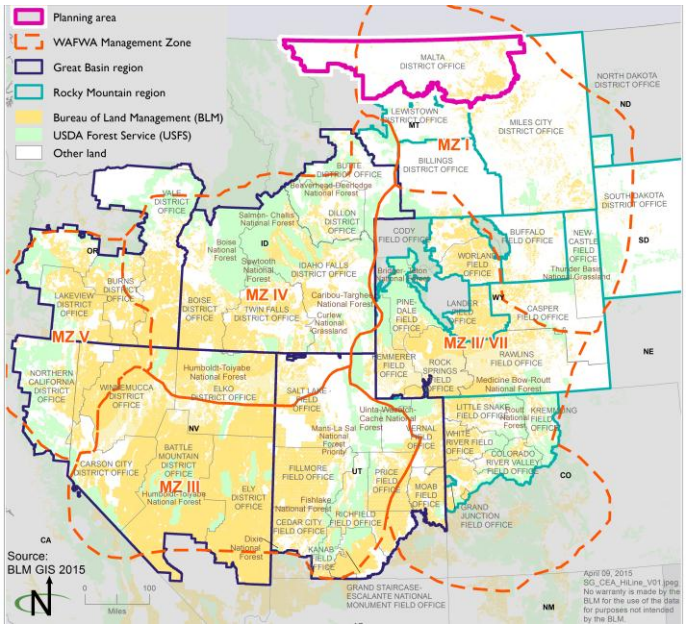
1.0 Greater Sage-Grouse Cumulative Effects Analysis: HiLine Planning Area

This cumulative effects analysis discloses the long-term effects on Greater Sage-Grouse (GRSG) from implementing each RMP/EIS alternative in conjunction with other past, present, and reasonably foreseeable future actions. In accordance with Council on Environmental Quality guidance, cumulative effects need to be analyzed in terms of the specific resource and ecosystem being affected (Council on Environmental Quality 1997). As discussed in Chapter 1, the purpose for the proposed federal action is to identify and incorporate appropriate conservation measures to conserve, enhance, and restore GRSG habitat by reducing, eliminating, or minimizing threats to GRSG habitat. The Western Association of Fish and Wildlife Agencies (WAFWA) delineated seven sage-grouse management zones based on populations within floristic provinces (Stiver, et al. 2006). Therefore, the cumulative effects analysis study area for the Greater Sage Grouse extends beyond the HiLine planning area boundary and incorporates WAFWA Management Zone (MZ) I.

The analysis of BLM actions in MZ I is primarily based on MZ-wide datasets developed by the BLM National Operations Center (NOC). Where quantitative data are not available, analysis is qualitative. This analysis includes past, present and reasonably foreseeable future actions for all land ownerships in the MZ, and evaluates the impacts of the HiLine RMP, by alternative, when added to those actions. Non-federal lands and actions considered in this analysis include the following:

- State plans
- Coordination with states and agencies during consistency reviews
- Additional data from non-BLM-administered lands

The following diagram shows the boundary of WAFWA MZ I and the HiLine planning area. Approximately 13.2 million acres of the HiLine planning area are located within MZ I, including large, intact blocks of Priority Habitat, areas that are considered to have high-quality GRSG habitat and greater densities of GRSG. As one of the larger planning areas in MZ I, actions in the HiLine RMP/EIS may have an important cumulative impact on GRSG.



Section 1.4, Regional Efforts to Manage Threats to GRSG, provides a broad-scale description of past, present, and reasonably foreseeable future federal, state, local, and private actions influencing GRSG in MZ I. **Section 1.2** lists assumptions used in the analysis. **Section 1.3** describes existing conditions in MZ I and in the HiLine RMP planning area. **Section 1.4** discusses present and reasonably foreseeable future federal, state, tribal, and private efforts to conserve GRSG in MZ I. **Section 1.5** describes relevant past, present, and reasonably foreseeable future actions in MZ I that could cumulatively affect GRSG. **Section 1.6** analyzes threats to GRSG in MZ I and discusses the potential cumulative effects resulting from each threat for each alternative. **Section 1.7**, Conclusions, determines the cumulative effects on GRSG as a result of implementing each alternative in the HiLine RMP, in combination with other private, local, regional, state, and federal past, present, and reasonably foreseeable future actions in MZ I.

1.1 Methods

The cumulative effects analysis uses the following methods: Data from the USGS publication Summary of Science, Activities, Programs, and Policies That Influence the Range-Wide Conservation of Greater Sage-Grouse (Manier, et al. 2013) establish the reference condition against which the alternatives and other past, present, and reasonably foreseeable future actions are compared. Data from this publication are presented in terms of priority habitat and general habitat. The USFWS's 12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered (USFWS 2010) and the USFWS publication Conservation Objectives: Final Report (i.e., the COT report; USFWS 2013) were reviewed to identify the primary threats facing GRSG in each WAFWA MZ. Table 2 of the COT report lists threats to GRSG that are present and widespread in each population in the MZ.

- For MZ I the list of threats that are directly or indirectly affected by BLM actions are energy development/ mining, infrastructure, grazing, conversion to agriculture, fire, spread of weeds, and recreation (USFWS 2013). Two other threats listed in the COT report, sagebrush eradication and isolation/small population size, affect GRSG populations in MZ I. While they are not addressed separately in this analysis, they are discussed as elements of other threats.

- Predation was not included as a threat in the final COT report and was not identified by USFWS as a significant threat to GRSG populations (USFWS 2010). Predation is a natural occurrence that may be enhanced by human habitat modifications such as construction of infrastructure that may increase opportunities for nesting and perching or increase exposure of GRSG nests. In such altered habitats, predators may exert an undue influence on GRSG populations. Predation is discussed in this cumulative effects analysis in the context of these other threats.

- Sagebrush eradication is a component of many threats. Isolation/small population size is not analyzed separately, because no management actions directly address this threat. These two threats are discussed as a component of other threats and in the conclusions. Not all the threats discussed in this section represent major threats to GRSG in each planning area in the MZ, but each poses a present and widespread threat to at least one population.

- Each threat is analyzed, and a brief conclusion for each threat is provided.

    - The BLM NOC compiled MZ-wide datasets for quantifiable actions in all proposed BLM RMP/EISs in MZ I. These datasets provide a means by which to quantify cumulative impacts resulting from direct impacts of the threats identified in the COT report.

    - PHMA and GHMA were developed to protect the best habitat and highest population density of GRSG. Although Alternative A does not designate PHMA or GHMA, spatial GIS data were clipped to these boundaries to allow for a consistent comparison across all alternatives.

    - Data and information were gathered from other federal, state, and local agencies and tribal governments, where available, and were used to inform the analysis of cumulative impacts on GRSG from each of the threats in MZ I.

  - The tables in this cumulative analysis display the number of acres across the entire MZ and the percentage of those acres that are located within the HiLine planning area. To calculate the total number of acres in the MZ, the number of acres in the other BLM and Forest Service proposed plans across MZ I are added to the number of acres in the applicable HiLine RMP alternative. For example, the total number of acres for Alternative A includes all of the other proposed plans in MZ I plus HiLine RMP Alternative A. Likewise, the Alternative B acreage includes all of the other proposed plans in MZ I plus HiLine RMP Alternative B.

- A discussion is provided for each alternative in **Section 1.7**. Each alternative considers the cumulative impacts on GRSG from each of the threats. It also considers whether those threats can be ameliorated by implementing that particular alternative in conjunction with past, present and reasonably foreseeable future non-BLM actions in MZ I.

- The list of relevant cumulative actions in **Section 1.5** was derived from each BLM Proposed RMP in MZ I to provide an overview of the ongoing and proposed land uses there.

- Baseline data that are consistent across planning areas and that analyze cumulative effects for each alternative, including the No Action Alternative and Proposed Plan (Alternative E, Preferred Alternative), are used in this analysis.

- This analysis uses the most recent information available. For purposes of this analysis, the BLM has determined that the Proposed Plans for the other ongoing GRSG planning efforts in MZ I are reasonably foreseeable future actions.

1.2 Assumptions

This cumulative analysis uses the same assumptions and indicators as those established for the analysis of direct and indirect effects on GRSG in Chapter 4, Wildlife. In addition, the following assumptions have been made:

- The timeframe for this analysis is 20 years.

- The cumulative effects analysis area extends beyond the planning area and encompasses all of WAFWA MZ I; the quantitative impact analysis focuses on impacts across the MZ. The MZ is the appropriate geographic scope for this analysis because it encompasses areas with similar floristic conditions containing important GRSG habitat.

- The magnitude of each threat would vary geographically and may have more or less impact on GRSG in some parts of the MZ, depending on such factors as climate, land use patterns, and topography.

- A management action or alternative would result in a net conservation gain to GRSG if there is an actual benefit or gain above baseline conditions. Baseline conditions are defined as the pre-existing condition of a defined area and/or resource that can be quantified by an appropriate metric(s). During environmental reviews, the baseline is considered the affected environment that exists at the time of the review's initiation, and is used to compare predictions of the effects of the proposed action or a reasonable range of alternatives.

- The cumulative effects analysis quantitatively analyzes impacts on GRSG and their habitat in the MZ. Impacts on habitat are likely to correspond to impacts on populations within the management zone (MZ I), since reductions or alterations in habitat could affect reproductive success through reductions in available forage or nest sites. Human activity could cause disturbance to the birds, preventing them from mating or successfully rearing offspring. Human activities also could increase opportunities for predation, disease, or other stressors (Connelly, et al. 2004; USFWS 2010; Manier, et al. 2013).

1.3 Existing Conditions in WAFWA MZ I and the HiLine RMP Planning Area

This section summarizes existing conditions and past and present actions for the HiLine RMP planning area (provided in more detail in **Chapter 3**) and for MZ I as a whole. Reasonably foreseeable future actions are discussed in **Section 1.5**.

GRSG Habitat and Populations

MZ I consists of four GRSG populations: the Dakotas, Northern Montana, Powder River Basin, and Yellowstone Watershed (Garton, et al. 2011). The HiLine RMP planning area includes all of the Northern Montana GRSG population. MZ I contains some of the highest-connected networks of GRSG leks in the range (Knick and Hanser 2011); however, it also contains less productive sagebrush, similar to areas where GRSG have been extirpated (Wisdom, et al. 2011). Sagebrush cover is naturally limited due to climate, soils, and the dominant presence of grassland ecosystems. In combination with agricultural pressure and energy production in the Powder River Basin and extensive infrastructure, including power lines, fences, and roads (USFWS 2010), this results in substantial habitat limitations for GRSG populations.

In MZ I, state and private lands account for approximately 35 million acres of GRSG habitat (approximately 75 percent of habitat), with BLM-administered and other federal land accounting for 25 percent of surface estate (Manier, et al. 2013, p. 118). The BLM also has management authority over subsurface mineral estate even when the surface ownership is non-federal (split-estate lands).

Table M.9-1 provides a breakdown of landownership and acres of GRSG habitat in MZ I. As the table shows, approximately 26 percent of PHMA and 13 percent of GHMA is on BLM-administered lands. In the HiLine RMP planning area, there are approximately 3.4 million acres of GRSG habitat, including approximately 1.7 million acres on BLM-administered lands (1,432,600 acres of PHMA and 289,000 acres of GHMA).

BLM-administered surface estate and federal mineral estate comprises approximately 14 percent and 24 percent, respectively, of the HiLine planning area. Due to the patchwork distribution of land ownership, the conservation results obtained on any ownership are limited unless conservation actions are enacted across ownership boundaries.

The BLM has incorporated management of Sagebrush Focal Areas (SFAs) into its proposed management approach for GRSG. SFAs are a subset of PHMA and represent recognized "strongholds" for the species that have been noted and referenced by the conservation community as having the highest densities of the species and other criteria important for the persistence of the species (Ashe 2014). Those portions of SFAs on BLM-administered lands would be petitioned for withdrawal from mineral entry, subject to an NSO stipulation with no exceptions, modifications, or waivers, and are prioritized for management and conservation actions, including, but not limited to, review of livestock grazing permits/ leases. There is one SFA comprising 1,807,600 acres in MZ I, in Montana.

Table M.9-1
Management Jurisdiction in MZ I by Acres of Priority and General Habitats

	Total Surface Area (Acres)	***Priority Habitat (Acres)***	***General Habitat (Acres)***	***Non-habitat (Acres)***
MZ I	84,110,800 (100%)	11,636,400 (14%)	34,663,000 (41%)	37,811,400 (45%)
BLM	8,325,300 (10%)	2,994,300 (26%)	4,524,900 (13%)	806,100 (10%)
Forest Service	4,532,500 (5%)	292,400 (3%)	515,300 (1%)	3,724,800 (82%)
Tribal and other federal	5,458,500 (6%)	219,700 (2%)	2,427,700 (7%)	2,811,100 (51%)
Private	54,998,900 (65%)	7,132,500 (61%)	24,682,800 (71%)	23,183,600 (42%)
State	5,421,400 (6%)	995,600 (9%)	2,498,400 (7%)	1,927,400 (36%)
Other	5,374,100 (6%)	1,900 (<1%)	13,900 (<1%)	5,358,300 (99%)

Source: Manier, et al. 2013, p. 118

Planning Area Habitat Conditions

Grassland communities are the most prevalent of all community types across the planning area. Two types of sagebrush communities can also be found throughout the planning area. The silver sagebrush type is found in areas with well drained soils, while the Wyoming big sagebrush type is adapted to much drier sites and more clayey soils. Silver sagebrush is the only sagebrush species found north of the Milk River in the MZ. Other commonly found species of shrubs include fringed sagewort, rabbitbrush, and winterfat.

As a result of past and ongoing human activities in the planning area, substantial areas of GRSG habitats have been altered from their natural conditions. Human disturbances in the HiLine planning area include agriculture, mining, roads, residential development, oil and gas development, compressor sites, and other ancillary facilities.

Changes in land use and land development are the primary causes of habitat loss, while habitat degradation is a complicated interaction among many factors, including drought, livestock grazing, changes in natural fire regimes, and invasive plant species (Fischer, et al. 1996; Pyle and Crawford 1996; Beck and Mitchell 2000; Nelle, et al. 2000).

The Northern Montana Population is predominantly in northeast Montana but extends north into southern Saskatchewan and Alberta, Canada. The southern portion of this area, south of the Milk River, has a high abundance of sage-grouse, has been designated as a PAC, and is predominately comprised of public land. Land use in this area is livestock grazing with limited dryland farming and irrigated hay production adjacent to creeks and rivers. In general, habitat in this Priority Area for Conservation (PAC) is expansive and intact and faces few if any significant threats, particularly on public lands. GRSG in this PAC make up the majority of birds in the population. North of the Milk River, habitats comprise a relatively low density of silver sagebrush and a correspondingly low density of GRSG. Habitat in this area includes more private lands and, in some portions of this area, have a long history of grain farming and low to moderate densities of natural gas production. A PAC was designated in northern Valley County where relatively intact habitats provide for resident GRSG as well as a conduit for spring and fall migrating GRSG between Saskatchewan and southern Valley County. This PAC is adjacent to considerable farming to the east but is itself relatively stable and lacks significant threats. One or more large conservation easements are in place to protect habitat values on key private lands in northern Valley County. Given the extent and limited threats associated with this population, it is considered to be at low risk of extirpation (USFWS 2013).

Population Trends in Management Zone I

GRSG has been extirpated from almost half of its original range in MZ I; populations continue to decline by 2 to 4 percent annually (Manier, et al. 2013). The MZ I GRSG population was estimated to be 14,814 males in 2007, having declined 17 percent in the number of males per lek since 1965. The number of leks declined by 22 percent over the same period (Manier, et al. 2013). Lek counts indicate a 67 percent drop in MZ I from 2007 to 2013 (Garton, et al. 2015).

Wyoming data suggest a cyclical pattern, with population lows in 1995, 2002, and 2013, and peaks in 2000 and 2006. Actual trends are difficult to discern due to the smaller survey before 2007, meaning the number and proportion of active to inactive leks is unknown. Since 2007, the number of active leks has remained stable (approximately 1,100 active leks), but the number of males per active lek has declined by more than half, from 42 to 17. In northeast Wyoming, the decreasing number of active leks since 2007 suggests a population decline in that area that is greater than that indicated by the average lek size. Similar population trends are suggested at both state and local scales (Christiansen 2013). The Powder River Basin population dropped 76 percent from 2007 to 2013, to 1,651 males (Garton, et al. 2015).

Similarly, in Montana, the GRSG population changes cyclically. The GRSG population declined sharply from 1991 to 1996, before increasing through 2000 (Montana Sage Grouse Work Group 2005). The population is thought to be down 33 percent from historic levels. Between 2004 and 2013, the average number of displaying males per lek in a given year in Montana ranged from 7 to 19 (Greater Sage-Grouse Habitat Conservation Advisory Council 2014). The Northern Montana population dropped 54 percent to 1,667 males in 2013, while the Yellowstone Watershed population dropped 65 percent to 3,045 males (Garton, et al. 2015).

In the Dakotas, GRSG numbered approximately 300 male birds in 2013, a drop of 72 percent from 2007 (Garton, et al. 2015). Although North and South Dakota populations remain connected to each other and to populations to the west in

Montana, their small size, situation on the edge of GRSG range, and ongoing threats place them at high risk (Manier, et al. 2013, p. 127; USFWS 2013).

1.4 Regional Efforts to Manage Threats to GRSG

Across the Greater Sage-Grouse range, other BLM and National Forest System sub-regions are undergoing RMP revision or amendment processes similar to this one for the HiLine District. The Final EIS associated with each of these efforts has identified a Proposed Plan that meets the purpose and need of conserving, enhancing, and/or restoring GRSG habitat by reducing, eliminating, or minimizing threats. The management actions from the various Proposed Plans will cumulatively decrease the threat of GRSG habitat loss and will limit fragmentation throughout the range. Key actions present in many of the Proposed Plans include an adaptive management strategy, anthropogenic disturbance cap, and protective management actions in priority and general habitat areas.

The BLM has incorporated management of Sagebrush Focal Areas (SFAs) into its proposed management approach for GRSG. SFAs are a subset of PHMA and represent recognized "strongholds" for the species that have been noted and referenced by the conservation community as having the highest densities of the species and other criteria important for the persistence of the species (Ashe 2014). Those portions of SFAs on BLM-administered lands would be petitioned for withdrawal from mineral entry, subject to an NSO stipulation with no exceptions, modifications, or waivers, and are prioritized for management and conservation actions, including, but not limited to, review of livestock grazing permits/leases.

In addition, there are several regional efforts to manage threats to GRSG in MZ I. These efforts may have a greater ability to alleviate threats to GRSG than BLM actions. This is because state and private lands account for approximately 35 million acres (approximately 75 percent) of GRSG habitat in MZ I (Manier, et al. 2013, p. 118).

Montana Statewide Efforts

Montana Fish, Wildlife and Parks (MFWP) is tasked with implementing the range-wide WAFWA Sage-Grouse Strategy (Stiver, et al. 2006) in Montana. The WAFWA Sage-Grouse Strategy monitors, researches, provides outreach, and funds conservation projects for GRSG. A basic premise of the WAFWA Sage-Grouse Strategy is that additional conservation capacity must be developed at all local, state, federal, and range-wide levels for both the short term (3 to 5 years) and the long term (10 years or more) to ensure GRSG conservation.

In addition, the MFWP's Montana Management Plan and Conservation Strategy for Sage-Grouse was initiated in 2005 to protect, maintain, and restore GRSG habitat. The plan ranks threats to the species across the state and provides an overall strategy for public and private cooperation in conservation actions. In 2013, the governor established the Greater Sage-Grouse Habitat Conservation Advisory Council to provide recommendations on policies and actions for GRSG conservation and provide regulatory authority for conservation actions. The council provided these recommendations in January 2014. The governor subsequently issued an executive order on September 9, 2014 (State of Montana 2014), based on the council recommendations that provided the direction for future GRSG conservation in Montana.

<u>Montana Executive Order</u>. The Montana governor issued an executive order on September 9, 2014 (State of Montana 2014), based on the council recommendations that provided the direction for GRSG conservation in Montana. Stipulations for development in the executive order and Montana Management Plan and Conservation Strategy for Sage-Grouse include but are not limited to:

- A 0.6-mile NSO buffer around active leks in Core Population Areas (0.25 mile in GHMA);
- A minimum 0.6-mile avoidance zone for power lines and communication towers in Core Population Areas;
- A minimum 2.0 mile buffer from lek perimeter for main roads and 0.6 mile buffer for facility site access roads;
- A 5 percent limit on anthropogenic surface disturbance
- Limits on activity during nesting season on Core Population Areas

The approach of the Montana executive order/Montana Management Plan and Conservation Strategy for GRSG is similar to the Wyoming executive order. Montana's plan will apply a disturbance cap in core habitat and will limit well density and apply timing limitations. The 0.6-mile buffer would protect males in the vicinity of leks during the breeding season; the density limits and disturbance cap would protect GRSG during nesting, brood-rearing, and winter

concentration activities. The timing restrictions would reduce the potential for displacement or disruption during the breeding season.

Wyoming Statewide Efforts

Wyoming has established Core Population Areas to help delineate landscape planning units by distinguishing areas of high biological value. These areas are based on the locations of breeding areas and are intended to help balance GRSG habitat requirements with demand for energy development (Doherty, et al. 2011).

In 2000, the Wyoming Sage-Grouse Working Group (WSGWG) was formed to develop a statewide strategy for GRSG conservation. This group prepared the Wyoming GRSG Conservation Plan (WSGWG 2003) to provide coordinated management and direction across the state. In 2004, local GRSG working groups were formed to develop and implement local conservation plans. Eight local working groups around Wyoming have completed conservation plans, many of which prioritize addressing past, present, and reasonably foreseeable threats at state and local levels, and prescribe management actions for private landowners to improve GRSG conservation at the local scale, consistent with the overall Wyoming Core Strategy. The HiLine RMP planning area is part of the Northeast Wyoming local working group, in which the BLM participates. The Northeast Wyoming Sage-Grouse Conservation Plan was completed in 2006 and was updated in 2014 (Northeast Wyoming Sage-grouse Working Group 2014). The local and regional working group plans would assist in GRSG conservation through monitoring, public awareness, and voluntary protective actions on private land.

Wyoming Executive Order. Wyoming Governor Matt Mead issued an executive order on June 2, 2011, that complemented and replaced several executive orders issued by his predecessor. The 2011 Wyoming executive order articulates Wyoming's Core Population Area Strategy (Core Area Strategy) as an approach to balancing GRSG conservation and development. It also provides an approach to mitigating human disturbances to GRSG. The USFWS believes that Wyoming's Core Area Strategy, if extended to all landowners via regulatory mechanisms, would provide adequate protection for GRSG and its habitat (USFWS 2010); however, universal implementation remains uncertain due to the variety in landownership and management (Manier, et al. 2013).

The Wyoming executive order applies to state trust lands starting in 2008. These trust lands cover almost 23 percent of GRSG habitat and benefit approximately 80 percent of the estimated breeding population in the state (USFWS 2010). All proposed activities are evaluated through a density/disturbance calculation tool to determine if the project would exceed recommended density/disturbance thresholds. Additionally, the order has stipulations to be included in permits, with varying restrictions depending on whether the proposed development activity occurs within or outside delineated Core Population Areas (Wyoming Executive Order, June 2, 2011).

In Core Areas, there is a 0.6-mile no surface occupancy (NSO) buffer around occupied leks and restrictions on activities in breeding and winter concentration habitat. Wyoming's Industrial Siting Council, which permits large development projects on all lands in the state, is subject to the terms of the executive order. This buffer provides protection for males during lekking season and acts in coordination with the density disturbance cap. The combination of protections could offer GRSG considerable regulatory protection when large wind energy and other development projects are being considered in Wyoming (USFWS 2010; Manier, et al. 2013).

Statewide modeling of trends under the Core Area Strategy suggests that with effective enforcement statewide, the strategy could reduce population losses by 9 to 15 percent across Wyoming. Moreover, the number of Core Areas predicted to maintain 75 percent of their current populations could increase from 20 to 25 under long-term scenarios (Copeland, et al. 2013). Combining the Core Area Strategy with $250 million in target conservation easements (provided willing landowners and funding are available) could reduce population declines by another 9 to 11 percent (Copeland, et al. 2013).

In BLM planning areas in Wyoming, however, the Core Area Strategy may be less protective than in other areas, because much development in GRSG habitat has already occurred and populations are already in decline. As stated in the Viability Analysis for Conservation of Greater Sage-Grouse Populations for the Buffalo Field Office (Taylor, et al. 2012), Core Areas in northeastern Wyoming were delineated only after widespread development had already occurred in GRSG habitat, leaving few options for conserving populations in this region.

Core Population Areas in Wyoming also incorporate connectivity corridors (Wyoming Executive Order 2011). These are areas GRSG use to maintain connectivity between habitat areas (Manier, et al. 2013). Connectivity reduces isolation, thereby increasing viability of a population and reducing vulnerability to disease, drought, or other events that may result in extirpation.

Umbrella Candidate Conservation Agreement with Assurances for Wyoming Ranch Management. Candidate Conservation Agreements with Assurances are voluntary conservation agreements between the USFWS and one or more federal or private partners (e.g., ranchers). In return for managing lands to benefit GRSG, landowners receive assurances against additional regulatory requirements should GRSG be listed under the Endangered Species Act. Within Wyoming, the USFWS and Wyoming Governor's Office in conjunction with the BLM, Natural Resources Conservation Service, Forest Service, and other agencies, have developed an umbrella Candidate Conservation Agreement with Assurances for range management activities. Enrolled landowners are expected to comply with grazing specific conservation measures including but not limited to: avoid (or rotationally utilize) known nesting and brood-rearing habitat as a location for activities that concentrate livestock such as stock tank placement branding and roundup; place salt or mineral supplements in sites minimizing impacts to GRSG habitat; and within 24 months develop and implement a written grazing management plan to maintain or enhance the existing plant community as suitable GRSG habitat (USFWS, et al. 2013).

North Dakota and South Dakota Statewide Efforts

The North Dakota Game and Fish Department has developed its Management Plan and Conservation Strategies for Greater Sage-Grouse in North Dakota (Robinson 2014). The purpose of the plan is in part to meet the objectives outlined in the COT report (USFWS 2013), which include:

- Stop population declines and habitat loss;
- Implement targeted habitat management and restoration;
- Develop and implement GRSG conservation strategies and associated actions and regulatory mechanisms;
- Develop and implement proactive, voluntary conservation actions;
- Develop and implement monitoring plans to track success of conservation strategies;
- Prioritize, fund, and implement research to address existing uncertainties.

Similar to the South Dakota plan, the North Dakota plan does not address disturbance caps or impose required restrictions but instead is intended to provide biological information on GRSG in North Dakota and be used as the conservation framework to minimize impacts to GRSG in North Dakota across all land ownerships.

South Dakota finalized a State Sage-Grouse Plan in 2014. While the plan does not address disturbance caps or impose restrictions that are required, it is designed to provide biological information about sage-grouse, identifies factors that influence sage-grouse in South Dakota, and guides future management direction and actions by establishing objectives to:

- Maintain or increase/improve the existing status and range of sage/steppe habitat in South Dakota;
- Use results from lek counts and inference from past hunting seasons to guide recommendations for the annual hunting season;
- Annually monitor sage-grouse population status and distribution;
- Use results from lek counts and inference from past hunting seasons to guide recommendations for the annual hunting season;
- Develop a public outreach and educational plan that informs the public, landowners, stakeholders, and wildlife/conservation agencies on sage grouse management and the issues of highest concern;
- Support local, interstate and interagency sage-grouse research projects and collaborative conservation planning efforts; and
- Document disease outbreaks and develop management responses (South Dakota Wildlife Division 2014).

Powder River Basin Restoration Program

The Powder River Basin Restoration Program is a collaborative partnership to restore and enhance GRSG habitat on a landscape level in the Powder River Basin. The basin encompasses 13,493,840 acres in northeast Wyoming and

southeast Montana. Surface ownership is composed of approximately 70 percent private lands, 14 percent BLM-administered lands (including 8 percent in Wyoming and 6 percent in Montana), 8 percent National Forest System lands, and 8 percent States of Wyoming and Montana lands. Split-estate mineral ownership is 50 to 60 percent federal (BLM 2015).

The Powder River Basin Restoration Program is focusing on areas affected by the federal oil and gas development that has occurred over the past decade in the Powder River Basin in northeastern Wyoming. Its objectives are restoring or enhancing disturbed previously suitable habitat to suitable habitat for sagebrush obligate species, primarily GRSG. This includes multiple sites affected by coal bed natural gas abandonment reclamation efforts, wildfires, and noxious and invasive plants. Priority will be given to those areas recognized as priority habitats (e.g., Core Population Areas and connectivity corridors).

Habitat objectives are meeting the needs for nesting, brood-rearing, and late brood-rearing. The program would contribute to efforts focused on the management and control of mosquitoes carrying West Nile virus and would include funding, labor, treatment locations, and other needs as determined.

Additionally, efforts would be coordinated to reduce fuels in and near GRSG habitat to enhance sagebrush stands, support restoration efforts, and reduce the risk of high-severity wildfire. Pine stands and juniper woodlands would be managed for structural diversity and to reduce fuels, especially near PHMA, human developments, and recreation areas.

Natural Resource Conservation Service Sage Grouse Initiative

The Natural Resource Conservation Service's (NRCS) Sage-Grouse Initiative (SGI) is working with private landowners in 11 western states to improve habitat for GRSG (Manier, et al. 2013). With approximately 31 percent of all sagebrush habitats across the range in private ownership (Stiver 2011, p. 39), and over 65 percent in MZ I (Manier, et al. 2013, p. 118), a unique opportunity exists for the NRCS to benefit GRSG and to ensure the persistence of large and intact rangelands by implementing the SGI (USFWS 2010, p.5). Local conservation districts in MZ I, such as the Lake DeSmet Conservation District (in the BLM's Buffalo Field Office RMP planning area), have been very active in GRSG conservation.

Participation in the SGI program is voluntary, but willing participants enter into binding contracts or easements to ensure that conservation practices that enhance GRSG habitat, such as fence marking, protecting riparian areas, and maintaining vegetation in nesting areas, are implemented. Participating landowners are bound by a contract (usually 3 to 5 years) to implement, in consultation with NRCS staff, conservation practices if they wish to receive the financial incentives offered by the SGI. These financial incentives generally take the form of payments to offset costs of implementing conservation practices and easements or rental payments for long-term conservation.

While potentially effective at conserving GRSG populations and habitat on private lands, incentive-based conservation programs that fund the SGI generally require reauthorization from Congress under subsequent farm bills, meaning future funding is not guaranteed.

As of 2015, SGI has secured conservation easements on over 455,000 acres across the GRSG range (NRCS 2015), with the largest percentage of easements occurring in Wyoming (approximately 200,000 acres). In MZ I, SGI has thus far secured conservation easements on 65,881 acres that maintain intact sagebrush-grassland habitat. It has also accomplished the following:

- Established grazing management programs on 1,370,000 acres to enhance GRSG habitat and sustainable ranching;
- Removed conifers encroaching on 181 acres of GRSG habitat;
- Seeded over 7,500 acres with native plants;
- Marked over 350 miles of fences.

Other Regional Efforts

Across the Greater Sage-Grouse range, other BLM and Forest Service sub-regions are undergoing RMP revision or amendment processes similar to this one for the HiLine planning area. The Final EIS associated with each of these

efforts has identified a Proposed Plan that meets the purpose and need of conserving, enhancing, and/or restoring GRSG habitat by reducing, eliminating, or minimizing threats. The management actions from the various Proposed Plans will cumulatively decrease the threat of GRSG habitat loss and will limit fragmentation throughout the range. Key actions present in many of the Proposed Plans include an adaptive management strategy, anthropogenic disturbance cap, and lek buffers. The cumulative effect of these actions, when added to the direct and indirect effects identified above, will be a reduction in the historic rate of fragmentation and loss of GRSG habitat.

A programmatic EIS by the Western Area Power Administration (WAPA) and the USFWS for the entire upper Great Plains will focus future wind energy developments in specific corridors outside of GRSG core habitat (WAPA 2013). In accordance with Section 7 of the ESA, preparation of the programmatic EIS has involved consultation between cooperating entities and the USFWS and preparation of a programmatic Biological Assessment to ensure that the action will not jeopardize the continued existence of any federally-listed species, including the federal candidate GRSG. At the time of this RMP specific conservation measures for protecting GRSG and its habitat under the programmatic EIS are not developed.

The United States Forest Service (USFS) is preparing a plan to manage nearly 96,000 acres of GRSG habitat in the Dakota Prairie National Grassland. The plan is not yet available for review but is likely to propose similar protections for GRSG on its lands as are included in the BLM RMPs.

Tribes, counties, and local working groups are playing a critical role in promoting GRSG conservation at the local level. Individual conservation plans have been prepared by most local working groups to develop and implement strategies to improve or maintain GRSG habitat and reduce or mitigate threats on the local level. The proposed conservation actions and recommendations in these plans are voluntary actions for private landowners. Local working group projects have included monitoring, research, and mapping habitat areas, as well as public outreach efforts such as landowner education and collaboration with federal, state, and other local entities. These efforts provide a net conservation gain to GRSG through increased monitoring and public awareness.

Some local working group conservation plans recommend restricting resource uses as well. For example, the Bates Hole/Shirley Basin Conservation Plan (Bates Hole/Shirley Basin Sage-grouse Working Group 2007) recommends that areas within 3.4 miles of an occupied GRSG lek not be leased for oil and gas development unless mitigation plans have been developed, approved, and funded. Local working group GRSG conservation plans in MZ I include the following:

- Bates Hole/Shirley Basin (Bates Hole/Shirley Basin Sage-grouse Conservation Plan; 2007);
- Big Horn Basin (Sage-Grouse Conservation Plan for the Big Horn Basin, Wyoming; 2007);
- Northeast Wyoming (Powder River Basin) (Northeast Wyoming Sage-grouse Conservation Plan; 2014);
- Glasgow (A Summary of Conservation Activities of the Glasgow, MT Sage-Grouse Local Working Group; 2011);
- Miles City/Forsyth (Miles City Sage-Grouse Local Working Group Action Plan 2011-2014);
- Central Montana Organized Conservation District (no local conservation plan);
- North Dakota (no local conservation plan);
- South Dakota (no local conservation plan).

1.5 Relevant Cumulative Actions

This cumulative effects analysis considers the incremental impact of the HiLine RMP alternatives in combination with other past, present, and reasonably foreseeable future federal and non-federal actions on all lands in MZ I. Where these actions occur within GRSG habitat, they would cumulatively add to the impacts of BLM-authorized activities set forth in the HiLine RMP. In addition to the conservation efforts described above, relevant reasonably foreseeable future actions occurring on federal, private, or mixed landownership in MZ I are described in the North Dakota, South Dakota, Buffalo, Lewistown, Miles City, Billings, and Wyoming GRSG Planning Area RMPs.

The following list includes past, present, and reasonably foreseeable future actions in MZ I that when added to the Proposed Plan and alternatives for the planning area could cumulatively affect GRSG (see **Table M.9-12** for more detail):

- Powder River Basin oil and gas leases in Campbell, Johnson, and Sheridan Counties, Wyoming;

- Surface coal mining and coal leasing in Powder River Basin, Wyoming;
- Carter Master Leasing Plan for Oil and Gas, Carter County, Montana;
- Surface coal leasing in northeast Montana, Big Dry RMP area;
- Greater Crossbow Oil and Gas Exploration and Development Project in Campbell and Converse Counties, Wyoming;
- Converse County Oil and Gas Development, Converse County, Wyoming;
- Nichols Ranch/Hank Unit Uranium In-situ Recovery Mining Project, Johnson and Campbell Counties, Wyoming;
- Proposed uranium mining in Newcastle, Wyoming and in South Dakota;
- Western Area Power Administration Upper Great Plains Wind Energy Programmatic Draft EIS;
- Bentonite mining in northeast Wyoming and in Carter County, Montana;
- Keystone XL Pipeline, Montana and South Dakota;
- Conversion of lands to agriculture and urban development;
- Conifer removal throughout MZ I.

1.6 Threats to GRSG in Management Zone I

In its COT report the USFWS identifies energy development, infrastructure, grazing, conversion to agriculture, fire, spread of weeds, and recreation as the present and widespread threats facing GRSG in MZ I (USFWS 2013). These threats impact GRSG mainly by fragmenting and degrading their habitat. The loss of sagebrush steppe across the West approaches or exceeds 50 percent in some areas. It is a primary factor in long-term declines in GRSG abundance across its historical range (USFWS 2010).

Habitat fragmentation reduces connectivity of populations and increases the likelihood of extirpation from random events such as drought or outbreak of West Nile virus. Furthermore, climate change is likely to affect habitat availability to some degree by decreasing summer flows and limiting growth of grasses and forbs, thereby limiting water and food supply (BLM 2012). Sensitive species such as GRSG, which are already stressed by declining habitat, increased development, and other factors, could experience additional pressures as a result of climate change.

Each COT report threat considered present and widespread in at least one population in MZ I is discussed below. For more detail on the nature and type of effects and the direct and indirect impacts on GRSG in the planning area, see Chapter 4 of the HiLine Proposed RMP/Final EIS. The quantitative impact analysis focuses on impacts in MZ 1, with planning area acres provided for context.

Energy Development and Mining

The COT report states that energy development should be designed to ensure that it will not impinge on stable or increasing GRSG population trends. For mining, the COT report objective is to maintain stable to increasing GRSG populations and no net loss of GRSG habitats in areas affected by mining (USFWS 2013). In the energy development areas of MZ I, population trends are not stable or increasing; for this reason, objectives in the planning area are intended to reduce losses, provide a net conservation gain, and sustain a viable GRSG population, though at a lower level than historical populations (Taylor, et al. 2012).

There are approximately 1,004,400 acres of GRSG habitat in MZ I where energy and mineral development, including oil and gas, coal leasing, mineral materials, and non-energy leasable minerals is occurring. There are approximately 33,264,000 acres indirectly influenced by energy development (Manier, et al. 2013, pp. 55-71). There is no geothermal energy development in MZ I.

Oil and Gas

<u>Nature and Type of Effects</u>. Oil and gas development has emerged as a range-wide issue in conservation because areas being developed contain large GRSG populations (Connelly, et al. 2004) and other sagebrush obligate species (Knick, et al. 2003).

As discussed in Chapter 4, oil and gas development impacts GRSG and sagebrush habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors. Indirect disturbances result from noise, gaseous emissions, changes in water availability and quality, and human presence. These factors could cumulatively or individually lead to habitat fragmentation in the long term (Connelly, et al. 2004; Holloran 2005).

Oil and gas development results in direct loss of habitat from well pad and road construction as well as direct mortality from vehicle strikes and disturbance from noise. Oil and gas development also indirectly impacts GRSG through the species' avoidance of infrastructure due to increased noise and vehicle traffic. This development can also impact GRSG survival or reproductive success. Indirect effects include habitat quality changes, predator communities, and disease dynamics (Naugle, et al. 2011).

Several studies from the Great Plains and Wyoming Basin have shown that breeding GRSG populations are affected at oil and gas well densities commonly permitted in Montana and Wyoming (Naugle, et al. 2011). Doherty, et al. (2010) found that although impacts were indiscernible at densities of less than one well per square mile, lek losses in parts of MZ I were two to five times greater in areas with development above this threshold. They also found that the abundance (number) of males per lek at the remaining leks declined by approximately 30 to 80 percent. These and other studies demonstrate that both direct and indirect impacts result from the impacts of energy development and geophysical exploration in GRSG habitat.

Several studies have quantified the distance from leks at which impacts of development become negligible. The studies also assessed the efficacy of BLM NSO stipulations for leasing and development within 0.25 mile of a lek (Holloran 2005; Walker, et al. 2007a). Walker, et al. (2007a) found that in the Powder River Basin buffer sizes of 0.25, 0.5, 0.6, and 1.0 mile resulted in an estimated lek persistence (the ability of leks to remain on the landscape) of approximately 5, 10, 15, and 30 percent, respectively; conversely, lek persistence in areas without oil and gas development averaged approximately 85 percent.

Naugle, et al. (2011) reported that impacts of energy development had been documented at distances greater than 3.5 miles from the lek in MZ I. Holloran (2005) found impacts on abundance at a distance between 3 and 4 miles in western Wyoming. However, Naugle, et al. (2011) also stated that impacts on leks caused by energy development were most severe near the lek.

Naugle, et al. (2011) also found that impacts from energy development often extirpate leks in gas fields. Doherty (2008) documented that lek losses increased and male abundance decreased as well density increased in the Powder River Basin. Lek extirpation in areas with 8 wells per section (40 to 100 wells total) within 2 miles of the lek was 5 times more likely to occur than in areas with no wells within 2 miles. Male attendance at the remaining leks in these areas declined approximately 20 to 60 percent (Doherty 2008).

Much oil and gas development previously occurred on private lands with minimal mitigation efforts, but restrictions are now in place to protect GRSG habitat under the Wyoming and Montana executive orders. Earlier research had demonstrated that 0.25-mile NSO lease stipulations were insufficient to conserve breeding GRSG populations in a typical landscape in portions of the planning area (Walker, et al. 2007a), when nearly 100 percent of the area within approximately 2 miles of leks remained open to full-scale development.

Lyon and Anderson (2003) reported that oil and gas development influenced the rate of nest initiation of GRSG in excess of approximately 2 miles of construction activities. GRSG numbers on leks within approximately 1 mile of natural gas compressor stations in Campbell County, Wyoming, were consistently lower than numbers on leks unaffected by this noise disturbance (Braun, et al. 2002). Holloran and Anderson (2005) reported that lek activity decreased downwind of drilling activities, suggesting that noise caused measurable impacts.

In addition to activities directly associated with oil and gas development, road traffic also generates noise. Knick, et al. (2003) indicated that there were no active GRSG leks within approximately 1 mile of Interstate 80 across southern Wyoming; only 9 leks were known to occur between approximately 1 and 2.5 miles of Interstate 80.

<u>Conditions in MZ I</u>. Energy development is a widespread threat to GRSG in MZ I, in particular the Powder River Basin, Bowdoin Field, and Williston Basin. The patchwork landownership pattern in MZ I means that many energy extraction

facilities are near property boundaries and may affect GRSG and its habitat on adjacent lands. Nearly 16 percent of GRSG habitat in MZ I is within 1.8 miles of oil and gas wells, a distance at which ecological impacts are likely to occur (Knick, et al. 2011). Oil and natural gas development-related wells indirectly influence 60 percent of PHMA and GHMA across MZ I, occurring to a distance of 12 miles from the development. Private surface lands account for 65 percent of wells in PHMA and 72 percent in GHMA in MZ I (Manier, et al. 2013). Thus, conservation actions on private land are likely to have a greater potential to reduce the adverse impacts of oil and gas development on GRSG habitat than any other single land management entity.

From 2001 to 2005, GRSG populations declined by 82 percent within the expansive coal bed natural gas fields in northeast Wyoming (Walker, et al. 2007a). This reduced the options for delineating large and intact Core Areas containing an abundance of high-quality GRSG habitats.

Although oil and gas activities have a disproportionately greater effect on private lands, regulatory mechanisms on both federal surface and split-estate lands in MZ I are influential. Federal actions on split-estate lands with federal subsurface minerals will require mitigation for impacts on GRSG habitat occurring on private surface lands that would not be required on lands with both privately held surface and subsurface.

As of December 2012, 1,199 existing federal oil and gas leases covered 804,873 acres, or approximately 19 percent of the federal oil and gas mineral estate in the HiLine RMP planning area.

No coal bed natural gas exploration or development has occurred within the HiLine RMP planning area, but it has been the largest fluid mineral development activity in other portions of MZ I. For example, there have been approximately 21,000 coal bed natural gas wells drilled from 1998 to 2010 in the Powder River Basin. This has fragmented GRSG habitat throughout that area and affected the Powder River Basin GRSG population. Development has included construction of well sites and other facilities, including metering buildings, compressor stations, and pumping stations; roads to access well sites, pipelines to transport product and waste water, power lines to bring electrical power to the wells, and other infrastructure; and water-holding impoundments to hold the produced water, as the wells must be de-watered to reduce pressure before the natural gas is released.

Hundreds of miles of pipelines have been constructed to transport coal bed natural gas from development site to delivery point. Other pipelines include those for gathering, transportation, and distribution and lines used to transport produced water to discharge points.

With a well life of approximately 12 – 18 years, many of the coal bed natural gas wells that were originally drilled are depleted and ready for abandonment. Native vegetation over most buried pipelines has reclaimed its composition. Utility roads and overhead power lines continue to fragment thousands of acres of GRSG habitat on private, federal, and state lands (BLM 2013c).

Existing leases on BLM-administered land in GRSG habitat remain valid. There is a potential for future development based on locations of geologic fields distributed extensively across eastern portions of GRSG range (Manier, et al. 2013). This development is subject to future Conditions of Approval (COAs) on plans for development in GRSG habitat. These COAs will provide a net conservation gain to GRSG compared to the No Action Alternative, under which these COAs would not apply.

The Dakotas population in MZ I is heavily influenced by oil and gas development; oil and gas developments are scattered throughout the Yellowstone Watershed (USFWS 2013, p. 63). The Powder River Basin contains substantial energy resources, including oil, natural gas, and coal bed natural gas (USFWS 2013, pp. 64-65); conversely, the Northern Montana population has little energy development. Coal bed methane wells typically last 12 to 18 years, while oil and gas wells may last 20 to 100 years in production (Connelly, et al. 2004). Most coal bed natural gas drilling in the Powder River Basin has concluded, and current and future oil and gas development is anticipated to impact GRSG less due to horizontal drilling technology.

Impact Analysis. **Tables M.9-2** and **M.9-3** provide a quantitative summary of present fluid mineral leasing conditions on BLM-administered lands under the HiLine Proposed RMP/Final EIS alternatives and across MZ I. An analysis of this summary along with past, present, and reasonably foreseeable actions in MZ I (see **Table M.9-12**) follows. As stated in the assumptions, the tables are limited to BLM-administered lands (including federal mineral estate for fluid

minerals calculations) and reflect the conditions assuming implementation of the Proposed Plans of the other planning areas in MZ I. Tables displaying fluid mineral acreage include the federal mineral estate and not just BLM-administered surface acres.

Table M.9-2
Acres Open and Closed to Fluid Mineral Leasing in GRSG Habitat in MZ 1

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Open* to Fluid Mineral Leasing				
Alternative A	0	0%	2,639,000	0%
Alternative B	0	0%	2,639,000	0%
Alternative C	0	0%	2,639,000	0%
Alternative D	0	0%	2,639,000	0%
Proposed Plan	0	0%	2,642,000	<1%
Closed to Fluid Mineral Leasing				
Alternative A	159,000	38%	159,000	1%
Alternative B	1,601,000	94%	768,000	80%
Alternative C	231,000	57%	218,000	28%
Alternative D	98,000	0%	218,000	28%
Proposed Plan	184,000	47%	157,000	0%

Source: BLM 2015
* Open with standard stipulations (i.e., without NSO, CSU, TL, or other resource protection stipulations). This table displays the acres of PHMA and GHMA open and closed to fluid mineral leasing in MZ I; it also displays the percentage of those acres that are found within the planning area.

Table M.9-3
Acres with NSO and CSU/TL Stipulations in GRSG Habitat in MZ 1

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
NSO Stipulations				
Alternative A	2,292,000	8%	1,274,000	5%
Alternative B	2,107,000	0%	1,206,000	0%
Alternative C	2,552,000	17%	1,488,000	19%
Alternative D	2,107,000	0%	1,470,000	18%
Proposed Plan	3,626,000	42%	1,281,000	6%
CSU/TL Stipulations				
Alternative A	2,835,000	40%	6,179,000	21%
Alternative B	1,707,000	0%	4,879,000	0%
Alternative C	2,477,000	31%	5,198,000	8%
Alternative D	1,707,000	0%	4,879,000	0%
Proposed Plan	1,707,000	0%	5,251,000	7%

Source: BLM 2015
This table displays the acres of PHMA and GHMA with NSO Stipulations and CSU/TL Stipulations in MZ I; it also displays the percentage of those acres that are found within the planning area.

As shown in **Tables M.9-2** and **M.9-3**, fluid mineral closures and NSO stipulations for PHMA within the HiLine RMP Proposed Plan exert relatively high influence due to their large acreage within the MZ. Other actions in MZ I contributing to a net conservation benefit for GRSG include 0.6-mile lek buffers and disturbance caps in the Montana and Wyoming executive orders, applying an NSO stipulation in PHMA in the HiLine planning area, applying CSU and TL Stipulations in nesting habitat and winter range in the HiLine planning area, and adaptive management and mitigation measures in the HiLine and other BLM and Forest Service proposed plans in MZ I. When added together, these actions would reduce the threat of impacts to GRSG from oil and gas development within the greater MZ.

In contrast, implementation of Alternative A in addition to the other conservation efforts described above would reduce the threat to a lesser degree due mainly to its reliance on less restrictive CSU and TL stipulations and lack of a disturbance cap. This would limit GRSG conservation efforts by providing less than adequate protection in the HiLine planning area. As a result, the Northern Montana population may experience a smaller net conservation benefit over the 20-year analysis period than those populations in portions of MZ I where the BLM and/or Forest Service proposed plan would be implemented in conjunction with applicable state plan(s).

Alternative B would provide the greatest protection to GRSG in the planning area and MZ I, primarily by closing PHMA and GHMA to new leases. When added to protections outlined in state plans in MZ I, this provision would reduce well density and impacts associated with construction and operation. The extensive fluid mineral leasing closures on federal mineral estate under Alternative B could affect reasonably foreseeable future oil and gas development projects by forcing them to relocate to BLM-administered lands outside of GRSG habitat. It may also push them onto adjacent lands, though many would be protected by the Montana executive order's NSO stipulations and associated buffers or Wyoming's Core Areas protections. Increasing habitat protections via these measures would improve the conditions for GRSG survival and successful reproduction across MZ I.

Alternative C would close slightly more acres of PHMA and GHMA than under current management. Also, more acreage would be open to leasing with NSO stipulations. The effect of closure and NSO are similar because both would prohibit surface-disturbing activities that fragment habitat and disturb GRSG. Both also reduce well density and impacts associated with construction and operation. At the broader MZ level, other BLM and Forest Service proposed plans and state GRSG plans would provide long-term net conservation benefits for GRSG populations in those areas; the Northern Montana population would likely experience a smaller net conservation benefit because protections in its range would be less stringent.

Fewer closures and NSO stipulations under Alternative D would result in less protection for GRSG on BLM-administered land within the HiLine planning area. Cumulative impacts at the MZ level would be similar to those described under Alternative C.

Under the Proposed Plan, PHMA would be subject to an NSO stipulation and leasing in SFAs would be subject to NSO without waiver or exception. As stated under Alternative C, the effects of NSO stipulations would be similar to those from closing areas to leasing. The HiLine Proposed RMP/Final EIS GRSG conservation measures in **Appendix M** would help protect unfragmented habitats, minimize habitat loss and fragmentation, and maintain conditions to meet GRSG life history needs. For example, remote telemetry (e.g., monitoring oil and gas operations) would be used to reduce vehicle traffic, disturbance areas would be kept to a minimum, and vegetation would be removed only when necessary. As under other alternatives, similar measures would be implemented in the BLM and Forest Service proposed plans elsewhere in MZ I. Together, these measures would provide a net conservation benefit to GRSG on federal land. When added to conservation efforts at the state level, the most important GRSG habitat and associated leks, nesting habitat, and breeding males across MZ I would be protected from impingement due to future oil and gas leasing. Continuation of adverse impacts from current leasing activities may reduce the net conservation benefit to GRSG populations in portions of MZ I that have experienced widespread development such as the Powder River Basin population.

Restoring disturbed habitats would require reestablishing native shrubs and forbs, including big sagebrush, which would benefit GRSG; however, restored habitats may not support sagebrush or provide habitat for GRSG for long periods following restoration (Arkle, et al. 2014, Minnick and Alward 2015). For this reason, successful restoration may not be successful without a nearby source population.

The effect of the alternatives and other conservation actions in the MZ (most notably the Montana and Wyoming executive orders) could be synergistic, meaning that the effects of the actions together is greater than the sum of their individual effects. For example, applying buffers in PHMA and on state and private land would effectively conserve larger blocks of land than if these actions occurred individually. This would provide a landscape-scale net conservation benefit, especially in areas where little development has occurred to date.

Implementing any alternative under the HiLine RMP would not affect pending or future oil and gas development projects outside of the planning area. For example, the Converse County Oil and Gas Project in Wyoming proposes to drill approximately 5,000 oil and natural gas wells in an area encompassing 1.5 million acres (including GRSG core habitat) in MZ I. However, the NSO buffer and the disturbance caps under the Wyoming and Montana executive orders would reduce the threat to GRSG from oil and gas development on non-federal lands in MZ I.

Development pressure for fluid mineral resources in the Dakotas, Powder River Basin, and Yellowstone Watershed is likely to continue; however, future drilling technologies are expected to impact GRSG less than coal bed natural gas development has in the past decade. While applying stipulations and closing areas to leasing would reduce impacts on federal mineral estate, the application of lek buffers and disturbance limitations would reduce, but likely not eliminate, impacts on GRSG populations. Reasonably foreseeable oil and gas development is widespread in the MZ. When the impacts of the HiLine RMP are added to these actions, the impact would be a net conservation gain under the Proposed Plan, due in large part to implementation of NSO stipulations, anthropogenic disturbance caps, and adaptive management that would minimize future disturbances to GRSG populations and habitats.

Overall, under the Proposed Plan the combination of past, present, and reasonably foreseeable future management actions for oil and gas exploration and development in combination with BLM management actions would provide a net conservation gain to GRSG populations in MZ I.

Coal

Nature and Type of Effects. Approximately 3 percent of BLM-administered PHMA in MZ I and 8 percent of PGMA is influenced by coal mining and coal is estimated to impact habitat to a distance of 12 miles from the direct impact area (Manier, et al. 2013). Surface mining accounts for about 67 percent of production in the United States; large mines can cover many square miles. Coal mining and the use of coal to produce electricity has environmental impacts. These include soil erosion, dust, noise, water pollution, acid-mine drainage, and air emissions, in addition to impacts on wildlife in the area. Burning coal releases toxic fumes and particulate matter into the atmosphere and contributes to climate change (Manier, et al. 2013, pp. 69-71).

Conditions in MZ I. The Powder River Basin in Wyoming and Montana contains some of the largest accumulations of low-sulfur sub-bituminous coal in the world. It is the nation's largest coal-producing region, and coal from the region is shipped nationwide. Most Powder River Basin coal production occurs in the BLM's Buffalo and Miles City RMP planning areas. Extensive leasing of coal has occurred over the last decade in prime GRSG habitat.

Coal forecasts for the Powder River Basin through 2020 indicate that total production is expected to grow at an annual rate of 2 to 3 percent. The preliminary work for the 2030 forecast indicates a slower rate of increase in the Powder River Basin of 0.25 to 2 percent. This is based on reduced coal demand, new natural gas discoveries, and possible regulation of greenhouse gases. By 2030 the BLM expects Powder River Basin coal production to be between 500 and 700 million tons annually, though more recent projections indicate lower coal demand because of increased supply of natural gas.

Major coal leasing and development areas extend beyond the Buffalo and Miles City RMP planning areas; however, coal management in these two RMPs will have a relatively greater impact on GRSG habitat than management from other BLM planning areas or other management entities. This is because of the prominence of the Powder River Basin as a source of coal.

Within the HiLine planning area, no coal production is occurring, and the potential for development is considered to be low enough that there is no interest in obtaining leases.

Although land disturbed by coal mining can be reclaimed to a point that supports a diversity of vegetation, including big sagebrush, reclamation projects require long durations and may fail to support sagebrush (Minnick and Alward 2015) or may not be recolonized by GRSG (Arkle, et al. 2014), thereby providing limited benefit to GRSG populations.

Impact Analysis. Because coal development in the planning area is not anticipated, coal leasing decisions under the HiLine RMP would have a negligible influence within the greater MZ compared to actions occurring within the Buffalo and Miles City RMP planning areas (including on private lands in the Powder River Basin). Acres suitable and unsuitable for coal leasing and development vary across the alternatives, and BLM Proposed Plans in MZ I would assess coal lease applications for suitability, with PHMA considered essential habitat for GRSG.

Despite the variance in suitable and unsuitable allocations across alternatives, the development of coal resources is not expected to vary considerably, according to the RFD scenario. Furthermore, areas considered suitable for leasing would not necessarily be leased; the actual amount of leasing depends on factors such as price and regulatory safeguards. PHMA in the HiLine planning area contains no leases.

Approximately 68 percent of coal leases in PHMA and 82 percent in GHMA occur on private lands in MZ I but may contain federal mineral estate (Manier, et al. 2013). Protective stipulations would be of particular benefit on privately owned surface and subsurface lands where the BLM's protective regulatory mechanisms would not apply.

Coal development that requires state agency review or approval would be subject to the permitting process and stipulations for development in GRSG Core Areas under the Wyoming and Montana executive orders, as well as BLM review under the Proposed Plan. However, as Core Areas were specifically drawn to avoid overlap with coal interests, there is unlikely to be coal development in those areas.

Coal resources would continue to be developed in MZ I outside of the planning area. However, new coal lease applications in GRSG Core Areas would be subject to the unsuitability criteria set forth in the BLM's regulations at 43 CFR Part 3461.5. In accordance with those regulations, special conditions could be required, as identified during the leasing process, to protect GRSG habitat. The regulatory requirements for unsuitability in combination with BLM planning efforts and state plans would help reduce the threat from coal extraction and would provide a net conservation gain to GRSG populations in MZ I.

Mineral Materials

Nature and Type of Effects. Development of surface mines (for sand, gravel, and other common mineral materials found in MZ I) may negatively impact GRSG numbers and disrupt the habitat and life-cycle of the species, similar to other types of mining activities (Braun 1998; Manier, et al. 2013).

Conditions in MZ I. Salable mineral materials disposal sites in PHMA and GHMA are widespread throughout MZ I. They are primarily located in northeast Wyoming, with an additional concentration in far southeast Montana. There are 65,000 acres of mining and mineral materials disposal sites (not including minerals mined as energy sources) on BLM-administered surface land in MZ I and 122,900 acres across all landownership types. Indirect effects are estimated to extend 1.5 miles out from the direct surface disturbance area (Manier, et al. 2013).

Across MZ I, PHMA and GHMA are most affected by mining and mineral materials disposal sites on private land surface. GRSG may be directly impacted, being in the path of development; however, indirect impacts on habitat affect a much wider population of birds. In total, 53 percent of PHMA and 80 percent of GHMA influenced by the indirect impact of mining and mineral materials disposal sites are on private land. This does not include minerals mined as energy sources. Mining and mineral materials disposal sites on BLM-administered surface land, by comparison, indirectly affect 38 percent of PHMA and 11 percent of GHMA (Manier, et al. 2013).

Impact Analysis. Mineral material extraction would directly affect GRSG, including loss of habitat, disturbance, and displacement. Under the proposed plans being implemented throughout the rest of MZ I, all PHMA would be closed to new mineral material disposal except for free use permits. This would limit new disturbance in areas with the most important habitat and highest density of birds. One of the main tools for protecting GRSG in the HiLine planning area is the establishment of Grassland Bird/Greater Sage-Grouse Priority Habitat Management Areas and the Greater-Sage-Grouse Priority Habitat Management Area. These vary by alternative and would be closed to new permits under

Alternative B, closed entirely under Alternative C, and closed with exceptions under the Proposed Plan. Under all alternatives, BLM-authorized activities associated with all resources and all resource use programs would be subject to mitigation and minimization guidelines and Best Management Practices (BMPs) (**Appendix C**), including specific Mitigation Measures and Conservation Actions for Greater Sage-Grouse (**Appendix M**). These measures would add additional protection for GRSG and their habitat for all alternatives by limiting disruptions to the habitat and life-cycle of the species, similar to impacts from other types of mining activities (Braun 1998; Manier, et al. 2013).

The Proposed Plan would close the most acres of PHMA in the planning area to mineral material disposal, and would constitute 41 percent of the closed acreage in MZ I, providing a relatively large influence on GRSG protection at the MZ and cumulative scale. Although it closes fewer acres of GHMA than some other alternatives, its widespread protections in PHMA mean the Proposed Plan would reduce disturbance and key habitat impacts more than any other alternative and would provide the greatest conservation benefit to GRSG populations. Closures or restrictions on mineral material development in the planning area would reduce the effects on GRSG from mineral material development on BLM-administered surface and split-estate lands in MZ I only where those minerals occur on the landscape. However, these actions may shift development onto non-federal lands, with potentially greater impact on GRSG habitats and populations because protective stipulations and permit requirements would not apply.

Table M.9-4
Acres Open and Closed to Mineral Material Disposal in GRSG Habitat in MZ I

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Open to Mineral Material Disposal				
Alternative A	3,172,000	42%	9,478,000	15%
Alternative B	1,845,000	0%	8,524,000	6%
Alternative C	1,845,000	0%	8,534,000	6%
Alternative D	1,845,000	0%	9,691,000	17%
Proposed Plan	1,845,000	0%	8,421,000	4%
Closed to Mineral Material Disposal				
Alternative A	2,339,000	3%	693,000	<1%
Alternative B	3,773,000	40%	754,000	8%
Alternative C	3,669,000	37%	793,000	13%
Alternative D	2,278,000	0%	835,000	17%
Proposed Plan	3,865,000	41%	700,000	1%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to mineral material disposal in MZ I; it also displays the percentage of those acres that are found within the planning area.

Under the Wyoming and Montana executive orders, authorizations of new mineral material disposal sites that require state agency review or approval would be subject to the GRSG permitting process. They also would be subject to stipulations for development in GRSG Core Areas. These stipulations would be of particular benefit on privately owned surface and subsurface lands, where BLM protective regulatory mechanisms do not apply.

Overall, the combination of BLM management actions for mineral materials development in the Proposed Plan for the HiLine RMP, Wyoming and Montana state actions, and planned restoration activities would preserve more habitat from disturbance than current management, reduce disturbance to birds, and provide a net conservation benefit to GRSG in MZ I.

Locatable Minerals

Nature and Type of Effects. Locatable minerals include gold, silver, uranium, and bentonite. Activities associated with locatable mineral development, such as stockpiling topsoil and extracting and transporting material, would cause mortality and nest disruption. These actions also would reduce the functionality of the surrounding habitat with noise and light disturbance, resulting in lost and degraded GRSG PHMA and GHMA.

As with fluid mineral development, reclamation practices may help to reduce long-term impacts on GRSG and their habitat. Although past mining efforts have not emphasized restoration of disturbed areas to near pre-disturbance conditions, recent efforts have been directed toward restoring functional habitat. Future reclamation should be focused on restoring habitats capable of supporting viable GRSG populations. Even with effective restoration, restored areas may not support GRSG populations at the same level as prior to disturbance.

Conditions in MZ I. The primary locatable minerals in commercially viable quantities in MZ I are sodium bentonite, gypsum, and uranium. Most current and forecasted extraction activities are for sodium bentonite, but uranium is also being mined in MZ I. In the event of a price increase, uranium mining activity would likely increase in GRSG habitat.

Impact Analysis. As shown in **Table M.9-5**, Acres Open and Recommended for Withdrawal from Locatable Mineral Entry in GRSG Habitat in MZ I, petitions for locatable minerals withdrawals on BLM-administered land in the HiLine planning area represent a large influence on acreages across the broader MZ. However, there are very limited locatable minerals in the planning area. Therefore, management in the planning area would have a larger influence on the acreage of minerals withdrawn but would not substantially reduce the threat on a MZ-wide scale.

Table M.9-5
Acres Open and Recommended for Withdrawal from Locatable Mineral Entry in GRSG Habitat in MZ I

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Open to Locatable Mineral Entry				
Alternative A	4,807,000	29%	8,238,000	17%
Alternative B	3,420,000	0%	7,259,000	6%
Alternative C	3,420,000	0%	7,269,000	6%
Alternative D	3,420,000	0%	8,453,000	19%
Proposed Plan	4,080,000	16%	7,190,000	5%
Recommended for Withdrawal from Locatable Mineral Entry				
Alternative A	158,000	0%	120,000	2%
Alternative B	1,653,000	90%	206,000	43%
Alternative C	1,498,000	89%	245,000	52%
Alternative D	158,000	0%	260,000	55%
Proposed Plan	1,085,000	85%	118,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open to mineral entry and recommended for withdrawal from locatable mineral entry in MZ I; it also displays the percentage of those acres that are found within the planning area.

Under all alternatives, GRSG conservation measures outlined in **Appendix M** would help minimize the impacts on GRSG from locatable mineral development on federal land. For example, locating facilities outside of PHMA would reduce noise disturbance. Clustering operations and facilities as closely as possible and placing new infrastructure in already disturbed locations would reduce impacts on sagebrush habitats. Locatable mineral development in the planning area would be expected to continue at a limited pace due to the limited amount of resources. Likewise, impacts from restrictions in the alternatives would have a limited impact because most of the mineral resources are already leased. For

these two reasons and because each alternative assumes implementation other the other BLM and Forest Service proposed plans in MZ I, impacts would vary only slightly across the alternatives.

Alternative B recommends the most total acres of PHMA and GHMA for withdrawal, and would restrict future locatable mineral operations on federal lands more than under the other alternatives if the Secretary choose to withdraw these areas; thus it would provide more long-term protections and conservation benefits to GRSG populations from locatable mineral development. The benefit of potential withdrawals would be muted to an extent because most mineral resources in the planning area are already leased. In the remainder of the MZ, implementation of other proposed plans would provide long term protection to GRSG if the areas proposed for withdrawal are withdrawn. Impacts under Alternative C would be similar, but to a slightly lesser extent because fewer acres would be petitioned for withdrawal.

Alternative D does not recommend withdrawal of any additional acres of GRSG habitat from locatable mineral development compared to current management. Lands petitioned for withdrawal would all be located in other BLM and Forest Service planning areas in MZ I and beneficial impacts from those potential withdrawals would be concentrated on other GRSG populations. In the planning area, sodium bentonite extraction and other forms of locatable mineral mining would continue to affect GRSG through disturbance, habitat loss, and habitat degradation. Locatable mineral extraction on private land in MZ I would continue and may be subject to fewer restrictions than similar activity on federal lands. Because mitigation measures and conservation actions would apply in the HiLine planning area and other BLM and Forest Service planning areas in MZ I, Alternative D would provide a net conservation benefit to GRSG because these measures would benefit GRSG above baseline conditions.

Under the Proposed Plan, all acreage in SFAs would be recommended for withdrawal, however there would be limited net conservation gain to GRSG populations through a reduction of disturbance to birds from human activity and habitat fragmentation from mining because there are very limited locatable minerals in the planning area and most of the mineral resources are already leased. As under the other alternatives, mitigation measures and conservation actions for GRSG would help to reduce impacts on GRSG and their habitat. The measures in the Proposed Plan would help alleviate the threat, and along with past, present, and reasonably foreseeable future actions, would provide a net conservation gain to GRSG throughout MZ I.

Non-energy Leasable Minerals

Non-energy leasable minerals are materials such as sulfates, silicates, and trona (sodium carbonate). Impacts on GRSG are similar to those from other types of mining.

Conditions in MZ I. Existing leases for non-energy leasable minerals represent a relatively small threat spatially (Manier, et al. 2013). The HiLine planning area has no occurrence potential for non-energy leasable minerals. Therefore, implementing any of the alternatives would not change the threat to GRSG from this activity in MZ I.

Impact Analysis. **Table M.9-6**, Acres Open and Closed to Non-energy Leasable Mineral Leasing in GRSG Habitat in MZ I, shows the results by alternative.

Table M.9-6
Acres Open and Closed to Non-energy Leasable Mineral Leasing in GRSG Habitat in MZ I

	PHMA		***GHMA***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Open to Non-energy Leasing				
Alternative A	3,380,000	39%	7,664,000	20%
Alternative B	2,049,000	0%	6,570,000	7%
Alternative C	2,049,000	0%	6,580,000	7%
Alternative D	2,049,000	0%	7,766,000	21%
Proposed Plan	2,049,000	0%	6,491,000	6%
Closed to Non-energy Leasing				
Alternative A	1,033,000	6%	664,000	1%

Table M.9-6
Acres Open and Closed to Non-energy Leasable Mineral Leasing in GRSG Habitat in MZ I

	PHMA		***GHMA***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Alternative B	2,470,000	61%	750,000	12%
Alternative C	2,315,000	58%	789,000	16%
Alternative D	972,000	0%	805,000	18%
Proposed Plan	2,564,000	62%	670,000	1%

Source: BLM 2015
This table displays the acres of PHMA and GHMA open and closed to non-energy leasing in MZ I; it also displays the percentage of those acres that are found within the planning area.

While, the HiLine planning area has no occurrence potential for non-energy leasable minerals, this resource would be managed under acreage allocations for solid leasable minerals including coal, sulfur, and solid and semi-solid bituminous rock. Therefore, acreage allocations vary by alternative, but the impact of non-energy leasable development on GRSG on BLM-administered lands within the planning area would not vary because no development is expected in the 20-year cumulative analysis period.

Precluding non-energy leasable development in more acres of PHMA or GHMA across MZ I would reduce habitat disturbance and fragmentation if leasing were to occur in GRSG habitat in the future.

In combination with the disturbance cap applied under state plans and BLM actions in other RMP planning areas in MZ I, the HiLine RMP alternatives in combination with other past, present, and reasonably foreseeable future actions,would provide a net conservation gain to GRSG.

Infrastructure

The USFWS (2013) considers energy development and associated infrastructure the largest threats to GRSG in MZ I. The COT report objective is to avoid development of infrastructure in GRSG PHMA.

Rights-of-Way

Nature and Type of Effects. As discussed in Chapter 4, power lines can directly affect GRSG by posing a collision and electrocution hazard. They also can indirectly decrease lek attendance and recruitment by providing perches and nesting habitat for potential avian predators such as golden eagles and ravens (Connelly, et al. 2004). In addition, power lines and pipelines often extend for many miles. The ground disturbance associated with construction, as well as vehicle and human presence on maintenance roads, may introduce or spread invasive weeds over large areas, degrading habitat. Impacts from roads may include direct habitat loss from road construction and direct mortality from collisions with vehicles. Roads may also facilitate predator movements, spread invasive plants, and increase human disturbance from noise and traffic (Forman and Alexander 1998).

Conditions in MZ I. Infrastructure such as ROWs and associated facilities and urbanization is widespread throughout MZ I. In some locations, such as the Powder River Basin, considerable infrastructure has already been constructed in GRSG habitat, making it necessary to focus GRSG management on minimizing impacts of infrastructure. Development of roads, fences, and utility corridors has also contributed to habitat loss and fragmentation in portions of MZ I. The best available estimates suggest about 16 percent of MZ I is within approximately 4 miles of urban development (Knick, et al. 2011). Impacts of infrastructure development in MZ I are primarily related to highways, roads, power lines, and communication towers, with nearly 90 percent of MZ I within 4 miles of a road, 30 percent within 4 miles of a power line, and 4 percent within 4 miles of a communication tower (Knick, et al. 2011). In the planning area, most ROWs on BLM-administered lands are associated with oil and gas development, electrical transmission, irrigation ditches, and communications.

Although not representative of all infrastructure ROWs, transmission lines greater than 115 kilovolts indirectly influence 29 percent of PHMA and 46 percent of GHMA across MZ I. Indirect effects are assumed to occur to a radius of 4 miles

(Manier, et al. 2013). Approximately 68 percent of transmission lines in PHMA and 73 percent in GHMA are on private lands across GRSG habitats in MZ I (Manier, et al. 2013). Therefore, conservation actions on private lands are likely to have a greater potential to affect transmission line ROWs in GRSG habitat than any other land management entity. Designating ROW exclusion and avoidance areas in PHMA and GHMA on BLM-administered lands could reduce the threat on these lands; however, the scattered federal landownership encourages routing infrastructure around federal lands, often increasing its length and impact. ROW avoidance and exclusion areas on BLM-administered lands could increase this tendency.

Impact Analysis. **Table M.9-7** lists the areas of ROW avoidance and exclusion in GRSG habitat in the HiLine RMP planning area and in MZ I by alternative. **Table M.9-8** lists acres of PHMA and GHMA in existing or future utility corridors.

Table M.9-7
Acres of Rights-of-Way Designations in GRSG Habitat in MZ I

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Open to Rights-of-Way				
Alternative A	5,000	0%	932,000	0%
Alternative B	5,000	0%	932,000	0%
Alternative C	5,000	0%	932,000	0%
Alternative D	5,000	0%	932,000	0%
Proposed Plan	5,000	0%	932,000	0%
Rights-of-Way Exclusion				
Alternative A	119,000	51%	150,000	1%
Alternative B	1,449,000	96%	209,000	29%
Alternative C	105,000	45%	209,000	29%
Alternative D	58,000	0%	209,000	29%
Proposed Plan	119,000	51%	148,000	0%
Rights-of-Way Avoidance				
Alternative A	2,081,000	0%	2,073,000	0%
Alternative B	2,081,000	0%	2,408,000	14%
Alternative C	3,020,000	32%	2,150,000	4%
Alternative D	2,081,000	0%	2,180,000	5%
Proposed Plan	3,449,000	40%	2,363,000	12%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within rights-of-way designations in MZ I; it also displays the percentage of those acres that are found within the planning area.

Under a continuation of current management, impacts on GRSG on BLM-administered lands within the planning area would be minimized via implementation of IMs, measures in **Appendix M**, and acres of ROW avoidance and exclusion that overlap PHMA and GHMA. This would provide the least protection of any alternative because there would be very few actions targeted at directly protecting GRSG. Across the MZ, implementation of state plans and other BLM/FS Proposed Plans would alleviate the infrastructure threat; adverse impacts would be concentrated on the Northern Montana population.

Alternative B and the Proposed Plan would provide the greatest protection for GRSG, but through different management strategies. Alternative B proposes the largest acreage of ROW exclusion areas in both PHMA and GHMA, but the Proposed Plan would manage the largest acreage of ROW avoidance areas. Exclusion and avoidance areas are designed to minimize disturbance to GRSG populations by limiting the siting of roads that can increase bird mortality, habitat

avoidance, and habitat fragmentation, and the location of tall structures that can increase predation, particularly nest predation (Connelly, et al. 2004). The Proposed Plan relies more on ROW avoidance than exclusion to protect GRSG habitat. This approach preserves management flexibility in situations where landownership is mixed. Flexibility is also preserved in areas where rerouting ROWs across non-federal land may result in a longer route, increasing disturbance of GRSG leks, nests, and brood-rearing and wintering areas more than direct routing across federal land. Because of this flexibility, the Proposed Plan provides the greatest net conservation benefit to GRSG in the HiLine RMP planning area.

The numbers of ROW authorizations are anticipated to grow in MZ I. Increasing populations, continued energy development, and new communication sites drive the need for new ROWs on BLM-administered lands and those lands not under BLM administration.

New ROW authorizations that require state agency review or approval would be subject to the permitting process and development restrictions, including the disturbance cap, in GRSG Core Areas under the Wyoming and Montana executive orders, as discussed in **Section 1.4**. These stipulations would benefit GRSG in Core Areas (although excluding many of the GRSG in the Powder River Basin) by encouraging ROW development outside of Core Habitat Areas, restricting surface occupancy within 0.6 mile of occupied leks, prohibiting power lines greater than 115 kV outside of designated corridors, and locating new roads used to transport products or waste over 1.9 miles from occupied leks. These provisions would reduce disturbance to GRSG populations from human traffic, noise, and increased predation associated with tall structures.

The effect of the alternatives and other conservation actions in the MZ (most notably the Montana and Wyoming executive orders) could be synergistic. By implementing restrictions on infrastructure in PHMA and on state and private lands together, the cumulative beneficial effect on GRSG would be greater than the sum of their individual effects because protections would be applied more consistently across the landscape. This is especially important in areas of mixed land ownership patterns where complementary protections can benefit leks, early brood rearing habitat, or other important areas that do not follow geopolitical boundaries.

In combination with these past, present, and reasonably foreseeable future actions and other BLM proposed plans in MZ I, the HiLine RMP Proposed Plan would provide the greatest net conservation gain to GRSG in MZ I. It would accomplish this by providing the flexibility to place ROWs in locations that would have the least impact on GRSG habitat.

Renewable Energy

Nature and Type of Effects. Impacts on GRSG from renewable energy development, such as that for wind and solar power, are similar to those from non-renewable energy development. Additional concerns associated with wind energy developments are rotor blade noise, structure avoidance, and mortality caused by collisions with turbines (Connelly, et al. 2004).

Conditions in MZ I. The BLM has received inquiries from several individuals and companies regarding renewable energy projects in the HiLine planning area. No solar energy potential exists in the planning area, but the potential does exist for increased commercial wind energy development, including facilities located on BLM lands. Currently, the BLM does not have any pending authorizations for wind site testing and monitoring or wind farms.

Across the entire MZ solar energy has very low potential, while wind energy development is a growing presence in MZ I. However, few of the higher potential areas for wind energy in the planning area are in GRSG habitat. Wind turbines indirectly influence 1 percent of PHMA and GHMA across MZ I (Manier, et al. 2013).

A programmatic EIS by the Western Area Power Administration (WAPA) and the USFWS for the entire upper Great Plains will focus future wind energy developments in specific corridors outside of GRSG core habitat (WAPA 2013). In accordance with Section 7 of the ESA, preparation of the programmatic EIS has involved consultation between cooperating entities and the USFWS and preparation of a programmatic Biological Assessment to ensure that the action will not jeopardize the continued existence of any federally-listed species, including the federal candidate GRSG. At the time of this RMPA specific conservation measures for protecting GRSG and its habitat under the programmatic EIS are not developed.

Impact Analysis **Table M.9-8** lists areas of wind energy ROWs by alternative.

Table M.9-8
Acres of Wind Energy Management Designations in GRSG Habitat in MZ I

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Open to Wind Rights-of-Way				
Alternative A	2,000	0%	655,000	0%
Alternative B	2,000	0%	655,000	0%
Alternative C	2,000	0%	655,000	0%
Alternative D	2,000	0%	655,000	0%
Proposed Plan	2,000	0%	655,000	0%
Wind Rights-of-Way Exclusion				
Alternative A	1,464,000	7%	520,000	12%
Alternative B	2,752,000	51%	863,000	47%
Alternative C	2,589,000	47%	599,000	24%
Alternative D	1,360,000	0%	622,000	27%
Proposed Plan	2,793,000	51%	479,000	5%
Wind Rights-of-Way Avoidance				
Alternative A	776,000	0%	2,019,000	0%
Alternative B	776,000	0%	2,035,000	1%
Alternative C	776,000	0%	2,348,000	14%
Alternative D	776,000	0%	3,414,000	41%
Proposed Plan	776,000	0%	2,285,000	12%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within wind energy management designations in MZ I; it also displays the percentage of those acres that are found within the planning area.

Private lands account for 72 percent of wind turbines affecting GRSG in PHMA and 87 percent in GHMA in MZ I (Manier, et al. 2013). Therefore, conservation actions on private land are likely to have a greater potential to reduce the effects of wind energy development than federal actions. Projects that require state agency review or approval would be subject to Wyoming or Montana executive order permitting processes. This would encourage wind energy development outside of Core Habitat Areas.

In the HiLine RMP planning area, Alternatives B and D and the Proposed Plan would exclude renewable energy development from the most GRSG habitat. Across MZ I, Proposed Plans in the other BLM/FS planning areas maintain avoidance and exclusion areas in PHMA for wind energy. Expanding exclusion and avoidance areas would reduce habitat fragmentation and disturbance to GRSG populations from noise, traffic, and increased predation.

Impacts would be minimized on BLM-administered land across all alternatives by adhering to the wildlife protection provisions of the Wind Energy Development Programmatic EIS (BLM 2005). Implementation of wind energy avoidance in PHMA in the HiLine RMP Proposed Plan, in combination with the disturbance caps under the state plans, avoidance and exclusion zones in other BLM planning areas, the protections in the Western Area Power Administration EIS, and other past, present, and reasonably foreseeable future actions, would provide a net conservation gain to GRSG in MZ I.

Grazing

Nature and Type of Effects

The remaining sagebrush habitats in MZ1 are mostly managed as grazing lands for domestic livestock. Domestic livestock function similarly to the native keystone species bison in the MZ through grazing and management actions related to grazing, by serving as the predominant large herbivore in the ecosystem. Grazing actions do not preclude wildlife and vegetation, but they do influence ecological pathways and species persistence (Bock, et al. 1993).

In general, livestock can influence habitat by modifying plant biomass, plant height and cover, and plant species composition. As a result, livestock grazing could cause changes in habitat that alter species abundances and composition in GRSG insect prey important to young GRSG chicks. Changes in plant composition could occur in varying degrees and could change vegetative structure, affecting cover for nesting birds. Grazing could also alter fire regimes (Davies, et al. 2010).

If not managed properly, cattle and sheep grazing can compact soil, enrich soil with nutrients, trample vegetation and nests, directly disturb GRSG, and negatively affect GRSG recruitment. Improper cattle and sheep grazing can also reduce invertebrate prey for GRSG or increase their exposure to predators (Beck and Mitchell 2000, pp. 998-1,000; Knick 2011; Coates 2007, pp. 28-33). Excessive grazing in riparian areas can destabilize streams and riverbanks, cause the loss of riparian shade, and increase sediment and nutrient loads in the aquatic ecosystem (George, et al. 2011). Stock watering tanks can contribute to stream and aquifer dewatering and may concentrate livestock movement and congregation in sensitive areas (Vance and Stagliano 2007).

Even periodic overgrazing can damage range resources over the long term. Grazing often exacerbates drought effects when stocking levels are not quickly reduced to match the limited forage production. Excessive grazing can eliminate perennial grasses and lead to expansion of invasive species such as cheatgrass or Japanese brome (Reisner, et al. 2013). The degree to which grazing affects habitat depends on several factors, such as the types of grasses being grazed, the amount of moisture in any given year, the number of animals grazing in an area, the time of grazing, and the grazing system used.

However, grazing can be used to reduce fuel load and reduce the risk of wildfire (Connelly, et al. 2004, p. 7, 28-30). Under certain conditions, grazing can reduce the spread of invasive grasses, if applied early in the season before the grasses have dried (Strand and Launchbaugh 2013). Light to moderate grazing does not appear to affect perennial grasses, which are important to nest cover (Strand and Launchbaugh 2013).

Much of the landscape in MZ I is adapted to withstand grazing disturbance, having been grazed by bison before the West was settled (Knick, et al. 2011). Since the passage of the 1934 Taylor Grazing Act, range conditions on BLM-administered lands have generally improved due to improved grazing management practices, decreased livestock numbers, and decreased duration of grazing.

In addition, the BLM has applied Standards for Rangeland Health since 1997. The purpose of this practice is to enhance sustainable livestock grazing and wildlife habitat, while protecting watersheds and riparian ecosystems.

Although livestock grazing is the most widespread land use across the sagebrush biome, it exerts a more limited influence on soils and vegetation than land uses that remove or fragment habitat (e.g., mineral extraction or infrastructure development). GRSG are able to co-exist with grazing animals when properly managed. Thus, reducing AUMs or acres open to grazing would not necessarily restore high-quality GRSG habitat.

Livestock grazing could reduce the suitability of breeding and brood-rearing habitat for GRSG populations (USFWS 2010). Reducing grass height in GRSG nesting and brood-rearing areas may negatively impact nesting success. Studies have showed such impacts when residual herbaceous cover was reduced below the approximately 7 inches needed for predator avoidance (Gregg et al. 1994, Doherty, et al. 2014). However, grazing is only one component of grass height, which is also influenced by soil and weather conditions. For BLM-administered lands, Standards for Rangeland Health require the BLM to ensure that the environment contains all of the necessary components to support viable populations of sensitive, threatened, and endangered species in a given area relative to site potential. The BLM Washington Office

IM 2009-018 requires that land health considerations, such as vegetation cover for GRSG, are primary considerations for prioritizing the processing of grazing authorizations.

Grazing shapes wildlife habitats, including habitats for numerous special status species. Potential impacts from livestock grazing would be minimized by managing BLM-administered lands to meet Standards for Rangeland Health, closing areas that fail to meet these standards, or changing grazing seasons and livestock numbers if grazing were a cause of the area's failure to meet Standards for Rangeland Health.

Range improvements could result in livestock overusing important GRSG areas. For example, developing springs would generally change vegetative composition from a high diversity of grasses and forbs, important to broods, to one dominated by grasses; conversely, in areas where livestock use was not well managed, invasive forbs may rise in prevalence.

Allowing spring developments along ephemeral streams and wetlands would decrease GRSG habitat. Springs, seeps, and wetland areas are vitally important to GRSG broods; therefore, allowing spring developments could reduce resources for GRSG.

On National Forest Systems lands, livestock grazing is administered in accordance to a number of laws and regulations, including the Multiple Use and Sustained Yield Act of 1960, Granger-Thye Act of 1950, and Organic Administration Act of 1897. Impacts on GRSG from complying with these laws are similar to those described for grazing on BLM-administered lands.

Conditions in MZ I. Livestock grazing is the dominant agricultural use in the Great Plains. It is widespread on many land types, including federal and private, across MZ I. Remaining sagebrush habitats in MZ I are mostly managed as grazing lands for domestic livestock. Much of the landscape in MZ I is adapted to withstand grazing disturbance, having been grazed by bison before the West was settled (Knick, et al. 2011).

Perhaps the most pervasive change associated with grazing management in GRSG habitats throughout MZ I is the construction of fencing and water developments (Knick, et al. 2011). Barbed wire fences contribute to direct mortality through fence collisions (Stevens, et al. 2011); water developments may contribute to the increased occurrence of West Nile virus (Walker and Naugle 2011). Fencing is common throughout MZ I; water developments are particularly prevalent in the north-central portion of MZ I, making that area especially susceptible to West Nile virus outbreaks.

Additional habitat modifications associated with grazing management are mechanical and chemical treatments to increase grass production, often by removing sagebrush (Knick, et al. 2011). Standards for Rangeland Health protect habitat from elements detrimental to GRSG, but not all rangelands in MZ I are in compliance with these standards.

As literature suggests that moderate grazing is compatible with GRSG habitat (Strand and Launchbaugh 2013), closing acres to grazing may not itself benefit or harm GRSG. Possibly equally or more beneficial is restricting range improvements in GRSG habitat, limiting fencing, and effectively implementing range health standards on grazing allotments in GRSG habitat.

The COT report objectives for livestock grazing are to manage grazing in a manner consistent with local ecological conditions. This management would maintain or restore healthy sagebrush shrub and native perennial grass and forb communities and conserve essential habitat components for GRSG. Restoration to meet these standards and adequate monitoring would be required. The COT report also states that land managers should avoid or reduce the impact of range management structures on GRSG habitat.

Impact Analysis. **Table M.9-9** lists the acres of PHMA and GHMA available and unavailable for grazing, by alternative.

Table M.9-9
Acres Available and Unavailable to Livestock Grazing in GRSG Habitat in MZ I

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Available to Livestock Grazing				
Alternative A	3,396,000	37%	4,187,000	26%
Alternative B	2,140,000	0%	3,117,000	0%
Alternative C	2,140,000	0%	3,117,000	0%
Alternative D	2,140,000	0%	3,117,000	0%
Proposed Plan	3,573,000	40%	3,407,000	9%
Unavailable to Livestock Grazing				
Alternative A	3,000	0%	8,000	0%
Alternative B	3,000	0%	8,000	0%
Alternative C	3,000	0%	8,000	0%
Alternative D	3,000	0%	8,000	0%
Proposed Plan	3,000	0%	8,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA available and unavailable to livestock grazing in MZ I; it also displays the percentage of those acres that are found within the planning area.

Acres open to livestock grazing in PHMA and GHMA in MZ I are similar across all alternatives. Under Alternatives B and C and the Proposed Plan, allotments within the Greater Sage-Grouse Protection Priority Area and the Grassland Bird/Greater Sage-Grouse Priority Areas would be high priority for reassessment of land health standards and processing grazing permit renewals as detailed in **Appendix M**, Mitigation Measures and Conservation Actions for Greater Sage-Grouse Habitat. This would benefit GRSG in areas where mitigation measures and conservation actions are applied.

In addition, new grazing guidance to be implemented under the BLM's Proposed Plans across MZ I would prioritize review of grazing permits in SFAs, followed by PHMA outside of SFAs (there is one SFA in the HiLine RMP planning area). Permits and leases may be modified for protection of riparian areas and wet meadows and may include enhanced monitoring and field checks.

Although the acres closed to livestock grazing are similar under Alternative A and the Proposed Plan, under the Proposed Plan allotments within the Greater Sage-Grouse Protection Priority Area and the Grassland Bird/Greater Sage-Grouse Priority Areas are priority areas to reassess and determine if land health standards (including specific sage-grouse measures) are being met and to process grazing permit renewals as detailed in **Appendix M**, Mitigation Measures and Conservation Actions for Greater Sage-Grouse Habitat. This will help improve GRSG habitat such as protective cover of riparian areas, vegetation, and leaf litter in areas where standards are not being met due to livestock grazing. It may also limit trampling damage to habitat in accordance with the COT report objectives.

Because most grazed land in GRSG habitat in MZ I is privately owned, restrictions on grazing on BLM-administered land may have limited direct effect on population areas. The NRCS's Sage-Grouse Initiative is protecting privately held ranchlands for GRSG habitat using conservation easements.

However, if BLM-administered lands were made unavailable for livestock grazing, this could increase grazing pressure on adjacent private lands. Loss of federal grazing permits would pose a threat of indirect adverse effects, including potential conversion of private grazing lands to agriculture, if the loss of federal grazing rights made ranching less economically viable.

Conversion to agriculture is a major concern in the eastern GRSG range in MZ I, including the Dakotas and Montana. In these areas agricultural conversion is profitable, and patchwork ownership boundaries increase the likelihood of habitat

fragmentation. While BLM management may preserve habitat on federal lands, if interspersed private lands are tilled, the entire landscape may be lost as GRSG habitat regardless of BLM conservation actions.

The most protective grazing management the BLM can implement for GRSG habitat is to maintain and improve habitat quality through the implementation of the Rangeland Health Standards on current allotments and by keeping BLM land available for grazing to assist in the maintenance of ranching as a viable land use in sage-grouse habitats.

In combination with NRCS actions under the Sage-Grouse Initiative, including fence marking and conservation easements, state efforts to maintain ranchland, and other past, present, and reasonably foreseeable future actions, BLM management actions in the Proposed Plan would provide a net conservation gain to GRSG.

Spread of Weeds

Nature and Type of Effects. As discussed in **Chapter 4**, invasive weeds alter plant community structure and composition, productivity, nutrient cycling, and hydrology. Invasive weeds also may cause declines in native plant populations, including sagebrush habitat, through such factors as competitive exclusion and niche displacement. Invasive plants reduce and may eliminate vegetation that GRSG use for food and cover. Invasive weeds fragment existing GRSG habitat and reduce habitat quality by competitively excluding vegetation essential to GRSG. Invasive weeds can also create long-term changes in ecosystem processes, such as fire cycles and other disturbance regimes that persist even after an invasive plant is removed (Connelly, et al. 2004). The COT report objective for invasive species is to maintain and restore healthy native sagebrush plant communities.

Although cheatgrass does occur, past fire history and research has repeatedly demonstrated a healthy northern mixed-grass prairie plant community is resilient to cheatgrass expansion. Haferkamp (2001) studying annual bromes, including cheatgrass in eastern Montana, concluded there would be no ecological shift of northern mixed-grass prairies toward annual grass dominance. Instead, he concluded the amount and abundance of annual bromes occurring on Northern Great Plains rangeland is cyclic, depending on seedbank, temperature, amount and distribution of precipitation. Expansion of annual bromes in mixed–grass prairie communities is buffered by two long-lived perennial grasses (western wheatgrass and blue grama), where grazing management maintains healthy native mixed-grass prairie vegetation (Haferkamp 2001). Vermiere et al. (2011) studied effects of fire on perennial and annual grasses (including cheatgrass) and found increased production of western wheatgrass and decreased annual grass production following summer fire in the northern mixed-grass prairie. Climate Change research also suggests there would not be a cheatgrass invasion into the Northern Great Plains. Climate change research also suggests there would not be a cheatgrass invasion into the Northern Great Plains. In particular, climate change modeling (Bradley 2009) illustrates the median precipitation change scenario (used to identify the most likely future climate change scenario) depicts little to no increase in cheatgrass climatic habitat within MZ I.

Roads and recreation can promote the spread of invasive weeds through vehicular traffic. Weed infestations can further exacerbate the fragmentation effects of roadways. Irrigation water has also supported the conversion of native plant communities to hayfields, pasture, and cropland, thus fragmenting sagebrush habitats. Excessive grazing in these habitats can lead to the demise of the most common perennial grasses in this system and an abundance of invasive species such as cheatgrass or Japanese brome (Reisner, et al. 2013).

Conditions in MZ I. Via seeds carried by wind, humans, machinery, and animals, invasive and noxious weeds have invaded and will continue to invade many locations in MZ I, including the planning area. Some species, including annual bromes and Canada thistle, have become so ubiquitous throughout the planning area that it is considered economically unfeasible to attempt to control them. They are considered part of the vegetative landscape despite their adverse impacts on other vegetation. Canada thistle, although common throughout the planning area, is not treated on a plant-by-plant basis; rather, it is treated when plant populations reach densities high enough to make it the majority species. Examples are when it is growing in the bottom of dry reservoirs, on recreation sites, and along established roads and undeveloped vehicle trails.

The BLM currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, manual, and educational methods. It is guided by the 1991 and 2007 Records of Decisions (RODs) for Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991) and by the 2007 Programmatic

Environmental Report (BLM 2007a). Weeds are managed in cooperation with county governments and represent a landscape-level approach across management jurisdictions.

Impact Analysis. Increased activity such as surface disturbance, motorized transportation, and animal and human activity would increase the chance for invasive plants to establish and spread.

Invasive species on BLM-administered lands would be controlled under all alternatives, but increases in facility development under any alternative could increase the presence and spread of invasive weeds. Management actions that limit activity near GRSG habitat and leks would reduce the chance of invasive species spreading and establishing. Therefore, alternatives such as Alternative B and the Proposed Plan that are more restrictive of development and/or protective of GRSG habitat would help alleviate the threat of spread of weeds better than other alternatives. This would provide a net conservation benefit to GRSG by restoring degraded sagebrush habitat and increasing native forbs, thus improving nest cover and food supply.

Past, present, and reasonably foreseeable future actions that result in surface-disturbing activities would increase the potential for the spread of invasive weeds on both land administered by the BLM and land that it does not administer. Projects subject to the general stipulations outlined in the Wyoming and Montana executive orders are required to control noxious and invasive weed species and to use native seed mixes during reclamation processes. These stipulations would benefit GRSG Core Habitat Areas. They would accomplish this by limiting the spread or establishment of invasive species, particularly on lands that lack BLM protective regulatory mechanisms.

These stipulations, in combination with state and county noxious weed regulations and other past, present and reasonably foreseeable future actions would provide a net conservation gain to GRSG habitats and populations in MZ I under all alternatives and especially the Proposed Plan and Alternative B.

Conversion to Agriculture

Nature and Type of Effects. Converting sagebrush habitat to agricultural use, commonly referred to as sodbusting, causes direct loss of habitat available for GRSG. Habitat loss also decreases the connectivity between seasonal habitats, increasing population isolation and fragmentation. Fragmentation then increases the probability for decline of the population, reduced genetic diversity, and extirpation from stochastic events (Knick and Hanser 2011).

In addition to reducing the land area available to support GRSG, habitat loss and fragmentation also increase the likelihood of other disturbances, such as human traffic, wildfire, and invasive plant spread.

Converting cropland has eliminated or fragmented sagebrush on private lands in areas with deep fertile soils or irrigation potential. Sagebrush remaining in these areas has been limited to the agricultural edge or to relatively unproductive environments.

Biofuel production and high prices for small grains has increased the conversion to cropland of native grasslands or lands formerly enrolled in the Conservation Reserve Program (CRP). This conversion of private lands further emphasizes the importance of BLM-administered lands and associated private grazing lands in maintaining large blocks of native grassland and shrubland habitats suitable for GRSG. Converting native grasslands to agricultural lands not only results in a direct loss of habitats for native wildlife, it fragments remaining habitat.

Conditions in MZ I. The most pervasive and extensive change to the sagebrush ecosystems in MZ I is the conversion of nearly 60 percent of native habitats to agriculture (Samson, et al. 2004). Cropland currently covers nearly 19 percent of MZ I and influences approximately 50 to 80 percent of sagebrush in MZ I (Knick, et al. 2011).

Regional assessments estimate that 7.2 percent of PHMA and GHMA in MZ I are directly influenced by agricultural development. These same assessments estimate that over 99 percent of PHMA and GHMA in MZ I are within approximately 4 miles of agricultural land (Manier, et al. 2013). Much of the direct habitat loss from conversion to agriculture has occurred in the northwestern and northeastern portions of MZ I, in Montana and the Dakotas (Knick, et al. 2011).

Impact Analysis. The BLM does not convert public lands to agriculture. As such, the only direct authority it has over conversion to agriculture is by retaining or disposing of lands in the realty program. Lands retained under BLM management will not be converted to agriculture.

Disposing of lands could increase the likelihood they will be converted to agriculture, depending on their location and new management authority.

As shown below in **Table M.9-10**, acreages identified for retention vary across alternatives within the planning area and subsequently the MZ.

Table M.9-10
Acres Identified for Retention and Disposal in GRSG Habitat in MZ I

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Acres Identified for Retention				
Alternative A	2,139,000	0%	2,991,000	0%
Alternative B	2,528,000	15%	3,124,000	4%
Alternative C	2,376,000	10%	3,148,000	5%
Alternative D	2,139,000	0%	3,208,000	7%
Proposed Plan	3,572,000	40%	3,279,000	9%
Acres Identified for Disposal				
Alternative A	20,000	100%	222,000	27%
Alternative B	1,004,000	100%	453,000	64%
Alternative C	992,000	100%	477,000	66%
Alternative D	0	0%	1,525,000	89%
Proposed Plan	0	0%	165,000	1%

Source: BLM 2015
This table displays the acres of PHMA and GHMA identified for retention and disposal in MZ I; it also displays the percentage of those acres that are found within the planning area.

BLM land tenure adjustments could result in GRSG habitat being converted to agriculture use. However, land tenure adjustments require site-specific NEPA analysis, and land sales must meet the disposal criteria under applicable law. BLM land tenure adjustments are not anticipated to be a significant contributing element to the threat of agricultural conversion.

Lands identified for disposal in MZ I are typically small isolated parcels that are difficult to manage and do not represent suitable GRSG habitat. Parcels determined to have GRSG habitat value would not likely meet the disposal criteria, unless disposal was seen to have a net conservation benefit. Studies of agricultural conversion risk on grasslands have shown a high probability of grassland plots being converted to cropland under current economic and climatic conditions (Rashford, et al. 2013). The recent federal Farm Bill tried to discourage converting prairie to cropland by denying crop insurance for such conversions. Nevertheless, if corn and other crop prices remain high, the economic incentive to convert parcels to cropland in GRSG habitat areas will continue and will potentially increase. Once converted to cropland, acreage is permanently lost as habitat for GRSG. Fragmentation of habitat from piecemeal conversions of ranchland to tilled cropland can increase disturbance over a large area and cause adjacent areas to become unusable or poor-quality GRSG habitat.

The BLM has no management authority over private land conversions. The loss of habitat on private lands may reduce the effectiveness of conservation actions on BLM-administered lands. This is because of habitat fragmentation from the patchwork pattern of landownership in MZ I.

Cumulative impacts vary relatively little across alternatives because BLM management may have little impact on alleviating this threat. Restrictions on grazing on federal land could increase agricultural pressure on adjacent private lands. If the loss of federal grazing rights makes ranching economically unviable, the potential conversion of private grazing lands to agriculture would increase. However, the Proposed Plan does not substantially increase acreage unavailable to grazing.

The COT report objectives for converting land to agriculture are to avoid further loss of sagebrush habitat for agricultural activities (both plant and animal production) and to prioritize restoration. In areas where taking agricultural lands out of production has benefited GRSG, the programs supporting these actions should be targeted and continued (USFWS 2013). In accordance with this objective, the NRCS's SGI program focuses on maintaining ranchland that provides habitat for GRSG.

This voluntary program provides private landowners with monetary incentives to protect GRSG habitat, often through conservation easements. As a result, private land containing GRSG habitat is protected from conversion to agriculture or other development for the life of the conservation agreement. The conservation easements and other conservation incentives such as restoration of water features and fence marking can enhance the ability of private ranchlands to support GRSG seasonal habitats. These efforts, in conjunction with BLM management and other past, present and reasonably foreseeable future actions, would provide a net conservation gain to GRSG in MZ I.

Fire

Nature and Type of Effects. Sagebrush killed by wildfire often requires many years to recover, especially after large fires. Contiguous old-growth sagebrush sites are at high fire risk, as are large blocks of contiguous dead sagebrush and sagebrush sites with a substantial cheatgrass understory. Before recovering, these sites are of limited use to GRSG, except along the edges and in unburned islands.

Because of its widespread impact on habitat, fire has been identified as a primary factor associated with GRSG population declines. Depending on the species of sagebrush and the size of a burn, a return to a full pre-burn community cover can take from 25 to 120 years (Baker 2011). In addition, fires can reduce invertebrate food sources and may facilitate the spread of invasive weeds.

While most sagebrush subspecies are killed by fire and slow to reestablish, cheatgrass recovers within one to two years of a fire from seed in the soil. This annual recovery leads to a reoccurring fire cycle that prevents sagebrush reestablishment (USFWS 2010). However, silver sage is the predominant sage species north of the Milk River in MZ 1, and silver sage sprouts from the roots after being burned and fire may enhance silver sage habitats in these areas.

BLM management to prevent or control wildfires can also affect GRSG and habitat. Increased human activity and noise associated with fire suppression, fuels treatments and prescribed fire in areas occupied by GRSG could affect nesting, breeding, and foraging behavior. Important habitats could be altered because of the use of heavy equipment, hand tools, and noise.

In addition, suppression may initially result in higher rates of conifer encroachment in some areas. In the initial stages of encroachment, fuel loadings remain consistent with the sagebrush understory. As conifer encroachment advances, fire return intervals are altered by decreasing understory abundance. The depleted understory causes the stands to become resistant to low-intensity wildfires; over years, the accumulating conifer loads contribute to larger-scale wildfires and confound control efforts due to extreme fire behavior.

Conditions in MZ I. Fire risk is generally low across MZ I, with 17 percent of PHMA and GHMA having high risk for fire; however, isolated areas, especially in central Montana, South Dakota, the border between Montana and Wyoming, and eastern Wyoming, are identified as having high fire risk. The risk of fire across other parts of this region needs better documentation (Manier, et al. 2013).

In the planning area, fire data from 1980 to 2006 indicates there were 288 BLM-reported fires that burned approximately 105,000 acres, with an average of 4,050 acres burned per year (see Chapter 3).

Impact Analysis. Management actions in the HiLine planning area that emphasize wildfire suppression in GRSG habitat would benefit the species by limiting habitat loss in the event of wildfire. However, in silver sage habitats, sage density could be enhanced through the use of fire because of the sprout response of this species when burned. For example, Alternatives B and C and the Proposed Plan state that within the Greater Sage-Grouse Protection Priority Area ACEC and the Grassland Bird/Greater Sage-Grouse Priority Areas ACEC, only land treatments that conserve, enhance or restore greater sage-grouse and/or grassland bird habitat would be allowed. This is in accordance with the COT report objective to retain and restore healthy native sagebrush plant communities within the range of GRSG.

Recognition of the importance of sagebrush habitat during interagency wildfire response would benefit GRSG populations in the event of an unplanned fire. The Wyoming and Montana executive orders emphasize fire suppression in Core Population Areas, while recognizing other suppression priorities may take precedent. This would benefit GRSG habitat during wildfire planning and response, particularly on lands not administered by the BLM.

WAFWA's guidance on fire and fuels management for GRSG conservation (WAFWA 2014) promotes coordination among local fire response agencies similar to a "natural disaster" response; it emphasizes the importance of fuel breaks and the need to incorporate GRSG habitat objectives in fire management, as well as the use of grazing as a fuel reduction tool.

Efforts at the local level can also benefit GRSG habitat in MZ I. For example, the Northeast Wyoming Sage Grouse Conservation Plan (2014) recommends coordinating with county fire agencies and landowners to develop and implement wildfire suppression guidelines that address GRSG habitat health and management. However, the conservation plan does not identify a funding source for this action.

The Interagency Standards for Fire and Fire Aviation Operations "Red Book" includes a BMP for GRSG habitat conservation for wildlife and fuels management (BLM 2013a). This document is a supplemental policy or guidance for the BLM, the Forest Service, and the USFWS. This BMP would benefit the GRSG during interagency wildland fire operations. It would do this by using spatial habitat data and predictive services to prioritize and pre-position firefighting resources in critical habitat areas. The coordination of federal, state, and local fire prevention actions, changes in fire management, and other past, present, and reasonably foreseeable future actions would provide a net conservation gain to GRSG in MZ I.

Recreation

Nature and Type of Effects. Recreation such as camping, bicycling, wildlife viewing, horseback riding, fishing, and hunting can be dispersed, concentrated (e.g., OHV use and developed campsites), or permitted (e.g., BLM Special Recreation Permit). The BLM also manages Special Recreation Management Areas (SRMAs) where recreation is a primary resource management consideration.

Recreation on federally administered lands that use the extensive network of double-track and single-track routes have an impact on sagebrush and GRSG. Ecological impacts of roads and motorized trails are mortality due to collisions; behavior modifications due to noise, activity, and habitat loss; alteration of physical environment; nutrient leaching; erosion; invasive plants spread; increased use; and alteration by humans due to accessibility (Knick, et al. 2011). Recreation activities can degrade GRSG habitat through direct impacts on vegetation and soils, introduction or spread of invasive species, and habitat fragmentation. This occurs in areas of concentrated use, trailheads, staging areas, and routes and trails.

Motorized activities, including OHV use, are expected to have a larger footprint on the landscape. They are anticipated to have the greatest level of impact due to noise levels, compared to non-motorized uses such as hiking or equestrian use. Cross-country motorized travel, which is permitted in designated areas on BLM-administered lands but not on National Forest System lands, would increase the potential for soil compaction, loss of perennial grasses and forbs, and reduced sagebrush canopy cover. Losses in sagebrush canopy could be the result of repeated, high-frequency, cross-country OHV use over long periods. In addition, the chances of wildfire are increased during the summer, when fire dangers are high and recreation is at its highest.

Dispersed uses expand the human footprint. Closing areas to recreation and reclaiming unused, minimally used, or redundant roads in and around sagebrush habitats during seasonal use by GRSG may reduce the footprint and

presumably impacts on wildlife. Restricting access to important habitat areas during seasonal use (lekking, nesting, brood-rearing, and wintering) may decrease the impacts associated with humans. However, access restriction will not eliminate other impacts, such as invasive plant spread, predator movements, cover loss, and erosion (Manier, et al. 2013).

Conditions in MZ I. Historically low in the Great Plains, human population densities have increased 666 percent since 1920 (Knick, et al. 2011). With expanding population comes greater human impacts (Leu, et al. 2008), with many people moving to the Great Plains region because of access to public lands (Hansen, et al. 2005).

Recreational use in the planning area is relatively low compared to other BLM RMP planning areas in MZ I. Although visitor use information is lacking or incomplete for some areas, BLM lands in the HiLine planning area received a minimum of 53,000 recreation visits in 2005. Recreation demands are anticipated to rise across MZ I in recreationally desirable areas.

The COT report objectives for recreation are to maintain healthy native sagebrush communities, based on local ecological conditions, and to manage direct and indirect human disturbance (including noise) to avoid interruption of normal GRSG behavior (USFWS 2013). Limits on road use under the action alternatives and limits on OHVs would help meet these objectives.

In the HiLine RMP planning area and elsewhere on BLM-administered lands in MZ I, travel management planning will determine specific routes available for closure; OHV management areas in the RMP provide guidance for these implementation efforts.

Impact Analysis. **Table M.9-11** shows acres of travel management designations in GRSG habitat in MZ I.

Table M.9-11
Acres of Travel Management Designations in GRSG Habitat in MZ I

	Priority Habitat Management Areas		***General Habitat Management Areas***	
	MZ I	***Percent Within Planning Area***	***MZ I***	***Percent Within Planning Area***
Open				
Alternative A	0	0%	0	0%
Alternative B	0	0%	0	0%
Alternative C	0	0%	0	0%
Alternative D	0	0%	0	0%
Proposed Plan	0	0%	0	0%
Limited				
Alternative A	3,837,000	33%	4,170,000	26%
Alternative B	3,522,000	40%	3,528,000	12%
Alternative C	3,359,000	37%	3,576,000	13%
Alternative D	2,130,000	0%	4,683,000	34%
Proposed Plan	3,563,000	40%	3,394,000	9%
Closed				
Alternative A	5,000	0%	40,000	0%
Alternative B	5,000	0%	40,000	0%
Alternative C	5,000	0%	40,000	0%
Alternative D	5,000	0%	40,000	0%
Proposed Plan	5,000	0%	40,000	0%

Source: BLM 2015
This table displays the acres of PHMA and GHMA within travel management designations of open, limited, and closed in MZ I; it also displays the percentage of those acres that are found within the planning area.

As shown in **Table M.9-11**, the number of acres for each OHV allocation in GRSG habitat vary little across the alternatives and cumulative impacts from OHV allocations would be similar under all alternatives.

SRMAs would be designated under Alternatives C and D and the Proposed Plan, with the greatest number of acres of SRMAs under Alternative D. SRMAs allow the BLM to more effectively manage areas for group recreation and minimize disturbance to GRSG populations. The Proposed Plan would provide a balanced approach, emphasizing recreational use and protecting natural resources.

Implementation of the alternatives described above, in concert with additional travel management planning on BLM-administered lands within MZ I, the disturbance caps applied under state plans, and other past, present, and reasonably foreseeable future actions would help reduce the threats from recreation and travel on GRSG habitats and would provide a net conservation benefit to GRSG populations in MZ I.

1.7 Conclusions

In addition to BLM management in the HiLine RMP planning area and other planning areas in MZ I—North Dakota, South Dakota, Miles City, Lewistown, Buffalo, and parts of Billings and 9-Plan—GRSG in MZ I will also be impacted by management and conservation at state, regional, tribal, and local levels. This analysis takes into account each alternative in the HiLine RMP in conjunction with state and private initiatives, and past and present actions at the federal, state, and local levels. The analysis assumes that the BLM RMP Proposed Plans would be implemented in the other BLM RMP planning areas in MZ I.

Some of the most important past and present actions benefitting GRSG populations on private land in MZ I are the conservation easements coordinated by the NRCS SGI with private ranchers. In only a few years, SGI has recorded easements on over 65,000 acres in MZ I and established GRSG-friendly grazing systems on over 1,300,000 acres (NRCS 2015). SGI has also worked with landowners to increase fence marking, seeding of native vegetation, and conifer removal to improve GRSG habitat quality. Future coordination of private landowners with SGI is expected to provide further benefits to GRSG habitat.

This coordination with private landowners enhances conservation in addition to what BLM management can accomplish on federal lands. Ranchers in Wyoming are also using Candidate Conservation Agreement with Assurances with the USFWS. Under these instruments, the ranchers voluntarily agree to manage lands to reduce threats to GRSG in exchange for a guarantee that they will not be subject to additional regulations should the species become listed. While ranchers have used these agreements across GRSG range, thus far the agreements have been applied to only a small number of ranches in Wyoming and Montana.

Both Wyoming and Montana have adopted statewide plans to promote GRSG conservation. Wyoming's plan implements a Core Population Area Strategy with well density limitations, timing restrictions, and a uniform 5 percent disturbance cap across all landownership types. These measures would improve GRSG population levels if effectively enforced (Copeland, et al. 2013). In Montana, a 5 percent limit on anthropogenic disturbance is applied within the Density and Disturbance Calculation Tool examination area (based upon occupied leks within any given core population area). Other state plans include similar, if sometimes less aggressive, measures to reduce impacts on state lands. In Utah, the Conservation Plan for Greater Sage-Grouse in Utah (Utah Greater Sage-Grouse Working Group 2013) includes, under certain circumstances, a general limit on new permanent disturbance of 5 percent of habitat on state or federally managed lands within any particular sage-grouse management area. The limitations on timing and density of energy development along with the disturbance cap, and BLM management on lands with federal mineral estate, would act in concert to promote GRSG conservation and reduce the impacts from energy development on leks, breeding habitat, and wintering habitat.

However, the state strategy is less effective in areas where widespread development has already occurred, such as the Powder River Basin population area. This is because the Core Areas were delineated after considerable GRSG habitat had already been disturbed (Taylor, et al. 2012). Montana's plan, published in September 2014, promotes a statewide conservation strategy on private and state lands. It also calls for a 5 percent disturbance cap for GRSG habitat, limits well density, and imposes timing restrictions, similar to the approach in Wyoming. Together, these measures would reduce habitat loss as well as direct disturbance, injury, or mortality of GRSG populations associated with anthropogenic disturbance across the MZ if effectively enforced.

Currently neither North Dakota nor South Dakota has a similar state plan in place, but these states contain smaller populations of GRSG on the edge of their range. State efforts in Montana and Wyoming that protect the core populations would also help sustain connected populations in North Dakota and South Dakota, if habitat and environmental conditions continue to support GRSG in those areas.

Habitat restoration is also important for sustaining GRSG populations across MZ I. Although the Northern Montana population is considered overall to be at low risk (USFWS 2013), the Powder River Basin GRSG population has declined due to widespread energy development. The Powder River Basin Restoration Program reasonably foresees large-scale habitat restoration; as drill sites go out of production, they would be reclaimed and restored to pre-disturbance conditions. While not all restored habitat is successfully reoccupied by GRSG, the Powder River Basin Restoration Program considers that as energy development ceases and locations are restored to habitat, GRSG in nearby habitats may recolonize restored areas successively. While GRSG are not anticipated to return to the area in pre-disturbance numbers, restoration in areas adjacent to core habitat, extant populations and connectivity habitat will expand the available breeding and wintering habitat for GRSG and provide a net conservation gain to the species.

The COT report states that the Powder River Basin GRSG population is at risk of extirpation from development of the vast energy resources in the region. Another risk is West Nile virus, which is particularly dangerous in populations already depleted by habitat fragmentation and loss (USFWS 2013). The viability analysis for GRSG in the Miles City field office found that declines in populations when faced with combinations of these stressors were more rapid and less recoverable (Taylor, et al. 2010). The population viability analysis for Powder River Basin reached similar conclusions (Taylor, et al. 2012). However, as described in this analysis, the threat from energy development can be effectively managed by coordinated action from BLM RMP amendments and revisions and state actions, including disturbance caps to limit loss of GRSG habitat and to protect leks with buffers. Risks to the Powder River Basin population would be minimized under all alternatives in this analysis because of the assumption that the BLM's Buffalo and Miles City proposed plans would be implemented. Impacts from implementing different alternatives in the HiLine RMP would largely affect the Northern Montana population.

BLM restrictions on energy development and associated infrastructure in GRSG habitat, and permit requirements for development of federal mineral estate, would help reduce loss and disturbance of GRSG populations. Under the Proposed Plan, for lands that are already leased, BLM can apply COAs as provisions of drilling permit issuance or renewal to minimize impacts on GRSG habitat.

From a management perspective, the threat to GRSG in MZ I from conversion of private lands to agriculture is particularly challenging. As described above, these conversions are attractive to ranchers as crop prices increase and climate conditions support more tillage. Once tilled, GRSG habitat is not only lost on the tilled land, but surrounding habitat areas become fragmented and less hospitable to birds. BLM management cannot restrict tillage on private lands, and state governments have limited control over this action; conversion to agriculture is primarily influenced indirectly by promoting sustainable grazing and voluntary efforts for conservation, such as the NRCS SGI program's conservation easements.

Alternative A: Current Management

Under Alternative A, current management would continue on BLM-administered lands in the HiLine RMP planning area. Several protective measures would not be implemented; for example, the BLM would not designate PHMA or GHMA and would not manage any additional ROW avoidance or exclusion areas. Appropriate and allowable uses and restrictions with regard to such activities as mineral leasing and development, recreation, utility corridors, and livestock grazing would also remain unchanged.

Mitigation measures and conservation actions would help to continue to avoid, minimize, rectify, reduce, or compensate for impacts. Management prescriptions to protect GRSG currently in place include an NSO within 0.25-mile of essential habitat, a TL within nesting habitat from March 1 to June 15, and a TL within winter range from December 1 to May 15. These would continue to provide somewhat limited protection; because there would be no Grassland Bird/Greater Sage-Grouse Priority Areas or Greater-Sage-Grouse Protection Priority Area, measures would be largely confined to those applied to fluid mineral leasing as opposed to all surface-disturbing activities.

Under current management, widespread energy development has degraded GRSG habitat in portions of MZ I. As a result, GRSG populations in the Powder River Basin have declined substantially. Energy development is also a primary threat to the Northern Montana population and others in MZ I. The Northern Montana population dropped 54 percent to 1,667 males in 2013, while the Yellowstone Watershed population dropped 65 percent to 3,045 males (Garton, et al. 2015). In addition, a viability analysis recently conducted for the Buffalo RMP planning area indicated that the GRSG populations in northeast Wyoming could be at risk of extirpation from the combined effect of development and West Nile virus (Taylor, et al. 2012). (Future drilling in the Powder River Basin is expected to have less impact on GRSG because a planned increase in restoration and continued implementation of the state Core Population Area Strategy.)

In the rest of MZ I, other BLM RMP planning efforts would implement their Proposed Plans to improve protection of GRSG and their habitat. In addition, GRSG conservation strategies would be implemented on state and private lands. As a result, the relative lack of protections under the HiLine RMP Alternative A would be offset to an extent by more protective management elsewhere in MZ I. In the HiLine RMP planning area, though, continuation of current management would do little to reduce the threats from energy development, mining, and infrastructure on GRSG wintering and breeding grounds; the HiLine RMP planning area may serve as sink habitat for the MZ-wide population of GRSG. Although current management actions, including temporary BLM GRSG IMs, provide an array of conservation measures that are intended to avoid continued degradation of GRSG habitat in MZ I, surface-disturbing activities would not be subject to the same development restrictions in GRSG habitat under the No Action Alternative as under the action alternatives. Thus, the No Action Alternative would not meet the goals and objectives in this plan to identify and incorporate conservation measures for GRSG and would not meet the COT report objectives for present and widespread threats to GRSG.

Alternative B

Alternative B emphasizes protecting natural resources and is the most restrictive alternative for development within GRSG habitat. In conjunction with NRCS and state initiatives on private land, several aspects of BLM management under Alternative B would benefit GRSG conservation at a landscape level. Important actions driving this benefit include closing all areas within 2 miles of lek, winter range, nesting habitat, Grassland Bird/Greater Sage-Grouse Priority Areas, and the Greater Sage-Grouse Protection Priority Area to fluid mineral leasing.

Alternative B is also the most restrictive in terms of ROWs; more acres would be managed as ROW exclusion, thus preventing adverse impacts to GRSG and their habitat on BLM-administered lands.

Alternative B would create the most special designations for resource protection, including for GRSG. These special designations would benefit GRSG by restricting surface-disturbing activities, retaining lands in public ownership, and maintaining or improving sagebrush quality and connectivity.

Implementing these protective measures on BLM-administered lands within the HiLine RMP planning area would help preserve GRSG habitat but could increase development pressure on adjacent lands with potentially less restrictive management. GRSG in MZ I would benefit most in states where non-federal lands have similarly restrictive measures such as in Core Areas in Wyoming and Montana (though Core Areas do not cover all existing GRSG populations). North and South Dakota do not have similar orders protecting GRSG on non-federal lands; thus, controls on BLM-administered land in MZ I may not reduce overall impacts on GRSG in the Dakotas.
As described above, Alternative B would likely meet the objectives laid out in the COT report for energy development, fire, invasive plants, range management, recreation, and infrastructure. Under Alternative B, the GRSG populations across the MZ would retain more of their range and distribution than under current management, and would experience a net conservation gain, in conjunction with other past, present and reasonably foreseeable future actions in the MZ.

The greater risk to GRSG would be development on private land, including conversion to agriculture where direct or indirect BLM management authority is absent or limited. Alternative B would minimize agricultural conversion by retaining lands providing GRSG habitat. It may result in more indirect impacts from potential conversions of private land providing GRSG habitat. However, this loss may be limited by the NRCS SGI program, which is helping landowners obtain conservation easements for ranchland providing GRSG habitat.

Alternative C

Although more protective of GSG than current management, Alternative C applies less stringent restrictions on surface-disturbing activities than Alternative B or the Proposed Plan. It would close fewer acres of GRSG habitat to fluid mineral leasing than Alternative B and would apply a CSU stipulation in the priority area for grassland birds/greater sage-grouse than the more protective NSO stipulation in the Proposed Plan. These moderate restrictions would likely allow for development on BLM-administered lands without increasing pressure adjacent lands with fewer protections. An NSO stipulation for new oil and gas leases on BLM lands with high habitat value would benefit GRSG (1,028,661 acres). This action would eliminate short-term direct impacts and long-term indirect impacts associated with oil and gas leasing much of the sagebrush habitat in the planning area. In whole, Alternative C would complement conservation efforts on adjacent state and private lands and would benefit GRSG and their habitat.

COT objectives for energy development, infrastructure, mining, range management, fire, and invasive plants would likely be met in the HiLine planning area and in other areas of MZ I due to implementation of the actions described in this analysis, other planning areas' Proposed Plans, conservation efforts on state and private lands, and other past, present and reasonably foreseeable future actions.

Alternative D

With reliance on fewer and less restrictive protections for GRSG populations, implementation of Alternative D would result in habitat fragmentation and degradation on BLM-administered lands within the planning area. There would be a dichotomy between conservation efforts on state and private lands and the impacts from development on BLM-administered lands within the planning area. The inconsistent protections could lead to continued population decline, due to the mixed land ownership pattern in much of the planning area.

Impacts in the remainder of MZ I would be the same as those described under the other alternatives and would help to offset losses in the HiLine planning area. Across the MZ, COT report objectives for range management, fire, and invasive plants would likely be met, but those for energy development, infrastructure, and mining would not be met in the HiLine planning area, a relatively large portion of the MZ.

Proposed Plan (Alternative E, Preferred Alternative)

The Proposed Plan emphasizes sustainable development with constraints on resource uses to protect GRSG and other natural resources. GRSG protective measures, such as NSO stipulations, would be implemented in and outside of priority habitat.

Under the Proposed Plan, the BLM would improve GRSG habitat protection over current management. The Proposed Plan would also apply resource constraints, such as CSU and TL stipulations for nesting habitat and winter range respectively, and would increase constraints on resource uses such as energy and mining. For example, applying an NSO stipulation on all federal mineral estate in PHMA would protect important habitat and the greatest densities of GRSG including the majority of breeding males. Similar protections for PHMA in other BLM and Forest Service proposed plans, along with protections for other lands via the Wyoming Executive Order and similar plans in Montana would protect breeding activities at the lek, while density and disturbance limits would protect nesting females and late brood-rearing habitat. In addition, protection priority areas for GRSG and priority areas for grassland birds/GRSG would be established which would minimize additional impacts to GRSG in these areas. In GHMA, a 0.6-mile NSO buffer would be applied around lek perimeters; effects would be similar to those in PHMA, but would be focused on the most important areas within GHMA (i.e., leks) instead of the broader habitat management area.

These provisions would protect GRSG more than current management and would complement protections on other lands. The Proposed Plan would maintain flexibility for land managers in areas with mixed public and private ownership. In such locations, strict restrictions on development on federal lands could result in more widespread development on private lands, without reducing overall impacts on sagebrush habitat. Flexible management has the potential to minimize impacts on GRSG populations, for example by permitting a shorter transmission line route through GRSG habitat across both public and private land.

In conjunction with state and regional planning efforts, implementation of disturbance caps in GRSG priority habitat, conservation easements on private lands, and implementation of the Proposed Plans for other BLM planning areas in MZ I, the Proposed Plan for the HiLine RMP would meet the goals and objectives for GRSG in this plan and the objectives laid out in the COT report for fire, invasive plants, range management, recreation, and infrastructure. The Proposed Plan, when added to the other BLM and Forest Service RMPs/LUPAs, conservation efforts and past, present, and reasonably foreseeable future actions in MZ I would address, though may not meet, the COT objectives for energy and mining, because prior habitat disturbances have impinged some populations such as the Powder River Basin population. Other populations, including the Northern Montana population, are more stable and implementation of the action described above would not impinge them; thus cumulative effects from energy and mining across MZ I would vary by GRSG population. The Proposed Plan would minimize agricultural conversion, to the extent that this is within BLM authority. Conversion would be minimized by retaining lands providing GRSG habitat and by working in conjunction with NRCS efforts to retain private ranchland providing continuous GRSG habitat and connectivity between habitats. However, converting private lands to agriculture would remain a risk to GRSG in MZ I under all alternatives.

Specifically, the following measures which would be implemented under the Proposed Plan, or are considered reasonably foreseeable future actions, would help meet the COT report objectives:

- Managing ROW exclusion and avoidance areas would help meet the COT report objective for infrastructure by limiting ROW development. These actions would also help to meet the COT objectives for invasive plant species by reducing disturbances that promote the spread of weeds.

- Designating oil and gas stipulations would limit development in PHMA, except where pre-existing valid rights apply. In these areas Conditions of Approval would limit disturbance.

- Implementation of state conservation plans and/or state executive orders would help meet all COT report objectives, particularly on non-BLM and non-National Forest System lands. Applying a 5 percent disturbance limit (under the Wyoming and Montana GRSG plans) would reduce impacts contributing to population declines and range erosion associated with threats including energy, mining, and infrastructure.

- Removal of encroaching trees near occupied leks and important habitats (e.g., nesting, wintering, and brood-rearing) would reduce the rate of conifer incursion and help to maintain healthy native sagebrush plant communities.

- Continued implementation of the Natural Resource Conservation Service Sage-Grouse Initiative would help meet the COT objective for the threat of agriculture conversion, by securing conservation easements on private lands. Fence marking, implementing prescribed grazing systems, and vegetation seeding would help meet the COT objectives for livestock grazing, and invasive plant species.

The Proposed Plan would minimize habitat loss by providing management flexibility to collocate ROWs and maintain grazing permits. Overall, under the Proposed Plan, future projects in PHMA would be subject to additional restrictions to protect GRSG that would not be implemented under Alternative A. This would protect important habitat with the greatest densities of GRSG over the 20-year analysis period. Thus, GRSG would experience a net conservation gain under the Proposed Plan.

Summary

Overall, GRSG populations across MZ I face pressures from energy development, conversion to agriculture, and such stressors as disease, drought, predation, and fire. These threats are magnified under the pressure of habitat fragmentation and the isolation of small populations in the Dakotas, on the eastern edge of the species' range.

While implementation of the action alternatives would reduce threats faced by GRSG, overall trends toward habitat loss and fragmentation are likely to continue, primarily due to energy and infrastructure development pressures in GRSG habitat, notably in the Dakotas and Powder River Basin. The isolation of smaller populations makes them particularly vulnerable to disease and other stressors. The Yellowstone watershed population also faces habitat loss pressure from energy and infrastructure development, and fragmentation risk due to the low percentage of land in public management.

GRSG populations respond to a variety of stressors acting in concert. If BLM effectively restricted energy development infrastructure, but adjacent lands were disturbed through tillage, poor grazing practices, or other surface-disturbing activities, the effectiveness of BLM actions would be limited and decreases in GRSG populations in the planning area would be expected. Private lands being converted to cropland is a particularly worrisome threat in this region, because of the economic incentive of high crop prices and the patchwork pattern of landownership between federal and private lands. Widespread habitat fragmentation and degradation have already occurred in MZ I, GRSG will depend on a combination of Federal conservation actions, such as the removal of crop insurance protections for converted lands, and the NRCS SGI, state development restrictions and disturbance limits and private landowner actions to maintain viable habitat in PHMA and GHMA for the Yellowstone Watershed population. Either Alternative B or the Proposed Plan would best promote these goals in the planning area. These alternatives would be most likely to stabilize GRSG populations throughout MZ I.

Because widespread habitat fragmentation and degradation have already occurred in many parts of MZ I, GRSG in MZ I will depend on a combination of federal conservation actions and development restrictions, private conservation easements, and state disturbance limits to maintain viable habitat in PHMA and GHMA and to sustain GRSG populations against present and widespread threats. Maintenance of habitat connectivity to populations in Montana will protect against GRSG population losses from disease and wildfire. Either Alternative B or the Proposed Plan would best promote these goals in the HiLine RMP planning area. These alternatives would be most likely to stabilize GRSG populations, maintain leks, improve nesting success, and reduce predation in the Northern Montana population area and throughout MZ I.

Though small fringe populations may continue to decline across MZ I in the next 20 years, implementing Alternative B or the Proposed Plan, in combination with the Proposed Plans for other BLM RMP planning areas, development restrictions in the Wyoming and Montana state plans, increased land protections via the NRSC SGI, and local and regional habitat restoration efforts, would effectively conserve the region-wide population of GRSG in MZ I.

1.8 MZ-Wide Reasonably Foreseeable Future Actions Summary Table

Table M.9-12 includes a selection of some of the larger projects from the reasonably foreseeable future actions tables in the RMPAs/LUPAs for MZ I. The full tables can be found in each EIS within the MZ.

Table M.9-12
Reasonably Foreseeable Future Actions in Management Zone I Likely to Impact GRSG Habitat

MZ	*Planning Area*	*GRSG Population(s) Affected*	*Project Name*	*Project Location*	*Project Description, Estimated Footprint*	*Project Status*
Energy and Mining						
I	Buffalo	Powder River Basin, Wyoming Basin	Greater Crossbow Oil and Gas Exploration and Development Project	Campbell and Converse Counties, Wyoming	Proposed development of 1,500 new oil and gas wells over 110,000 acres of split estate mixed surface ownership lands. There are no BLM surface lands within the proposed development area; however, approximately 62 percent of the mineral estate is managed by the BLM.[1]	Proposed
I	Wyoming Greater Sage-Grouse	Powder River Basin, Wyoming Basin	Converse County Oil and Gas	Converse County, Wyoming	Proposed development of up to 5,000 new oil and gas wells in northern Converse County, Wyoming. The proposed development area encompasses roughly 1.5 million acres of split estate mixed surface ownership	Proposed

Table M.9-12
Reasonably Foreseeable Future Actions in Management Zone I Likely to Impact GRSG Habitat

MZ	*Planning Area*	*GRSG Population(s) Affected*	*Project Name*	*Project Location*	*Project Description, Estimated Footprint*	*Project Status*
					lands, and includes all or parts of three different GRSG Core Areas.[2]	
I	Buffalo	Powder River Basin	Buffalo Oil and Gas Leases	Campbell, Johnson, Sheridan Counties, Wyoming	As of 2008, federal oil and gas leases covered approximately 2,533,975 acres in the Buffalo planning area.[3]	Ongoing
I	Miles City	Dakotas	Carter Master Leasing Plan (MLP)	Carter County, Montana	Proposed development of up to 119 oil and gas wells and associated infrastructure. 71 percent of oil and gas estate in MLP Area is comprised of federal mineral estate.[4]	Proposed
I	Miles City	Northern Montana, Yellowstone Watershed	Big Dry RMP Area	13 counties, northeast Montana	Surface coal leasing in the Fort Union Coal Region. 1,674,500 acres of high and moderate development potential (847,379 federal acres) in the RMP area.[5]	Ongoing
I	Miles City	Dakotas, Yellowstone Watershed, Powder River Basin	Surface coal leasing	Southeast Montana	Surface coal leasing in the Powder River Resource area. Lease proposals pending with the BLM comprise 2,242 acres and include the following mines: Spring Creek (1,772 acres), Rosebud (160) acres, Decker (310 acres).[3,6,7,8]	Ongoing and proposed
I	Buffalo	Powder River Basin	Powder River Basin Coal Mines	Campbell County, Wyoming	13 operating mines in planning area, and two proposed mines; all are surface coal mines, covering 162,336 federal acres in the Buffalo planning area[6]	Ongoing and proposed
I	Miles City	Dakotas	Pending Bentonite expansion	Carter County, Montana	Increase in permitted area by 2,050 acres, of which, 1,649 acres would be federal (BLM-administered) and 401 acres would represent private ownership.[5]	Proposed
I	Buffalo	Powder River Basin	Black Hills Bentonite (Mayoworth Area Mine and Peterson Draw/Willow Creek-Posey Creek/Tisdale-Wall Creek Areas Mine)	Johnson County, Wyoming	Currently, there are 2 authorized active open-pit bentonite mines, 1 mine pending authorization, and 47 active bentonite mining claims in the Buffalo planning area on federal lands (both federal surface/federal minerals and split estate).[8]	Ongoing and proposed

Table M.9-12
Reasonably Foreseeable Future Actions in Management Zone I Likely to Impact GRSG Habitat

MZ	*Planning Area*	*GRSG Population(s) Affected*	*Project Name*	*Project Location*	*Project Description, Estimated Footprint*	*Project Status*
I	Buffalo	Powder River Basin	Nichols Ranch/Hank Unit Uranium in-situ Recovery Mining Project	Johnson County, and Campbell County, Wyoming	Pending authorization for a proposed 2,250-acre in-situ uranium recover mine, which includes 303 acres of BLM-administered surface lands. Seven occupied leks occur within 2 miles of the Hank Unit.[9]	Proposed
I	HiLine, Lewistown, Billings, Miles City, North Dakota, South Dakota	Northern Montana, Yellowstone Watershed, Belt Mountains, Powder River Basin, Dakotas	WAPA Upper Great Plains Wind Energy Programmatic EIS	Montana, North and South Dakota, other Great Plains states	Programmatic EIS will identify environmental impacts, mitigation strategies, and review procedures for future wind-energy proposals in the upper great plains region.[10]	Proposed
Rights-of-Way						
I	HiLine, Miles City, South Dakota	Northern Montana, Yellowstone Watershed, Dakotas	Keystone XL Pipeline	Montana, South Dakota, other states	285-mile ROW in Montana and South Dakota, of which 45 miles may occur on BLM-administered lands.[11]	Proposed
I	Miles City	Yellowstone Watershed	Tongue River Railroad Project	Colstrip to Decker, Montana	Construction and operation of a 42-mile railroad between Miles City and Colstrip, Montana.[12]	Proposed

[1] Greater Crossbow Oil and Gas EIS: http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA.Par.24843.File.dat/hot_sheet.pdf
[2] Convers County Oil and Gas Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/cfo/Converse_County_Oil_and_Gas.html
[3] Buffalo Oil and Gas Leases: http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo/docs.html
[4] Carter Master Leasing Plan – Miles City RFD. Minerals Appendix of DEIS. P. MIN-164-165: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp/draft_rmp.html
[5] Miles City RFD, Minerals Appendix of DEIS. P. MIN-165-173: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp/draft_rmp.html
[6] Powder River RMP Area – Miles City RFD, Minerals Appendix of DEIS. P. MIN-173-188, and Powder River Resource Area RMP (BLM 1984) (http://www.blm.gov/mt/st/en/prog/planning/powder_river.html)
[7] Spring Creek, Rosebud, Decker Mines – Miles City RFD, Minerals Appendix of DEIS. P. MIN-192
[8] Buffalo Revised Final Mineral Report: http://www.blm.gov/pgdata/etc/medialib/blm/wy/programs/planning/rmps/buffalo/docs.Par.90169.File.dat/RevisedFinalMineralReport_Part1.pdf.
[9] Nichols Ranch/Hank Unit Uranium in-situ Recovery Mining Project: http://www.blm.gov/wy/st/en/info/NEPA/documents/bfo/nichols-ranch.html
[10] Upper Great Plains Wind Energy PEIS: http://plainswindeis.anl.gov/documents/dpeis/index.cfm.
[11] Keystone XL Pipeline: http://keystonepipeline-xl.state.gov/finalseis/index.htm
[12] Tongue River Railroad EIS: http://www.tonguerivereis.com

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Appendix N
Fish and Fisheries

Table N.1
Fish Species in the HiLine Planning Area

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Arctic Grayling	*Thymallus arcticus*			
Bigmouth Buffalo	*Ictiobus cyprinellus*			
Black Bullhead	*Ameiurus melas*			
Black Crappie	*Pomoxis nigromaculatus*			
Blue Sucker	*Cycleptus elongatus*			
Bluegill	*Lepomis macrochirus*			
Brassy Minnow	*Hybognathus hankinsoni*			PSOC
Brook Stickleback	*Culaea inconstans*			PSOC
Brook Trout	*Salvelinus fontinalis*			
Brown Trout	*Salmo trutta*			
Bull Trout	*Salvelinus confluentus*	SENSITIVE	LT	SOC
Burbot	*Lota lota*			PSOC
Channel Catfish	*Ictalurus punctatus*			
Chinook Salmon	*Oncorhynchus tshawytscha*			
Cisco	*Coregonus artedi*			
Columbia River Redband Trout	*Oncorhynchus mykiss gairdneri*			SOC
Common Carp	*Cyprinus carpio*			
Cutthroat Trout	*Oncorhynchus clarkii*			
Deepwater Sculpin	*Myoxocephalus thompsonii*			
Emerald Shiner	*Notropis atherinoides*			
Fathead Minnow	*Pimephales promelas*			
Finescale Dace	*Phoxinus neogaeus*			
Flathead Chub	*Platygobio gracilis*			
Freshwater Drum	*Aplodinotus grunniens*			
Golden Shiner	*Notemigonus crysoleucas*			
Goldeye	*Hiodon alosoides*			
Goldfish	*Carassius auratus*			
Green Sunfish	*Lepomis cyanellus*			
Iowa Darter	*Etheostoma exile*			PSOC
Kokanee Salmon	*Oncorhynchus nerka*			
Lake Chub	*Couesius plumbeus*			
Lake Trout	*Salvelinus namaycush*			PSOC
Lake Whitefish	*Coregonus clupeaformis*			
Largemouth Bass	*Micropterus salmoides*			
Longnose Dace	*Rhinichthys cataractae*			

Table N.1
Fish Species in the HiLine Planning Area

Common Name	***Scientific Name***	***BLM Status***	***Endangered Species Status****	***State of MT Species of Concern+***
Longnose Sucker	*Catostomus catostomus*			
Mottled Sculpin	*Cottus bairdi*			
Mountain Sucker	*Catostomus platyrhynchus*			
Mountain Whitefish	*Prosopium williamsoni*			
Northern Pike	*Esox lucius*			
Northern Redbelly Dace	*Phoxinus eos*			PSOC
Northern Redbelly X Finescale Dace	*Phoxinus eos x phoxinus neogaeus*	SENSITIVE		SOC
Paddlefish	*Polyodon spathula*	SENSITIVE		SOC
Pallid Sturgeon	*Scaphirhynchus albus*	SENSITIVE	LE	SOC
Pearl Dace	*Margariscus margarita*	SENSITIVE		SOC
Plains Minnow	*Hybognathus placitus*			PSOC
Pumpkinseed	*Lepomis gibbosus*			
Rainbow Trout	*Oncorhynchus mykiss*			
River Carpsucker	*Carpiodes carpio*			
Sand Shiner	*Notropis stramineus*			
Sauger	*Sander canadensis*	SENSITIVE		SOC
Shorthead Redhorse	*Moxostoma macrolepidotum*			
Shorthead Sculpin	*Cottus confusus*			PSOC
Shorthead Sculpin X Slimy Sculpin	*Cottus confusus x cognatus*			
Shortnose Gar	*Lepisosteus platostomus*			
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*			
Sicklefin Chub	*Macrhybopsis meeki*			
Smallmouth Bass	*Micropterus dolomieu*			
Smallmouth Buffalo	*Ictiobus bubalus*			
Spoonhead Sculpin	*Cottus ricei*			SOC
Spottail Shiner	*Notropis hudsonius*			
Stonecat	*Noturus flavus*			
Sturgeon Chub	*Macrhybopsis gelida*	SENSITIVE		SOC
Tiger Muskellunge	*Esox masquinongy x lucius*			
Trout-perch	*Percopsis omiscomaycus*			SOC
Walleye	*Sander vitreus*			
Western Mosquitofish	*Gambusia affinis*			
Western Silvery Minnow	*Hybognathus argyritis*			
Westslope Cutthroat Trout	*Oncorhynchus clarkii lewisi*	SENSITIVE		SOC
White Crappie	*Pomoxis annularis*			
White Sucker	*Catostomus commersoni*			
Yellow Perch	*Perca flavescens*			

Table N.2
Fish-Bearing Streams in the HiLine Planning Area

Stream Name	*Total Miles*	*Habitat Class*	*Sport Class*	*Final Value*
Blaine County				
Battle Creek	69.9	3	4	Substantial
Bean	35.7	4	5	Moderate
Bigworm	5.5	4	5	Moderate
Birch	9.8	6	5	Limited
Black Coulee	11.1	4	5	Moderate
Bull	5.5	6	5	Limited
Bullwacher	37.7	4	5	Moderate
Clear	46.8	3	3	Substantial
Cow	54.8	4	4	Moderate
Dry Fk Battle	1	6	5	Limited
Duck	11.4	6	5	Limited
E Branch 30 mile	1	6	5	Limited
East Fk Battle	1.1	6	5	Limited
Little Peoples	23.5	4	4	Moderate
Lodge	51.2	2	4	High Value
Lodgepole	31.2	4	4	Moderate
Lyons Coulee	.5	6	5	Limited
Milk River	64.8	2	4	High Value
Murray Coulee	3.8	6	5	Limited
North Fk Cow	6.7	4	4	Moderate
Peoples	93.9	3	4	Substantial
Red Rock Coulee	21.4	3	5	Substantial
Sand	9.6	6	5	Limited
Snake	64.5	3	4	Substantial
South Fk Cow	9.4	4	4	Moderate
Suction	1.3	6	5	Limited
Thirty-mile	6.3	6	5	Limited
Wind	1.0	N/A	N/A	N/A
Woodpile Coulee	5.8	3	4	Substantial
Wood Island Coulee	41.3	4	5	Moderate
Total	**727.6**			
Chouteau County				
Big Sandy	44.2	3	4	Substantial
Birch	1	6	5	Limited
Black Coulee	1	6	5	Limited
Box Elder	8.5	4	4	Moderate
Little Sandy	20.9	6	5	Limited
Marias	36.8	1	3	Outstanding
Missouri River	22	1	1	Outstanding
Pondera Coulee	6.2	6	5	Limited
Ranger	1.6	N/A	N/A	N/A
Sand	19.1	6	5	Limited
Teton	75.2	2	4	High Value
Total	**236.5**			

Table N.2
Fish-Bearing Streams in the HiLine Planning Area

Stream Name	*Total Miles*	*Habitat Class*	*Sport Class*	*Final Value*
Glacier County				
Allen	2.5	N/A	N/A	N/A
Apucini	1.5	N/A	N/A	N/A
Atlantic Creek	2.7	N/A	N/A	N/A
Badger Creek	32.4	4	4	Moderate
Baring Creek	0.6	N/A	N/A	N/A
Belly River		6	5	Limited
Birch Creek		4	4	Moderate
Boulder Creek	12.1	4	5	Moderate
Boundary Creek	7	6	5	Limited
Box Creek	4.4	4	4	Moderate
Camp Creek	2.5	N/A	N/A	N/A
Canyon Creek	5.9	6	5	Limited
Cataract Creek	6.6	N/A	N/A	N/A
Cleveland Creek	3.4	N/A	N/A	N/A
Coonsa Creek	3.6	6	5	Limited
Cutbank Creek	22.9	3	4	Substantial
Divide Creek	10.4	4	5	Moderate
Dry Fork	6.2	6	5	Moderate
East Fork Lee Creek	5.3	N/A	N/A	N/A
East Fork Woods Creek	0.6	3	4	Substantial
Fortymile Creek	3.5	N/A	N/A	N/A
Fortyone Mile Creek	2.5	N/A	N/A	N/A
Hall Creek	2.5	4	4	Moderate
Hyde Creek	5.2	4	4	Moderate
Jule Creek	2.1	N/A	N/A	N/A
Kennedy Creek	14.2	4	5	Moderate
Kootenai	3.8	N/A	N/A	N/A
Lake Creek	7.5	N/A	N/A	N/A
Lee Creek	7.8	4	5	Moderate
Marias River	2.3	3	4	Substantial
Middle Fork Lee Creek	2.7	6	5	Limited
Midvale Creek	10.5	6	5	Limited
Mokowanis River	9.8	6	5	Limited
North Fork Belly River	5.6	6	5	Limited
North Fork Cut Bank Creek	27	6	5	Limited
North Fork Little Badger Creek	5.7	3	4	Moderate
North Fork Milk River	1.1	6	5	Limited
Olson Creek	6.5	6	5	Limited
Otatso Creek	11.2	4	5	Moderate
Paradise Creek	5.7	6	5	Limited
Pass Creek	2.2	N/A	N/A	N/A
Railroad Creek	9.3	4	4	Moderate
Red Eagle Creek	14.7	6	5	Limited
Roberts Creek	5	N/A	N/A	N/A

Table N.2
Fish-Bearing Streams in the HiLine Planning Area

Stream Name	*Total Miles*	*Habitat Class*	*Sport Class*	*Final Value*
Rose Creek	1.7	6	5	Limited
St. Mary River	34	4	5	Moderate
So. Fork Two Medicine River	18.8	4	4	Moderate
South Fork Valentine Creek	3	6	5	Limited
Street Creek	1.1	6	5	Limited
Summit Creek	4.8	4	3	Substantial
Swiftcurrent Creek	13.6	6	5	Limited
Two Dog Creek	0.7	N/A	N/A	N/A
Two Medicine River	0.3	2	4	High-Value
Valentine Creek	6.9	6	5	Limited
Virginia Creek	4.1	N/A	N/A	N/A
Waterton River	17.4	6	5	Limited
Whitecrow Creek	2.4	6	5	Limited
Whiterock Creek	0.3	3	4	Substantial
Wilbur Creek	2.5	6	5	Limited
Wild Creek	2.4	N/A	N/A	N/A
Woods Creek	1.4	3	4	Substantial
Total	**405.4**			
Hill County				
Beaver Creek	41	3	4	Substantial
Big Sandy Creek	53.1	3	4	Substantial
Black Coulee	1	6	5	Limited
Boxelder Creek	19.7	4	4	Moderate
Eagle Creek	1	4	5	Moderate
East Fork Beaver Creek	2.3	4	3	Substantial
Kennedy Coulee	1.1	6	5	Limited
Little Boxelder Creek	42.9	4	4	Moderate
Lodge Creek	30.1	2	4	High-Value
Marias River	11	2	3	High-Value
Milk River	62.4	2	4	High-Value
Ranger Creek	1.5	N/A	N/A	N/A
Redrock Coulee	3.1	3	5	Substantial
Sage Creek	102.8	4	5	Moderate
Woodpile Coulee	8.3	3	4	Substantial
Total	**381.3**			
Liberty County				
Breed Creek	1	6	5	Limited
Cottonwood Creek	1	6	5	Limited
Eagle Creek	3	6	5	Limited
Marias River	46	2	3	High-Value
Pondera Coulee	1.4	6	5	Limited
Sage Creek	31.2	4	5	Moderate
Total	**82.6**			

Table N.2
Fish-Bearing Streams in the HiLine Planning Area

Stream Name	*Total Miles*	*Habitat Class*	*Sport Class*	*Final Value*
Phillips County				
Alkali Creek	27	4	5	Moderate
Assiniboine	4.4	6	5	Limited
Beauchamp Creek	1	6	5	Limited
Beaver Creek	219.9	3	4	Substantial
Big Warm Creek	64.5	4	5	Moderate
Black Coulee	6.1	4	5	Moderate
Button Butte Coulee	1	N/A	N/A	N/A
C K Creek	1	6	5	Limited
Coburg Coulee	1.1	N/A	N/A	N/A
Cottonwood Coulee	1	6	5	Limited
Cottonwood Creek	54.1	4	5	Moderate
Dodson Creek	0.6	6	5	Limited
Flat Creek	1	6	5	Limited
Fourchette Creek	39.7	3	4	Substantial
Frenchman Creek	74	3	4	Substantial
Garland Creek	4	4	5	Moderate
Joiner Coulee	1	N/A	N/A	N/A
Kill Woman Creek	1	N/A	N/A	N/A
Larb Creek	15.2	4	5	Moderate
Lemere Coulee	0.9	N/A	N/A	N/A
Little Cottonwood Creek	1.2	6	5	Limited
Little Warm Creek	2	6	5	Limited
Lodge Pole Creek	3.9	4	4	Moderate
Milk River	64.8	2	4	High-Value
Peoples Creek	18.5	4	4	Moderate
Rock Creek	1	6	5	Limited
Sage Creek	1	6	5	Limited
Second Creek	1.1	6	5	Limited
Sevenmile Creek	29.2	6	5	Limited
Siparyann Creek	1	6	5	Limited
Stinky Creek	1	6	5	Limited
Telegraph Creek	1	6	5	Limited
Whitewater Creek	62.3	4	5	Moderate
Windmill Coulee	1	N/A	N/A	N/A
Woody Island Coulee	21.9	4	5	Moderate
Total	**729.4**			
Toole County				
Dry Fork Marias River	2.2	4	5	Moderate
Marias River	78	3	4	Substantial
Miners Coulee	1.1	6	5	Limited
Trail Creek	1.1	6	5	Limited
Willow Creek	5.9	3	4	Substantial
Total	**88.3**			

Table N.2
Fish-Bearing Streams in the HiLine Planning Area

Stream Name	*Total Miles*	*Habitat Class*	*Sport Class*	*Final Value*
Valley County				
Antelope Creek	25.7	4	5	Moderate
Bear Creek	3	6	5	Limited
Beaver Creek	25.8	3	4	Substantial
Bluff Creek	1	6	5	Limited
Brazil Creek	32.6	4	5	Moderate
Buggy Creek	1	N/A	N/A	N/A
Canyon Creek	1	N/A	N/A	N/A
Cherry Creek	38.2	3	4	Substantial
Chisholm Creek	1	N/A	N/A	N/A
Coal Creek	3.8	4	5	Moderate
Cow Coulee	1	N/A	N/A	N/A
Crow Creek	2.8	6	5	Limited
Deep Creek	1	6	5	Limited
Desert Coulee	2.1	N/A	N/A	N/A
Dry Fork Creek	1	6	5	Limited
Eagle Creek	15.9	4	5	Moderate
East Fork Crow Creek	1.1	6	5	Limited
East Fork Little Porcupine Creek	1.3	6	5	Limited
Frenchman Creek	3.6	3	4	Substantial
Hardscrabble Creek	1	N/A	N/A	N/A
Larb Creek	36.2	4	5	Moderate
Little Brazil Creek	1	N/A	N/A	N/A
Little Porcupine Creek	45.2	6	5	Limited
Lone Tree Coulee	1	N/A	N/A	N/A
Morgan Creek	1	N/A	N/A	N/A
North Fork Antelope Creek	1	N/A	N/A	N/A
North Fork Lone Tree Creek	13.8	N/A	N/A	N/A
North Fork South Creek	1	N/A	N/A	N/A
Porcupine Creek	45.8	3	4	Substantial
Roanwood Creek	1	N/A	N/A	N/A
Rock Creek	92.7	3	4	Substantial
Snake Creek	1.1	6	5	Limited
Snow Coulee	1	6	5	Limited
Spring Coulee	1	6	5	Limited
Sutherland Creek	1	6	5	Limited
Timber Creek	16.3	4	5	Moderate
West Fork Poplar River	21.1	2	4	High-Value
West Fork Porcupine Creek	25.8	4	4	Moderate
Willow Creek	49.2	4	5	Moderate
Willow Creek (Rock Creek Trib)	59.9	4	5	Moderate
Total	**580**			

Table N.3
Fishing Lakes, Ponds, and Reservoirs in the HiLine Planning Area

Name	***Fish Type***	***BLM Surface Ownership***
Blaine County		
ALS Rsvr	Trout	
BR-12	Warm/cool water species	X
Cow Cr	Warm/cool water species	
Faber	Trout and warm/cool water species	
Grasshopper	Trout	
Kuhr	Warm/cool water species	
Lyons	Warm/cool water species	
Twin	Warm/cool water species	
Billmayer	Warm/cool water species	
Brookie	Trout	
Bus	Winterkilled	X
Butch	Trout and warm/cool water species	
Choteau	Trout and warm/cool water species	
Don	Warm/cool water species	X
Dry Fork	Trout and warm/cool water species	X
Floyd Fynn	Trout and warm/cool water species	
FR	Winterkilled	X
Gazob	Winterkilled	X
Jenson	Trout	
N. Faber	Trout	X
Petrie Pond	Trout	
Reser	Trout	X
Ridge	Winterkilled	X
Ross	Trout	
Salmo	Trout and warm/cool water species	X
South Cassidy – BR 19	Warm/cool water species	Blaine
Sundance	Winterkilled	
Chouteau County		
Dry Fork	Trout and warm/cool water species	
Glacier County		
Bullhead	Trout	
Cameron	Trout	
Cosley	Trout	
Cracker	Trout	
Duck	Trout	
Elizabeth	Trout	
Flattop	Trout	
Four Horns	Trout	
Glenns	Trout	
Grinnell	Trout	
Gunsight	Trout	
Hidden	Trout	
Hope	Trout	

Table N.3
Fishing Lakes, Ponds, and Reservoirs in the HiLine Planning Area

Name	*Fish Type*	*BLM Surface Ownership*
Katoya	Trout	
Kipp	Trout	
Kootenai	Trout	
Lake Francis	Trout	
Lake Janet	Trout	
Lake Josephine	Trout	
Lost	Trout	
Lower St. Mary	Trout	
Margaret	Trout	
Medicine-Grizzly	Trout	
Mokowanis	Trout	
Morning Star	Trout	
No Name	Trout	
Old Man	Trout	
Otatso	Trout	
Otokoni	Trout	
Pray	Trout	
Ptarmagin	Trout	
Red Eagle	Trout	
Sherburne	Trout and warm/cool water species	
Slide	Trout	
St. Mary	Trout and warm/cool water species	
Stoney Indian	Trout	
Stump	Trout	
Swift current	Trout	
Twin Lakes	Trout	
Two Medicine	Trout	
Upper Mission	Trout	
Upper Two Medicine	Trout	
Waterton	Trout and warm/cool water species	
Wind Maker	Trout	
Hill County		
Bailey	Warm/cool water species	
Bearpaw	Trout	
Beaver	Trout and warm/cool water species	
Fresno	Trout and warm/cool water species	
Sawmill Coulee	Warm/cool water species	
Normandy Coulee Pond	Trout	
East Fork	Trout	
Liberty County		
Duncan	Trout	
Phillips County		
Barrett Rsvr	Warm/cool water species	
Bell Ridge	Winterkilled	X
Batosh	Trout	X

Table N.3
Fishing Lakes, Ponds, and Reservoirs in the HiLine Planning Area

Name	*Fish Type*	*BLM Surface Ownership*
Bison Bone	Warm/cool water species	X
Bresaylor	Warm/cool water species	X
Buddy	Winterkilled	X
Cole Pond	Warm/cool water species	
Compton	Winterkilled	X
Current	Trout	X
Dog Town	Winterkilled	X
Doucette	Winterkilled	X
Ester Lake	Warm/cool water species	
Flake	Trout (restocked in 2011)	X
Frenchman	Warm/cool water species	
Gullwing	Winterkilled	X
Hart	Trout	
Karsten Coulee	Warm/cool water species	X
King	Trout	X
Lark	Warm/cool water species	X
Little Warm	Warm/cool water species	
Loader	Winterkilled	X
McChesney	Warm/cool water species	
Nelson	Warm/cool water species	
Paleface	Trout and warm/cool water species	X
The Plunge	Warm/cool water species	
Plutz	Trout	X
PR 16	Winterkilled	X
PR 18	Warm/cool water species	X
PR 20	Warm/cool water species	X
PR 22	Winterkilled	X
PR 54	Warm/cool water species	X
PR 109A	Winterkilled	X
Rebate	Trout	X
Rotator Cup	Winterkilled	X
Saddle Brook Pond	Trout	
Sagebrush	Trout and warm/cool water species	X
Sentinel	Trout	X
Seven-up	Winterkilled	X
Shallow	Trout	X
Shoulder Blade	Winterkilled	X
Smith	Warm/cool water species	
Spanky	Winterkilled	X
Taint	Warm/cool water species	X
Thundercloud	Trout and warm/cool water species	X
Ulrich	Winterkilled	
Wapiti	Warm/cool water species	X
Wedding	Winterkilled	X
Whiteface	Warm/cool water species	X

Table N.3
Fishing Lakes, Ponds, and Reservoirs in the HiLine Planning Area

Name	***Fish Type***	***BLM Surface Ownership***
Wrangler	Trout and warm/cool water species	X
Toole County		
Aloe	Warm/cool water species	
Cameron	Trout	
Coxs	Trout	
Devon	Trout and warm/cool water species	
Fitzpatrick	Trout	
Shelby Kids Pond	Trout	
Tiber	Trout and warm/cool water species	
Westmarks #1	Trout	
Westmarks #2	Trout	
Valley County		
Atlas	Warm/cool water species	X
Big	Winterkilled	X
Boucher	Trout	
Chapman	Warm/cool water species	
COE Campsite	Trout	
Fast	Warm/cool water species	
Flat	Warm/cool water species	
Fort Peck Lake	Trout and warm/cool water species	
Fort Peck Trout Pond	Warm/cool water species	
Frazer Lake	Trout and warm/cool water species	
Gay	Winterkilled	X
Glasgow Base Pond	Warm/cool water species	
Helen	Warm/cool water species	X
Home Run Pond	Trout	
Hose	Trout	X
Langen	Warm/cool water species	X
Lunch	Winterkilled	X
Midway	Warm/cool water species	
O’juel Lake	Trout	
Paul	Warm/cool water species	
Paulo	Warm/cool water species	X
Shoot	Winterkilled	X
Snow	Winterkilled	
Triple Crossing	Winterkilled	X
Valley	Trout and warm/cool water species	X
VR9	Trout	X
Wards	Warm/cool water species	X
Whitetail	Warm/cool water species	

Table N.4
Game Fish in the HiLine Planning Area

Common Name	***Scientific Name***	***Record Size in Montana through April 2012***
Arctic grayling	*Thymallus arcticus*	3.63 lbs.
Black crappie	*Pomoxis nigromaculatus*	3.13 lbs.
Brook trout	*Salvelinus fontinalis*	9.06 lbs.
Brown trout	*Salmo trutta*	29.00 lbs.
Bull trout	*Salvelinus confluentus*	25.63 lbs.
Burbot	*Lota lota*	17.08 lbs.
Channel catfish	*Ictalurus punctatus*	30.12 lbs.
Chinook salmon	*Onchorhychus tshawytscha*	31.13 lbs.
Cisco	Coregonus artedi	1.75 lbs.
Kokanee salmon	*Onchorhychus nerka*	7.85 lbs.
Lake trout	*Salvelinus namaycush*	42.69 lbs.
Lake whitefish	*Coregonus clupeaformis*	10.46 lbs.
Largemouth bass	*Micropterus salmoides*	8.80 lbs.
Mountain whitefish	Prosopium williamsoni	5.11 lbs.
Northern pike	*Esox lucius*	37.50 lbs.
Paddlefish	*Polydon spathula*	142.50 lbs.
Pallid sturgeon	*Scaphirhychus albus*	60.00 lbs.
Rainbow trout	*Onchorhychus mykiss*	33.10 lbs.
Sauger	*Stizostedion canadense*	8.81 lbs.
Shovelnose sturgeon	*Scaphirhychus platorynchus*	14.125 lbs.
Smallmouth bass	*Micropterus dolomieu*	6.66 lbs.
Walleye	*Stizostedion vitreum*	17.75 lbs.
White crappie	*Pomoxis annularis*	3.68 lbs.
Yellow perch	*Perca flavescens*	2.39 lbs.
Yellowstone cutthroat trout	*Onchorhynchus clarki bouvieri*	16.00 lbs.

Table N.5
Pearl Dace, Northern Redbelly Dace x Finescale Dace Hybrid, Northern Redbelly Dace, and Finescale Dace

Stream/Lake	***Tributary of:***	***County Location***	***BLM Surface Ownership***
Pearl Dace			
Assiniboine Creek	Milk River	Phillips	X
Cottonwood Creek	Milk River	Phillips	X
Eagle Creek	Missouri River	Chouteau	X
Larb Creek	Beaver Creek	Valley	X
Lodge Creek	Milk River	Blaine	X
Milk River	Missouri River	Blaine	X
Porcupine Creek	Milk River	Valley	X
Snake Creek	Milk River	Blaine	
Whitewater Creek	Milk River	Phillips	X
Northern Redbelly Dace, Northern Redbelly Dace x Finescale Dace Hybrid			
Assiniboine Creek	Milk River	Phillips	X
Cherry Creek	Milk River	Valley	X
Crow Creek	Rock Creek	Valley	X
Eagle Creek	Missouri River	Chouteau	X
East Fork Little Porcupine Creek	Little Porcupine Creek	Valley	
Garland Creek	Cottonwood Creek	Phillips	X
Lodge Creek	Milk River	Blaine, Hill	X
Porcupine Creek	Milk River	Valley	X
Siparyann Creek	Missouri River	Phillips	
Snake Creek	Milk River	Blaine	
Northern Redbelly Dace (also found in the hybrid streams above)			
Alkali Creek	Milk River	Phillips	X
Antelope Creek	Milk River	Valley	
Battle Creek	Milk River	Blaine	X
Bearpaw Lake	Beaver Creek	Hill	
Beaver Creek	Milk River	Phillips, Hill, Valley	X
Big Sandy Creek	Milk River	Chouteau, Hill	
Big Warm Creek	Beaver Creek	Blaine, Phillips	X
Bullhook Creek	Milk River	Hill	
Cameron Lake	Fourmile Coulee	Toole	
Clear Creek	Milk River	Blaine	
Cottonwood Creek	Milk River	Phillips	
East Fork Beaver Creek	Beaver Creek	Hill	
Frenchman Creek	Milk River	Phillips, Valley	X
Larb Creek	Beaver Creek	Phillips, Valley	X
Little Box Elder Creek	Milk River	Hill	X
Little Porcupine Creek	Missouri River	Valley	

Table N.5
Pearl Dace, Northern Redbelly Dace x Finescale Dace Hybrid, Northern Redbelly Dace, and Finescale Dace

Stream/Lake	***Tributary of:***	***County Location***	***BLM Surface Ownership***
Little Warm Creek	Big Warm Creek	Phillips	
Lodge Pole Creek	South Fork Peoples Creek	Blaine, Phillips	X
Milk River	Missouri River	Blaine, Hill, Phillips, Valley	X
Miners Coulee	Willow Creek	Toole	
Peoples Creek	Milk River	Blaine	
Redrock Coulee	Milk River	Blaine, Hill	X
Snake Creek	Milk River	Blaine	
Stinky Creek	Milk River	Phillips	X
Timber Creek	Missouri River	Valley	X
West Fork Poplar Creek	Poplar River	Valley	
Whitewater Creek	Milk River	Phillips	X
Willow Creek	Milk River	Valley	X
Woodpile Creek	Battle Creek	Blaine, Hill	
Woody Island Coulee	Cottonwood	Phillips	X
Finescale Dace			
Whitewater Creek	Milk River	Phillips	

Appendix O
Wind Energy
Reasonable Foreseeable Development Scenario

Introduction

This Reasonable Foreseeable Development (RFD) scenario for commercial wind energy development in the planning area describes existing, proposed, and potential wind farms. Specific data from a wind farm proposal in the planning area that is no longer under consideration were used for hypothetical modeling of potential future wind farms. This RFD is the basis for assessing cumulative impacts from the potential for future wind farms on BLM land.

Potential

The potential for commercial wind energy development in the planning area is based on the methods used in the Final Programmatic Environmental Impact Statement on Wind Energy Development (BLM 2005). Areas are grouped by wind power class, which is an indicator of likely resource strength, with a higher wind power class representing higher wind resource levels. Wind power classes are divided into seven classes: poor, marginal, fair, good, excellent, outstanding and superb.

The seven wind power classes are further grouped into three distinct levels: high, moderate and low potential for wind power resources (Table O.1). Included in the low potential are the poor and marginal wind power classes; the fair wind power class is included in the moderate potential; and good, excellent, outstanding and superb are grouped within the high potential category.

Table O.1
Wind Power Classes Converted to Development Potential

Wind Power Class	*Resource Potential (Utility Scale)*	*50m Wind Power Density (W/m^2)*	*Development Potential (20 Years)*	*% of Planning Area*	*% of Development Potential that is BLM Surface Ownership*
1	Poor	0-200	Low	9%	16%
2	Marginal	200-300			
3	Fair	300-400	Moderate	52%	22%
4	Good	400-500	High	39%	6%
5	Excellent	500-600			
6	Outstanding	600-800			
7	Superb	>800			

The high, moderate and low development potential areas are shown on Map O.1 (located at the end of this Appendix O) and surface ownership is delineated in Table O.2. The percentage of high potential acres managed by the BLM is 2% of the planning area; 11% of moderate potential is managed by the BLM; and 1% of low potential is managed by the BLM.

The majority of high potential acres for wind resources are located in the western third of the planning area (Glacier, Toole and Liberty Counties), which has the least amount of BLM land. Two large polygons of high potential are located in Blaine County, which includes scattered tracts of BLM land. A block of high potential acreage lies in southwest Phillips County. This block coincides with the Little Rocky Mountains, both on and off the Fort Belknap Indian Reservation and BLM land. Another large block of high potential acreage lies in northeast Valley County, which

includes only a couple of small tracts of BLM land. Very few low potential areas are managed by BLM. The remainder of the area has moderate potential for wind resources; the majority of BLM land falls within this category.

Table O.2
Land Ownership in High, Moderate and Low Development Potential Areas
(Acres)

	High	*Moderate*	*Low*	*Total*
BLM	366,000	1,841,000	235,000	2,442,000
Fish and Wildlife Service	27,000	149,000	225,000	401,000
National Park Service	182,000	42,000	149,000	373,000
Other (Private, State)	5,570,000	6,244,000	844,000	12,658,000
Total	6,145,000	8,276,000	1,453,000	15,874,000

Qualified Resource Areas

The Western Renewable Energy Zones – Phase 1 Report identified two qualified resource areas (QRAs) in the planning area (WGA and DOE 2009). Qualified resource areas represent those lands with the greatest energy density within a contiguous area. The QRAs are located in the western and central part of the planning area (Figure O.1). One of the QRAs (MT_NW) includes the Sweet Grass Hills and Kevin Rim ACECs and areas west and southwest of the ACECs. The other QRA (MT_NE) includes BLM land in the Little Rocky Mountains and areas northwest and southwest of the mountains. The QRAs include about 3,052,200 acres, of which 1,723,000 acres (56%) are within the planning area and about 31,000 acres are BLM land (1%) (Table O.3).

Table O.3
Qualified Resource Areas for Renewable Energy

Name	*Total Area (acres)*	*Planning Area (acres)*	*BLM Land (acres)*
MT_NW	2,001,870	1,092,856	15,999
MT_NE	1,050,316	630,150	15,125
Total	3,052,186	1,723,006	31,123

Operating and Proposed Wind Farms

At this time no existing or proposed wind farms are located on BLM land; however, several wind farms in varying stages of planning are located on lands not managed by the BLM. These wind farms have the potential to expand, and therefore, future wind farms and/or associated facilities (i.e., transmission lines) could occur on BLM land. Currently, renewable energy development in the proximity of the Interstate 15 corridor, where a new transmission line is being constructed to make the produced wind energy available for the power grid, is limited to wind energy development on private lands.

Operating Wind Farms

Two wind farms are located within planning area, two are operating in Montana near the planning area, and 18 are operating in Canada near the planning area (Table 0.4). The four Montana wind farms are located on private land.

Figure O.1 Qualified Resource Areas (QRA) in the Planning Area

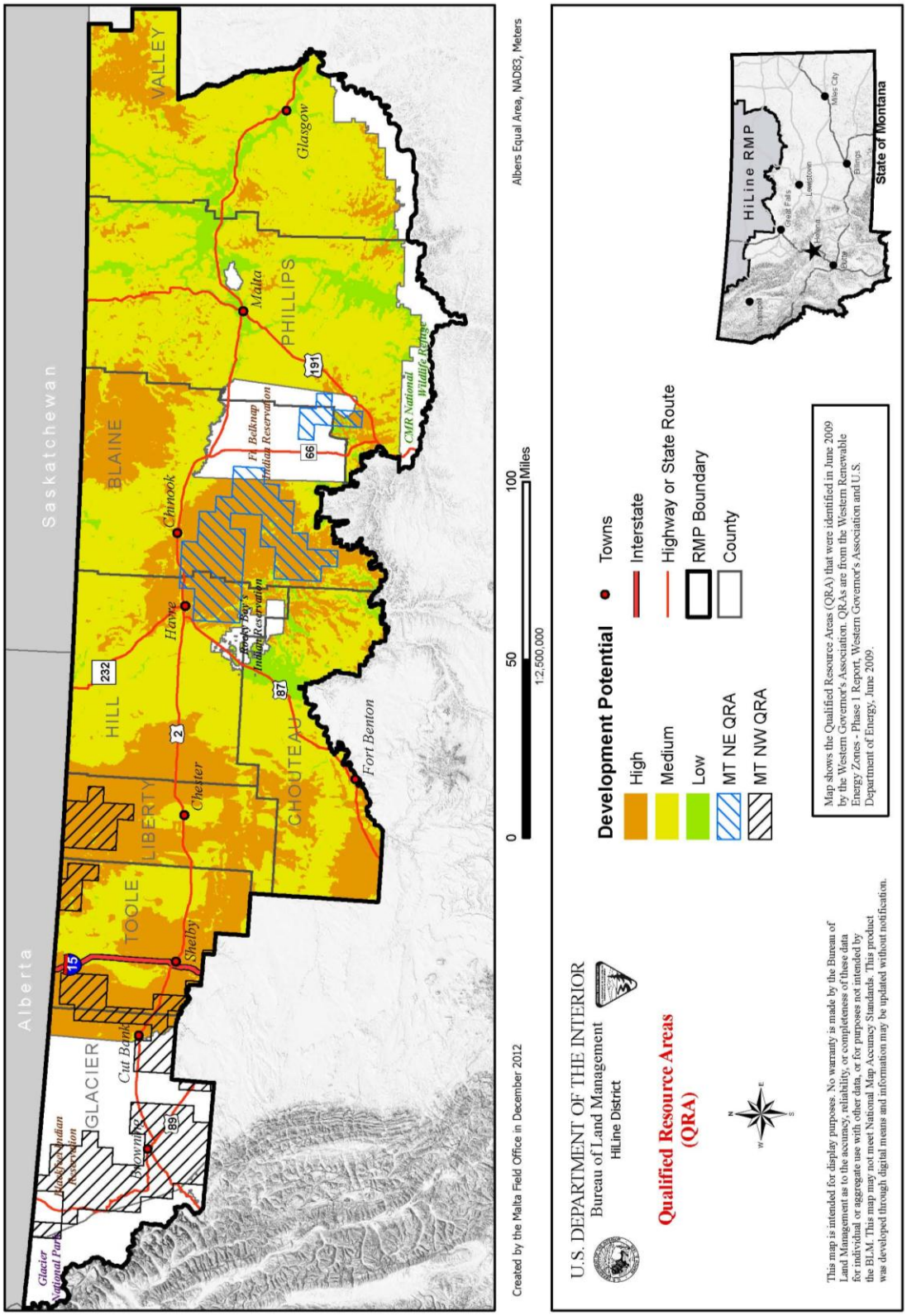


Table O.4
Operating/Under Construction Wind Farms
In and Near the HiLine Planning Area

Operating Wind Farm	*Owner*	*Location*	*No. of Turbines*	*Energy Production Per Turbine*	*Total Energy Production*	*Status*
Montana – In the HiLine Planning Area						
Glacier I	NaturEner	Near Ethridge in Toole and Glacier Counties	71	1.5 MW	106.5 MW	Operating
Glacier II	NaturEner	Near Ethridge in Toole and Glacier Counties	69	1.5 MW	103.5 MW	Operating
Rim Rock	NaturEner	Northwest of Kevin in Toole County	126	1.5 MW	189 MW	Operating
Montana – Near the HiLine Planning Area						
Bole Bench	Foundation Windpower/ WINData	Southeast of Fairfield in Teton County	4	1.6-1.7 MW	10 MW	Under Construction*
Diamond Willow Wind	MDU	South of Baker Fallon County	13	1.5 MW	20 MW	Operating
Gordon Butte	Oversight Resources	Martinsdale in Meagher County	7	1.6 MW	10 MW	Operating
Horseshoe Bend	Exergy	West of Great Falls in Cascade County	6	1.5 MW	9 MW	Operating
Judith Gap I	Invenergy	South of Judith Gap in Wheatland County	90	1.5 MW	135 MW	Operating
Judith Gap II	Invenergy	South of Judith Gap in Wheatland County	35	1.5 MW	52.5MW	Operating
Martinsdale I	Horizon Wind Energy	Near Martinsdale in Wheatland and Meagher Counties	27	2.1 MW	58 MW	Under Construction
Musselshell Wind I	Goldwind	Southeast of Harlowton in Wheatland County	7	1.5 MW	10 MW	Operating
Musselshell Wind II	Goldwind	Southeast of Harlowton in Wheatland County	7	1.5 MW	10 MW	Operating
Spion Kop	NorthWestern Energy	Near Geyser in Judith Basin County	25	1.6 MW	40 MW	Operating
Alberta, Canada – Near the HiLine Planning Area						
Blue Trail	TransAlta	Near Fort MacLeod	22	3 MW	66 MW	Operating
Castle River	TransAlta	Near Pincher Creek	59	660 kW	38.9 MW	Operating
Chin Chute	Suncor/Acciona/Enbridge	Southwest of Taber	20	1.5 MW	30 MW	Operating
Cowley Ridge	TransAlta	Near Pincher Creek	57	375 kW	21.4 MW	Operating
Cowley Ridge North	TransAlta	Near Pincher Creek	15	1,300 kW	19.5 MW	Operating
Kettle Hills I	Enmax	Near Pincher Creek	5	1.8 MW	9 MW	Operating

Table O.4
Operating/Under Construction Wind Farms
In and Near the HiLine Planning Area

Operating Wind Farm	*Owner*	*Location*	*No. of Turbines*	*Energy Production Per Turbine*	*Total Energy Production*	*Status*
Kettle Hills II	Enmax	Near Pincher Creek	30	1.8 MW	54 MW	Operating
Magrath	Suncor/Enbridge/EHN	Near Magrath	20	1.5 MW	30 MW	Operating
McBride Lake	Enmax/TransAlta	Near McBride Lake	114	660 kW	75.2 MW	Operating
Sinnott	TransAlta	Near Pincher Station	5	1,300 kW	6.5 MW	Operating
Soderglen	Nexen/TransAlta	Near Fort McLeod	47	1.5 MW	70.5 MW	Operating
Summerview	TransAlta	Near Pincher Creek	38	1.8 MW	68.4 MW	Operating
Summerview 2	TransAlta	Near Pincher Creek	22	3 MW	66 MW	Operating
Taber	Enmax	Near Taber	37	2.2 MW	81.4 MW	Operating
Taylor	TransAlta	Near Magrath	9	375 kW	3.38 MW	Operating
Saskatchewan, Canada – Near the HiLine Planning Area						
Centennial	SaskPower International	Near Swift Current	83	1.8 MW	149.4 MW	Operating
Cypress	SaskPower International	Near Gull Lake	16	660 kW	10.6 MW	Operating
Sunbridge	Suncor/Enbridge	Near Swift Current	17	660 kW	11.2 MW	Operating

* Construction begun as of March 13, 2014.

Proposed Wind Farms

Three wind farms are proposed to be built on private land near the planning area (Table O.5). More than a dozen potential wind farms located on private or state land are in the initial phases of testing, but no proposal has been submitted for permitting.

Reasonable Foreseeable Development Scenario

In addition to the methodology described above for determining high, moderate and low development potential areas, the BLM previously analyzed the proposed Valley County Wind Farm, which was dropped from consideration, for the hypothetical modeling of potential future wind farms on BLM land (BLM 2006). The Valley County Wind Farm was initially proposed as a 33 turbine wind farm, 1.5 MW each and capable of producing 50 MW of energy. The development proposal grew in scale to include three more phases, each increasing the amount of turbines and energy capacity resulting in a four-phase, 334 turbine wind farm capable of producing 500 MW of energy. The Valley County Wind Farm was proposed initially on private land immediately south of the Bitter Creek Wilderness Study Area (WSA). However, later phases and the approximately 30 mile transmission line would have been located on BLM land. Table O.6 shows the projected temporary and permanent ground disturbance acreage for each phase of the Valley County Wind Farm development.

Hypothetical Wind Farms

To determine the reasonable foreseeable commercial wind energy development scenario for the planning area, two types of wind farms were hypothetically described. Table O.7 shows two hypothetical wind farms, one small and one large that are somewhat representative of potential future development. These two wind farms are based on the Phase II and Phase IV proposals of the Valley County Wind Farm. It is assumed that the two wind farms would be located in high or moderate development potential areas for wind resources.

In addition to turbines, it is expected that collector substations, collector systems, new access roads, internal road networks, turbine string turnaround areas, turbine foundations, pad-mounted transformers, material staging areas and operations and maintenance buildings would be included in a wind farm proposal as associated facilities.

A small wind farm is expected to utilize 2,800 acres of land as a general “footprint” for construction staging areas, turbines, and associated facilities. These associated facilities are assumed to create 200 acres of short-term surface disturbance and 48 acres of long-term surface disturbance (post reclamation) for a small wind farm proposal.

A large wind farm is expected to utilize 10,706 acres for construction staging areas, turbines, and associated facilities. The acres of surface disturbance for a large wind farm would be 727 acres of short-term surface disturbance and 183 acres of long-term surface disturbance (post reclamation).

The associated transmission lines may or may not be sited on BLM land. This would depend on the location of the wind farm to existing transmission lines. Two transmission lines (Highway 89 and Highway 2) are capable of transporting power to the grid within the planning area. Because of the expense associated with transmission lines, it is assumed that siting of potential wind farms would be near existing lines rather than far from existing lines, which would require new transmission lines.

The increased need for energy and reducing American reliance on foreign energy resources will most likely increase the demand for wind farms. If that trend continues the hypothetical model for either small or large wind farms could occur.

Table O.5
Proposed/Approved Wind Farms in Montana Near the HiLine Planning Area

Proposed Wind Farm	*Owner*	*Location*	*No. of Turbines*	*Energy Production Per Turbine*	*Total Energy Production*	*Status*
Big Otter	Invenergy	Near Belt in Cascade County	16	1.5 MW	24 MW	Proposed*
Coyote Wind	Enerfin Energy	Southwest of Big Timber in Sweet Grass County	44	1.8 MW	80 MW	Approved
Two Dot Wind	NJR Clean Energy Ventures	Near Two Dot in Wheatland County	6	1.6 MW	9.7 MW	Approved

* In December 2010 the Cascade County Zoning Board granted Invenergy a special use permit to begin construction of the Big Otter wind farm within 18 months.

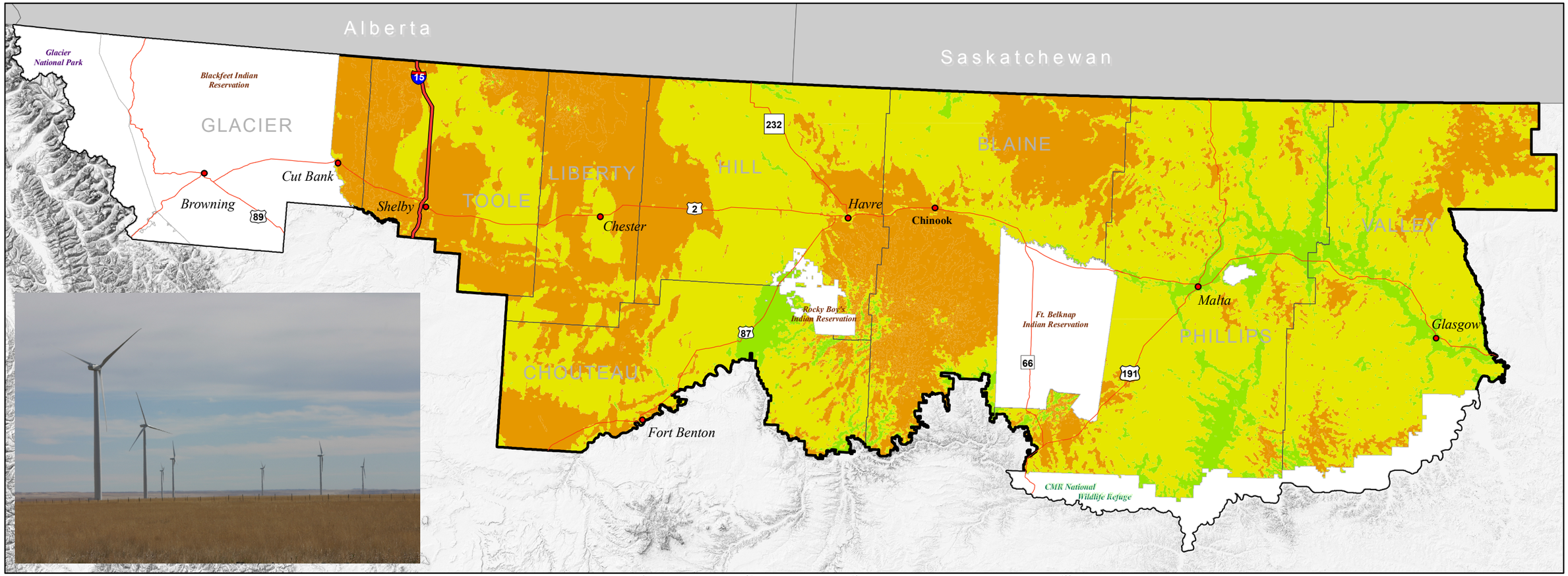
Table O.6
Valley County Wind Farm
Temporary and Permanent Ground Disturbance by Wind Farm Phase

	Phase I			*Phase II*			*Phase III*			*Phase IV*			*Full Build-Out*		
Number of Turbines	33			63			104			134			334		
Acres	1,094			2,800			5,520			10,706			20,120		
Power Generated (MW)	50			100			150			200			500		
Acres of Disturbance															
	Temp.	*Perm.*	*Subtotal*	*Temp.*	*Perm.*	*Subtotal*	*Temp.*	*Perm.*	*Subtotal*	*Temp.*	*Perm.*	*Subtotal*	*Temp.*	*Perm.*	*Subtotal*
O&M Buildings	2	2	4	0	0	0	0	0	0	0	0	0	2	2	4
Collector Substation	1	2	3	0	0	0	0	0	0	0	0	0	1	2	3
Collector System	6.8	0	6.8	10.8	0	10.8	22.4	0	22.4	41.6	0	41.6	81.6	0	81.6
New Access Road	8.7	5.8	14.5	0	0	0	0	0	0	0	0	0	8.7	5.8	14.5
Internal Road Network	8	14.4	22.4	12.7	22.9	35.6	25.2	45.4	70.6	49	88.1	137.1	94.9	170.8	265.7
Turbine String Turnaround Area	0.8	0	0.8	5.2	0	5.2	4.4	0	4.4	11.6	0	11.6	22	0	22
Wind Turbine Foundations	0	0.1	0.1	0	0.2	0.2	0	0.3	0.3	0	0.4	0.4	0	1	1
Pad-Mounted Transformers	0	0.1	0.1	0	0.2	0.2	0	0.3	0.3	0	0.4	0.4	0	1	1
Turbine Work Areas/ Material Staging	33	0	33	63	0	63	104	0	104	134	0	134	334	0	334
Total Acres	60.3	24.4	84.7	91.7	23.3	115	156	46	202	236.2	88.9	325.1	544.2	192.6	726.8

Source: Valley County Wind Energy Project Public Review EA, June 2006

Table O.7
Small and Large Hypothetical Models and Associated Facilities
(Not Including Potential Transmission Lines)

	Small			***Large***		
Number of Turbines	63			134		
Overall Area (acres)	2,800			10,706		
Power Generated (MW)	100			200		
	Surface Disturbance (Acres)			***Surface Disturbance (Acres)***		
	Short-Term	***Long-Term***	***Reclaim***	***Short-Term***	***Long-Term***	***Reclaim***
Operation and Maintenance Buildings	4	2	2	4	2	2
Collector Substation	3	1	2	3	1	2
Collector System	11	0	11	82	0	82
New Access Road	15	9	6	15	9	6
Internal Road Network	36	23	13	266	171	95
Turbine String Turnaround Area	5	0	5	22	0	22
Wind Turbine Foundations	0.2	0.2	0	1	1	0
Pad-Mounted Transformers	0.2	0.2	0	1	1	0
Turbine Work Areas/Material Staging	63	0	63	334	0	334
Total	133	33	100	724	183	541



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Bureau of Land Management

HiLine District Office

Map O.1

Wind Energy
Development Potentials

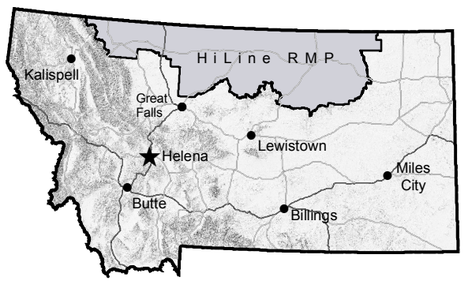
Map shows the Develpment Potential for Wind Energy. Development Potentials are based on Wind Power Classifications.

Development Potential

- High
- Moderate
- Low
- Not Analyzed

- RMP Boundary
- County
- Interstate
- Highway or State Route
- Town

N W E S



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Appendix P
Locatable Mineral Resources
Reasonable Foreseeable Development Scenario

Introduction

Purpose

The purpose of this Reasonable Foreseeable Development scenario (RFD) is to provide a model that anticipates the level and type of future locatable minerals activity in the HiLine planning area and serve as a basis for cumulative impacts analysis. The RFD first describes the main legal framework of mineral development, the Mining Law of 1872. Next is a discussion of the steps involved in developing a mineral deposit. The current activity levels are briefly addressed. Future trends and assumptions affecting mineral activity are then addressed, followed by predictions and identification of anticipated mineral exploration and development. The RFD is based on the current management situation. The Future Activity section describes variations in the RFD by alternative.

Scope

The RFD is based on the known or inferred mineral resource capabilities of the lands involved, and applies conditions and assumptions discussed under Future Trends and Assumptions. Changes in available geologic data and/or economic conditions would alter the RFD, and some deviation is to be expected over time.

The mineral development discussed within this RFD includes only locatable minerals as described in Chapter 2, and the development scenario is limited in scope to the planning area. The mineral commodities that could see future activity are gold, silver and bentonite. Although there is some minor activity regarding rare earths, gems, and diamonds, the RFD will pay special attention to hardrock and bentonite mining since the activity coincides with large amounts of BLM land ownership.

The types of lands analyzed in this RFD are restricted to only federal surface and federal minerals administered by the BLM. Activities on private, state, or Forest Service lands are considered when BLM lands or minerals are nearby and may be involved or affected.

Within the HiLine planning area, the BLM manages about 2.4 million acres of BLM land and 3.8 million acres of federal mineral estate. The acres of BLM-administered surface and mineral estate by county (within the planning area) are shown in Table P.1.

Table P.1
BLM-Administered Surface and Mineral Estate by County (Acres)

	Blaine	*Chouteau*	*Glacier*	*Hill*	*Liberty*	*Phillips*	*Toole*	*Valley*	*Total*
Mineral Estate	612,101	158,014	6,181	122,732	54,404	1,465,009	116,180	1,229,261	3,763,882
BLM Surface	300,019	45,230	1,060	14,558	7,620	1,030,895	27,368	1,014,518	2,441,268

Resource Area

The areas with the highest levels of mineral development potential for hardrock mineral occurrences are the alkalic igneous intrusive centers in the planning area, mainly the Little Rocky Mountains and Sweet Grass Hills. Diverse types of significant epithermal gold mineralization occur at these intrusive centers. The mineralization took place during the late stages of igneous activity during the Tertiary period and is hosted stockworks or fracture sets. The latter are mostly localized by intraformation solution breccias in the upper Madison, near the porphyry contacts. In these mineral

systems, gold occurs as auriferous pyrite, sylvanite, or in native form. Mineralization is accompanied by varying amounts of silver, base metal and tellurides, with quartz, fluorite, carbonate and barite (Giles 1982).

Bentonite is one of the principal commodities of the HiLine and is composed of clay minerals from the montmorillonite group. Deposits of bentonite are generally created from metamorphism of volcanic ash deposited in a marine environment. The geologic formation that contains the most noted bentonite deposits in the planning area is the Bearpaw Shale of the Montana Group. Although bentonite does occur in other formations, it is this formation that is considered to have the necessary thickness and physical properties to contain commercial deposits.

The Mining Law

The 1872 Mining Law (as amended) governs locatable minerals and other mineral activity in the HiLine planning area. The BLM must approve any Plan of Operations or review any Notice on all public land. Except for areas withdrawn or otherwise segregated from mineral location, all BLM-administered mineral estate remains open for prospecting and development of locatable minerals. Development is subject to the regulations contained in 43 CFR 3809.

History

The General Mining Law of 1872 (17 Stat. 91) is the authorizing act for mineral exploration and development in the planning area. The origin of the Mining Law can be traced to the 16th century, and reflects close ties to English and Spanish traditions.

Early American colonial charters contained outright grants of mineral land to settlers; however, these grants were accompanied by certain permanent reservations of precious metals to the sovereign. This formed the basis for the early traditions and customs regarding mineral rights for the colonies in the eastern part of United States until early 1800s.

In 1849, there was no formal mining law in the United States. Congress passed several leasing or sales acts of limited duration for gold, silver, lead, and iron. These acts were administered by the War Department. In 1849, when the California gold rush began, miners were technically in mineral trespass when they located claims on the public domain. The gold rush brought into conflict the two mining traditions. In 1860, the silver strike in the Comstock Lode in Nevada started a second mining rush to the West, opening up further conflict between the two mining traditions. As eastern interests were financing the Comstock Lode and California Mother Lode, the question of security of title and tenure became a major political issue in Congress.

From 1865 to 1885, congressional policy for the public lands focused on encouraging westward migration of people to settle and develop the West. In furthering this policy a series of statutes was passed including various homestead acts, agricultural entry laws, soldier compensation acts, and several acts designed to emphasize mineral exploration and development.

On July 26, 1866, the first mining law was passed as the Lode of 1866 (14 Stat. 251). This act provided for the entry and location of lode claims, assessment work and patents for lode claims.

The Placer Act was passed on July 9, 1870. It provided for the entry and location of placer claims on non-agricultural land, for location by legal description, and patent.

These two acts were consolidated, with amendments, into the General Mining Law of May 10, 1872. This statute is the basis for appropriation of mineral resources from the public domain today.

Principles

The Mining Law consists of five basic elements: discovery of a valuable mineral, location of mining claims, recordation of claims, maintenance – performance of annual requirements on claims, and patenting of the mineral (possibly surface) estate to the claimant.

Discovery

There is no federal statutory definition of what constitutes a valuable mineral deposit, but several judicial and administrative rulings or declarations on the subject have been made. In 1894 in the case of *Castle v. Womble*, the Department of the Interior established the "prudent person rule." This rule states:

> "... where minerals have been found and the evidence is of such a character that a person of ordinary prudence would be justified in the further expenditure of his labor and means, with a reasonable prospect of success in developing a valuable mine, the requirements of the statutes have been met."

This definition was approved by the United States Supreme Court in 1905.

In the 1968 case of *U.S. v. Coleman*, the Supreme Court approved the marketability test as a complement to the prudent person rule. This test requires a showing of marketability to confirm that a mineral could be mined, removed, and marketed at a profit. In other words, the marketability test takes into account economics, requiring the claimant to show that there is a reasonable prospect of selling material from a claim or a group of claims. It is not necessary that the material has been sold or is selling at a profit, but that there is a reasonable likelihood that it could be sold at a profit.

Some minerals, such as bentonite, can be classified as either locatable (uncommon variety) or salable (common variety), depending on the characteristics of the deposit. In 1969, *McClarty v. Secretary of the Interior* (408 F.2d 907, 908) set the following standards to distinguish locatable minerals from salable minerals:

1. the mineral deposit in question must have unique property;
2. the unique property must give the deposit a distinct and special value;
3. if the special value is for uses to which ordinary varieties of the mineral are put, the deposit must have some distinct and special value for such use; and
4. the distinct and special value must be reflected by the higher price which the material commands in the market place (or by reduced cost or overhead so that the profit to the claimant would be substantially more).

Location

Mining claims may be located only by citizens of the United States, persons who have declared an intention to become citizens, and corporations organized under any state law. Mining claims may only be located on federal lands open to mineral entry under the mining laws, and only for mineral commodities considered to be locatable. A mineral is locatable if it is in the public domain, and is a metallic mineral, or of an uncommon variety valuable chiefly for chemical, rather than physical properties. Mining claims may be located before or after discovery of valuable mineral, on unappropriated public domain land. This claim grants the locator an exclusive possessory right to the mineral deposit. This possessory right allows the locator to continue to develop the claim as provided for by law. It is valid against the United States and other claimants only if a valuable mineral deposit has been discovered.

There are two main types of mining claims: lode and placer. Lode claims are located on indurated bedrock; while placer claims are usually located on loosely consolidated materials such as mineral bearing sands and gravels. Two additional types of mining claims may be located under the mining law: mill sites and tunnel sites. A mill site may be located on unappropriated public domain land that is nonmineral in character. It is used for the construction of a mill or reduction works, or for other uses reasonably incident to a mining operation. A tunnel site may be located on a plot of land where a tunnel is run to develop a vein or lode, or for the purpose of intersecting unknown veins or lodes. The actual location of a mining claim in Montana involves posting a notice of location at the discovery point and erecting corner posts, or monuments, on the ground to insure that the claim boundaries are readily identifiable.

Recordation

Prior to the Federal Land Policy and Management Act (FLPMA), claimants were required to file their location and assessment notices only in the office of the county recorder, or county clerk, in the county in which the claim was located. Since enactment of FLPMA, notices of location and other notices must be filed with the BLM state office, as well as the appropriate county recorder. This requirement has allowed the BLM to know the number, types, and current status of claims located on public land. Failure to file these documents with the BLM is considered abandonment of a mining claim.

Maintenance

The General Mining Law of 1872 requires performance of an annual minimum of $100 worth of labor or improvements to retain a possessory interest in the claim. An affidavit of assessment work must be filed with both the county recorder and with the BLM State Office. Owners of mill and tunnel sites are not required to file assessment work, but are required to file a notice of intent to hold the site.

Exploration and mining activities on BLM-administered lands are subject to regulation under 43 CFR 3715, 43 CFR 3802, and 43 CFR 3809. These regulations require that an operator prevent unnecessary or undue degradation and perform reasonable reclamation.

Patents

Since October 1, 1994, Congress has imposed a budget moratorium on BLM acceptance of any new mineral patent applications. Until the moratorium is lifted, no new applications may be accepted by the BLM.

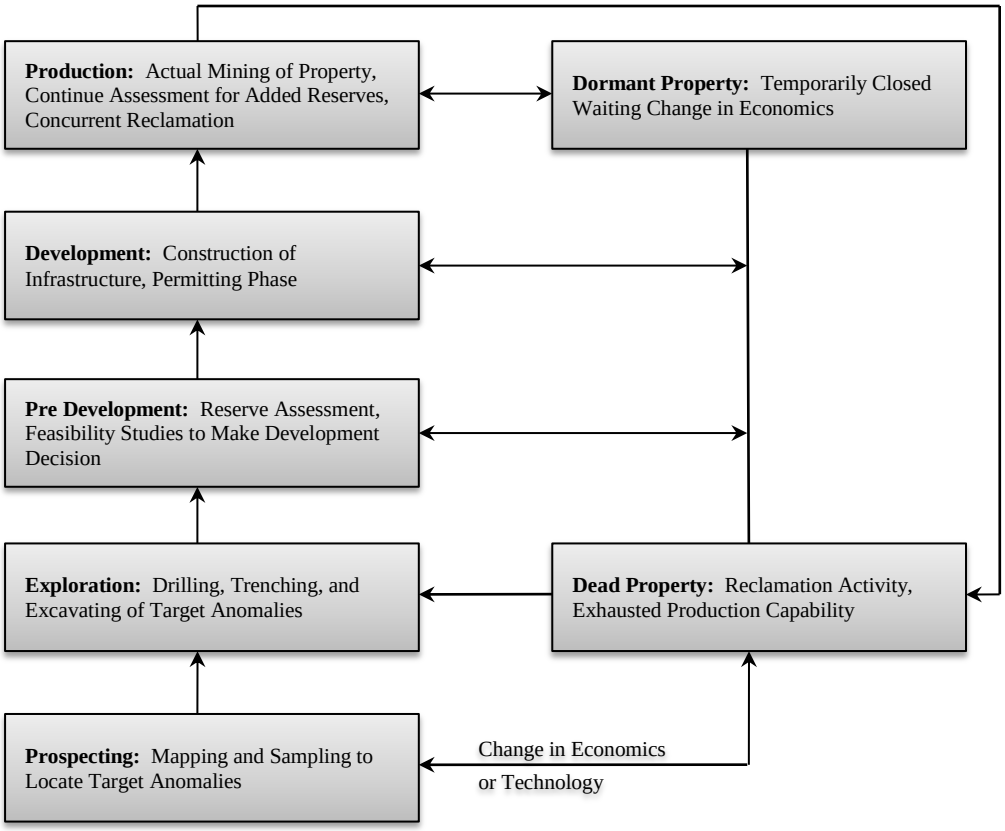
It is not necessary to have a patent to mine to remove minerals from a mining claim. In fact, it is not even necessary to have a mining claim at all if the land is open to mineral entry. However, a patent gives the owner exclusive title to the locatable minerals and, in most cases, to the surface estate. In order to obtain patent, the claimant must have performed at least $500 worth of development work per claim; had a mineral survey and plat prepared at his expense; show he holds possessory rights by chain of title documents; publish a notice for potential adverse claimants to assert his claims; and demonstrate discovery of a valuable mineral deposit within the meaning of the Mining Law. Upon satisfactory completion of the above requirements, the claimant is given the opportunity to purchase the mining claim(s) at $2.50 per acre for placer claims and $5 per acre for lode claims.

Development of a Mine

The development of a mine from exploration to production can be divided into six stages. Each stage requires the application of more discriminating (and more expensive) techniques over a successively smaller land area to identify and develop an economic mineral deposit.

A full sequence of developing a mineral project involves the following stages: appraisal of a large region, reconnaissance of selected parts of the region, detailed surface investigation of a target area, three dimensional physical sampling of the target area, development of the mine infrastructure, and actual production. These can be grouped into four categories: Reconnaissance, Prospecting, Exploration, and Mine Development. A diagram showing the relationship of these various stages in the life of a mine is shown in Figure P.1.

Figure P.1
Mine Life Cycle



Source: BLM 2009

Reconnaissance

Reconnaissance-level activity is the first stage in exploring for a mineral deposit. This activity involves initial literature search of an area of interest, using available references such as publications, reports, maps, aerial photos, etc. The area of study can vary from hundreds to thousands of square miles.

Activity that will normally take place during reconnaissance includes regional scale mapping, regional geochemical and geophysical studies, and remote sensing with aerial photography or satellite imagery. These studies are usually undertaken by academic or government entities, or major corporations.

The type of surface-disturbing activity associated with reconnaissance level mineral inventory is usually no more than occasional stream sediment, soil, or rock sampling. Minor off-road vehicle use may be required.

Prospecting

Any anomalous results from reconnaissance are used to identify prospecting areas, ranging in sizes from a fraction of a square mile to several hundred square miles. Activities that will take place in an effort to locate a mineral prospect include more detailed mapping, sampling, geochemical and geophysical study programs. Also, this is the time when property acquisition efforts usually begin, and most mining claims are located in order to secure ground while trying to make a mineral discovery. Prospecting on an annual basis is considered a minimum requirement, under the mining laws, to secure a claim.

Types of surface-disturbing activity associated with prospecting would involve more intense soil and rock chip sampling using mostly hand tools, frequent off-road vehicle use, and placement and maintenance of mining claim monuments. This activity is normally considered casual use (43 CFR 3809.5) and does not require BLM notification or approval.

Exploration

Upon location of sufficiently anomalous mineral occurrence or favorable occurrence indicator, a mineral prospect is established and is subjected to more intense evaluation through exploration techniques.

Activities that take place during exploration include those utilized during prospecting but at a more intense level in a more focused area. In addition, activities such as road building, trenching, and drilling are conducted. In later stages of exploration, an exploratory adit or shaft may be driven. If the prospect already has underground workings, these may be sampled, drilled, or extended. Exploration activities use mechanized earth moving equipment (excavators, backhoes, drill rigs, etc.) and may involve the use of explosives.

A typical exploration project in the planning area would require construction of approximately 5,000 feet of access road, establishment of about a dozen drill sites, with several holes at each site drilled to less than 500 feet deep, and possibly several trenches 200 feet by 8 feet by 6 to 8 feet deep. If initial results are encouraging, the exploration program will be expanded to determine the limits of the deposit. Most surface disturbance associated with exploration projects amounts to less than 5 acres and is conducted under a Notice (43 CFR 3809.21 and 43 CFR 3809.300-336), requiring the operator to notify the BLM 15 days before beginning activity.

Mine Development

If exploration results show that an economically viable mineral deposit may be present, activity will intensify to obtain detailed knowledge sufficient to delineate possible reserves, mining methods, and mineral processing requirements. This will involve applying all the previously used exploration tools in a more focused effort. Once enough information is acquired, a feasibility study will be made to decide whether to proceed with mine development and what mining and ore processing methods will be used.

Once the decision to develop the property is made, the Plan of Operations process begins. Upon approval, work begins on development of the mine and its infrastructure. This includes construction of the processing facilities, offices, and a laboratory; driving of development workings if the property is to be mined underground, or prestripping if it is to be mined through open pit methods. During this time, building of access roads or haulage routes and placement of utilities are completed while also continuing any additional refinement of ore reserves.

When enough facilities are in place, actual mine production begins. Along with production, there often are satellite exploration efforts to expand the mine's reserve base and extend the project life. Upon completion of the operation, concurrent with mining, the property is reclaimed. Sub-economic resources are often left unmined and the property is dormant, waiting for changes in commodity price or production technology that would make these resources economic (Figure P.1).

Activities that occur during mine development include: actual mining, ore processing, tailings disposal, waste rock placement, solution, metal refining, and placement of support facilities such as repair shops, labs, and offices. Such activities involve the use of heavy earthmoving equipment and explosives for mining and materials handling, exploration equipment for refinement of the ore reserve base, potentially hazardous or dangerous reagents for processing requirements, and general construction activities.

The size of mines varies greatly, and not all mines would require all the previously mentioned facilities and equipment. Acreage involved can range from single acres to several hundred, with most projects requiring surface disturbance greater than casual use and an approved Plan of Operations (43 CFR 3809).

Plan of Operations Approval Process

The Montana Department of Environmental Quality (DEQ) is the state permitting authority for hardrock operations and open-cut mining in Montana. All Plans of Operations required by the BLM are reviewed and approved in coordination with the DEQ.

Often before submitting a proposed Plan of Operation to the BLM (Operating or Open-cut Permit to the DEQ), the operator will contact the agencies for guidance on specific information or data that should be included in the application. The application is then filed with both agencies that coordinate staffing needs and agency roles for the review. The pre-Plan coordination is not required by regulations, but can be arranged as a convenience to the operator.

Upon receipt, the Plan is reviewed for completeness. A completeness review involves identifying any additional information the operator must provide to allow the BLM to determine whether the Plan of Operations is adequate to prevent unnecessary or undue degradation. The deficiencies identified during a completeness review are provided to the operator within 30 days of receipt. The applicant then revises the Plan as appropriate and resubmits it to the agencies for another completeness review. The cycle of completeness review by the agencies, including subsequent modification of the Plan by the applicant, continues until the application is accepted as complete.

After a complete Plan of Operations is received, the environmental analysis is prepared in accordance with both Montana Environmental Policy Act (MEPA) and National Environmental Policy Act (NEPA) requirements. Depending on the anticipated impacts of the proposal, this may be either an environmental assessment (EA) or an environmental impact statement (EIS). Typically, but not always, three alternatives are analyzed in the document: the operator's proposal, the operator's proposal with additional agency-imposed modifications (usually the preferred alternative), and the no action alternative. During this time the BLM may require the operator to submit additional information or baseline studies that assist the BLM with its environmental analysis under NEPA, National Historic Preservation Act (NHPA) consultation, or any other review process associated with the Plan of Operations.

When the environmental analysis and review process is to the point where the BLM and the operator can anticipate what the approved Plan of Operations will be, the operator will be required to provide a Reclamation Cost Estimate (RCE). Within 30 days of receipt, the BLM will review the RCE and notify the operator of any deficiencies in the cost estimate or any additional information required.

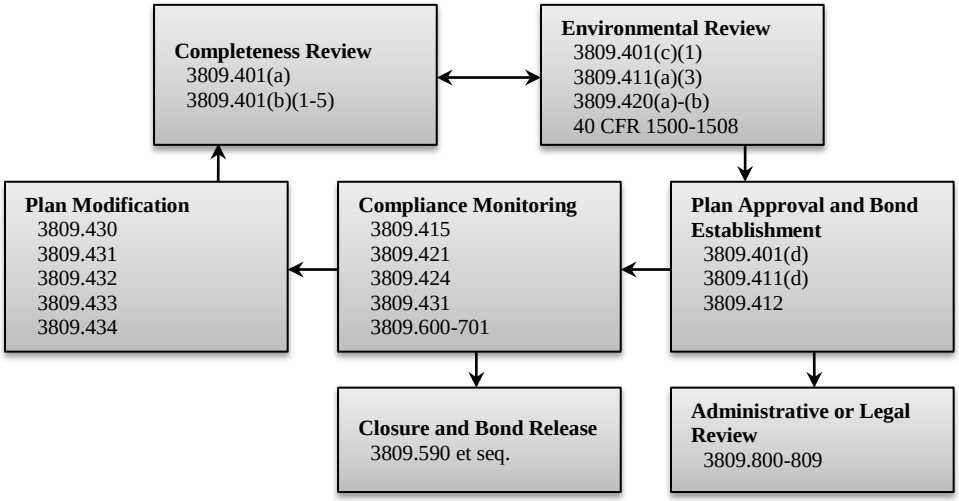
Public review and comment on the Plan of Operations may be solicited at any time during the process, but is mandatory after a complete Plan is filed. The time period for public comment is dependent on the issues and interest in the operation, but a minimum of 30 calendar days is required. Public meetings for scoping and/or comment are held as appropriate.

After the Plan of Operations review, including the environmental analysis, and the consultation requirements are complete, and the public comments have been considered, the agencies make an approval decision. Conformance with the modified mining and reclamation plans, plus any additional mitigation measures required to prevent unnecessary and undue degradation as defined in 43 CFR 3809.415, are conditions of approval. A financial guarantee based on the RCE must be posted before surface disturbance can begin.

In areas withdrawn from mineral entry, Plans of Operations will not be approved unless the Department of the Interior has determined that the mining claims covered by the Plans of Operations are valid under the surface management regulations at 43 CFR 3809.100.

The Plan of Operations approval process is laid out with associated regulation in Figure P.2, the Plan of Operations Approval Diagram below. Amendments to an existing Plan of Operations are processed in a similar manner.

Figure P.2
Plan of Operations Approval Process



Source: BLM 2009

Mining and Exploration Activities

The number of mining claims in the HiLine planning area is shown in Chapter 3, Table 3.46. It is important to note that while there over 740 mining claims in the planning area, only a small portion (about 10%) of these claims will have any activity above the prospecting level. Many claims are adjacent to known minable areas and serve to secure the property from potential rivals. Many of the claims overlap and might cover the same portion of ground. Often blocks of claims are located to serve as a basis for exploration projects. These blocks will naturally cover more area than the initial geology indicates is warranted so as to provide room for possible expansion should the mineral prospects be favorable.

Little Rocky Mountains

Mining in the Little Rocky Mountains began in the late 1880s and proceeded intermittently until the 1970s. In 1979, large-scale mining began in the area. The ore was found amenable to the cyanide heap leaching process due primarily to the finely disseminated gold particles occurring along abundant fractures in the rock, allowing contact between the cyanide and gold without requiring crushing. From 1979 to 1998, Pegasus Gold Corporation and its wholly owned subsidiary operating company, Zortman Mining, Inc. (ZMI), operated the Zortman and Landusky Mines.

The Zortman mine consisted of eight valley fill leach pads containing an estimated 16 million tons of ore grading 0.028 ounces per ton (opt) gold and 0.171 opt silver. Solution inventory averaged about 20 million gallons.

The Landusky mine consisted of eight valley fill leach pads containing over 34 million tons of ore. One leach pad, constructed in 1987, was estimated to contain some 40 million tons when fully loaded. The average ore grade at Landusky was slightly lower than Zortman. Mined ore averaged 0.022 opt gold and 0.125 opt silver. Solution inventory averaged over 33 million gallons.

In January 1998, Pegasus Gold Corporation and ZMI filed for bankruptcy protection, and in March 1998, plans to proceed with reclamation began, using the Reclamation Plan developed by the BLM, DEQ, EPA, and the Fort Belknap Indian Reservation between 1999 and 2001. Reclamation (including water treatment and monitoring) continues to this day.

Currently, there are no exploration projects in the Little Rocky Mountains. This is mostly due to the large area of land withdrawn from mineral entry within the footprint of the Zortman and Landusky Mine reclamation. There is currently one Plan of Operations for placer mining in Alder Gulch, just outside the town of Zortman.

Sweet Grass Hills

Historical records and physical evidence indicate exploration interest in lode and placer deposits at various times through the early 1960s on all three buttes of the Sweet Grass Hills. The only reported amount of gold recovered from placer operations was near Gold Butte, yielding less than 2,000 ounces (Ross 1950). Other lode deposits around East Butte were reported at about 8,700 pounds of copper, 8,400 pounds of lead, 1,100 pounds of zinc, and 651 troy ounces of silver. This activity was reported from underground exploration at the Sweetgrass Mine in 1963 (Hubbard, et al. 1966).

Contemporary exploration in the Sweet Grass Hills commenced in the early 1970s. Several companies have had exploration interest in all three buttes, particularly in the Tootsie Creek area of East Butte, up to the early 1990s.

In 1995, the BLM completed the validity examination of 14 unpatented mining claims located on East Butte as a result of the area being segregated for evaluation of Native American traditional interests and hydrological concerns. The results indicated eight of the claims meet the test of discovery under the mining law and were found valid. (BLM 1996b).

There are currently no Notices for exploration or Plans of Operations in the Sweet Grass Hills.

Brazil Creek

Brazil Creek is an area southwest of Glasgow that has a history of bentonite mining. From 1976 to 1979, there was an open-pit mine and processing plant that had the capacity to produce approximately 200,000 tons annually. Plant production shut down in 1979, but mining of bentonite continued from 1983 through 1985, producing approximately 180,000 tons during that period.

There is currently one Notice for bentonite exploration and one Plan of Operation for bentonite mining.

Future Trends and Assumptions

This section discusses anticipated future trends and assumptions that will be made when predicting solid minerals activity in the planning area.

Commodities Produced

The major commodity of interest will continue to be the precious metals, gold and silver. This is based on the combination of price and favorable geology for mineral occurrence. Minor base metal production will occur in association with precious metals, but is not expected to be a significant factor in mine economics.

Bentonite will also continue to be a commodity of interest. The deposits within the Bearpaw Shale of Valley and Phillips counties will continue to attract exploration and mining interest.

Technology

As in most any other industry, advances in technology will have a substantial effect on future mineral exploration and development. Along with the exploration and data collection, analysis and geologic modeling methods will become more sophisticated and available to the average user. This will advance accuracy and speed when assessing a mineral deposit's potential.

Mining and mineral processing efficiency will continue to improve in the future. As general technology advances, availability to the mining industry increases as well. More knowledge from these advancements will continue to be gained through experience and research by industry and government agencies. Advancements in environmental science, including alternative mining and processing methods, could open up greater potential for development.

In the same way, reclamation science will advance as well. More detailed design efforts will continue to be placed on reclamation of mined land, resulting in an overall increase in reclamation costs. These costs should pay dividends in the long term with increased reclamation success. As the rate of reclamation success further improves by decreasing environmental impacts of mining, the potential for development will increase.

Commodity Markets

The economics of mining in the planning area will be driven by the relationship between commodity production costs and market price. Though more silver is often produced than gold, it is the relatively high unit value of gold that will be critical in establishing the economic viability of mining. While production costs can be controlled or anticipated, through management and technology, the significant unknown factor will be the price of gold. The overall profitability of an operation, and hence the level of activity at the prospecting, exploration, and mining phases, for development of gold ore bodies will be closely related to the price of gold (Table P.2).

Table P.2
Gold and Silver Prices

		Gold Prices 1988-2008			*Silver Prices 1988-2008*		
Year	***PPI* (Metals)***	***Gold (Unadjusted)***	***Gold (2008 $)***	***10-yr Avg.***	***Silver (Unadjusted)***	***Silver (2008 $)***	***10-yr Avg.***
1988	1.187	$436.98	$784.13		$6.53	$11.72	
1989	1.241	$381.44	$654.69		$5.51	$9.46	
1990	1.229	$383.51	$664.67		$4.83	$8.37	
1991	1.202	$362.11	$641.68		$4.05	$7.18	
1992	1.192	$343.82	$614.38		$3.95	$7.05	
1993	1.192	$359.77	$642.88		$4.31	$7.70	
1994	1.248	$384.00	$655.38		$5.28	$9.02	
1995	1.345	$383.79	$607.79		$5.20	$8.24	
1996	1.31	$387.81	$630.56		$5.20	$8.46	
1997	1.318	$331.02	$534.96	$643.11	$4.91	$7.93	$8.51
1998	1.278	$294.24	$490.40	$613.74	$5.55	$9.25	$8.26
1999	1.246	$278.98	$476.91	$595.96	$5.22	$8.92	$8.21
2000	1.281	$279.11	$464.09	$575.90	$4.95	$8.23	$8.20
2001	1.254	$271.04	$460.38	$557.77	$4.37	$7.42	$8.22
2002	1.259	$309.73	$524.01	$548.74	$4.60	$7.78	$8.29
2003	1.292	$363.38	$599.07	$544.35	$4.88	$8.04	$8.33
2004	1.496	$409.72	$583.36	$537.15	$6.67	$9.50	$8.38
2005	1.608	$444.74	$589.11	$535.28	$7.32	$9.69	$8.52
2006	1.816	$603.46	$707.80	$543.01	$11.55	$13.54	$9.03
2007	1.935	$695.39	$765.47	$566.06	$13.38	$14.73	$9.71
2008	2.13	$871.96	$871.96	$604.22	$14.99	$14.99	$10.28
2009		$957.84			$14.40		

*Producer Price Indexes (PPI): U.S. Bureau of Labor Statistics
Gold and silver prices: http://www.kitco.com, 2009

The supply and demand for gold, and ultimately the price, is determined by several factors. On the supply side, production costs must be lower than price for firms to earn a profit. Relatively low-grade deposits, which were once uneconomical to mine, have become profitable resources to develop due to the emergence of new production techniques. Thus, supply has been increasing while the relative cost of production generally has declined. However, the profitability of these mining processes has increased the number of suppliers worldwide and made the market more competitive.

Factors influencing the demand for gold, both nationally and internationally, include the growth of disposable income, inflationary expectations, international stock market activity, the value of the US dollar relative to other currencies, and political events.

The primary market for bentonite is drilling muds and foundry application, so demand is tied closely with activity in these associated industries. But, when containing certain properties, bentonite can find a market in a wide range of applications in the food, medical, and construction industries. The distance from the source area to available markets is the primary limiting factor when meeting demand.

Legislative Changes

There are several areas of legislative change that may affect how the locatable mineral resources are developed.

One is the ongoing effort to amend, repeal, or reform the Mining Law of 1872. This could result in anything from simply leaving the law as is to completely restructuring it into a leasing and royalty system that is similar to what is now used for coal or oil and gas. In regards to exploration, a major change in the mining law would be if the right of self-initiation was lost, there would be a decrease in the amount of activity undertaken by small operators. Another affect, perhaps more extensive, would be if a royalty is placed on mineral production, decreasing the ultimate number and size of mines that could be developed. An increase of production cost with an added royalty would raise the cut-off ore grade, making some currently economic deposits uneconomical.

Changes in the way mining property and production is taxed could also have a substantial effect on the viability of individual operations. No changes in state tax schedules are anticipated, and no federal royalty is assumed in this analysis.

Another area of possible legislative change is in environmental laws or regulations which would affect exploration and mining activity.

For purposes of analysis, it is assumed that the mining law could be changed, the right of self-initialization will not be changed, and there will be no federal royalty system imposed. Also for this analysis, the Montana law for the ban on open-pit gold and silver mining that utilizes heap leaching or vat leaching with cyanide ore-processing reagents, Section 82-4-390, MCA, is considered a mine planning criteria, so it is not applicable to the development potential for public lands managed by the BLM.

Development and Activity Potential

The HiLine planning area is classified into three categories for development potential: high, moderate, and low as shown on Map P.1 (located at the end of this Appendix P). A fourth category is also discussed, which is the very low or unknown development potential. The term development potential as used in this document refers to the potential of the lands to support actual mine development. It is dependent on a variety of factors which include geology, engineering, and economics. It should not be anomalous amounts. All of the lands in the moderate and high development potential areas have high occurrence potential for locatable mineral (hardrock and bentonite) resources. Table P.3 shows the federal minerals by development potential.

Table P.3
Mineral Development Potential
(BLM Acres)

Development Potential	*Federal Minerals*	*Percent of the Planning Area*
High	12,567	0.3%
Moderate	29,204	0.8%
Low	95,182	2.5%
Very Low (Unknown)	3,626,929	96.4%

The development potential of these lands can be correlated with the types of activity and the Mine Life Cycle Diagram (Figure P.1). A description of development potential and associated level of activity follows.

Very Low or Unknown Development Potential/Reconnaissance Level Activity

The vast majority of lands in the planning area are in this category and have either little or unknown potential for locatable mineral development. Geologic conditions are not favorable for mineral occurrence, or geologic data is insufficient to support a determination. Activities that would occur on these lands are at the reconnaissance level as described in the Development of a Mine, Reconnaissance section. Negligible surface disturbance is usually associated with this level of activity.

Low Development Potential/Prospecting Level Activity

Lands in this category have geologic conditions moderately favorable for mineral resource occurrence, or have recent claim staking or property acquisition activities. These lands may contain mineral resources but cannot be put into a moderate or high development potential category due to lack of evidence indicating minable reserves, in either quality or quantity, that would warrant further consideration for development. Prospecting activities would occur on these lands as described in the Development of a Mine, Prospecting section. If an exploration program is successful further exploration would follow, and the lands may eventually be placed in a high development potential category.

Moderate Development Potential/Exploration Level Activity

Lands in this category exceed the requirements for Low Development Potential by having recent or anticipated exploration activity and/or a prospect identified requiring more intense exploration methods. These lands have high to very high mineral occurrence potential. Activities that would occur on these lands can involve use of mechanized earthmoving equipment and are described in the Development of a Mine section.

High Development Potential/Mining Level Activity

Lands in this category exceed the requirements for moderate development potential and contain proven, probable or inferred reserves and/or are within, or potential additions to, the permit area of a proposed or operating mine. Activities that would occur on these lands are described in the Development of a Mine section.

Future Activity

This section describes the extent of exploration and mine development within the foreseeable future, broken into specific geographic areas with high development potential and by alternative. This includes development of known resource occurrence and of undiscovered resource bodies resulting from prospecting and exploration activity.

The acres of disturbance due to foreseeable locatable mineral activity by alternative is shown in Table P.4 below, and the description of potential exploration and mining development activity by region and alternative follows. In some cases,

the acres of disturbance vary between short-term and long-term categories under the same alternative. This difference is due to allowing a withdrawal to expire or be reduced over a period of time, eventually opening more lands to mineral location.

Also under some of the alternatives, there are instances where development scenarios with differing acres of disturbance are discussed. For analysis, the development scenario with the greatest disturbance footprint is selected.

Table P.4
Locatable Minerals Acres of Disturbance

	Acres of Disturbance by Alternative						
	Alternative A (Current Management)		***Alternative B***	***Alternative C***	***Alternative D***		***Alternative E (Preferred Alternative)***
Geographic Region	***Short-Term***	***Long-Term***	***Short-Term and Long-Term***	***Short-Term and Long-Term***	***Short-Term***	***Long-Term***	***Short-Term and Long-Term***
Little Rocky Mountains	130	2,170	130	130	10	10	130
Sweet Grass Hills	110	175	110	110	110	175	110
Brazil Creek	150	150	115	115	115	115	115
Total	390	2,495	355	355	235	300	355

Little Rocky Mountains

Alternative A (Current Management)

Under this alternative, the withdrawal from mineral entry for the Zortman/Landusky Mine Reclamation in the Little Rocky Mountains (3,380 acres) would expire in October 2015, opening BLM land in this area to more exploration and mining activity in the long term. Ten possible exploration projects can be anticipated in this area. Average disturbance for this activity would be 5 acres per project, amounting to a total of 50 acres of disturbance due to exploration.

Along with other circumstances on the private land of the Zortman and Landusky Mines, lifting the current withdrawal could also result in reestablishment of mining operations. This would create disturbance on currently reclaimed areas of the mine footprint, about 1,200 acres. Foreseeable development would also include an expansion of the Zortman and Landusky Mines, about 710 acres.

If future exploration discovers an economic deposit on Antoine Butte or in the Pony Gulch area as could be anticipated, an underground mine operation would extract ore from selected mineralized areas and process it by crushing and vat leaching. The tailings from the vats would be disposed of at a facility designed to meet the applicable engineering requirements. This type of operation would result in 50 acres of surface disturbance each, totaling 100 acres.

If the exploration was successful in the discovery of sufficient reserves on either the Antoine Butte or in the Pony Gulch area, an open-pit mine with associated processing facilities could be constructed. This type of development would result in the extraction of gold and silver from the deposit. The total area of disturbance for all roads, mills, plants, pads, and ponds would be less than 100 acres each, totaling 200 acres.

Continued casual use level prospecting could also result in one anticipated placer mining operation, resulting in 10 acres of disturbance.

It is estimated that 90% of activity would occur within the high and moderate development potential areas shown on Map P.1. The remaining 10% could occur in the area having low development potential.

Alternative B

Under this alternative, the BLM would recommend a 20-year withdrawal from mineral entry for the Zortman/Landusky mine reclamation area (3,380 acres) when the current withdrawal expires in 2015. In addition to this withdrawal, the entirety of the Little Rocky Mountains area would be withdrawn under this alternative for the protection of cultural values under the Little Rocky Mountains Traditional Cultural Property (TCP) (37,387 acres). These withdrawals would eliminate any foreseeable locatable minerals development.

Alternative C

Under this alternative, the BLM would recommend a 20-year withdrawal from mineral entry for the Zortman/Landusky mine reclamation area (3,380 acres) when the current withdrawal expires in 2015. Four possible exploration projects can be anticipated in this area. Average disturbance for this activity would be 5 acres per project, amounting to a total of 20 acres of disturbance due to exploration.

The withdrawal would eliminate any foreseeable development with any possible reestablishment and expansion of the Zortman and Landusky Mines. Development of a mining operation could still potentially occur in the Pony Gulch area. If future exploration discovers an economic deposit, an underground mine operation would extract ore from selected mineralized areas and process the ore by crushing and vat leaching. The tailings from the vats would be disposed of at a facility designed to meet the applicable engineering requirements. This type of operation would result in 50 acres of surface disturbance.

If the exploration was successful in the discovery of sufficient reserves, an open-pit mine with associated processing facilities could be constructed. This type of development would result in the extraction of gold and silver from the deposit. The total area of disturbance for all roads, mills, plants, pads, and ponds would be less than 100 acres.

Continued casual use level prospecting could also result in one anticipated placer mining operation, resulting in 10 acres of disturbance.

Alternative D

As under Alternative A, the withdrawal from mineral entry for the Zortman/Landusky mine reclamation area in the Little Rocky Mountains (3,380 acres) would be allowed to expire in October 2015. This would open BLM land in this area to more exploration and mining activity in the long term, but under Alternative D, another withdrawal (15,000 acres) associated with the Little Rocky Mountains ACEC would be in place. This ACEC and withdrawal would eliminate any foreseeable development with any possible reestablishment and expansion of the Zortman and Landusky Mines.

Continued casual use level prospecting could also result in one anticipated placer mining operation in areas not withdrawn, resulting in 10 acres of disturbance.

Alternative E (Preferred Alternative)

Under this alternative, the potential level of development activity in the short term would be the same as in Alternative C, but in the long term, the Zortman/Landusky Mine Reclamation ACEC and withdrawal would be reduced from 3,380 acres to 2,605 acres. Even though this would increase the amount of land open to mineral entry, the continued withdrawal of the reclamation site would not facilitate the reestablishment or expansion of the Zortman and Landusky Mines, keeping the resulting acres of disturbance to 130 acres.

As reclamation and water treatment is further established for the Zortman and Landusky Mine sites, future assessment may deem a reduction of the withdrawn area appropriate. The amount of acres for this reduction is unknown, but any amount of acres withdrawn of the mine site would have the same influence on the reestablishment of mineral development as the current withdrawal.

Sweet Grass Hills

Alternatives A (Current Management) and D

Under this alternative, the withdrawal from mineral entry in the Sweet Grass Hills TCP (19,671 acres) would be allowed to expire in April 2017, opening BLM land in this area to more exploration and mining activity in the long term. Three possible exploration projects can be anticipated in this area. Average disturbance for this activity would be 5 acres per project, amounting to a total of 15 acres of disturbance due to exploration.

If future exploration discovers an economic deposit, an underground mine operation would extract ore from selected mineralized areas and process it by crushing and vat leaching. The tailings from the vats would be disposed of at a facility designed to meet the applicable engineering requirements. This type of operation would result in 50 acres of surface disturbance.

If the exploration was successful in the discovery of sufficient reserves, an open-pit mine with a processing facility could be constructed. This type of development would result in the extraction of gold and silver from the deposit. The total area of disturbance for all roads, mills, plants, pads, and ponds would be less than 150 acres.

Continued casual use level prospecting could also result in one anticipated placer mining operation with 10 acres of disturbance.

It is estimated that 85% of activity would occur within the high and moderate development potential areas shown on Map P.1. The remaining 15% could occur in the area having low development potential.

Alternatives B, C, and E (Preferred Alternative)

Under these alternatives, it is recommended the withdrawal from mineral entry in the Sweet Grass Hills be extended for an additional 20 years. All foreseeable future activity would be limited to the valid existing mining claims (about 100 acres) in the Tootsie Creek area of East Butte. Two exploration projects can be anticipated in this area. Average disturbance for this activity would be 5 acres per project, amounting to a total of 10 acres of disturbance due to exploration.

If future exploration discovers an economic deposit, an underground mine operation would extract ore from selected mineralized areas and process the ore by crushing and vat leaching. The tailings from the vats would be disposed of at a facility designed to meet the applicable engineering requirements. This type of operation would result in 50 acres of surface disturbance.

If the exploration was successful in the discovery of sufficient reserves, an open-pit mine with a processing facility could be constructed. This type of development would result in the extraction of gold and silver from the deposit. The total area of disturbance for all roads, mills, plants, pads, and ponds would be less than 100 acres.

Brazil Creek

Alternative A (Current Management)

In the foreseeable future, 10 exploration projects are anticipated for the Brazil Creek area. The projects would consist mostly of off-road drilling and would not occur simultaneously. At any one time, an estimated two projects would be in one of the following stages: initial evaluation, actual drilling, held open for study, or in the reclamation phase. Average disturbance would be about 5 acres per project. This would amount to a total disturbance of about 50 acres of disturbance due to exploration. The intent of exploration would vary from evaluating new deposits identified by surface study, expanding resource delineation on existing projects, or expanding reserve delineation adjacent to existing mines.

As a result of the exploration and expansion of current operations, it is estimated that four bentonite mining projects will be developed in the Brazil Creek area. These mines would be open-cut and would have 25 acres of disturbance per operation, totaling 100 acres of disturbance due to mining activity.

It is estimated that 85% of the exploration and mining activity would occur within the high and moderate development potential areas shown on Map P.1. The remaining 15% could occur in the area having low development potential.

Alternatives B, C, and D

Under these alternatives, the area of the Mountain Plover ACEC (24,672 acres) would be withdrawn from mineral entry. A total of 3,009 acres of high development potential and 6,744 acres of low development potential would be withdrawn as indicated on Map P.1. The withdrawal of this area would reduce the amount of exploration to eight projects. The projects would consist mostly of off-road drilling similar to that performed in the past. The activities would not occur simultaneously. At any one time, an estimated two projects would be in one of the following stages: initial evaluation, actual drilling, held open for study, or in the reclamation phase. Average disturbance would be about 5 acres per project. This would amount to a total disturbance of about 40 acres of disturbance due to exploration.

As a result of exploration and expansion of current operations, it is estimated that three bentonite mining projects would be developed in the Brazil Creek area. These mines would be open-cut and would have 100 acres of disturbance per operation, totaling 300 acres of disturbance due to mining activity.

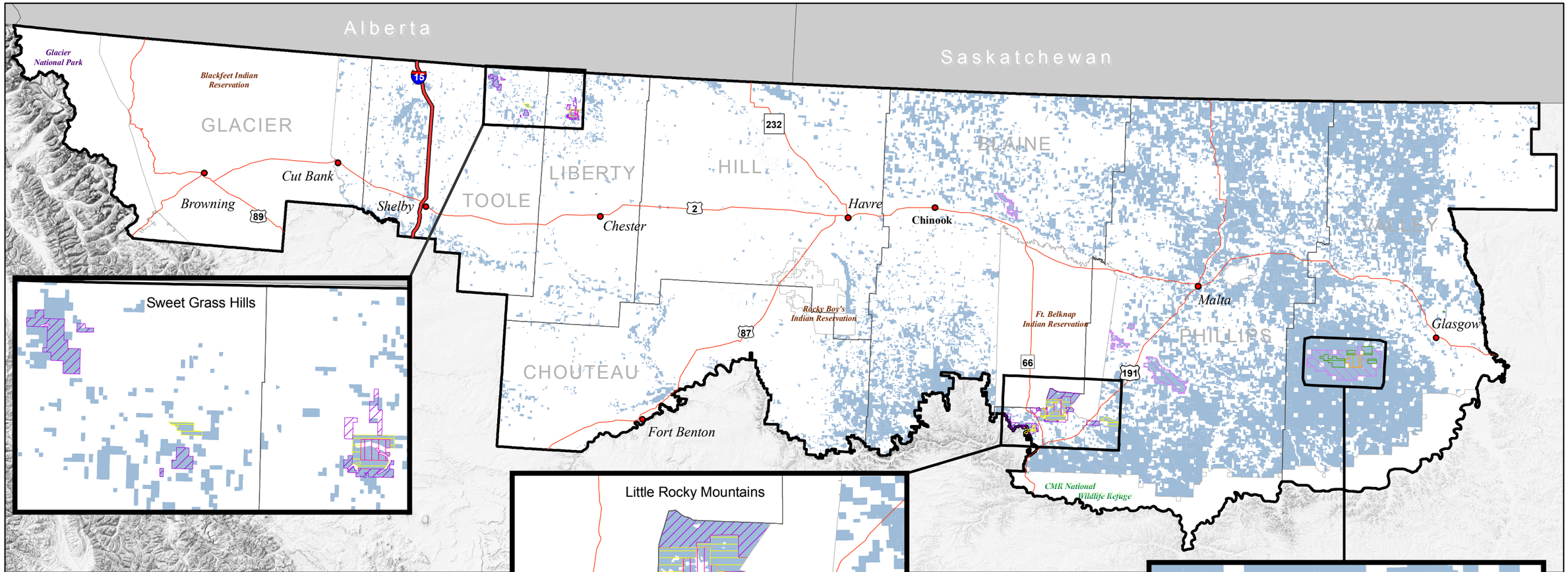
It is estimated that 85% of the exploration and mining activity would occur within the high and moderate development potential areas shown on Map P.1. The remaining 15% could occur in the area having low development potential.

Alternative E (Preferred Alternative)

Under this alternative, the area of the Sagebrush Focal Area (927,074 acres) is recommended to be withdrawn from mineral entry. A total of 6,442 acres of high development potential, 11,453 acres of moderate development potential, and 71,514 acres of low development potential would be withdrawn as indicated on Map P.1. The mining claims located within and before the withdrawal would be subject to valid existing rights as determined by a mining claim validity examination. Assuming the mining claims subject to activity are determined to be valid, the withdrawal of the Sagebrush Focal Area would reduce the amount of exploration to six projects due to the additional time it would take to conduct a validity examination. The exploration projects would consist mostly of off-road drilling similar to that performed in the past. This activity would not occur simultaneously. At any one time, an estimated two projects would be in one of the following stages: initial evaluation, actual drilling, held open for study, or in the reclamation phase. Average disturbance would be about 5 acres per project. This would amount to a total disturbance of about 30 acres of disturbance due to exploration.

As a result of exploration and expansion of current operations, it is estimated that two bentonite mining projects would be developed in the Brazil Creek area. These mines would be open-cut and have 100 acres of disturbance per operation, totaling 200 acres of disturbance as a result of mining activity.

It is estimated that 85% of the exploration and mining activity would occur within the high and moderate development potential areas shown on Map P.1. The remaining 15% could occur in the area having low development potential.



Created by the Malta Field Office in December 2012

Albers Equal Area, NAD83, Meters

U.S. DEPARTMENT OF THE INTERIOR

Bureau of Land Management

HiLine District Office

Map P.1

Solid Minerals
Locatable Hardrock & Bentonite
Mineral Potentials

Map shows the Federal Mineral Estate for Locatable Minerals (Hardrock & Bentonite) The mining potential for those minerals varies even though they are both a locatable mineral, therefore the potential is shown for each type of mining.

- High - Hardrock
- Moderate - Hardrock
- Low - Hardrock
- High - Bentonite
- Moderate - Bentonite
- Low - Bentonite
- Locatable Minerals
- Not Analyzed
- RMP boundary
- County
- Interstate
- Highway or State Route
- Towns

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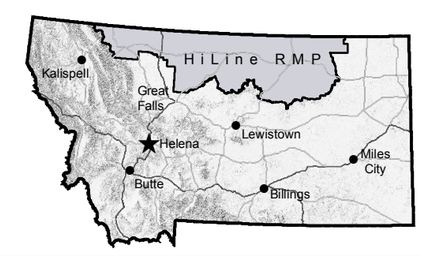

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Appendix Q
Wildlife Species

Table Q.1
Wildlife Species in the HiLine Planning Area -- Amphibians

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Amphibians				
Boreal Chorus Frog	*Pseudacris maculata*			
Columbia Spotted Frog	*Rana luteiventris*			
Great Plains Toad	*Bufo cognatus*	SENSITIVE		SOC
Long-toed Salamander	*Ambystoma macrodactylum*			
Northern Leopard Frog	*Rana pipiens*	SENSITIVE		SOC
Plains Spadefoot	*Spea bombifrons*	SENSITIVE		SOC
Rocky Mountain Tailed Frog	*Ascaphus montanus*			
Tiger Salamander	*Ambystoma tigrinum*			
Western Toad	*Bufo boreas*	SENSITIVE		SOC
Woodhouse's Toad	*Bufo woodhousii*			

* C – Candidate
CH – Critical Habitat
LE – Listed Endangered
LT – Listed Threatened
PE – Proposed Endangered
PT – Proposed Threatened
XN – Experimental Non-essential

\+ SOC – Species of Concern
PSOC – Potential Species of Concern

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Alder Flycatcher	*Empidonax alnorum*			SOC
American Avocet	*Recurvirostra americana*			
American Bittern	*Botaurus lentiginosus*			
American Black Duck	*Anas rubripes*			
American Coot	*Fulica americana*			
American Crow	*Corvus brachyrhynchos*			
American Dipper	*Cinclus mexicanus*			
American Golden-plover	*Pluvialis dominica*			
American Goldfinch	*Carduelis tristis*			

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
American Kestrel	*Falco sparverius*			
American Pipit	*Anthus rubescens*			
American Redstart	*Setophaga ruticilla*			
American Robin	*Turdus migratorius*			
American Three-toed Woodpecker	*Picoides dorsalis*	SENSITIVE		PSOC
American Tree Sparrow	*Spizella arborea*			
American White Pelican	*Pelecanus erythrorhynchos*			SOC
American Wigeon	*Anas americana*			
Arctic Tern	*Sterna paradisaea*			
Baird's Sandpiper	*Calidris bairdii*			
Baird's Sparrow	*Ammodramus bairdii*	SENSITIVE		SOC
Bald Eagle	*Haliaeetus leucocephalus*	SENSITIVE		SOC
Baltimore Oriole	*Icterus galbula*			PSOC
Band-tailed Pigeon	*Patagioenas fasciata*			
Bank Swallow	*Riparia riparia*			
Barn Owl	*Tyto alba*			SOC
Barn Swallow	*Hirundo rustica*			
Barred Owl	*Strix varia*			
Barrow's Goldeneye	*Bucephala islandica*			
Bay-breasted Warbler	*Dendroica castanea*			
Belted Kingfisher	*Ceryle alcyon*			
Black Scoter	*Melanitta nigra*			
Black Swift	*Cypseloides niger*			SOC
Black Tern	*Chlidonias niger*	SENSITIVE		SOC
Black Turnstone	*Arenaria melanocephala*			
Black-and-white Warbler	*Mniotilta varia*			SOC
Black-backed Woodpecker	*Picoides arcticus*	SENSITIVE		SOC
Black-bellied Plover	*Pluvialis squatarola*			
Black-billed Cuckoo	*Coccyzus erythropthalmus*			PSOC
Black-billed Magpie	*Pica hudsonia*			
Blackburnian Warbler	*Dendroica fusca*			
Black-capped Chickadee	*Poecile atricapillus*			
Black-chinned Hummingbird	*Archilochus alexandri*			
Black-crowned Night-heron	*Nycticorax nycticorax*	SENSITIVE		SOC
Black-headed Grosbeak	*Pheucticus melanocephalus*			

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Black-legged Kittiwake	*Rissa tridactyla*			
Black-necked Stilt	*Himantopus mexicanus*			PSOC
Blackpoll Warbler	*Dendroica striata*			
Black-throated Blue Warbler	*Dendroica caerulescens*			
Black-throated Gray Warbler	*Dendroica nigrescens*			
Black-throated Green Warbler	*Dendroica virens*			
Black-throated Sparrow	*Amphispiza bilineata*			
Blue Jay	*Cyanocitta cristata*			
Blue-gray Gnatcatcher	*Polioptila caerulea*	SENSITIVE		SOC
Blue-headed Vireo	*Vireo solitarius*			
Blue-winged Teal	*Anas discors*			
Bobolink	*Dolichonyx oryzivorus*	SENSITIVE		SOC
Bohemian Waxwing	*Bombycilla garrulus*			
Bonaparte's Gull	*Larus philadelphia*			
Boreal Chickadee	*Poecile hudsonica*			SOC
Boreal Owl	*Aegolius funereus*			
Brant	*Branta bernicla*			
Brewer's Blackbird	*Euphagus cyanocephalus*			
Brewer's Sparrow	*Spizella breweri*	SENSITIVE		SOC
Broad-winged Hawk	*Buteo platypterus*			
Brown Creeper	*Certhia americana*			
Brown Thrasher	*Toxostoma rufum*			
Brown-headed Cowbird	*Molothrus ater*			
Buff-breasted Sandpiper	*Tryngites subruficollis*			
Bufflehead	*Bucephala albeola*			
Bullock's Oriole	*Icterus bullockii*			
Burrowing Owl	*Athene cunicularia*	SENSITIVE		SOC
Cackling Goose	*Branta hutchinsii*			
California Gull	*Larus californicus*			
Calliope Hummingbird	*Stellula calliope*			
Canada Goose	*Branta canadensis*			
Canada Warbler	*Wilsonia canadensis*			
Canvasback	*Aythya valisineria*			
Canyon Wren	*Catherpes mexicanus*			
Cape May Warbler	*Dendroica tigrina*			

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Caspian Tern	*Sterna caspia*			SOC
Cassin's Finch	*Carpodacus cassinii*			
Cassin's Vireo	*Vireo cassinii*			
Cattle Egret	*Bubulcus ibis*			
Cedar Waxwing	*Bombycilla cedrorum*			
Chestnut-backed Chickadee	*Poecile rufescens*			
Chestnut-collared Longspur	*Calcarius ornatus*	SENSITIVE		SOC
Chestnut-sided Warbler	*Dendroica pensylvanica*			
Chimney Swift	*Chaetura pelagica*			PSOC
Chipping Sparrow	*Spizella passerina*			
Cinnamon Teal	*Anas cyanoptera*			
Clark's Grebe	*Aechmophorus clarkii*			PSOC
Clark's Nutcracker	*Nucifraga columbiana*			
Clay-colored Sparrow	*Spizella pallida*			
Cliff Swallow	*Petrochelidon pyrrhonota*			
Common Goldeneye	*Bucephala clangula*			
Common Grackle	*Quiscalus quiscula*			
Common Loon	*Gavia immer*	SENSITIVE		SOC
Common Merganser	*Mergus merganser*			
Common Nighthawk	*Chordeiles minor*			
Common Poorwill	*Phalaenoptilus nuttallii*			PSOC
Common Raven	*Corvus corax*			
Common Redpoll	*Carduelis flammea*			
Common Tern	*Sterna hirundo*			SOC
Common Yellowthroat	*Geothlypis trichas*			
Connecticut Warbler	*Oporornis agilis*			
Cooper's Hawk	*Accipiter cooperii*			
Cordilleran Flycatcher	*Empidonax occidentalis*			
Curlew Sandpiper	*Calidris ferruginea*			
Dark-eyed Junco	*Junco hyemalis*			
Dickcissel	*Spiza americana*	SENSITIVE		SOC
Double-crested Cormorant	*Phalacrocorax auritus*			
Downy Woodpecker	*Picoides pubescens*			
Dunlin	*Calidris alpina*			
Dusky Flycatcher	*Empidonax oberholseri*			

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Dusky Grouse	*Dendragapus obscurus*			
Eared Grebe	*Podiceps nigricollis*			
Eastern Bluebird	*Sialia sialis*			SOC
Eastern Kingbird	*Tyrannus tyrannus*			
Eastern Screech-owl	*Megascops asio*			PSOC
Eurasian Collared-dove	*Streptopelia decaocto*			
Eurasian Wigeon	*Anas penelope*			
European Starling	*Sturnus vulgaris*			
Evening Grosbeak	*Coccothraustes vespertinus*			
Ferruginous Hawk	*Buteo regalis*	SENSITIVE		SOC
Field Sparrow	*Spizella pusilla*			
Forster's Tern	*Sterna forsteri*			SOC
Fox Sparrow	*Passerella iliaca*			
Franklin's Gull	*Larus pipixcan*	SENSITIVE		SOC
Gadwall	*Anas strepera*			
Garganey	*Anas querquedula*			
Glaucous Gull	*Larus hyperboreus*			
Glaucous-winged Gull	*Larus glaucescens*			
Glossy Ibis	*Plegadis falcinellus*			
Golden Eagle	*Aquila chrysaetos*	SENSITIVE		
Golden-crowned Kinglet	*Regulus satrapa*			
Golden-crowned Sparrow	*Zonotrichia atricapilla*			
Golden-winged Warbler	*Vermivora chrysoptera*			
Grasshopper Sparrow	*Ammodramus savannarum*			SOC
Gray Catbird	*Dumetella carolinensis*			
Gray Jay	*Perisoreus canadensis*			
Gray Partridge	*Perdix perdix*			
Gray-cheeked Thrush	*Catharus minimus*			
Gray-crowned Rosy-finch	*Leucosticte tephrocotis*			SOC
Great Black-backed Gull	*Larus marinus*			
Great Blue Heron	*Ardea herodias*			PSOC
Great Egret	*Ardea alba*			
Great Gray Owl	*Strix nebulosa*	SENSITIVE		SOC
Great Horned Owl	*Bubo virginianus*			

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	***Scientific Name***	***BLM Status***	***Endangered Species Status****	***State of MT Species of Concern+***
Birds				
Greater Sage-Grouse	*Centrocercus urophasianus*	SPECIAL STATUS	C	SOC
Greater Scaup	*Aythya marila*			
Greater White-fronted Goose	*Anser albifrons*			
Greater Yellowlegs	*Tringa melanoleuca*			
Great-tailed Grackle	*Quiscalus mexicanus*			
Green Heron	*Butorides virescens*			
Green-tailed Towhee	*Pipilo chlorurus*			
Green-winged Teal	*Anas crecca*			
Gyrfalcon	*Falco rusticolus*			
Hairy Woodpecker	*Picoides villosus*			
Hammond's Flycatcher	*Empidonax hammondii*			
Harlequin Duck	*Histrionicus histrionicus*	SENSITIVE		SOC
Harris's Sparrow	*Zonotrichia querula*			
Hermit Thrush	*Catharus guttatus*			
Herring Gull	*Larus argentatus*			
Hoary Redpoll	*Carduelis hornemanni*			
Hooded Merganser	*Lophodytes cucullatus*			
Hooded Warbler	*Wilsonia citrina*			
Horned Grebe	*Podiceps auritus*			PSOC
Horned Lark	*Eremophila alpestris*			
House Finch	*Carpodacus mexicanus*			
House Sparrow	*Passer domesticus*			
House Wren	*Troglodytes aedon*			
Hudsonian Godwit	*Limosa haemastica*			
Indigo Bunting	*Passerina cyanea*			PSOC
Interior Least Tern	*Sterna antillarum athalassos*	SENSITIVE	LE	SOC
Kentucky Warbler	*Oporornis formosus*			
Killdeer	*Charadrius vociferus*			
Lapland Longspur	*Calcarius lapponicus*			
Lark Bunting	*Calamospiza melanocorys*			SOC
Lark Sparrow	*Chondestes grammacus*			
Laughing Gull	*Larus atricilla*			
Lazuli Bunting	*Passerina amoena*			
Le Conte's Sparrow	*Ammodramus leconteii*	SENSITIVE		SOC

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Least Bittern	*Ixobrychus exilis*			
Least Flycatcher	*Empidonax minimus*			
Least Sandpiper	*Calidris minutilla*			
Lesser Goldfinch	*Carduelis psaltria*			
Lesser Scaup	*Aythya affinis*			
Lesser Yellowlegs	*Tringa flavipes*			
Lewis's Woodpecker	*Melanerpes lewis*			SOC
Lincoln's Sparrow	*Melospiza lincolnii*			
Little Blue Heron	*Egretta caerulea*			
Loggerhead Shrike	*Lanius ludovicianus*	SENSITIVE		SOC
Long-billed Curlew	*Numenius americanus*	SENSITIVE		SOC
Long-billed Dowitcher	*Limnodromus scolopaceus*			
Long-eared Owl	*Asio otus*			
Long-tailed Duck	*Clangula hyemalis*			
Long-tailed Jaeger	*Stercorarius longicaudus*			
MacGillivray's Warbler	*Oporornis tolmiei*			
Magnolia Warbler	*Dendroica magnolia*			
Mallard	*Anas platyrhynchos*			
Marbled Godwit	*Limosa fedoa*	SENSITIVE		
Marsh Wren	*Cistothorus palustris*			
McCown's Longspur	*Calcarius mccownii*	SENSITIVE		SOC
Merlin	*Falco columbarius*			
Mew Gull	*Larus canus*			
Mountain Bluebird	*Sialia currucoides*			
Mountain Chickadee	*Poecile gambeli*			
Mountain Plover	*Charadrius montanus*	SENSITIVE		SOC
Mourning Dove	*Zenaida macroura*			
Mourning Warbler	*Oporornis philadelphia*			
Nashville Warbler	*Vermivora ruficapilla*			
Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*	SENSITIVE		SOC
Northern Cardinal	*Cardinalis cardinalis*			
Northern Flicker	*Colaptes auratus*			
Northern Goshawk	*Accipiter gentilis*	SENSITIVE		SOC
Northern Harrier	*Circus cyaneus*			
Northern Hawk Owl	*Surnia ulula*			SOC

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Northern Mockingbird	*Mimus polyglottos*			
Northern Parula	*Parula americana*			
Northern Pintail	*Anas acuta*			
Northern Pygmy-owl	*Glaucidium gnoma*			
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*			
Northern Saw-whet Owl	*Aegolius acadicus*			
Northern Shoveler	*Anas clypeata*			
Northern Shrike	*Lanius excubitor*			
Northern Waterthrush	*Seiurus noveboracensis*			
Olive-sided Flycatcher	*Contopus cooperi*			SOC
Orange-crowned Warbler	*Vermivora celata*			
Orchard Oriole	*Icterus spurius*			PSOC
Osprey	*Pandion haliaetus*			
Ovenbird	*Seiurus aurocapilla*			PSOC
Pacific Loon	*Gavia pacifica*			
Palm Warbler	*Dendroica palmarum*			
Parasitic Jaeger	*Stercorarius parasiticus*			
Passenger Pigeon	*Ectopistes migratorius*			Extinct
Pectoral Sandpiper	*Calidris melanotos*			
Peregrine Falcon	*Falco peregrinus*	SENSITIVE		SOC
Philadelphia Vireo	*Vireo philadelphicus*			
Pied-billed Grebe	*Podilymbus podiceps*			
Pileated Woodpecker	*Dryocopus pileatus*			
Pine Grosbeak	*Pinicola enucleator*			
Pine Siskin	*Carduelis pinus*			
Pine Warbler	*Dendroica pinus*			
Pinyon Jay	*Gymnorhinus cyanocephalus*			
Piping Plover	*Charadrius melodus*	SENSITIVE	LT, CH	SOC
Plumbeous Vireo	*Vireo plumbeus*			PSOC
Pomarine Jaeger	*Stercorarius pomarinus*			
Prairie Falcon	*Falco mexicanus*			
Prairie Warbler	*Dendroica discolor*			
Purple Finch	*Carpodacus purpureus*			
Purple Martin	*Progne subis*			
Pygmy Nuthatch	*Sitta pygmaea*			

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Red Crossbill	*Loxia curvirostra*			
Red Knot	*Calidris canutus*	SPECIAL STATUS	LT	
Red Phalarope	*Phalaropus fulicarius*			
Red-bellied Woodpecker	*Melanerpes carolinus*			
Red-breasted Merganser	*Mergus serrator*			
Red-breasted Nuthatch	*Sitta canadensis*			
Red-eyed Vireo	*Vireo olivaceus*			
Redhead	*Aythya americana*			
Red-headed Woodpecker	*Melanerpes erythrocephalus*	SENSITIVE		SOC
Red-naped Sapsucker	*Sphyrapicus nuchalis*			
Red-necked Grebe	*Podiceps grisegena*			
Red-necked Phalarope	*Phalaropus lobatus*			
Red-tailed Hawk	*Buteo jamaicensis*			
Red-throated Loon	*Gavia stellata*			
Red-winged Blackbird	*Agelaius phoeniceus*			
Ring-billed Gull	*Larus delawarensis*			
Ring-necked Duck	*Aythya collaris*			
Ring-necked Pheasant	*Phasianus colchicus*			
Rock Pigeon	*Columba livia*			
Rock Wren	*Salpinctes obsoletus*			
Rose-breasted Grosbeak	*Pheucticus ludovicianus*			
Ross's Goose	*Chen rossii*			
Rough-legged Hawk	*Buteo lagopus*			
Ruby-crowned Kinglet	*Regulus calendula*			
Ruby-throated Hummingbird	*Archilochus colubris*			
Ruddy Duck	*Oxyura jamaicensis*			
Ruddy Turnstone	*Arenaria interpres*			
Ruffed Grouse	*Bonasa umbellus*			
Rufous Hummingbird	*Selasphorus rufus*			
Rusty Blackbird	*Euphagus carolinus*			
Sabine's Gull	*Xema sabini*			
Sage Thrasher	*Oreoscoptes montanus*	SENSITIVE		SOC
Sanderling	*Calidris alba*			
Sandhill Crane	*Grus canadensis*			

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Savannah Sparrow	*Passerculus sandwichensis*			
Say's Phoebe	*Sayornis saya*			
Scarlet Tanager	*Piranga olivacea*			
Scissor-tailed Flycatcher	*Tyrannus forficatus*			
Sedge Wren	*Cistothorus platensis*	SENSITIVE		SOC
Semipalmated Plover	*Charadrius semipalmatus*			
Semipalmated Sandpiper	*Calidris pusilla*			
Sharp-shinned Hawk	*Accipiter striatus*			
Sharp-tailed Grouse	*Tympanuchus phasianellus*			
Short-billed Dowitcher	*Limnodromus griseus*			
Short-eared Owl	*Asio flammeus*			PSOC
Snow Bunting	*Plectrophenax nivalis*			
Snow Goose	*Chen caerulescens*			
Snowy Egret	*Egretta thula*			
Snowy Owl	*Bubo scandiacus*			
Snowy Plover	*Charadrius alexandrinus*			
Solitary Sandpiper	*Tringa solitaria*			
Song Sparrow	*Melospiza melodia*			
Sora	*Porzana carolina*			
Spotted Sandpiper	*Actitis macularius*			
Spotted Towhee	*Pipilo maculatus*			
Sprague's Pipit	*Anthus spragueii*	SENSITIVE	C	SOC
Spruce Grouse	*Falcipennis canadensis*			
Steller's Jay	*Cyanocitta stelleri*			
Stilt Sandpiper	*Calidris himantopus*			
Surf Scoter	*Melanitta perspicillata*			
Swainson's Hawk	*Buteo swainsoni*	SENSITIVE		SOC
Swainson's Thrush	*Catharus ustulatus*			
Swamp Sparrow	*Melospiza georgiana*			
Tennessee Warbler	*Vermivora peregrina*			PSOC
Thayer's Gull	*Larus thayeri*			
Townsend's Solitaire	*Myadestes townsendi*			
Townsend's Warbler	*Dendroica townsendi*			
Tree Swallow	*Tachycineta bicolor*			
Trumpeter Swan	*Cygnus buccinator*	SENSITIVE		SOC

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Tundra Swan	*Cygnus columbianus*			
Turkey Vulture	*Cathartes aura*			
Upland Sandpiper	*Bartramia longicauda*			
Varied Thrush	*Ixoreus naevius*			
Vaux's Swift	*Chaetura vauxi*			
Veery	*Catharus fuscescens*	SENSITIVE		
Vesper Sparrow	*Pooecetes gramineus*			
Violet-green Swallow	*Tachycineta thalassina*			
Virginia Rail	*Rallus limicola*			
Warbling Vireo	*Vireo gilvus*			
Western Bluebird	*Sialia mexicana*			
Western Grebe	*Aechmophorus occidentalis*			
Western Kingbird	*Tyrannus verticalis*			
Western Meadowlark	*Sturnella neglecta*			
Western Sandpiper	*Calidris mauri*			
Western Screech-owl	*Megascops kennicottii*			PSOC
Western Tanager	*Piranga ludoviciana*			
Western Wood-pewee	*Contopus sordidulus*			
Whimbrel	*Numenius phaeopus*			
White-breasted Nuthatch	*Sitta carolinensis*			
White-crowned Sparrow	*Zonotrichia leucophrys*			
White-faced Ibis	*Plegadis chihi*	SENSITIVE		SOC
White-rumped Sandpiper	*Calidris fuscicollis*			
White-tailed Ptarmigan	*Lagopus leucura*			SOC
White-throated Sparrow	*Zonotrichia albicollis*			
White-throated Swift	*Aeronautes saxatalis*			
White-winged Crossbill	*Loxia leucoptera*			
White-winged Dove	*Zenaida asiatica*			
White-winged Scoter	*Melanitta fusca*			
Whooping Crane	*Grus americana*	SENSITIVE	LE	SOC
Wild Turkey	*Meleagris gallopavo*			
Willet	*Catoptrophorus semipalmatus*	SENSITIVE		
Williamson's Sapsucker	*Sphyrapicus thyroideus*			PSOC
Willow Flycatcher	*Empidonax traillii*			
Wilson's Phalarope	*Phalaropus tricolor*	SENSITIVE		

Table Q.2
Wildlife Species in the HiLine Planning Area – Birds

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Birds				
Wilson's Snipe	*Gallinago delicata*			
Wilson's Warbler	*Wilsonia pusilla*			
Winter Wren	*Troglodytes troglodytes*			
Wood Duck	*Aix sponsa*			
Wood Thrush	*Hylocichla mustelina*			
Yellow Warbler	*Dendroica petechia*			
Yellow-bellied Sapsucker	*Sphyrapicus varius*			
Yellow-billed Cuckoo	*Coccyzus americanus*			SOC
Yellow-billed Loon	*Gavia adamsii*			
Yellow-breasted Chat	*Icteria virens*			
Yellow-crowned Night-heron	*Nyctanassa violacea*			
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*			
Yellow-rumped Warbler	*Dendroica coronata*			
Yellow-throated Vireo	*Vireo flavifrons*			

* C – Candidate
CH – Critical Habitat
LE – Listed Endangered
LT – Listed Threatened
PE – Proposed Endangered
PT – Proposed Threatened
XN – Experimental Non-essential

\+ SOC – Species of Concern
PSOC – Potential Species of Concern

Table Q.3
Wildlife Species in the HiLine Planning Area -- Mammals

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Mammals				
American Badger	*Taxidea taxus*			
American Beaver	*Castor canadensis*			
American Marten	*Martes americana*			
American Pika	*Ochotona princeps*			
Big Brown Bat	*Eptesicus fuscus*			
Bighorn Sheep	*Ovis canadensis*			
Black Bear	*Ursus americanus*			
Black-footed Ferret	*Mustela nigripes*	SPECIAL STATUS	LE, XN	SOC
Black-tailed Prairie Dog	*Cynomys ludovicianus*	SENSITIVE		SOC

Table Q.3
Wildlife Species in the HiLine Planning Area -- Mammals

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Mammals				
Bobcat	*Lynx rufus*			
Bushy-tailed Woodrat	*Neotoma cinerea*			
California Myotis	*Myotis californicus*			
Canada Lynx	*Lynx canadensis*	SPECIAL STATUS	LT	SOC
Columbian Ground Squirrel	*Spermophilus columbianus*			
Common Gray Fox	*Urocyon cinereoargenteus*			
Common Porcupine	*Erethizon dorsatum*			
Common Raccoon	*Procyon lotor*			
Coyote	*Canis latrans*			
Deer Mouse	*Peromyscus maniculatus*			
Desert Cottontail	*Sylvilagus audubonii*			
Dwarf Shrew	*Sorex nanus*			SOC
Eastern Fox Squirrel	*Sciurus niger*			
Eastern Gray Squirrel	*Sciurus carolinensis*			
Eastern Red Bat	*Lasiurus borealis*			SOC
Elk	*Cervus elaphus*			
Franklin's Ground Squirrel	*Spermophilus franklinii*			
Fringed Myotis	*Myotis thysanodes*	SENSITIVE		SOC
Golden-mantled Ground Squirrel	*Spermophilus lateralis*			
Gray Wolf	*Canis lupus*	SPECIAL STATUS	LE	SOC
Grizzly Bear	*Ursus arctos horribilis*	SPECIAL STATUS	LT	SOC
Hayden's Shrew	*Sorex haydeni*			PSOC
Heather Vole	*Phenacomys intermedius*			
Hoary Bat	*Lasiurus cinereus*			PSOC
Hoary Marmot	*Marmota caligata*			PSOC
House Mouse	*Mus musculus*			
Least Chipmunk	*Tamias minimus*			
Least Weasel	*Mustela nivalis*			
Little Brown Myotis	*Myotis lucifugus*			
Long-legged Myotis	*Myotis volans*	SENSITIVE		
Long-tailed Vole	*Microtus longicaudus*			
Long-tailed Weasel	*Mustela frenata*			
Masked Shrew	*Sorex cinereus*			

Table Q.3
Wildlife Species in the HiLine Planning Area -- Mammals

Common Name	***Scientific Name***	***BLM Status***	***Endangered Species Status****	***State of MT Species of Concern+***
Mammals				
Meadow Vole	*Microtus pennsylvanicus*			
Merriam's Shrew	*Sorex merriami*			SOC
Mink	*Mustela vison*			
Montane Shrew	*Sorex monticolus*			
Moose	*Alces alces*			
Mountain Cottontail	*Sylvilagus nuttallii*			
Mountain Goat	*Oreamnos americanus*			
Mountain Lion	*Puma concolor*			
Mule Deer	*Odocoileus hemionus*			
Muskrat	*Ondatra zibethicus*			
North American Wolverine	*Gulo gulo luscus*	SPECIAL STATUS		SOC
Northern Bog Lemming	*Synaptomys borealis*			SOC
Northern Flying Squirrel	*Glaucomys sabrinus*			
Northern Grasshopper Mouse	*Onychomys leucogaster*			
Northern Pocket Gopher	*Thomomys talpoides*			
Northern River Otter	*Lontra canadensis*			
Northern Short-tailed Shrew	*Blarina brevicauda*			
Norway Rat	*Rattus norvegicus*			
Olive-backed Pocket Mouse	*Perognathus fasciatus*			
Ord's Kangaroo Rat	*Dipodomys ordii*			
Plains Pocket Mouse	*Perognathus flavescens*			
Prairie Vole	*Microtus ochrogaster*			
Preble's Shrew	*Sorex preblei*			SOC
Pronghorn	*Antilocapra americana*			
Pygmy Shrew	*Sorex hoyi*			
Red Fox	*Vulpes vulpes*			
Red Squirrel	*Tamiasciurus hudsonicus*			
Red-tailed Chipmunk	*Tamias ruficaudus*			
Richardson's Ground Squirrel	*Spermophilus richardsonii*			
Sagebrush Vole	*Lemmiscus curtatus*			
Short-tailed Weasel	*Mustela erminea*			
Silver-haired Bat	*Lasionycteris noctivagans*			PSOC
Snowshoe Hare	*Lepus americanus*			
Southern Red-backed Vole	*Clethrionomys gapperi*			

Table Q.3
Wildlife Species in the HiLine Planning Area -- Mammals

Common Name	*Scientific Name*	*BLM Status*	*Endangered Species Status**	*State of MT Species of Concern+*
Mammals				
Striped Skunk	*Mephitis mephitis*			
Swift Fox	*Vulpes velox*	SENSITIVE		SOC
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*			
Townsend's Big-eared Bat	*Corynorhinus townsendii*	SENSITIVE		SOC
Townsend's Ground Squirrel	*Spermophilus mollis*			
Vagrant Shrew	*Sorex vagrans*			
Water Shrew	*Sorex palustris*			
Water Vole	*Microtus richardsoni*			
Western Harvest Mouse	*Reithrodontomys megalotis*			
Western Jumping Mouse	*Zapus princeps*			
Western Small-footed Myotis	*Myotis ciliolabrum*			
White-footed Mouse	*Peromyscus leucopus*			
White-tailed Deer	*Odocoileus virginianus*			
White-tailed Jack Rabbit	*Lepus townsendii*			
Woodchuck	*Marmota monax*			
Yellow-bellied Marmot	*Marmota flaviventris*			
Yellow-pine Chipmunk	*Tamias amoenus*			
Yuma Myotis	*Myotis yumanensis*			PSOC

* C – Candidate
CH – Critical Habitat
LE – Listed Endangered
LT – Listed Threatened
PE – Proposed Endangered
PT – Proposed Threatened
XN – Experimental Non-essential

\+ SOC – Species of Concern
PSOC – Potential Species of Concern

Table Q.4
Wildlife Species in the HiLine Planning Area -- Reptiles

Common Name	***Scientific Name***	***BLM Status***	***Endangered Species Status****	***State of MT Species of Concern+***
Reptiles				
Common Gartersnake	*Thamnophis sirtalis*			
Common Sagebrush Lizard	*Sceloporus graciosus*			SOC
Eastern Racer	*Coluber constrictor*			
Gophersnake	*Pituophis catenifer*			
Greater Short-Horned Lizard	*Phrynosoma hernandesi*	SENSITIVE		SOC
Milksnake	*Lampropeltis triangulum*	SENSITIVE		SOC
Painted Turtle	*Chrysemys picta*			
Plains Gartersnake	*Thamnophis radix*			
Prairie Rattlesnake	*Crotalus viridis*			
Smooth Greensnake	*Opheodrys vernalis*			
Snapping Turtle	*Chelydra serpentine*	SENSITIVE		SOC
Spiny Softshell Turtle	*Apalone spinifera*	SENSITIVE		SOC
Terrestrial Gartersnake	*Thamnophis elegans*			
Western Hog-nosed Snake	*Heterodon nasicus*	SENSITIVE		SOC

* C – Candidate
CH – Critical Habitat
LE – Listed Endangered
LT – Listed Threatened
PE – Proposed Endangered
PT – Proposed Threatened
XN – Experimental Non-essential

\+ SOC – Species of Concern
PSOC – Potential Species of Concern

Appendix R
Economic Impact Analysis Methodology

Introduction

This appendix describes the methodology and data used to model the economic impacts of public land management decisions on communities surrounding federal lands. Input-output models, such as the Impact Analysis for Planning (IMPLAN) model, provide a quantitative representation of the production relationships between individual economic sectors. Thus, the economic modeling analysis uses information about physical production quantities and the prices and costs for goods and services. The inputs required to run the IMPLAN model are described in the following narrative and tables. The resulting estimates from the IMPLAN model, by alternative, can be found in the Economic Conditions section in Chapter 4. The first section of this appendix describes general aspects of the IMPLAN model and how it was used to estimate economic impacts. The remaining sections provide additional detailed data used in the analysis for livestock grazing, recreation, and oil and gas.

L.2 The IMPLAN Model

IMPLAN is a widely accepted economic model commonly used for regional contribution and impact analysis. This model provides a mathematical representation of the local economy, which enables the flow of money, goods, and services to be tracked and reported in terms of regional jobs and income. IMPLAN models the way a dollar injected into one sector is spent and re-spent in other sectors of the local economy, creating a ripple-like effect. This ripple effect, also called the "multiplier effect," reflects changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly impacted) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

This analysis conducted for this RMP used IMPLAN 2012; prior to running the model, cost and price data were converted to a consistent dollar year (2012) using sector-specific adjustment factors from the IMPLAN model. The values in this appendix are expressed in year 2012 dollars so that the earnings and employment estimates can be easily compared to the latest (i.e., 2012) earnings and employment data available from the Bureau of Economic Analysis. The current IMPLAN model has 440 economic sectors, of which 151 are represented in the eight planning area counties. This analysis involved direct changes in economic activity for 54 IMPLAN economic sectors, as well as changes in all other related sectors due to the ripple effect. The IMPLAN production coefficients were modified to reflect the interaction of producing sectors in the study area. As a result, the calibrated model does a better job of generating multipliers and the subsequent impacts that reflect the interaction between and among the sectors in the study area compared to a model using unadjusted national coefficients. For instance, worker productivity in oil and gas production is higher in Montana than the national average.

Key variables within the IMPLAN model use data specific to the HiLine region of Montana, including employment estimates, labor earnings, and total industry output. Data on resource outputs from the BLM (recreation visits, AUMs, mineral uses, etc.) are also specific to the BLM in the HiLine region. Because resource outputs from the BLM are only available at the multi-county level the IMPLAN model is run at a regional (multi-county) scale, with the coefficients that describe linkages between sectors aggregated to the eight-county level. Because of this mathematical aggregation, impacts for individual counties and communities are not included.

Livestock Grazing

Economic impacts associated with livestock grazing on BLM lands within the planning area were estimated in accordance with protocols developed by Economists at the Bureau of Land Management and Forest Service (U.S. Department of Interior 2012). Forage availability was measured in animal unit months (AUMs), with one AUM defined

as the amount of forage needed to feed a cow, a bison, one horse, or five sheep for one month. Data on two types of AUM measures were obtained from the BLM's Rangeland Administration System (BLM 2013): Active AUMs (amount of forage authorized under a term grazing permit or lease) and Billed AUMs (the amount of forage that the BLM billed for in a year). According to Rangeland Reports there were 408,282 active AUMs within the HiLine in 2012 but only 371,975 AUMs were billed that year.

Billed AUMs have a tendency to be lower than active authorized levels because active AUM counts include unit months indefinitely suspended for non-use, and forage needs of permitted operators change from year to year so they may utilize less than the maximum number of AUMs they are authorized under their permit. Since billed use reflects the availability of forage under varying climatic conditions (e.g. drought, wildfire) and provides a more accurate estimate of actual use levels by permittees, billed use is a more appropriate baseline from which reductions in available AUMs due to surface disturbance or restrictions on grazing land should be measured. If reductions were measured from a baseline of active AUMs, economic impacts of livestock grazing on BLM land within the HiLine would be overstated.

The direct employment associated with cattle and sheep grazing on BLM lands within the planning area was estimated in two steps. First, the number of hired farm laborers was taken from the 2007 Census of Agriculture for the beef cattle ranching and sheep and goat farming sectors. Second, unpaid and self-employed individuals are considered since the Census of Agriculture data does not include these individuals. The 2005-2009 American Community Survey includes information on the class of worker (e.g., self-employed, local government, unpaid family worker) by two-digit NAICS industry. In order to determine how public land forage contributed to industry employment (hired laborers, unpaid and self-employed individuals) the number of direct jobs per unit of forage was calculated. Data from the Census of Agriculture on total inventory of beef cows that calved, ewes one year or older, and all goats was used to calculate total forage requirements.[1] The ratio of employment to forage requirements was then used to calculate direct contributions from BLM-administered forage across the HiLine, using data on authorized AUMs[2] in 2012. The indirect and induced contributions were then estimated using analysis-by-parts in IMPLAN.[3] Economic impacts associated with changes in range management under the alternatives were modeled in similar fashion.

Recreation

Visitation data collected from BLM's Recreation Management Information System RMiS suggests that BLM lands within the HiLine District support more than 113,000 recreational visits annually, more than half of which are associated with wildlife-related activities (BLM, RMIS 2011). On their way to the planning area, and once they arrive, these visitors spend money on goods and services such as gas, food, lodging, and souvenirs. In contrast to many other resource and land uses, outdoor recreation is not captured by any one industrial sector. Instead, spending associated with recreational visits to the HiLine stimulates economic activity in a wide range of economic sectors associated with accommodations and food service, arts and entertainment, passenger transportation, and retail trade (Marcouiller and Xia 2008).

Rather than measuring economic impacts, the analysis conducted for the revised HiLine RMP examined the economic significance of outdoor recreation on planning area lands to the local economy. While both impact and significance analysis measures the amount of economic activity in the local economy attributable to outdoor recreation within a defined area, impact analysis only includes spending by visitors who reside outside of the local region since their spending constitutes "new dollars" being injected into the local economy. A significance analysis however, includes the effects of spending by all visitors, both those who reside in the planning area and those who do not. Since much of the spending by local recreationists would likely be shifted to other sectors of the local economy, the results of this analysis do not reflect the loss to the local economy if recreation on BLM lands across the HiLine were eliminated. Instead, the significance analysis shows the size and nature of economic activity associated with these recreational experiences to show how important they are to the local economy.

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[1] Total cattle annual Animal Unit Months (AUM) required = total inventory * 12; Total sheep annual AUMs required = (Sheep & lambs or Goats * 12)/5.

[2] Authorized AUMs are those AUMs that are authorized under a term grazing permit or lease.

[3] Analysis-by-parts is a method of calculating the impacts of a particular activity by separating out the various spending activities of that activity and analyzing their specific impacts. This is done since production functions for IMPLAN sectors 11 and 14 for cattle ranching and other animal production, are not considered completely adequate for consideration of indirect and induced contributions.

Outdoor recreationists participating in activities on public lands have unique spending profiles. Analyses of expenditures reported by national forest visitors has shown that the primary factor determining the amount of money spent on a recreational visit to public lands was the type of trip taken rather than the specific activity they intended to participate while visiting (White, Goodding, and Stynes 2013). Based on this assumption, estimates of visitation to BLM lands within the HiLine were segmented into local and non-local visits and then by trip type. Trip segments examined in the significance analysis included:

Visitors who reside greater than 50 miles from BLM land within the planning area:

- Non-local residents on day trips
- Non-local residents staying overnight on BLM land
- Non-local residents staying overnight off BLM land

Visitors who live within 50 miles of BLM land within the planning area:

- Local residents on day trips
- Local residents staying overnight on BLM land
- Local residents staying overnight off BLM land

The analysis of recreation on BLM lands within the HiLine assumes that visitation in the planning area would be similar to that found on the Lewis and Clark National Forest because of their proximity and similar motorized use levels, enabling analysts to utilize detailed National Visitor Use Monitoring (NVUM) data. Expenditures associated with these visits were estimated using national forest visitor spending profiles developed by the U.S. Forest Service from NVUM survey responses[4]. Using the Lewis and Clark National Forest as a proxy for the HiLine, spending profiles for average spending forests (Table R.2) were applied to visitation estimates for the planning area (Table R.1). Economic contributions of current recreation use levels, and those anticipated under alternative management actions, were modeled in IMPLAN to estimate the indirect and induced effects of recreation related spending under the alternatives on the local economy.

Table R.1
Annual HiLine Recreation Visits by Trip Segment

	Non-Local Segments			***Local Segments***			***Total Annual Visits***
Annual Visits	***Day***	***Overnight on NF***	***Overnight off NF***	***Day***	***Overnight on NF***	***Overnight off NF***	
Non-Wildlife	2,113	3,170	7,396	30,113	528	9,509	52,829
Wildlife	2,417	3,626	8,460	34,443	604	10,877	60,427
Share of Total Visits	**4%**	**6%**	**14%**	**57%**	**1%**	**18%**	**113,256**

Source: BLM, RMIS 2011; White, Goodding, and Stynes 2013

[4] National average spending profiles are developed for seven trip type segments: day trips and overnight trips involving stays on and off the forest for local and non-local visitors, and visitors whose primary trip purpose was not recreation on the forest. Distinct spending profiles are also estimated for high and low spending areas and for selected recreation activity subgroups.

Table R.2
Spending Profiles by Trip Segments for Average Spending Forests*

	Non-Local Segments			*Local Segments*			
Spending Category	*Day*	*Overnight on NF*	*Overnight off NF*	*Day*	*Overnight on NF*	*Overnight off NF*	*Non-Primary‡*
Lodging	0	64	183	0	31	55	136
Restaurant	16	28	119	5	7	36	95
Groceries	10	60	73	7	72	59	46
Gas and Oil	25	57	76	14	41	43	51
Other Transportation	1	2	4	0	0	1	3
Activities	4	9	29	2	4	6	18
Admissions/Fees	5	10	19	2	4	7	12
Souvenirs/Other	7	21	46	5	15	21	34
Total	**67**	**249**	**550**	**35**	**173**	**228**	**397**

Source: White, Goodding, and Stynes 2013

* Dollar figures are expressed in 2012 dollars and represent the spending of the entire group on BLM lands and within 50 miles of the boundary of BLM lands during the trip. Figures have been adjusted to 2012 dollars using the Bureau of Labor Statistics' CPI Inflation Calculator, available online: http://www.bls.gov/data/inflation_calculator.htm. The spending figures depicted in this table are one of three sets of national-level spending averages developed from the NVUM data. The shown spending averages are those determined to be most-applicable to the selected forest based on statistical analysis. For more information see "Estimation of National Forest Visitor Spending Averages from National Visitor Use Monitoring: Round 2" by E.M. White, D. B. Goodding, and D. J. Stynes (2013), available online: http://www.fs.fed.us/pnw/pubs/pnw_gtr883.pdf.

Oil and Gas

The economic impact analysis for mineral development reflects drilling, completion, and production activities. Future development scenarios of federally administered minerals within the HiLine District were developed by BLM minerals specialists based on known mineral potential and commercial interest in developing these resources.

Since the BLM does not know exactly what areas will be targeted for development in the future, or how technological advances may affect future production costs or industry outputs, potential economic impacts associated with future mineral development on BLM lands within the HiLine under the alternatives were developed by BLM minerals specialists based on the Reasonable Foreseeable Development scenario (Tables R.3 and R.4). Local economic activity associated with the extraction of federal solid minerals was modeled in IMPLAN as a change in final demand for construction sand and gravel and bentonite. These changes in final demand were estimated by multiplying average annual production by the average 2012 market price for construction sand/ gravel and bentonite. Secondary effects (i.e. indirect and induced) were estimated by IMPLAN based on local trade flows between industrial sectors and those that support personal consumption.

Table R.3
Federal Solid Minerals RFD

	Annual Average					
	Existing	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*	*Alternative E*
Sand and Gravel (short tons)	38,480	38,480	38,480	38,480	38,480	38,480
Bentonite (short tons)	---	230,000	230,000	230,000	230,000	172,500

Table R.4 Federal Fluid Minerals RFD						
Annual Average						
Wells	***Existing***	***Alternative A***	***Alternative B***	***Alternative C***	***Alternative D***	***Alternative E***
New Gas Wells - Producing	--	76	24	65	76	72
New Oil Wells - Producing	--	1	1	1	2	1
New Dry Wells	--	12	12	12	12	12
Gas Production (MCFs)	16,956,257	21,408,854	7,103,972	18,278,203	21,639,476	20,141,212
Oil Production (barrels)	103,353	140,058	127,515	137,044	140,264	138,891

Prices for fluid minerals are much more volatile than those for solids, so economic contributions and impacts associated with federal oil and gas production were estimated using a local industry output to employment ratio rather than as a change in final demand. This ratio was then multiplied by the oil and gas output attributable to federals minerals administered by the HiLine to obtain the direct employment effect of BLM production in the planning area (Table R.5). The indirect and induced effects were then estimated from this direct effect using IMPLAN. Impacts associated with oil and gas development under the alternatives were estimated using the same two-step process where direct employment is calculated by maintaining the industry output to employment ratio and using IMPLAN to calculate the secondary effects (indirect and induced).

Table R.5 Baseline Contributions of Federal Oil and Gas Production	
Baseline Data	
Total Value of 8-County Production	$ 275,648,596
Average Output per Worker	$ 314,237
Baseline Local Employment Contribution (jobs)	496
Direct Employment	305
Indirect & Induced Employment	191
Baseline Local Income Contribution	$ 22,013,170
Direct Income	$ 14,608,278
Indirect & Induced Income	$ 7,404,892

Source: IMPLAN Impact Analysis for Planning 2012
* Multipliers are used to measure economy-wide impacts of industry-specific economic changes. Estimated as the ratio of total to direct impacts, multipliers are a measure of the ripple effect created by new money.

Payments to Counties

Federal land management agencies administer a number of revenue-sharing programs to compensate states and counties for federal lands within their boundaries. These programs are complex and include stipulations affecting the formulas for the distribution of the payments, the recipients of the payments, and the timing, number, or specified uses of the payments. Since many of the programs and payments are crosscutting, numerous land management agencies work in partnership to collect and distribute revenue to counties entitled to compensation. While only a small portion of natural

resource-related payments are associated with BLM resources, these payments are critical to funding basic services such as law enforcement, education, fire protection and road maintenance in rural communities across the West.

Revenue-sharing programs administered by the BLM entitle local governments to a portion of receipts derived from the use, extraction, or sale of natural resources on BLM lands within their jurisdiction; as well as payments in lieu of the property taxes (PILT) that would have been received if these federal lands were privately owned (Chapter 4, Tables 4.35 and 4.36). While PILT payments are calculated based on population size and the number of federal acres, revenue-sharing payments are determined by use levels and whether the revenue was generated on acquired or public domain lands[5].

Federal revenues (Chapter 4, Tables 4.35 and 4.36) associated with livestock graving, mineral development, right-of-ways, and recreation were estimated based on current permit and rental costs, and market values. The distribution of these payments back to State and local governments were then estimated in accordance with the regulations in Table R.6 and based on the assumption that 75% of minerals and 65% of surface acres administered by the HiLine District are public domain and 25% of minerals and 35% of surface lands were LU acquired lands.

While payments associated with BLM resources only account for a portion of natural resource-related revenue distributed to counties across the HiLine, local rural communities rely heavily on these payments to cover basic operating costs and to fund basic community services. The economic contributions of payments to counties from BLM natural resources were analyzed through the salary and non-salary expenditures funded by these payments. Using institutional and household spending profiles developed by the US Forest Service, general local government, education, road, and household spending associated with natural resource revenues were modeled in IMPLAN. To assess how management actions under the alternatives may affect future payments to counties, changes in federal, state, and county revenue from BLM land and resource uses were estimated and anticipated levels of local government, education, construction, and household spending associated with these payments were modeled in IMPLAN.

Table R.6
Distribution of Natural Resource Related Payments to State/Counties

Type of Payment	*Public Domain Lands*	*Acquired (LU) Lands*	*Reclamation Lands*
Taylor Grazing Act of 1934 (43 U.S.C. 315)	50% of grazing fees from section 3 (inside grazing districts) and 12.5% of grazing fees from section 15 (outside grazing district) are distributed to the State. 100% of these funds area reallocated back to the counties where 50% goes to the general fund and 50% goes to schools.		
Bankhead Jones Farm Tenant Act of 1937 (7 U.S.C. 1012)		25% of gross revenue from land uses (i.e grazing, recreation, minerals, timber, and right-of-ways) are paid to the state who distributes 100% back to counties of production for schools, roads, or both.	

[5] There are two types of land under federal ownership: public domain and acquired. Public domain lands are those that have always been in federal ownership, while acquired lands (LU) are lands in federal ownership but were obtained from private owners.

Mineral Leasing Act of 1920 (30 U.S.C. 181)	49% of gross revenue is distributed to the State. 25% of these funds are redistributed back to counties of production and put towards the general fund and schools.		
Proceed of Sales Payments (31 U.S.C. 487)			4% of gross revenues from the sale of lands and materials is distributed to the State
PILT	Annual PILT payments are estimated in two ways based on 1) eligible federal acres in the county, 2) federal revenue sharing prior fiscal year, and 3) the population of the county to the extent that it provides a limit for the payment. The county then receives the larger of the two calculated amounts as PILT which is put towards the general fund.		

Literature Cited

Marcouiller, D.W. and X. Xia. 2008. Distribution of income from tourism sensitive employment. Tourism Economics 14, 3: 545-565. Available online at http://urpl.wisc.edu/people/marcouiller/publications/TE.pdf.

White, E.ric M., D. B. Goodding, and D. J. Stynes. 2013. "Estimation of National Forest Visitor Spending Averages from National Visitor Use Monitoring: Round 2" by E.M. Available online at http://www.fs.fed.us/pnw/pubs/pnw_gtr883.pdf.

Appendix S
Recreation Sites and Management Areas

The BLM released Handbook H-8320-1, Planning for Recreation and Visitor Services, on August 22, 2014. The handbook assists BLM staff in the planning and management of recreation and visitor services on public land. The release of the handbook coincided with the final development of the Proposed RMP/Final EIS. Accordingly, not all recreation and visitor services decisions in this Proposed RMP/Final EIS follow the recommended format provided in the handbook. As a result of following guidance in the earlier handbook, the alternatives contain both land use planning-level and implementation-level decisions for recreation and visitor services. Implementation-level decisions for recreation management areas and recreation sites (Map 2.10) are presented below.

Recreation Sites

Decisions Common to All Alternatives

Any existing recreational facilities, such as picnic tables or fire rings, would be removed from areas that would not be managed as recreation sites. Whether or not to remove or maintain livestock exclosure fences would be analyzed on a case-by-case basis.

Alternative A (Current Management)

The BLM would continue to manage the existing recreation sites and facilities (72 sites) that are shown in Table S.1 and displayed on Map 2.10, which is located at the end of Chapter 2.

Alternatives B and C

The BLM would manage 48 recreation sites and facilities (Table S.1 and Map 2.10). Some of the existing fishing reservoir recreation sites (24 sites) would not be managed due to poor habitat and/or insufficient water capacity. Those reservoirs that lack water during dry periods would be considered for fish stocking in good water years.

Recreation sites and facilities would be maintained and managed to promote resource value protection, public safety and health, quality facilities, visitor experiences, management efficiency, and value-based returns. New sites could be developed commensurate with public demand, resource constraints, and management capabilities. Priority would be given to new sites that have partnership funding strategies and are consistent with established management guidelines.

Alternative D

The BLM would manage 50 recreation sites and facilities (Table S.1 and Map 2.10). Some of the existing fishing reservoir recreation sites (24 sites) would not be managed due to poor habitat and/or insufficient water capacity. Those reservoirs that lack water during dry periods would be considered for fish stocking in good water years. In addition to the 48 sites under Alternatives B and C, Timber Creek Ridge and Thirty Mile OHV would also be managed as recreation sites.

Recreation sites and facilities would be maintained and managed to promote resource value protection, public safety and health, quality facilities, visitor experiences, management efficiency, and value-based returns. New sites could be developed commensurate with public demand, resource constraints, and management capabilities. Priority would be given to new sites that have partnership funding strategies and are consistent with established management guidelines.

Alternative E

The BLM would manage 49 recreation sites and facilities (Table S.1 and Map 2.10). Some of the existing fishing reservoir recreation sites (24 sites) would not be managed due to poor habitat and/or insufficient water capacity. Those

reservoirs that lack water during dry periods would be considered for fish stocking in good water years. In addition to the 48 sites under Alternatives B and C, Timber Creek Ridge would also be managed as a recreation site.

Recreation sites and facilities would be maintained and managed to promote resource value protection, public safety and health, quality facilities, visitor experiences, management efficiency, and value-based returns. New sites could be developed commensurate with public demand, resource constraints, and management capabilities. Priority would be given to new sites that have partnership funding strategies and are consistent with established management guidelines.

In PHMAs, the BLM would not construct new recreation facilities (e.g., campgrounds, trails, trailheads, staging areas) unless the development would have a net conservation gain to Greater Sage-Grouse habitat (such as concentrating recreation, diverting use away from critical areas, etc.), or unless the development is required for visitor health and safety or resource protection.

Table S.1
BLM-Managed Recreation Sites and Facilities

Recreation Site Name	***Alternative A (Current Management)***	***Alternatives B, C, D and E (Preferred Alternative)***
Blaine County		
Anita Fishing Reservoir	✓	✓
BR-12 Watchable Wildlife Reservoir	✓	✓
Bus Fishing Reservoir	✓	
Don Fishing Reservoir	✓	✓
Floyd Flynn Fishing Reservoir	✓	✓
FR Fishing Reservoir	✓	✓
North Faber Fishing Reservoir	✓	✓
Reser Fishing Reservoir	✓	✓
Ridge Fishing Reservoir	✓	
Salmo Fishing Reservoir	✓	✓
South Cassidy Fishing Reservoir (BR-19)	✓	✓
Thirty Mile OHV		✓ (Alternative D only)
Glacier County		
Sullivan Bridge Boat Take Out Area	✓	✓
Hill County		
Fresno OHV	✓	✓
Gauging Station Boat Take Out Area	✓	✓
Liberty County		
Moffat Bridge Boat Take Out Area	✓	✓
Pugsley Bridge Recreation Area	✓	✓
Phillips County		
Batosh Fishing Reservoir	✓	✓
Bell Ridge Fishing Reservoir	✓	
Bison Bone Fishing Reservoir	✓	
Bresaylor Fishing Reservoir	✓	
Buddy Fishing Reservoir	✓	
Buffington Day Use Picnic Area	✓	✓
Camp Creek Campground/Watchable Wildlife Area	✓	✓
Compton Fishing Reservoir	✓	
Cottonwood Riparian Protection Area	✓	✓
Current Fishing Reservoir	✓	✓
Dogtown Fishing Reservoir	✓	
Douchette Fishing Reservoir (PR-132)	✓	
Flake Fishing Reservoir	✓	
Karsten Coulee Fishing Reservoir	✓	✓
King Fishing Reservoir	✓	✓

Table S.1
BLM-Managed Recreation Sites and Facilities

Recreation Site Name	***Alternative A (Current Management)***	***Alternatives B, C, D and E (Preferred Alternative)***
Lark Fishing Reservoir	✓	✓
Loader Fishing Reservoir	✓	
Montana Gulch Campground	✓	✓
Paleface Fishing Reservoir	✓	✓
Plutz Fishing Reservoir	✓	✓
PR-109A Fishing Reservoir	✓	
PR-16 Fishing Reservoir	✓	
PR-18 Fishing Reservoir	✓	✓
PR-20 Fishing Reservoir	✓	✓
PR-22 Fishing Reservoir	✓	
PR-54 Fishing Reservoir	✓	✓
Rebate Fishing Reservoir	✓	✓
Rotator Cup Fishing Reservoir	✓	
Sagebrush Fishing Reservoir	✓	✓
Sentinel Fishing Reservoir	✓	✓
Shallow Fishing Reservoir	✓	✓
Shoulder Blade Fishing Reservoir	✓	
Spanky Fishing Reservoir	✓	
Taint Fishing Reservoir	✓	✓
Thunder Cloud Fishing Reservoir	✓	✓
Wapiti Fishing Reservoir	✓	
Wedding Fishing Reservoir	✓	
Whiteface Fishing Reservoir	✓	✓
Wrangler Fishing Reservoir	✓	✓
Valley County		
Atlas Fishing Reservoir	✓	✓
Big Fishing Reservoir	✓	✓
Bitter Creek WSA/Watchable Wildlife Area	✓	✓
Faraasen Park Recreation Area	✓	✓
Gay Fishing Reservoir	✓	
Glasgow OHV	✓	✓
Helen Fishing Reservoir	✓	✓
Hose Fishing Reservoir	✓	✓
Langen Fishing Reservoir	✓	✓
Lunch Fishing Reservoir	✓	
Paulo Fishing Reservoir	✓	✓
Shoot Fishing Reservoir	✓	
Snow Fishing Reservoir	✓	
Timber Creek Ridge		✓ (Alternatives D and E only)
Triple Crossing Fishing Reservoir	✓	
Troika Fishing Reservoir	✓	✓
Valley Fishing Reservoir	✓	✓
Wards Dam Watchable Wildlife Area	✓	✓

The BLM has established a three-tier system of lands managed for recreation where Special Recreation Management Areas (SRMAs) will be given management priority to provide quality recreation opportunities and visitor experiences. Extensive Recreation Management Areas (ERMAs) will also require specific management consideration, but commensurate with the management of other resources and resource uses. All remaining lands will be managed as public lands not designated as recreation management areas (LND), and would generally be managed only to address basic recreation and visitor services and resource stewardship needs such as visitor safety and use, and user conflicts. The three Recreation Management Area categories are described as follows:

- **Special Recreation Management Areas**

  Special Recreation Management Areas (SRMAs) are administrative units where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance and/or distinctiveness, especially as compared to other areas used for recreation.

  SRMAs have recreational values with development potential and need more intensive recreation management because outdoor recreation is a high priority, thus requiring a greater recreation investment. Major investments in facilities within Special Recreation Management Areas can be excluded where the BLM's strategy is to target demonstrated, undeveloped, recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demands to sustain distinctive recreation setting characteristics. However, major investments in visitor services can be authorized both to sustain those distinctive setting characteristics and to maintain visitor freedom to choose where to go and what to do; all in response to demonstrated demand for undeveloped recreation.

- **Extensive Recreation Management Areas**

  Extensive Recreation Management Areas (ERMAs) are administrative units that require specific management consideration in order to address recreation use, demand or recreation and visitor services program investments.

  ERMAs also have recreational values with development potential but require less intensive recreation management than Special Recreation Management Areas. Management of these areas focuses on supporting and sustaining the principal recreation activities and the associated qualities and conditions of the area, but these activities are commensurate with management of other resources and resource uses. Recreational uses that are not compatible with other resources may be restricted or constrained to achieve the interdisciplinary objectives of the area.

- **Public Lands Not Designated as Recreation Management Areas**

  Public Lands Not Designated as Recreation Management Areas (LND) are all lands not designated as a SRMA or ERMA. These lands are managed to meet basic recreation and visitor services and resource stewardship needs. Recreation is not emphasized; however, recreation activities may occur as long as they are not in conflict with the primary uses of these lands. This category applies to most of the BLM lands that are managed for traditional dispersed recreational use with little or no facility development.

This report presents the completed evaluation forms for all existing and proposed SRMAs and ERMAs in the HiLine planning area (Forms S.1 through S.14). A summary listing is shown below. Maps S.1 through S.14 showing the locations of the SRMAs and ERMAs are found following the individual evaluations.

The HiLine Proposed Resource Management Plan (RMP) includes existing and proposed SRMAs and ERMAs which vary by alternative. All of the SRMAs and ERMAs listed in the Proposed RMP are described in the following pages.

Table S.2 Existing and Proposed SRMAs and ERMAs
HiLine Planning Area

No.	*Name*	*SRMA*	*ERMA*	*Page No.*
S.1	BR-12 Watchable Wildlife Area	Alt. D		1724
			Alt. C, E	1728
S.2	Cottonwood Riparian Area	Alt. D		1731
			Alt. C, E	1735
S.3	Faraasen Park	Alt. D		1738
			Alt. C, E	1742
S.4	Fresno OHV	Alt. D		1745
			Alt. C, E	1748
S.5	Glasgow OHV	Alt. D, E		1751
			Alt. C	1754
S.6	Little Rocky Mountains SRMA	Alt. A, C, D, E		1757
			N/A	
S.7	Marias River	Alt. D		1769
			Alt. C, E	1778
S.8	Paulo Reservoir	Alt. D		1781
			Alt. C, E	1785
S.9	South Phillips Recreation Complex	Alt. D		1788
			Alt. C, E	1792
S.10	Sweet Grass Hills	Alt. D		1795
			Alt. E	1799
S.11	Thirty Mile OHV	Alt. D		1802
			N/A	
S.12	Timber Creek Ridge	N/A		
			Alt. D, E	1806
S.13	Troika Reservoir	Alt. D		1809
			Alt. C, E	1813
S.14	Wards Dam	N/A		
			Alt. D	1816

S.1 BR-12 Watchable Wildlife Area SRMA Alternative D

Supporting Information

Important Values of the SRMA

- Compared to other public wetlands in the area, Wards Dam offers a more diverse wetland ecology providing a variety of aquatic wildlife and plant viewing opportunities that are easily accessed via maintained public roads.
- The SRMA is a Watchable Wildlife site featured in the "Montana Wildlife Viewing Guide" which features the best wildlife viewing sites across Montana.

Recreation Demand

- The primary customers are bird watchers traveling the Montana HiLine and local school groups.

General Types of Visitors to be Targeted

- The visitor segment is identified as school groups on day field trips, birdwatchers and other organized groups such as Boy Scouts and Girls Scouts.

Ability to Manage Recreation Resources

- The SRMA is currently fenced off from the surrounding rangeland to exclude cattle except during prescribed grazing treatments. BR-12 is a Watchable Wildlife site featured in the "Montana Wildlife Viewing Guide" which features the best wildlife viewing sites across Montana. The area also has a history of use by the Chinook Schools for day field trips, Montana Audubon Society for bird watching, and Boy Scouts for badge projects. This area has support and potential partnership opportunities with these groups and others, such as Montana Ducks Unlimited and Montana Fish, Wildlife, and Parks to maintain and further develop the wildlife habitat and visitor opportunities at the site.

SRMA Outcome Objective

Maintain and enhance the facilities at BR-12 Watchable Wildlife Area as needed to meet recreational demands and comply with public health and safety requirements. Establish the site as an annual outdoor classroom destination for the Chinook Schools and other area schools.

Activities	• Outdoor Classroom/School Field Trips • Bird Watching/Wildlife Viewing
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups

	Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Naturalness:
- The site provides a variety of native upland and wetland plant and animal species.

Visitor Facilities:
- The site is accessible from the County Road by an approach and cattle guard. Parking is provided at the entrance to the site. Future facilities proposed include an interpretive panel describing the unique wildlife and plant features of the area at the parking area, as well as a walking trail to the northwest end of the wetland where a wildlife photography/observation blind will be made available to minimize impacts to the plant, soil and wildlife resources.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 2 encounters per day.

Group Size (avg.):
- The average size of the casual or bird watching group size would be 2-4 whereas the average outdoor classroom group size would be around 20.

Evidence of Use:
- Sounds of other people occasionally heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- Motorized travel is limited to existing trails. The rest of the area would be accessible by foot. The predominant uses at this site are non-motorized.

Visitor Services/Info:
- An interpretive panel and site map at the parking area will assists visitors with area rules, regulations and ethics as well as viewing opportunities. A walking trail leading to a wildlife photography/observation blind will provide visitors with enhanced wildlife viewing opportunities while minimizing disturbance to the vegetation and wildlife resources.
- Picnic tables will be provided near the parking area to enhance visitor use and outdoor classroom activities.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence is low and infrequent except during outdoor classroom group visits.

Supporting Management Action and Allowable Use Decisions

Camping:
- The SRMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Firearm Use Restriction:
- The discharge of firearms for recreational target shooting is prohibited in developed recreation sites.

Lands and Realty:
- ROW avoidance areas are applied to the SRMA.
- ROW avoidance areas are applied to developed recreation sites.
- The SRMA is retained for long-term management.
- Developed recreation sites are retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the SRMA for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be low priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative D, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:
- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:
- Reroute trails that that create resource damage and trespass on private property.
- Develop a wildlife and habitat monitoring-management plan to maintain the diversity of native wildlife and plant species on which the area recreation is dependent.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the SRMA objectives and RMA opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.1 BR-12 Watchable Wildlife Area ERMA Alternatives C and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the facilities at BR-12 Watchable Wildlife Area as needed to meet recreational demands and comply with public health and safety requirements. Establish the site as an annual outdoor classroom destination for the Chinook Schools and other area schools.

Activities	• Outdoor Classroom/School Field Trips • Bird Watching/Wildlife Viewing • Waterfowl Hunting
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:
- ROW avoidance areas are applied to the ERMA.
- The SRMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the ERMA for the protection of the recreation activities and objectives.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.

Facilities:

- Under Alternative E (preferred), the ERMA boundary will be expanded to the County road to the west to provide a graveled public parking area and interpretive sign to enhance visitor experience.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Develop a wildlife and habitat monitoring-management plan to maintain the diversity of native wildlife and plant species on which the area recreation is dependent.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

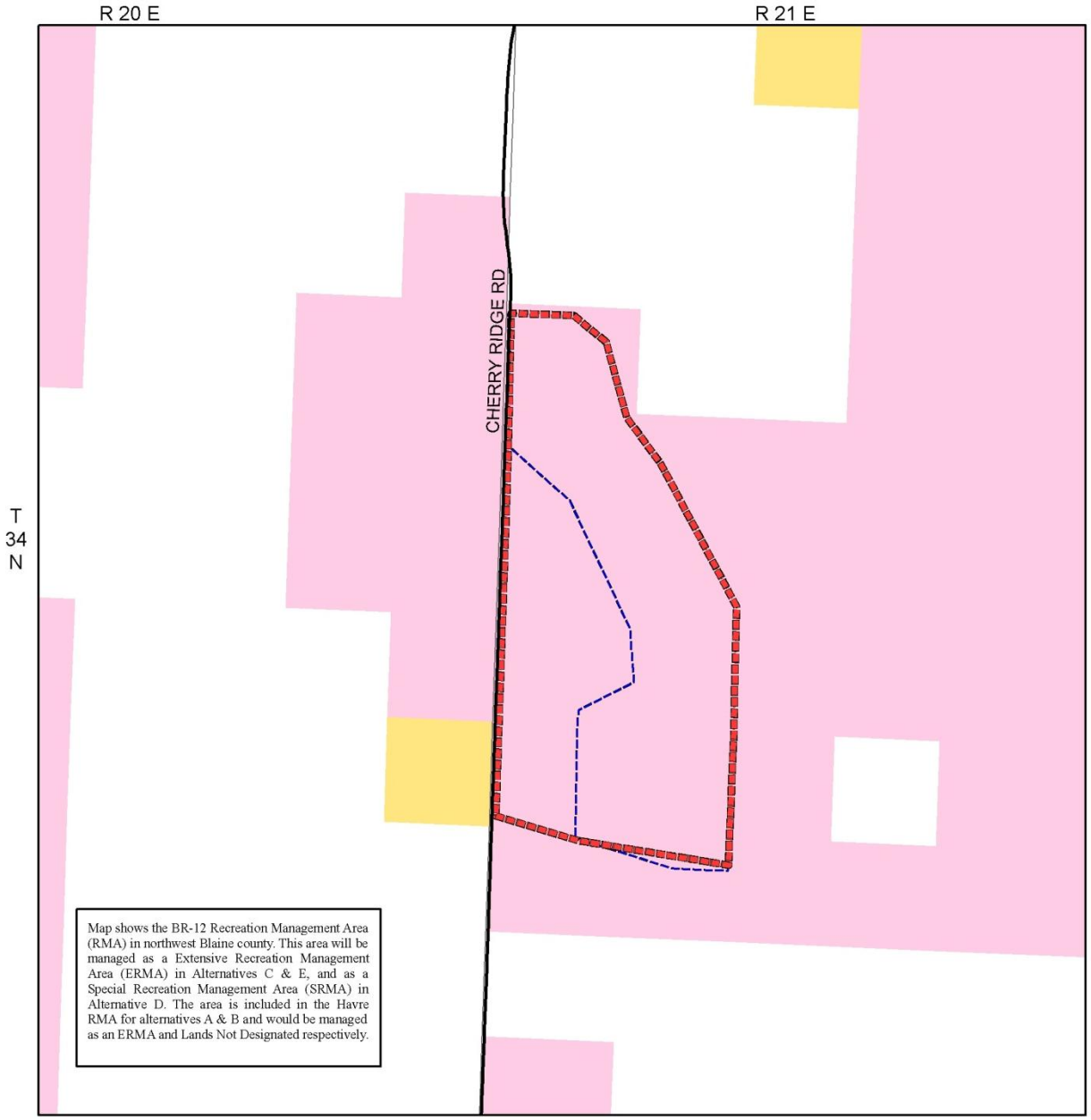
- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation annually during the primary use season of mid-April through November.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.



U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District

Map S.1

BR-12
Recreation Management Area

This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.

- Bureau of Land Management (BLM)
- Bankhead-Jones Land Use Lands
- US Fish and Wildlife National Wildlife Refuge
- Bureau of Reclamation
- Indian Reservation
- State
- Private
- Water
- RMA Boundary (C & D)
- RMA Boundary (E)
- County Route
- U.S. Route

Approximate location within the planning area

S.2 Cottonwood Riparian Area SRMA Alternative D

Supporting Information

Important Values of the SRMA

- The area offers diverse wildlife and riparian area ecology viewing opportunities that are easily accessed via maintained public roads.

Recreation Demand

- The primary customers are bird watchers, anglers, campers and local school groups.

General Types of Visitors to be Targeted

- The visitor segment is identified as school groups on day field trips, birdwatchers and Milk River anglers.

Ability to Manage Recreation Resources

- The SRMA is currently fenced off from the surrounding rangeland to exclude cattle except during prescribed grazing treatments. The area is occasionally used by the Malta Schools for day field trips, outdoor classroom and science fair projects. This area has support and potential partnership opportunities with the local schools and other groups and agencies to maintain and further develop the wildlife habitat and visitor opportunities at the site.

SRMA Outcome Objective

Maintain and enhance the facilities at Cottonwood Riparian Area as needed to meet recreational demands and comply with public health and safety requirements. Establish the site as an annual outdoor classroom destination for the Malta Schools and other area schools.

Activities	• Outdoor Classroom/School Field Trips • Bird Watching/Wildlife Viewing • Fishing
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics • River fishing
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place • Catch fish for a healthy food source Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups Environmental: • Preserve the special landscape character of this place

	Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Naturalness:
- The site provides a variety of native riparian plant and animal species.

Visitor Facilities:
- The site is accessible from the County Road by a maintained BLM road with approaches and cattle guards. Parking, restroom and camping/picnic facilities are provided as well as access to the Milk River. Future facilities proposed include additional camp sites and interpretive panels describing the unique wildlife and plant features of the area.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 2 encounters per day.

Group Size (avg.):
- The average size of the casual or bird watching or fishing group size would be 2-4 whereas the average outdoor classroom group size would be around 20.

Evidence of Use:
- Sounds of other people occasionally heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- Motorized travel is limited to existing roads. The rest of the area would be accessible by foot. The predominant uses at this site are non-motorized.

Visitor Services/Info:
- A sign and brochure box at the parking/restroom area will inform visitors of area rules, regulations and ethics as well as recreational opportunities. A walk-through gate on the south boundary provides access to the Milk River.
- A picnic table and fire ring are provided at each camp site to enhance visitor use and outdoor classroom activities.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM cleans and maintains the bathroom and campsite facilities on a weekly basis during the spring-fall season and monthly during the winter season. BLM staff accompanies outdoor classroom groups.

Supporting Management Action and Allowable Use Decisions

Camping:
- The SRMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:

- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.

Firearm Use Restriction:

- The discharge of firearms for recreational target shooting is prohibited in developed recreation sites.

Lands and Realty:

- ROW avoidance areas are applied to the SRMA.
- ROW avoidance areas are applied to developed recreation sites.
- The SRMA is retained for long-term management.
- Developed recreation sites are retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:

- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the SRMA for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative D, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Develop a wildlife and habitat monitoring-management plan to maintain the diversity of native wildlife and plant species on which the area recreation is dependent.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the SRMA objectives and RMA opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.2 Cottonwood Riparian Area ERMA Alternatives C and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the facilities at Cottonwood Riparian Area as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Bird Watching/Wildlife Viewing • Camping • Picnicking • Fishing
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:
- Under Alternative E (preferred) ROW avoidance areas are applied to the ERMA.
- The ERMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the ERMA for the protection of the recreation activities and objectives.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Develop a wildlife and habitat monitoring-management plan to maintain the diversity of native wildlife and plant species on which the area recreation is dependent.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

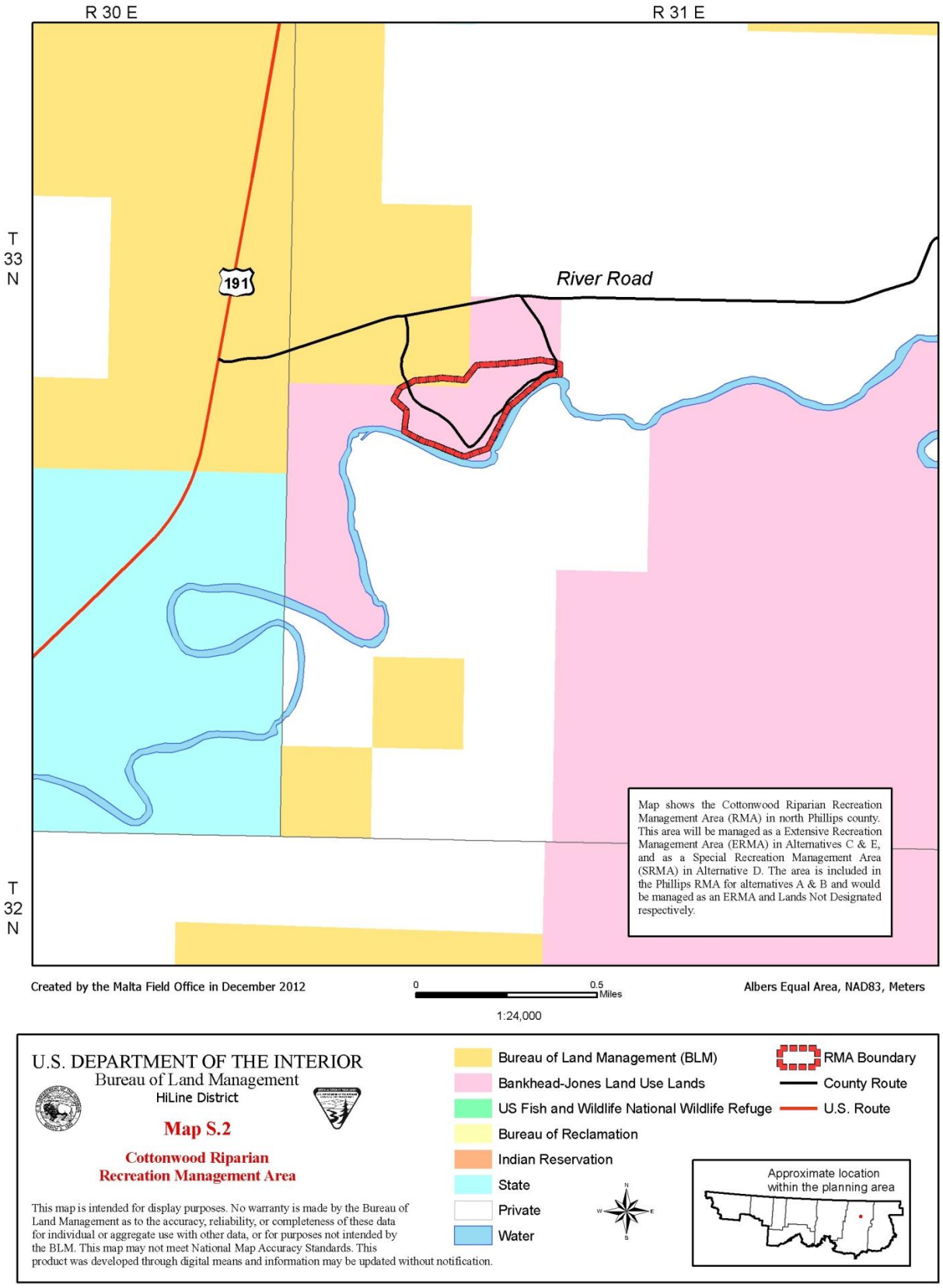
- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation annually during the primary use season of mid-April through November.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.


R 30 E
R 31 E
T 33 N
T 32 N
191
River Road
Map shows the Cottonwood Riparian Recreation Management Area (RMA) in north Phillips county. This area will be managed as a Extensive Recreation Management Area (ERMA) in Alternatives C & E, and as a Special Recreation Management Area (SRMA) in Alternative D. The area is included in the Phillips RMA for alternatives A & B and would be managed as an ERMA and Lands Not Designated respectively.
Created by the Malta Field Office in December 2012
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U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.2
Cottonwood Riparian
Recreation Management Area
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMA Boundary
County Route
U.S. Route
Approximate location within the planning area

S.3 Faraasen Park SRMA
Alternative D

Supporting Information

Important Values of the SRMA
- The area offers diverse wildlife and riparian area ecology viewing opportunities that are easily accessed via maintained public roads.

Recreation Demand
- The primary customers are local families (picnics), anglers, and overnight campers.

General Types of Visitors to be Targeted
- The visitor segment is identified as Milk River anglers and local families.

Ability to Manage Recreation Resources
- The SRMA is currently fenced off from the surrounding lands to exclude cattle except during prescribed grazing treatments. This area has support and potential partnership opportunities with the local schools and other groups and agencies to maintain and further develop the wildlife habitat and visitor opportunities at the site.

SRMA Outcome Objective

Maintain and enhance the facilities at Faraasen Park as needed to meet recreational demands and comply with public health and safety requirements. Promote the site as an annual outdoor classroom destination for the Glasgow schools and other area schools.

Activities	• Family/Group Picnics • Bird Watching/Wildlife Viewing • Fishing • Outdoor Classroom
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics • River fishing
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place • Catch fish for a healthy food source Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups Environmental: • Preserve the special landscape character of this place

	Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Naturalness:
- The site provides a variety of native riparian plant and animal species.

Visitor Facilities:
- The site is accessible from the County Road by a maintained BLM road with an approach and cattle guard. Parking and picnic facilities are provided as well as access to the Milk River. Future facilities proposed include additional camp sites, restroom and signage describing the rules, regulations and recreation opportunities at the site.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 2 encounters per day.

Group Size (avg.):
- The average size of the casual or picnic or fishing group size would be 2-4 whereas the average outdoor classroom group size would be around 20.

Evidence of Use:
- Sounds of other people occasionally heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- Motorized travel is limited to existing roads. The rest of the area would be accessible by foot. The predominant uses at this site are non-motorized.

Visitor Services/Info:
- A sign and brochure box at the parking/restroom area will inform visitors of area rules, regulations and ethics as well as recreational opportunities. A walk-through gate on the south boundary provides access to the Milk River.
- A picnic table and fire ring are provided at each camp site to enhance visitor use and outdoor classroom activities.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM mows the parking and picnic areas and fishing access trail on a monthly basis during the spring-fall seasons, maintains the fence and other visitor use facilities as needed. BLM staff accompanies outdoor classroom groups.

Supporting Management Action and Allowable Use Decisions

Camping:
- The SRMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.

Firearm Use Restriction:
- The discharge of firearms for recreational target shooting is prohibited in developed recreation sites.

Lands and Realty:
- ROW avoidance areas are applied to the SRMA.
- ROW avoidance areas are applied to developed recreation sites.
- The SRMA is retained for long-term management.
- Developed recreation sites are retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the SRMA for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be moderate priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative D, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:
- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:
- Reroute trails that that create resource damage and trespass on private property.
- Develop a wildlife and habitat monitoring-management plan to maintain the diversity of native wildlife and plant species on which the area recreation is dependent.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the SRMA objectives and RMA opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.3 Faraasen Park ERMA
Alternatives C and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the facilities at Faraasen Park as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Camping • Fishing • Picnicking
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:
- ROW avoidance areas are applied to the ERMA.
- The ERMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the ERMA for the protection of the recreation activities and objectives.

Visual Resource Management (VRM):
- The ERMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority under Alternative E and moderate priority under Alternative C. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

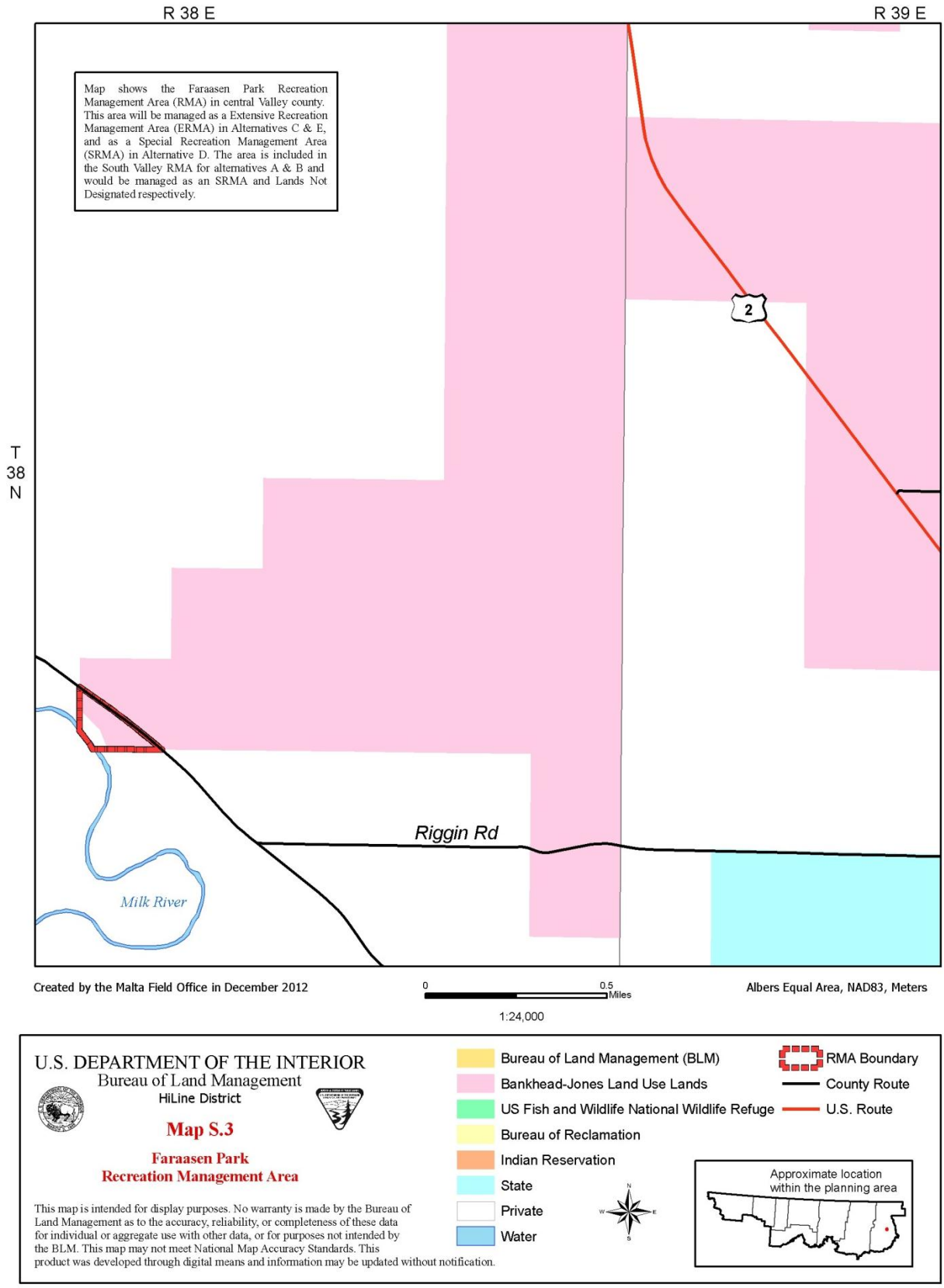
- Pursue partnerships with other agencies and user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation annually during the primary use season of mid-April through October.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.


R 38 E
R 39 E
T 38 N
Map shows the Faraasen Park Recreation Management Area (RMA) in central Valley county. This area will be managed as a Extensive Recreation Management Area (ERMA) in Alternatives C & E, and as a Special Recreation Management Area (SRMA) in Alternative D. The area is included in the South Valley RMA for alternatives A & B and would be managed as an SRMA and Lands Not Designated respectively.
2
Riggin Rd
Milk River
Created by the Malta Field Office in December 2012
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Miles
1:24,000
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U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.3
Faraasen Park
Recreation Management Area
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMA Boundary
County Route
U.S. Route
Approximate location within the planning area

S.4 Fresno OHV SRMA
Alternative D

Supporting Information

Important Values of the SRMA
- The area offers challenging, close-to-town, easy to access recreational opportunities.
- The RMA offers a variety of off-road riding opportunities for OHV recreationists of all skill levels.

Recreation Demand
- The primary customers are local OHV enthusiasts.

General Types of Visitors to be Targeted
- The visitor segment is identified as close-to-home, day-use OHV riders.

Ability to Manage Recreation Resources
- The SRMA is currently accessible via public routes that cross private and State lands. Some issues arise during wet conditions when SRMA users drive through the landowner's fields to get around low, wet spots in the road. The private landowner and State are willing to work with BLM to improve access to the site. Local and State OHV groups are possible partners who can help address these issues as well as develop other improvements and public educational programs for the SRMA.

SRMA Outcome Objective

Maintain and enhance the facilities and signage at Fresno OHV area as needed to meet recreational demands and comply with public health and safety requirements. Avoid damage to surrounding resources by enhancing and/or replacing boundary fences and markers.

Activities	• OHV Riding
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing your skills and abilities • For the challenge or sport • Enjoying the area's scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve natural resources of surrounding area by providing quality motorized recreational opportunities at a designated site Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Remoteness:
- The site provides an unstructured, open, OHV experience in a rugged, natural setting.

Visitor Facilities:
- The site has public access. Improved parking and signage will be developed to enhance the visitor experience and protect surrounding public and private lands.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 8 encounters per day.

Group Size (avg.):
- Participants would encounter a season average of up to 6 people per group.

Evidence of Use:
- Sounds of other people occasionally heard. Localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- The area is open to all types of vehicle use at all times anywhere in the area subject to the operating regulations and vehicle standards set for the in 43 CFR 8341 and 8342.

Visitor Services/Info:
- A simple brochure/map assists visitors. SRMA Boundaries are clearly marked. Rules, regulations and ethics clearly posted at SRMA parking area.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence is low. Parking, boundary and signage will be maintained. A traffic counter will be used to monitor the level of visitor use.

Supporting Management Action and Allowable Use Decisions

Comprehensive Trails and Travel Management:
- The area is classified as open to all types of vehicle use at all times anywhere in the area subject to the operating regulations and vehicle standards set for the in 43 CFR 8341 and 8342.

Lands and Realty:
- The SRMA is retained for long-term management.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority. In the interim, motorized travel is open to all types of vehicle use at all times anywhere in the area subject to the operating regulations and vehicle standards set for the in 43 CFR 8341 and 8342.

Special Recreation Permits:

- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute access trails that that create resource damage and trespass on private property.
- Develop additional access and/or improve current public access to the site to prevent impacts to private and public lands surrounding the SRMA.
- Improve and maintain boundary markings to avoid user conflicts and damage to surrounding resources.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Information and Education:

- Continue to provide a basic, simple SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.
- Pursue partnerships with State and local OHV groups to provide safety and Leave No Trace training for OHV recreationists using public lands.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October using traffic counters.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.4 Fresno OHV ERMA
Alternatives C and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the facilities and signage at Fresno OHV area as needed to meet recreational demands and comply with public health and safety requirements. Avoid damage to surrounding resources by enhancing and/or replacing boundary fences and markers.

Activities	• OHV Riding
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing your skills and abilities • For the challenge or sport • Enjoying the area's scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve natural resources of surrounding area by providing quality motorized recreational opportunities at a designated site Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as closed to OHV use under Alternative C and open to OHV use under Alternative E until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:
- The SRMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities within the ERMA for the protection of the recreation activities and objectives.
- The ERMA would be an exclusion area for wind energy development.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority under Alternative C and moderate priority under Alternative E. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Mark or fence the ERMA boundary to minimize resource damage and trespass on surrounding State and private property.
- Improve signage and public access to the site to avoid impacts to private lands.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

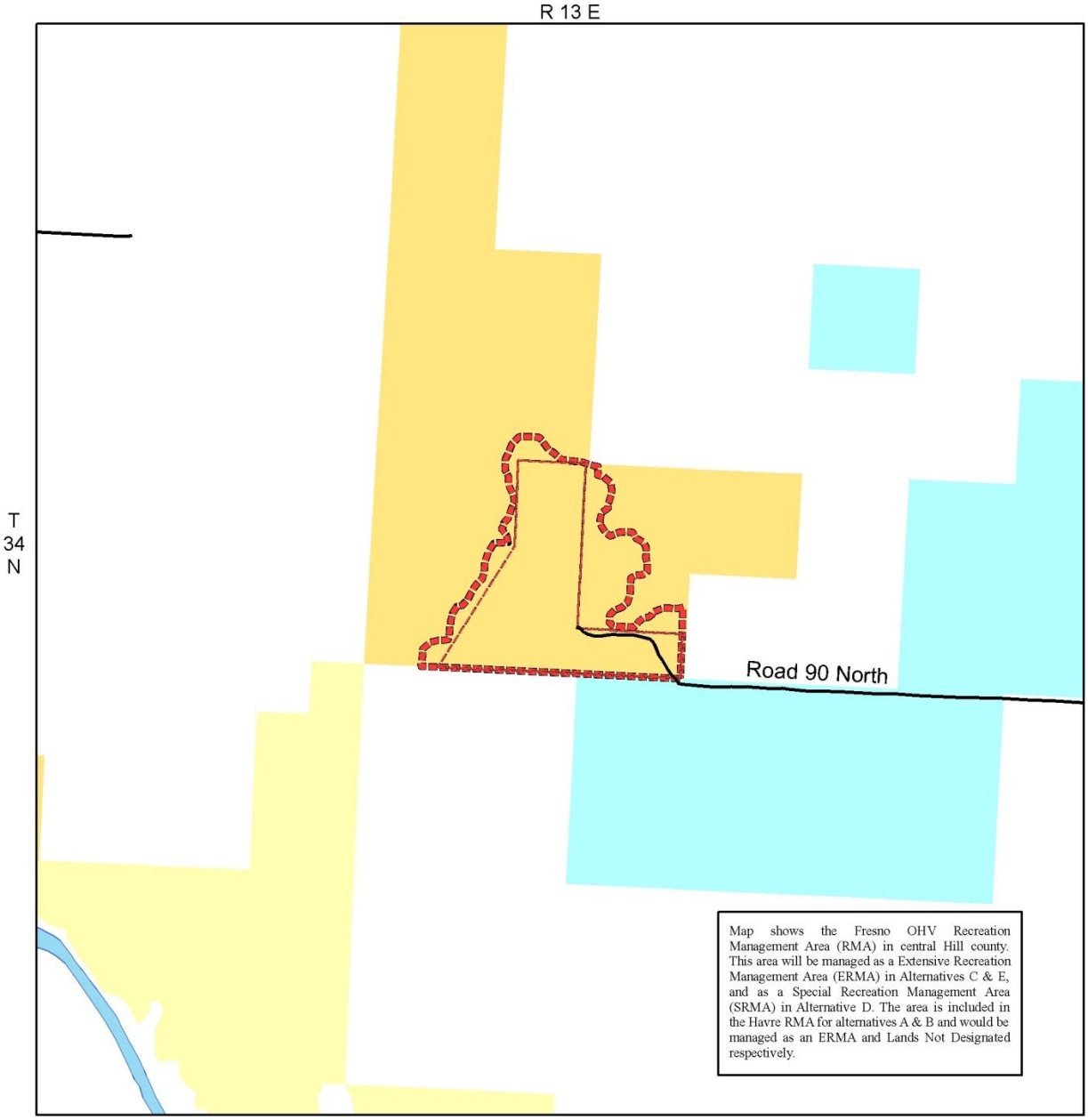
- Pursue partnerships with local user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation annually during the primary use season of mid-April through October.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.



Created by the Malta Field Office in December 2012

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HiLine District

Map S.4

Fresno OHV Recreation Management Area

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Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Bureau of Reclamation
US Fish and Wildlife National Wildlife Refuge
Indian Reservation
State
Private
Water

RMA Boundary Alt. C & D
RMA Boundary Alt. E
County Route
U.S. Route

Approximate location within the planning area

S.5 Glasgow OHV SRMA
Alternatives D and E (Preferred Alternative)

Supporting Information

Important Values of the SRMA
- The area offers challenging, close-to-town, easy to access recreational opportunities.
- The RMA offers a variety of off-road riding opportunities for OHV recreationists of all skill levels.

Recreation Demand
- The primary customers are local OHV enthusiasts.

General Types of Visitors to be Targeted
- The visitor segment is identified as close-to-home, day-use OHV riders.

Ability to Manage Recreation Resources
- The SRMA is currently accessible via public routes that cross City of Glasgow property. BLM works closely with city and county law enforcement to monitor use in and around the SRMA. The boundary of the site is marked by a fence and "Entering Public Lands" signs are installed at each access point. Local and State OHV groups are possible partners who can help address these issues as well as develop other improvements and public educational programs for the SRMA.

SRMA Outcome Objective

Maintain and enhance the facilities and signage at Glasgow OHV area as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• OHV Riding
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing your skills and abilities • For the challenge or sport • Enjoying the area's scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve natural resources of surrounding area by providing quality motorized recreational opportunities at a designated site Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Visitor Facilities:
- The site has public access, boundary fence and signs, restroom, parking and picnic area.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 8 encounters per day.

Group Size (avg.):
- Participants would encounter a season average of up to 6 people per group.

Evidence of Use:
- Sounds of other people occasionally heard. Localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- The area is open to all types of vehicle use at all times anywhere in the area subject to the operating regulations and vehicle standards set for the in 43 CFR 8341 and 8342.

Visitor Services/Info:
- A simple brochure/map assists visitors. SRMA Boundaries are clearly marked. Rules, regulations and ethics clearly posted at SRMA parking area.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM staff will visit the site on a weekly basis through the spring-fall season and monthly during the winter season for restroom and parking area maintenance and cleaning and to monitor for unauthorized uses. Parking, boundary and signage will be maintained. A traffic counter will be used to monitor the level of visitor use.

Supporting Management Action and Allowable Use Decisions

Comprehensive Trails and Travel Management:
- The area is classified as open to all types of vehicle use at all times anywhere in the area subject to the operating regulations and vehicle standards set for the in 43 CFR 8341 and 8342.

Lands and Realty:
- The SRMA is retained for long-term management.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority. In the interim, motorized travel is open to all types of vehicle use at all times anywhere in the area subject to the operating regulations and vehicle standards set for the in 43 CFR 8341 and 8342.

Special Recreation Permits:

- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Continue to coordinate with city and county law enforcement to ensure public safety and adherence to rules and regulations that pertain to the SRMA and surrounding lands.
- Improve and maintain boundary markings to avoid user conflicts and damage to surrounding resources.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Information and Education:

- Continue to provide a basic, simple SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.
- Pursue partnerships with State and local OHV groups to provide safety and Leave No Trace training for OHV recreationists using public lands.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October using traffic counters.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.5 Glasgow OHV ERMA
Alternative C

ERMA Outcome Objective

Maintain and enhance the facilities at Glasgow OHV Area as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Picnicking
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Enjoying the area's scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The public (City of Glasgow) access road to the site is posted as Day Use Only.

Comprehensive Trails and Travel Management:
- Under Alternative C, the area is classified as closed to OHV use until subsequent site-specific travel management planning occurs.
- Over snow travel by snowmobiles is allowed.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be low priority. In the interim, under Alternative C, motorized travel is closed. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.

Special Recreation Permits:
- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Continue to work with other local law enforcement agencies to ensure public safety and conformance with the rules and regulations of the ERMA and surrounding areas.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

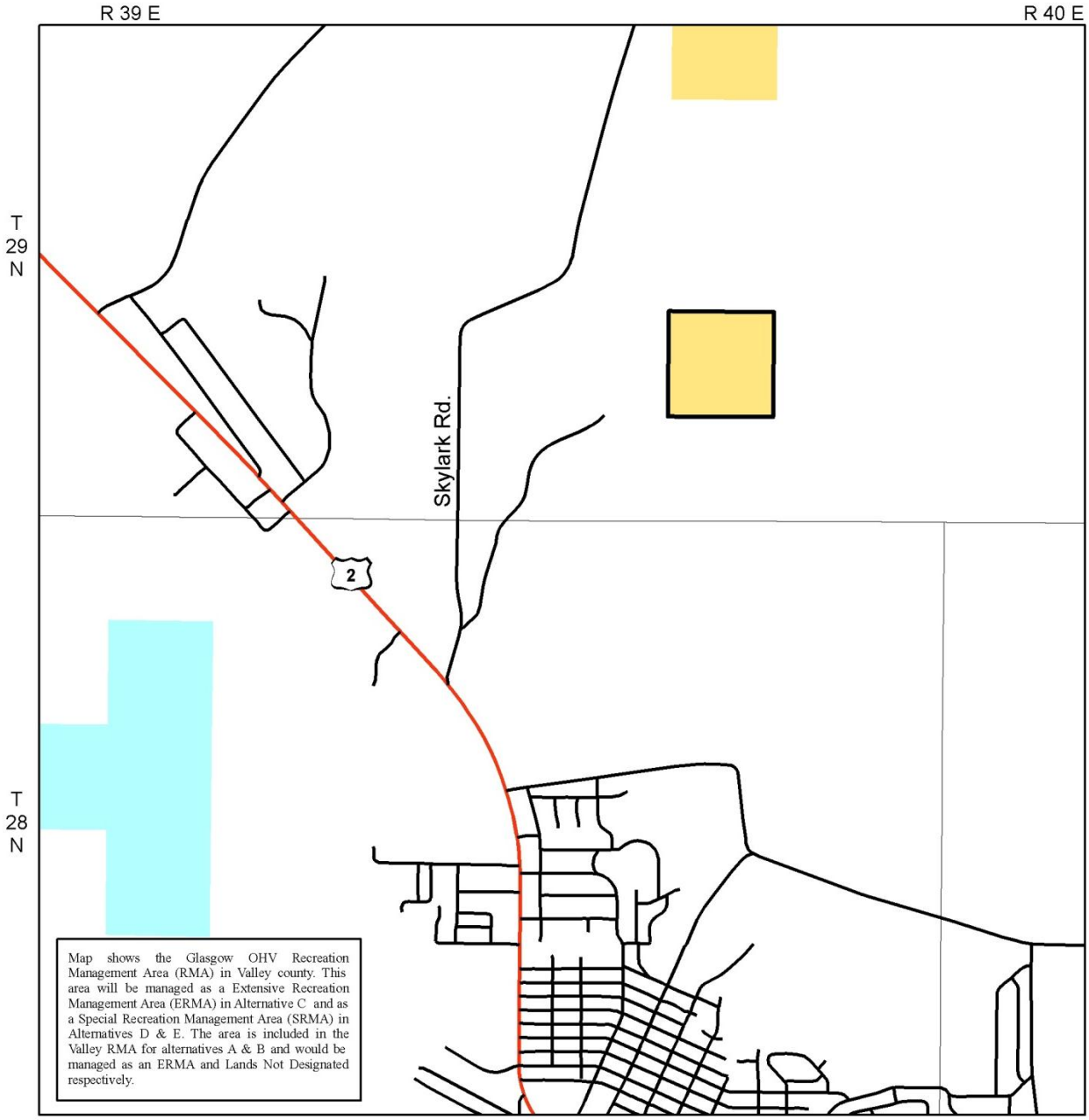
- Pursue partnerships with local user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation annually during the primary use season of mid-April through October.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.



Created by the Malta Field Office in December 2012

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HiLine District

Map S.5

Glasgow OHV Recreation Management Area

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Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water

RMA Boundary
County Route
U.S. Route

Approximate location within the planning area

S.6 Little Rocky Mountains SRMA Alternatives A, C, D and E (Preferred Alternative)

Supporting Information

Important Values of the SRMA

- Includes the Zortman, Landusky and Little Rockies Recreation Management Zones (RMZs)
- Includes the only two developed BLM fee campgrounds within the HiLine District.
- SRMA surrounds two small communities (Zortman and Landusky) and other private lands
- SRMA is surrounded on three sides by Fort Belknap Indian Reservation
- The Little Rocky Mountains area is also designated as a Traditional Cultural Property (TCP)
- Azure Cave ACEC and the former Pegasus Gold Mine are located within the SRMA
- Destination for OHV riders, horseback riders, birders, hunters, anglers, gold panners, hikers, etc.
- Camp Creek is part of Montana's Northeastern Plains Birding Trail

Recreation Demand

- Camping, hunting, birdwatching/wildlife viewing, cross-country skiing and snowshoeing
- OHV and horseback riding
- Access to nearby fishing and hunting opportunities
- Gold panning
- Motorized and nonmotorized trail use
- Most concentrated recreation use within the HiLine District

General Types of Visitors to be Targeted

- HiLine residents, OHV riders, horseback riders, birders, hunters and anglers, gold panners, travelers passing through the area on Highways 191 and 66.

Ability to Manage Recreation Resources

- The community of Zortman depends on the recreational opportunities to support their local store, gas station, restaurant and hotel. Other amenities are more than 50 miles away in Malta or Harlem. The community would like to increase promotion of ecotourism in the area and, since it is surrounded by BLM lands with area restrictions and/or sensitive resources, it's vital that BLM work with the community to assure that these promotions are done in a responsible manner to protect these resources and ensure visitor safety.
- BLM coordinates with Fort Belknap Agency on law enforcement, travel management, and other recreational uses/issues within the SRMA.
- Under Alternatives C, D and E, the SRMA is divided into three Recreation Management Zones (RMZ) (Zortman, Landusky, and Little Rockies) to better manage for the diverse facilities and outcomes based recreation in the area.

Zortman Recreation Management Zone (RMZ)

RMZ Outcome Objective

Maintain and enhance the facilities at the Camp Creek Campground, Horse Corral Campground, and Buffington Day Use Picnic Area as needed to meet recreational demands and comply with public health and safety requirements. Specific areas within this zone could be set aside for recreational gold panning through coordination and/or partnership with the local community.

Activities	• Off-Highway Vehicle Riding and Driving • Overnight Developed Camping • Picnicking • Hiking • Horseback Riding • Bird watching/Wildlife Viewing • Recreational Gold Panning
Experiences	• Enjoying frequent access to outdoor physical activity • Enjoying closeness of family/friends • To test my equipment • Developing your skills and abilities • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved outdoor recreation skills • Improved outdoor knowledge and self – confidence • Improved balance of work and play in my life • Living a more outdoor- oriented lifestyle • Developing stronger ties with my family or friends • Heightened sense of satisfaction with our community • Restore mind from stress/tension/anxiety Community/Social: • Lifestyle improvement or maintenance • Strengthening relationships with family and friends Environmental: • Greater community ownership & stewardship of recreation & natural resources Economic: • Increased desirability as a place to live or retire • Promote tourism and increase commerce to local businesses

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Remoteness:
- Motorized and nonmotorized trails provide access throughout the RMZ.

Naturalness:
- More man-made landscape alterations in the form of trails and facilities are seen. New, non-recreational modifications (e.g. ROWs, fences, ponds) are not visually obvious near recreation facilities and trails.

Visitor Facilities:
- Improved recreation facilities in the form of a diverse range of motorized and nonmotorized trail suited to different fitness and skill levels, restrooms, developed campsites with tables, fire rings and trash cans, information kiosks and signage providing rules, regulations and fee instructions. Drinking fountains and faucets with potable water, horseshoe pits and a volleyball pit are also provided.
- Camp Creek contains 15 designated campsites, Horse Corral has 5 designated sites, and all have access to city drinking water, trash collection and bathroom facilities. A system of motorized and nonmotorized trails is accessible from the campgrounds. Buff's has picnic and outdoor sports facilities as well as city water and a bathroom. The proposal is to maintain these facilities and add campsites and interpretive features as public demand and resources allow.

Proposed Social RSCs:

Contacts (avg.):
- Participants encounter a season average of up to 20 encounters per day.

Group Size (avg.):
- Participants encounter a season average of up to 4 people per group.

Evidence of Use:
- Sounds of other people and OHVs frequently heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use impacts are being rehabilitated.

Proposed Operational RSCs:

Access (types of travel):
- Upon completion of travel management planning, motorized and nonmotorized access will be maintained throughout the RMZ on designated routes.

Visitor Services/Info:
- Upon completion of travel management planning, a brochure/map will be developed to assists visitors with trail information. A moderate level of directional signage will be installed on routes with names/numbers of trails identified. Rules, regulations and ethics are clearly posted at information kiosks.
- A maintenance contract provides regular trash removal, restroom cleaning and campground maintenance during the high-use season.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence, including law enforcement is moderate during the high-use season. County and State law enforcement officers also assist with patrolling and dealing with law enforcement issues in the campgrounds. Fee envelopes track visitor use and provide an opportunity for campers to provide information and feedback to BLM.

Supporting Management Action and Allowable Use Decisions

Camping Restrictions:
- Camping and overnight use is prohibited on BLM lands outside of designated campsites and developed campgrounds within the Camp Creek Recreation Area.
- Visitors are limited 14-day camping stays within the developed campground.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails.
- Over-snow snowmobile travel is allowed.
- Cross-country motorized/mechanized travel for big game retrieval is allowed under Alternative D between the hours of 10:00 a.m. and 2:00 p.m.

Firearm Use Restriction:
- The discharge of firearms is prohibited in developed recreation sites.

Forestry:
- The campground area is closed to timber harvest, firewood cutting and special forest product harvest.

Lands and Realty:
- ROW avoidance areas are applied to the RMZ.
- ROW avoidance areas are applied to developed recreation sites.
- The RMZ is retained for long-term management.
- Developed recreation sites are retained for long-term management.

Mineral Withdrawal:
- The campground is withdrawn from exploration or development of locatable and salable minerals.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the RMZ for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):
- Under Alternatives A, the RMZ would be classified as VRM Class II and managed under VRM Class II objectives.
- Under Alternatives C, D, and E, the RMZ would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be high priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails.
- Off road big game retrieval is allowed under Alternative D.

Special Recreation Permits:
- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:
- Reroute trails that that create resource damage and trespass on private property.
- Through travel management planning, designate trails for motorized and/or nonmotorized travel and provide information on skill level required and other safety and recreational opportunity concerns.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.
- Develop an agreement with the Phillips County Sheriff's Office to increase law enforcement patrols for the RMZ.
- Survey the campground boundary and post with boundary markers for law enforcement purposes and to aid in the maintenance and development of campground facilities.

Administration:
- Continue to charge overnight camping fees to help fund campground maintenance and improvements.
- Assess use fees every 5 years by utilizing the recreation area Business Plan assessment.

Information and Education:
- Create a basic, simple SRMA/RMZ brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

- Partner with local communities and OHV groups to educate visitors on Leave No Trace, Tread Lightly and other safety and ethical recreational issues.

Monitoring:
- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through November using traffic counters and overnight camping permits.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

Landusky Recreation Management Zone (RMZ)

RMZ Outcome Objective

Maintain and enhance the facilities at the Montana Gulch Campground as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Overnight Developed Camping • Picnicking • Hiking • Horseback Riding • Bird watching/Wildlife Viewing
Experiences	• Enjoying frequent access to outdoor physical activity • Enjoying closeness of family/friends • To test my equipment • Developing your skills and abilities • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved outdoor recreation skills • Improved outdoor knowledge and self – confidence • Improved balance of work and play in my life • Living a more outdoor- oriented lifestyle • Developing stronger ties with my family or friends • Heightened sense of satisfaction with our community • Restore mind from stress/tension/anxiety Community/Social: • Lifestyle improvement or maintenance • Strengthening relationships with family and friends Environmental: • Greater community ownership & stewardship of recreation & natural resources Economic: • Increased desirability as a place to live or retire • Promote tourism and increase commerce to local businesses

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Remoteness:
- Ponderosa pine rural setting near the very small community of Landusky.

Naturalness:

- Some man-made landscape alterations in the form of trails and facilities are seen. New, non-recreational modifications (e.g. ROWs, fences, ponds) are not visually obvious near recreation facilities and trails.
- Upstream water treatment plant at the Zortman Mine, at times, produces a discoloration and unpleasant smell in the creek that runs through the campground.

Visitor Facilities:

- Montana Gulch contains 10 designated campsites and a family picnic area and provides trash collection and bathroom facilities. There is no potable water provided. The proposal is to maintain these facilities and add campsites and interpretive features as public demand and resources allow.

Proposed Social RSCs:

Contacts (avg.):

- Participants encounter a season average of up to 10 encounters per day.

Group Size (avg.):

- Participants encounter a season average of up to 4 people per group.

Evidence of Use:

- Sounds of other people frequently heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use impacts are being rehabilitated.

Proposed Operational RSCs:

Access (types of travel):

- Upon completion of travel management planning, motorized and nonmotorized access will be maintained throughout the RMZ on designated routes.

Visitor Services/Info:

- Upon completion of travel management planning, a brochure/map will be developed to assists visitors with trail information. A moderate level of directional signage will be installed on routes with names/numbers of trails identified. Rules, regulations and ethics are clearly posted at information kiosks.
- A maintenance contract provides regular trash removal, restroom cleaning and campground maintenance during the high-use season.

Management Controls:

- A moderate degree of visitor and land use controls exercised. BLM on-site presence, including law enforcement is moderate during the high-use season. Fee envelopes track visitor use and provide an opportunity for campers to provide information and feedback to BLM.

Supporting Management Action and Allowable Use Decisions

Camping Restrictions:

- Camping and overnight use is prohibited on BLM lands outside of designated campsites and developed campgrounds within the Montana Gulch Recreation Area.
- Visitors are limited 14-day camping stays within the developed campground.

Comprehensive Trails and Travel Management:

- The area is classified as limited to existing roads, primitive roads and trails.
- Over-snow snowmobile travel is allowed.
- Cross-country motorized/mechanized travel for big game retrieval is allowed under Alternative D between the hours of 10:00 a.m. and 2:00 p.m.

Firearm Use Restriction:
- The discharge of firearms is prohibited in developed recreation sites.

Forestry:
- The campground area is closed to timber harvest, firewood cutting and special forest product harvest.

Lands and Realty:
- ROW avoidance areas are applied to the RMZ.
- ROW avoidance areas are applied to developed recreation sites.
- The RMZ is retained for long-term management.
- Developed recreation sites are retained for long-term management.

Mineral Withdrawal:
- The campground is withdrawn from exploration or development of locatable and salable minerals.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the RMZ for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):
- Under Alternatives A, the RMZ would be classified as VRM Class II and managed under VRM Class II objectives.
- Under Alternatives C, D, and E, the RMZ would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be high priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails.
- Off road big game retrieval is allowed under Alternative D.

Special Recreation Permits:
- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:
- Reroute trails that that create resource damage and trespass on private property.
- Through travel management planning, designate trails for motorized and/or nonmotorized travel and provide information on skill level required and other safety and recreational opportunity concerns.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.
- Develop an agreement with the Phillips County Sheriff's Office to increase law enforcement patrols for the RMZ.
- Survey the campground boundary and post with boundary markers for law enforcement purposes and to aid in the maintenance and development of campground facilities.

Administration:
- Continue to charge overnight camping fees to help fund campground maintenance and improvements.
- Assess use fees every 5 years by utilizing the recreation area Business Plan assessment.

Information and Education:

- Create a basic, simple SRMA/RMZ brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.
- Partner with local communities and OHV groups to educate visitors on Leave No Trace, Tread Lightly and other safety and ethical recreational issues.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through November using traffic counters and overnight camping permits.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

Little Rockies Recreation Management Zone (RMZ)

RMZ Outcome Objective

Recreation Management Objective: Provide for dispersed back country experiences for both nonmotorized and motorized recreational activities. Emphasize the "Leave No Trace" and "Tread Lightly" programs to aid in minimizing the conflicts of use between motorized and nonmotorized BLM land users.

Activities	• Off-Highway Vehicle Riding and Driving • Hiking/Backpacking • Horseback Riding • Bird watching/Wildlife Viewing
Experiences	• Enjoying frequent access to outdoor physical activity • Enjoying closeness of family/friends • To test my equipment • Developing your skills and abilities • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved outdoor recreation skills • Improved outdoor knowledge and self – confidence • Improved balance of work and play in my life • Living a more outdoor- oriented lifestyle • Developing stronger ties with my family or friends • Heightened sense of satisfaction with our community • Restore mind from stress/tension/anxiety Community/Social: • Lifestyle improvement or maintenance • Strengthening relationships with family and friends Environmental: • Greater community ownership & stewardship of recreation & natural resources Economic: • Increased desirability as a place to live or retire • Promote tourism and increase commerce to local businesses

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Remoteness:
- Motorized and nonmotorized trails provide access throughout the RMZ. Nonmotorized users can travel cross-country to avoid sights and sounds of motorized recreationists in a forested mountain setting.

Naturalness:
- Topography and vegetation of this mountainous area allow visitors to avoid the sights and sounds of other recreationists.

Visitor Facilities:
- Improved recreation facilities in the form of a diverse range of motorized and nonmotorized trails suited to different fitness and skill levels.

Proposed Social RSCs:

Contacts (avg.):
- Participants encounter a season average of up to 10 encounters per day.

Group Size (avg.):
- Participants encounter a season average of up to 4 people per group.

Evidence of Use:
- Sounds of other people and OHVs frequently heard near roads and ATV trails. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use impacts are being rehabilitated.

Proposed Operational RSCs:

Access (types of travel):
- Upon completion of travel management planning, motorized and nonmotorized access will be maintained throughout the RMZ on designated routes.

Visitor Services/Info:
- Upon completion of travel management planning, a brochure/map will be developed to assists visitors with trail information. A moderate level of directional signage will be installed on routes with names/numbers of trails identified. Rules, regulations and ethics are clearly posted at information kiosks.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence, including law enforcement is low to moderate during the high-use season.

Supporting Management Action and Allowable Use Decisions

Camping Restrictions:
- Overnight camping, limited to 16-day stays, is allowed.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails.
- Over-snow snowmobile travel is allowed.
- Cross-country motorized/mechanized travel for big game retrieval is allowed under Alternative D between the hours of 10:00 a.m. and 2:00 p.m.

Forestry:
- Timber harvest, firewood cutting and special forest product harvest is allowed by permit only.

Lands and Realty:
- ROW avoidance areas are applied to the RMZ.
- The RMZ is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the RMZ for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):
- Under Alternatives A and D, the RMZ would be classified as VRM Class II and managed under VRM Class II objectives.
- Under Alternatives C and E, the RMZ would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be high priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails.
- Off road big game retrieval is allowed under Alternative D.

Special Recreation Permits:
- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-level Planning and Management

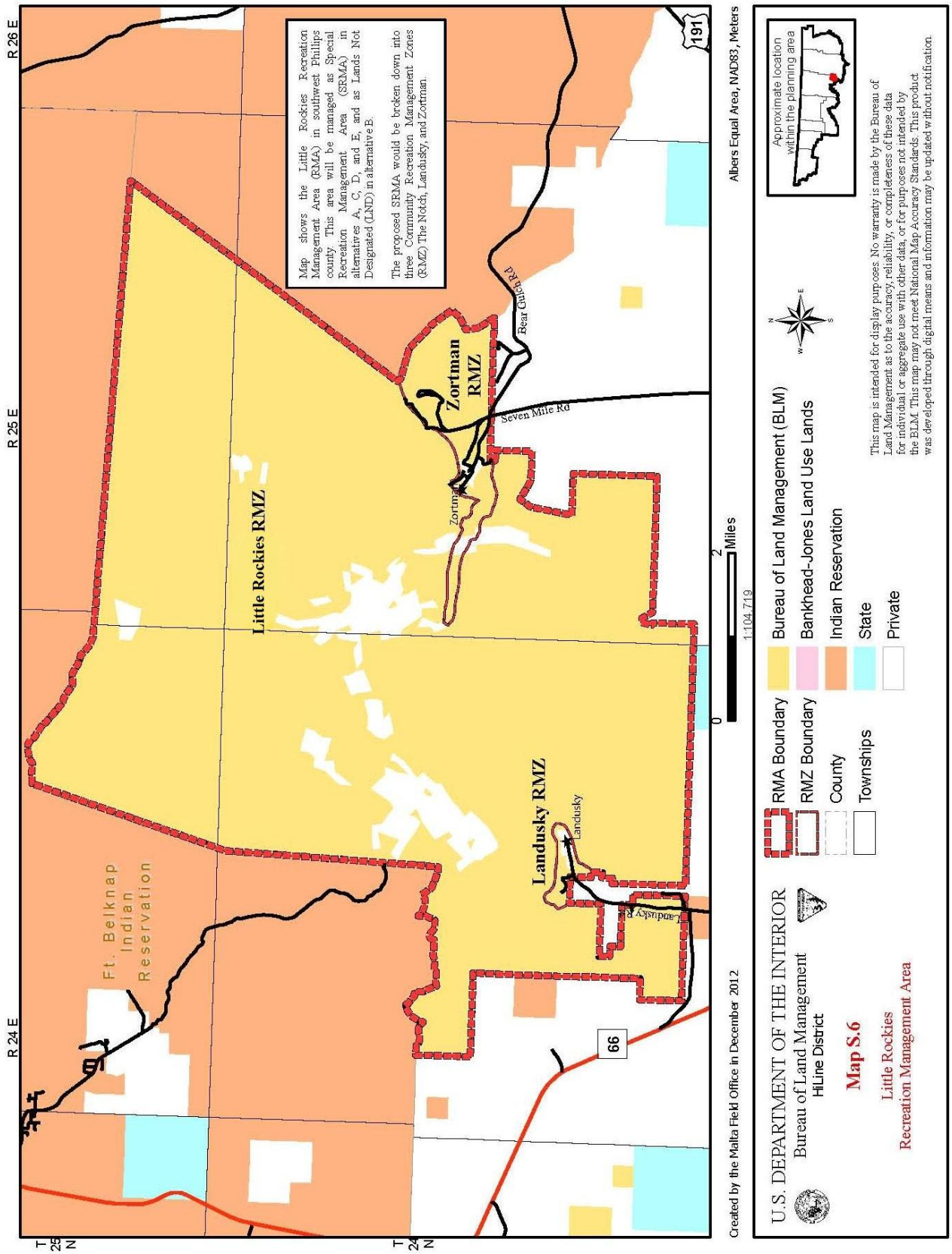
Management:
- Reroute trails that that create resource damage and trespass on private property.
- Through travel management planning, designate trails for motorized and/or nonmotorized travel and provide information on skill level required and other safety and recreational opportunity concerns.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:
- Pursue partnerships with local communities, the county, Fort Belknap Agency, and recreational user groups to assist with maintenance and monitoring activities.

Information and Education:
- Create a basic, simple SRMA/RMZ brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.
- Partner with local communities and OHV groups to educate visitors on Leave No Trace, Tread Lightly and other safety and ethical recreational issues.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through November using traffic counters and overnight camping permits.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.


R 24 E
R 25 E
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T 25 N
T 24 N
Ft. Belknap Indian Reservation
Little Rockies RMZ
Landusky RMZ
Landusky
Zortman RMZ
Zortman
Seven Mile Rd
Bear Gulch Rd
191
66
Map shows the Little Rockies Recreation Management Area (RMA) in southwest Phillips county. This area will be managed as Special Recreation Management Area (SRMA) in alternatives A, C, D, and E, and as Lands Not Designated (LND) in alternative B.
The proposed SRMA would be broken down into three Community Recreation Management Zones (RMZ) The Notch, Landusky, and Zortman.
Created by the Malta Field Office in December 2012
0
2
Miles
1:104,719
Albers Equal Area, NAD83, Meters
Approximate location within the planning area
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
Indian Reservation
State
Private
RMA Boundary
RMZ Boundary
County
Townships
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.6
Little Rockies
Recreation Management Area

S.7 Marias River SRMA (Alternative D)

Supporting Information

Important Values of the SRMA

- Public lands along the Marias River corridor offer visitors outstanding opportunities for float boating, fishing, and scenic driving. This corridor attracts visitors mainly from the local communities and school groups from the Fort Benton and Highwood Schools annually.
- Public boat input/takeout sites along the river provide legal access to other public lands along the river that don't otherwise have public access.

Recreation Demand

- Recreational and commercially guided fishing, mainly between Tiber Dam and the confluence with the Missouri River.
- Raft, canoe and kayak floating, dispersed overnight camping, wildlife viewing and picnicking.

General Types of Visitors to be Served

- The visitor segment is identified as rafters and anglers and school groups from the local area.

Ability to Manage Recreation Resources

- The recreation infrastructure (e.g. river access, parking areas, small campgrounds and restrooms) are created and meeting current demand. Requests for Special Recreation Permits for guided fishing have increased over the past couple years and may be an indication that overall recreational use along the Marias River is on the rise.
- There is potential for partnerships with the Marias River Watershed Alliance, Montana Department of Natural Resources Conservation (DNRC), FWP and local schools to monitor and maintain facilities and undeveloped campsites on public and private lands along the river corridor.

Upper Marias Recreation Management Zone (RMZ)

RMZ Outcome Objective

Ensure that the area continues to provide undeveloped water-based recreation opportunities.

Activities	• Floating • Fishing • Undeveloped Camping
Experiences	• Enjoying closeness to family/friends • Enjoying the area's wildlife, scenery, views and aesthetics • Experiencing the natural surroundings • Developing your skills and abilities • Escaping everyday responsibilities for a while

Benefits	Personal: • Developing stronger ties with my family or friends • Greater awareness of this area as a special place • Improved balance of work and play in my life • Improved outdoor recreation skills • Renewed human spirit Community/Social: • Strengthening relationships with family and friends • Increase stewardship and protection of river corridor • Lifestyle improvement or maintenance Environmental: • Preservation of the special landscape character of this place Economic: • Generates employment • Maintain tourism revenue

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Remoteness:
- The river corridor retains the current level of remoteness.

Naturalness:
- The level of change to the characteristic natural landscape is low.

Visitor Facilities:
- The boat put in/takeout at Sullivan Bridge is the only semi-developed BLM site along the Upper Marias. Some expansion of this site may occur as public use demands. Some stone fire rings have been established by recreational users.

Proposed Social RSCs:

Contacts (avg.):
- Participants encounter a season average of up to 6 encounters/day.

Group Size (avg.):
- Participants encounter a season average of up to 4 people per group.

Evidence of Use:
- Sounds of other people occasionally heard. Small localized areas of vegetation alteration and compacted/bare soils are found at camping and high-use areas. Inappropriate recreation use is rehabilitated.

Proposed Operational RSCs:

Access (types of travel):
- New recreational access is non-motorized away from developed facilities.
- Isolated parcels of BLM lands that otherwise do not have overland public access can be accessed by boat via the river.

Visitor Services/Info:
- Brochures, maps, signs/kiosks provide visitor information and ethics throughout RMZ.

Management Controls:

- A moderate to high degree of visitor and land use controls exercised. BLM on-site presence is low at developed recreation sites.

Supporting Management Action and Allowable Use Decisions

Camping Restriction:

- Overnight camping stays of up to 16 days are allowed on BLM lands along the river.

Comprehensive Trails and Travel Management:

- Motorized use in the RMZ is classified as limited to existing roads, primitive roads and trails.
- Over-snow snowmobile travel is allowed in the RMZ.
- Cross-country motorized/mechanized travel for big game retrieval is allowed in Alternative D.

Lands and Realty:

- ROW avoidance areas are applied to the RMZ.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:

- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the RMZ for the protection of the recreation activities, recreation outcomes and the RSCs.
- Apply a controlled surface use stipulation.
- Apply a timing lease stipulation to protect mule deer winter range from December 1 to March 31.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be high priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails.
- Off road big game retrieval is allowed under Alternative D.

Special Recreation Permits:

- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Expansion of existing visitor facilities at Sullivan Bridge may be necessary to accommodate increases in use.
- Reroute trails that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

- Pursue partnerships with Marias Watershed Alliance and other federal, State and private landowners along the river corridor to address resource issues such as off-road violations, spread of invasive species, and need for expanded or improved recreational facilities.

Information and Education:

- Continue to provide a basic, simple SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of June through September.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

Middle Marias Recreation Management Zone (RMZ)

RMZ Outcome Objective

Maintain and enhance the recreation facilities at the Pugsley Bridge and Moffat Bridge boat launch and take out areas as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Floating • Fishing • Commercial Guided Fishing • Undeveloped Camping • Outdoor Classroom
Experiences	• Enjoying closeness to family/friends • Enjoying the area's wildlife, scenery, views and aesthetics • Experiencing the natural surroundings • Developing your skills and abilities • Escaping everyday responsibilities for a while
Benefits	Personal: • Developing stronger ties with my family or friends • Greater awareness of this area as a special place • Improved balance of work and play in my life • Improved outdoor recreation skills • Renewed human spirit Community/Social: • Strengthening relationships with family and friends • Increase stewardship and protection of river corridor • Lifestyle improvement or maintenance • Provide outdoor classroom setting for local school groups Environmental: • Preservation of the special landscape character of this place Economic: • Generates employment • Maintain tourism revenue

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Remoteness:
- The river corridor retains the current level of remoteness.

Naturalness:
- The level of change to the characteristic natural landscape is low.

Visitor Facilities:
- Primitive boat launch/takeout facilities are located at Pugsley and Moffat Bridge access points.
- Restrooms are available at Pugsley and Moffat access points. Some additional improvements may be made at these sites as public use demands.

Proposed Social RSCs:

Contacts (avg.):
- Participants encounter a season average of up to 6 encounters/day.

Group Size (avg.):
- Participants encounter a season average of up to 6 people per group.
- Participants encounter a season average of up to 25 people per school group.

Evidence of Use:
- Sounds of other people occasionally heard. Small localized areas of vegetation alteration and compacted/bare soils are found at camping and high-use areas. Inappropriate recreation use is rehabilitated.

Proposed Operational RSCs:

Access (types of travel):
- New recreational access is non-motorized away from developed facilities.
- Isolated parcels of BLM lands that otherwise do not have overland public access can be accessed by boat via the river.

Visitor Services/Info:
- Brochures, maps, signs/kiosks provide visitor information and ethics throughout RMZ.

Management Controls:
- A moderate to high degree of visitor and land use controls exercised. BLM on-site presence is low at developed recreation sites.
- Signs are available at Pugsley and Moffat sites to explain supplemental rules at those sites.

Supporting Management Action and Allowable Use Decisions

Camping Restriction:
- Overnight camping stays of up to 16 days are allowed on undeveloped BLM lands along the river.
- Overnight camping is prohibited at Pugsley year round.
- At the BLM riparian area near Moffat Bridge access site, overnight camping is limited to 3 days and 3 nights from April 1 through September 1. The area is closed to camping September 2 through March 31.

Comprehensive Trails and Travel Management:
- Motorized use in the RMZ is classified as limited to existing roads, primitive roads and trails.
- Over-snow snowmobile travel is allowed in the RMZ.
- Cross-country motorized/mechanized travel for big game retrieval is allowed in Alternative D.

Lands and Realty:
- ROW avoidance areas are applied to the RMZ.
- BLM has a perpetual ROW easement for public access to the BLM riparian area at Moffat Bridge.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the RMZ for the protection of the recreation activities, recreation outcomes and the RSCs.
- Apply a controlled surface use stipulation.
- Apply a timing lease stipulation to protect mule deer winter range from December 1 to March 31.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be high priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails.
- Off road big game retrieval is allowed under Alternative D.

Special Recreation Permits:
- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:
- Expansion of existing visitor facilities at Pugsley and Moffat to accommodate increases in use.
- Reroute trails that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:
- Pursue partnerships with Marias Watershed Alliance and other federal, State and private landowners along the river corridor to address resource issues such as off-road violations, spread of invasive species, and need for expanded or improved recreational facilities.
- Develop a Memorandum of Understanding with DNRC to determine management and facilities maintenance responsibilities at Moffat Bridge access site. The restroom, picnic tables, fire rings and boat ramp are located on DNRC surface but BLM has been helping maintain the site facilities because of their proximity to the BLM riparian area immediately downstream.

Information and Education:
- Continue to provide a basic, simple SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:
- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of June through September.

- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

Lower Marias Recreation Management Zone (RMZ)

RMZ Outcome Objective

Ensure that the area continues to provide undeveloped water-based recreation opportunities.

Activities	• Floating • Fishing • Commercial Guided Fishing • Undeveloped Camping
Experiences	• Enjoying closeness to family/friends • Enjoying the area's wildlife, scenery, views and aesthetics • Experiencing the natural surroundings • Developing your skills and abilities • Escaping everyday responsibilities for a while
Benefits	Personal: • Developing stronger ties with my family or friends • Greater awareness of this area as a special place • Improved balance of work and play in my life • Improved outdoor recreation skills • Renewed human spirit Community/Social: • Strengthening relationships with family and friends • Increase stewardship and protection of river corridor • Lifestyle improvement or maintenance Environmental: • Preservation of the special landscape character of this place Economic: • Generates employment • Maintain tourism revenue

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Remoteness:
- The river corridor retains the current level of remoteness.

Naturalness:
- The level of change to the characteristic natural landscape is low.

Proposed Social RSCs:

Contacts (avg.):
- Participants encounter a season average of up to 6 encounters/day.

Group Size (avg.):
- Participants encounter a season average of up to 4 people per group.
- Participants encounter a season average of up to 25 people per school group.

Evidence of Use:
- Sounds of other people occasionally heard. Small localized areas of vegetation alteration and compacted/bare soils are found at camping and high-use areas. Inappropriate recreation use is rehabilitated.

Proposed Operational RSCs:

Access (types of travel):
- New recreational access is non-motorized away from developed facilities.
- Isolated parcels of BLM lands that otherwise do not have overland public access can be accessed by boat via the river.

Visitor Services/Info:
- Brochures, maps, signs/kiosks provide visitor information and ethics throughout RMZ.

Management Controls:
- A moderate to high degree of visitor and land use controls exercised. BLM on-site presence is low.

Supporting Management Action and Allowable Use Decisions

Camping Restriction:
- Overnight camping stays of up to 16 days are allowed on BLM lands along the river.

Comprehensive Trails and Travel Management:
- Motorized use in the RMZ is classified as limited to existing roads, primitive roads and trails.
- Over-snow snowmobile travel is allowed in the RMZ.
- Cross-country motorized/mechanized travel for big game retrieval is allowed in Alternative D.

Lands and Realty:
- ROW avoidance areas are applied to the RMZ.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the RMZ for the protection of the recreation activities, recreation outcomes and the RSCs.
- Apply a controlled surface use stipulation.
- Apply a timing lease stipulation to protect mule deer winter range from December 1 to March 31.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be high priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails.
- Off road big game retrieval is allowed under Alternative D.

Special Recreation Permits:

- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Expansion of existing visitor facilities at Sullivan Bridge may be necessary to accommodate increases in use.
- Reroute trails that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

- Pursue partnerships with Marias Watershed Alliance and other federal, State and private landowners along the river corridor to address resource issues such as off-road violations, spread of invasive species, and need for expanded or improved recreational facilities.

Information and Education:

- Continue to provide a basic, simple SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of June through September.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.7 Marias River ERMA
Alternatives C and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the facilities along the Marias River corridor as needed to meet recreational demands and comply with public health and safety requirements. Continue to support use by local school groups.

Activities	• Outdoor Classroom/School Field Trips • Bird Watching/Wildlife Viewing
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:

- The ERMA is open to camping and overnight use except for the following restrictions: Pugsley Bridge site is closed to overnight camping year round; camping at Moffatt BLM riparian area is limited to 3 days and 3 nights from April 1 through September 1 and closed to camping from September 2 through March 31.

Comprehensive Trails and Travel Management:

- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:

- ROW avoidance areas are applied to the upper and middle portions of the ERMA.
- The ERMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:

- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the ERMA for the protection of the recreation activities and objectives.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class II and managed under VRM Class II objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be high priority under Alternative C and moderate priority under Alternative E. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

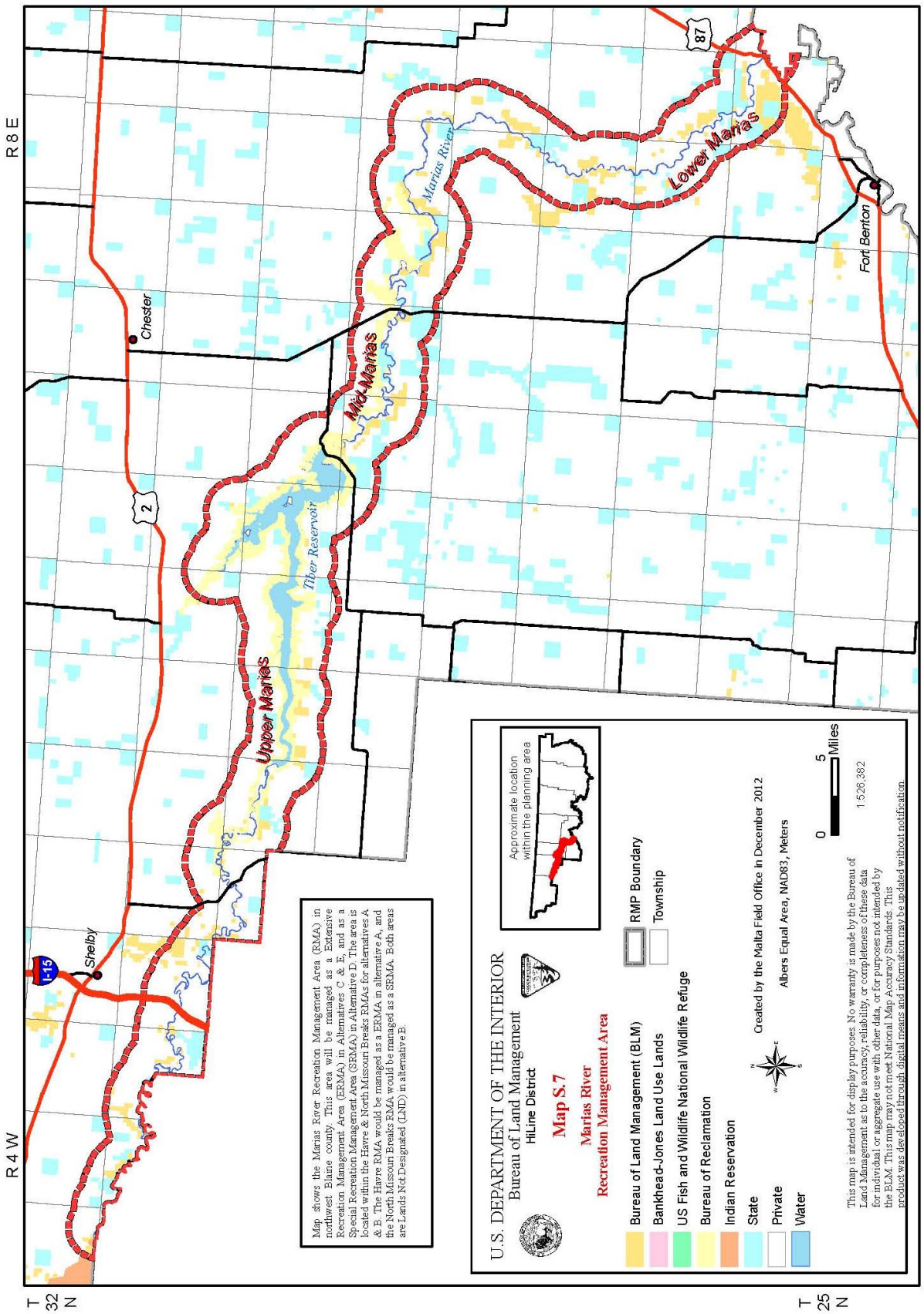
- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation annually during the primary use season of mid-April through October.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.


R 4 W
R 8 E
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T 25 N
Shelby
I-15
Chester
2
Upper Marias
Tiber Reservoir
Mid Marias
Marias River
Lower Marias
87
Fort Benton
Map shows the Marias River Recreation Management Area (RMA) in northwest Blaine county. This area will be managed as a Extensive Recreation Management Area (ERMA) in Alternatives C & E, and as a Special Recreation Management Area (SRMA) in Alternative D. The area is located within the Havre & North Missouri Breaks RMAs for alternatives A & B. The Havre RMA would be managed as a ERMA in alternative A, and the North Missouri Breaks RMA would be managed as a SRMA. Both areas are Lands Not Designated (LND) in alternative B.
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.7
Marias River
Recreation Management Area
Approximate location within the planning area
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMP Boundary
Township
Created by the Malta Field Office in December 2012
Albers Equal Area, NAD83, Meters
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This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.

S.8 Paulo Reservoir SRMA
Alternative D

Supporting Information

Important Values of the SRMA
- The area offers fishing and diverse wildlife and wetland ecology viewing opportunities that are easily accessed via maintained public roads.
- Montana Fish, Wildlife and Parks (FWP) helps maintain this popular sport fishery by periodically monitoring and re-stocking the fish in the reservoir.

Recreation Demand
- The primary customers are anglers, hunters, local families, bird watchers and local school groups.

General Types of Visitors to be Targeted
- The visitor segment is identified as school groups on day field trips, birdwatchers, and anglers.

Ability to Manage Recreation Resources
- The SRMA is currently fenced off from the surrounding rangeland to exclude cattle except during prescribed grazing treatments. This area has support and potential partnership opportunities with Montana Fish, Wildlife, and Parks to maintain and improve the health of the fishery and further develop and maintain visitor opportunities at the site.

SRMA Outcome Objective

Maintain and enhance the facilities at Paulo Reservoir RMA as needed to meet recreational demands and comply with public health and safety requirements. Establish the site as an annual outdoor classroom destination for the Glasgow Schools and other area schools.

Activities	• Outdoor Classroom/School Field Trips • Bird Watching/Wildlife Viewing • Fishing
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place • Fresh fish provides a healthy food source Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups Environmental: • Preserve the special landscape character of this place

	Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Naturalness:
- The site provides a variety of native upland and wetland plant and animal species.

Visitor Facilities:
- The site has public access via County and BLM roads. Parking, restroom and picnic facilities are provided. Future facilities proposed include an interpretive panel describing the unique wildlife and plant features of the area and an accessible parking pad, trail and fishing pier.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 2 encounters per day.

Group Size (avg.):
- The average size of the casual or bird watching group size would be 2-4 whereas the average outdoor classroom group size would be around 20.

Evidence of Use:
- Sounds of other people occasionally heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- Motorized travel is limited to existing trails. The rest of the area would be accessible by foot. The predominant uses at this site are non-motorized.

Visitor Services/Info:
- A message board and brochure box at the restroom assists visitors with area rules, regulations and ethics as well as viewing opportunities.
- Addition of accessible parking, fishing and interpretive facilities will provide outdoor recreation and environmental education opportunities to a wider range of visitors.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence is low and infrequent except during outdoor classroom group visits.

Supporting Management Action and Allowable Use Decisions

Camping:
- The SRMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Over snow travel by snowmobiles is allowed.

Firearm Use Restriction:
- The discharge of firearms for recreational target shooting is prohibited in developed recreation sites.

Lands and Realty:
- ROW avoidance areas are applied to the SRMA.
- ROW avoidance areas are applied to developed recreation sites.
- The SRMA is retained for long-term management.
- Developed recreation sites are retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the SRMA for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be moderate priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.

Special Recreation Permits:
- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:
- Reroute trails that that create resource damage and trespass on private property.
- Continue to work with FWP to maintain and improve the health of the recreational fishery.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:
- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:
- Provide a basic SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the SRMA objectives and RMA opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.8 Paulo Fishing Reservoir ERMA Alternatives C and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the facilities at Paulo Fishing Reservoir as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Camping • Fishing
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance • Provide bathroom and camping facilities close to prime big game hunting areas Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:
- ROW avoidance areas are applied to the ERMA.
- The ERMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the ERMA for the protection of area resources.
- Apply stipulations for wind development for protection of area resources.
- Closed to fluid mineral leasing.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be moderate priority under Alternative C and high priority under Alternative E.. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative C, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

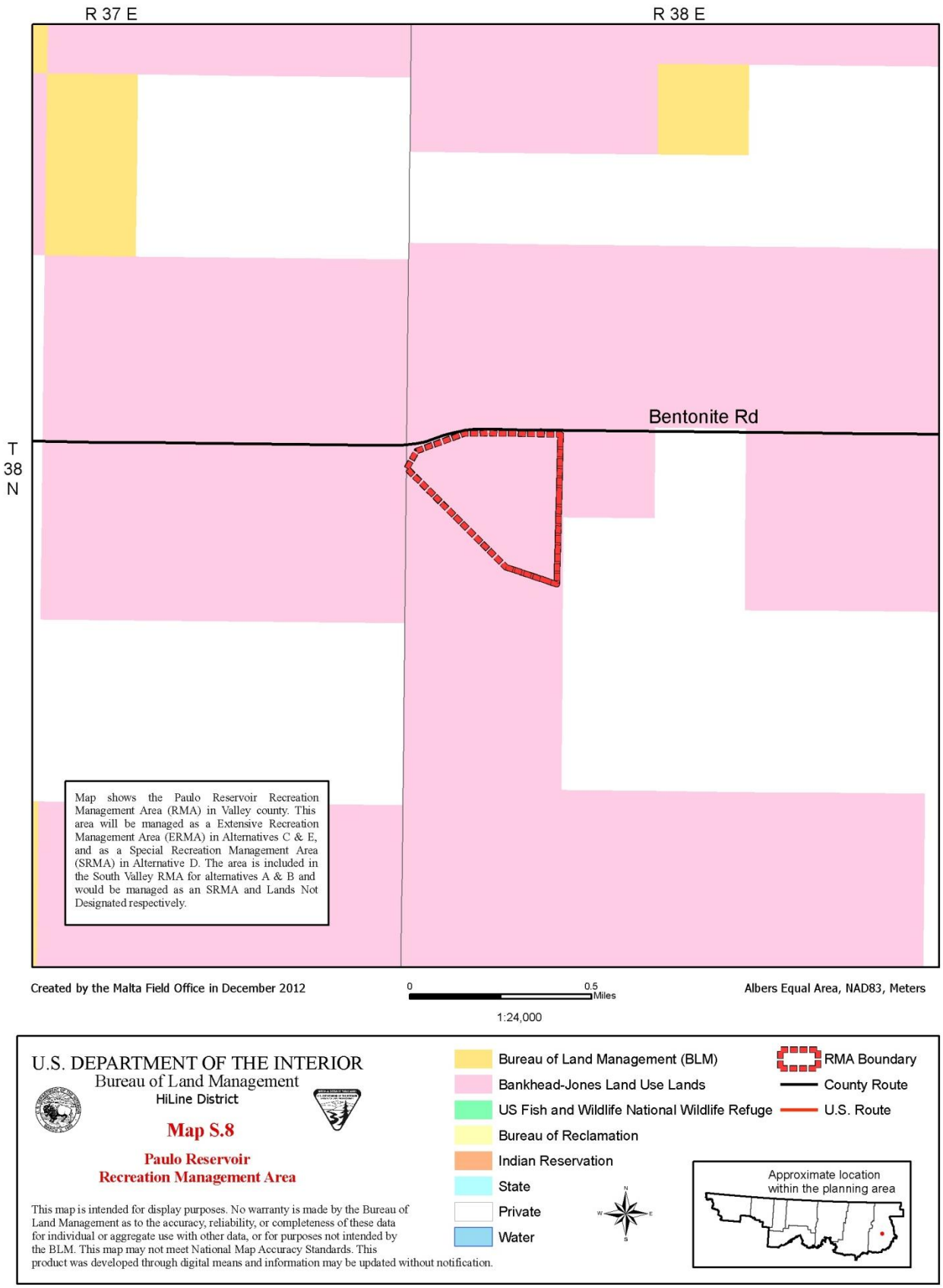
- Pursue partnerships with other agencies and user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through November.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.


R 37 E
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Map shows the Paulo Reservoir Recreation Management Area (RMA) in Valley county. This area will be managed as a Extensive Recreation Management Area (ERMA) in Alternatives C & E, and as a Special Recreation Management Area (SRMA) in Alternative D. The area is included in the South Valley RMA for alternatives A & B and would be managed as an SRMA and Lands Not Designated respectively.
Created by the Malta Field Office in December 2012
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U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.8
Paulo Reservoir
Recreation Management Area
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMA Boundary
County Route
U.S. Route
Approximate location within the planning area

S.9 South Phillips Recreation Complex SRMA Alternative D

Supporting Information

Important Values of the SRMA

- The area offers diverse wildlife and wetland ecology viewing opportunities that are easily accessed via maintained public roads.
- The Auto Tour Route along the west edge of the SRMA is a high-use road that provides access to the wildlife viewing area on Charles M Russell (CMR) National Wildlife Refuge (NWR) and several popular BLM recreational fisheries.
- The Manning Corral Road is a high-use road that provides access to CMR NWR and several of the most popular BLM recreational fisheries in the HiLine District.
- The Dryfork Road is a high-use road that provides access to CMR NWR and several of the most popular BLM recreational fisheries in the HiLine District. Directional signage to many of the fisheries and an information kiosk are located at the intersection of Dryfork Road with Highway 191.

Recreation Demand

- The primary customers are hunters, anglers and bird watchers.

General Types of Visitors to be Targeted

- The visitor segment is identified as statewide upland game bird and big game hunters and bird watchers and local anglers.

Ability to Manage Recreation Resources

- The SRMA is overlapped by a series of large grazing allotments. The recreational fisheries within the SRMA are not fenced off from these grazing allotments and are, therefore regularly frequented by cattle.
- The area is easily accessible by a system of maintained public roads including U.S. Highways 191 and 66.
- This area has support and potential partnership opportunities with CMR NWR, FWP and local communities.

SRMA Outcome Objective

Maintain and enhance the recreational fisheries, access roads/trails, and facilities as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Hunting • Fishing • Bird Watching/Wildlife Viewing • Picnicking • Pleasure Driving
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life

	• Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Naturalness:
- The site provides a large diversity of native upland and wetland plant and animal species in a natural prairie and breaks setting

Remoteness:
- Large size of the SRMA along with the natural setting provide ample opportunities to recreate away from the sights and sounds of other visitors.

Visitor Facilities:
- Parking, informational kiosk/signs and trash cans are available at the intersection of Dryfork Road and Highway 191.
- Some of the more popular recreational fisheries have picnic tables.
- Well-traveled, maintained roads provide access to the area from Highway 191.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 10 encounters per day.

Group Size (avg.):
- The average group size would be 2-4.

Evidence of Use:
- Sounds of other people occasionally heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- Motorized travel is limited to existing roads, primitive roads and trails. The rest of the area would be accessible by foot.

Visitor Services/Info:
- Additional interpretive and informational signs/maps will be provided at main access points to assist visitors with recreation opportunities within the SRMA.
- Picnic tables will be provided at the more popular recreational fisheries to enhance visitor use.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence is low and infrequent.

- Cattle exclusion fences and off-site watering facilities may be added to the more popular recreational fisheries to protect recreational facilities.

Supporting Management Action and Allowable Use Decisions

Camping:
- The SRMA is open to undeveloped overnight camping stays of up to 16 days.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.
- Cross-country motorized/mechanized travel for big game retrieval is allowed in Alternative D.

Lands and Realty:
- ROW avoidance areas are applied to the recreational fisheries within the SRMA.
- The SRMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities around the recreational fisheries within the SRMA for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be moderate priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative D, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:
- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:
- Reroute trails that that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

- Pursue partnerships with local communities, agencies user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the SRMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.9 South Phillips Recreation Complex ERMA Alternatives C and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the current facilities within the ERMA as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Fishing • Undeveloped Camping • Bird Watching/Wildlife Viewing • Hunting
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:
- ROW avoidance areas are applied to the ERMA.
- The ERMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the entire ERMA under Alternative E and for the recreational fisheries only for Alternative C, for the protection of the recreation activities and objectives.
- The ERMA will be managed as an exclusion area for wind energy.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class II and III and managed under VRM Class II and III objectives respectively.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be moderate priority under Alternative C and high priority under Alternative E. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative C, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Develop a recreational fisheries management plan and coordinate with FWP to monitor and stock game fish as needed.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

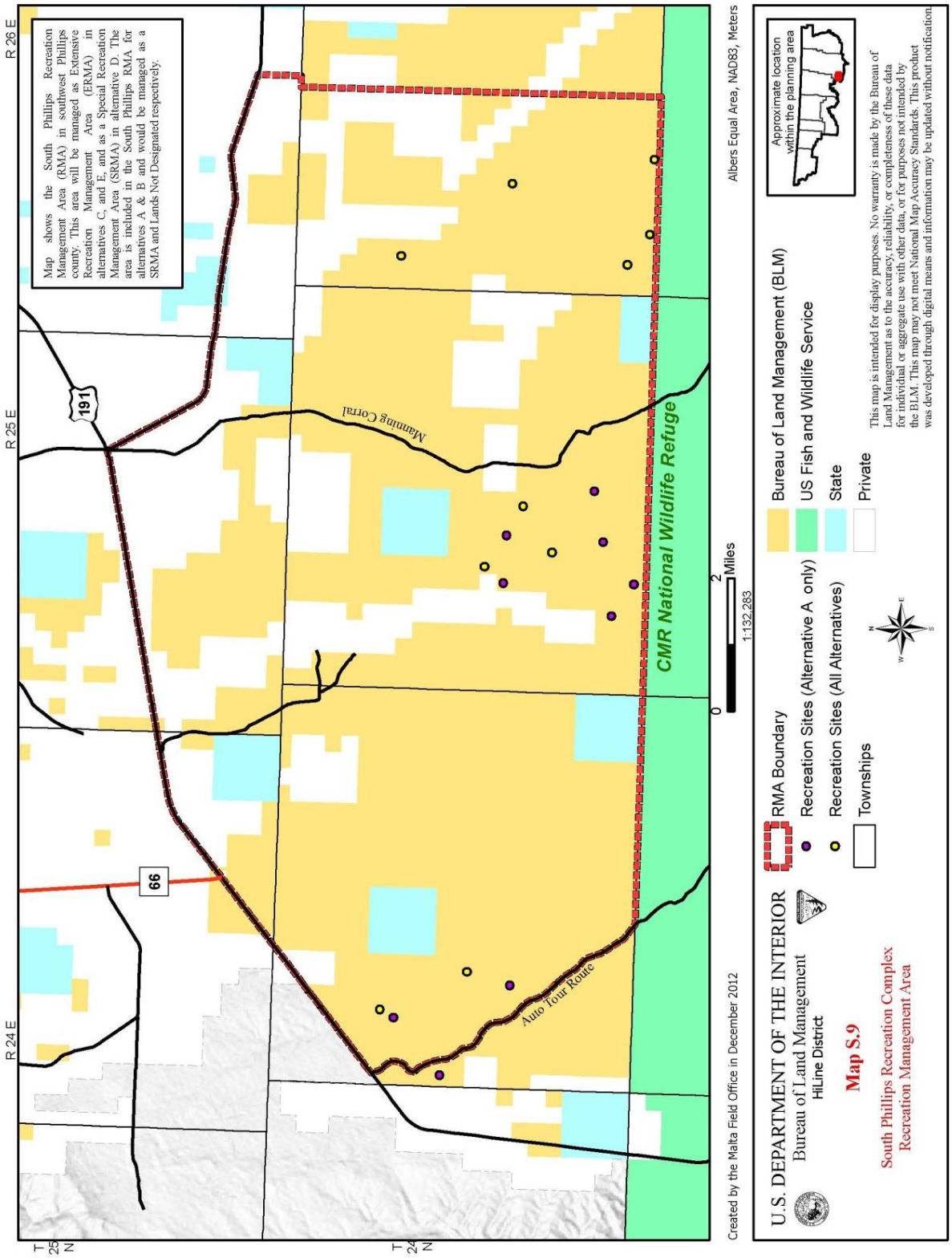
- Pursue partnerships with FWP and user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation annually during the primary use season of mid-April through October.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.


Map shows the South Phillips Recreation Management Area (RMA) in southwest Phillips county. This area will be managed as Extensive Recreation Management Area (ERMA) in alternatives C, and E, and as a Special Recreation Management Area (SRMA) in alternative D. The area is included in the South Phillips RMA for alternatives A & B and would be managed as a SRMA and Lands Not Designated respectively.
R 24 E
R 25 E
R 26 E
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Auto Tour Route
Manning Corral
CMR National Wildlife Refuge
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Albers Equal Area, NAD83, Meters
Created by the Malta Field Office in December 2012
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.9
South Phillips Recreation Complex
Recreation Management Area
RMA Boundary
Recreation Sites (Alternative A only)
Recreation Sites (All Alternatives)
Townships
Bureau of Land Management (BLM)
US Fish and Wildlife Service
State
Private
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Approximate location within the planning area

S.10 Sweet Grass Hills SRMA
Alternative D

Supporting Information

Important Values of the SRMA

- This island mountain range provides topography and vegetation that is unique to the surrounding rolling hills and grasslands.
- This is a Traditional Cultural Property that is a destination for members of several Native American tribes.
- The SRMA is also an Area of Critical Environmental Concern (ACEC) established for its traditional cultural importance and seasonally important wildlife habitat.
- During the 2011 wilderness characteristic inventory update, the western block of the Sweet Grass Hills was determined to meet the minimum criteria of possessing wilderness characteristics.

Recreation Demand

- The primary customers are hunters, participants in traditional religious ceremonies, and hikers.

General Types of Visitors to be Targeted

- The visitor segment is identified as big game hunters, backcountry hikers/campers, and Native American tribes.

Ability to Manage Recreation Resources

- The SRMA is currently fenced off from the surrounding rangeland to exclude cattle except during prescribed grazing treatments.
- Legal public access is very limited throughout the SRMA.

SRMA Outcome Objective

Maintain the important values and overall natural setting of the SRMA while providing opportunities for a quality outdoor recreation experience.

Activities	• Hunting • Backcountry Hiking/Camping • Wildlife Viewing • Traditional Cultural/Religious Ceremonies
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Experience traditional religious ceremonies • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place • Experience traditional religious ceremonies Community/Social: • Lifestyle improvement or maintenance

	Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Naturalness:
- The SRMA is a series of small, island mountain ranges surrounded by native rolling hills and prairie. The area provides opportunities for primitive types of outdoor recreation in a natural, forested setting.

Remoteness:
- The topography and vegetation within the SRMA provide visitors with an opportunity to avoid the sights and sounds of other people.

Visitor Facilities:
- Public access to the SRMA is very limited and there are currently no developed facilities. Future facilities proposed include an interpretive panel describing the unique wildlife and cultural features of the area, a parking and camping area near the main public access point which will help minimize impacts to the low meadow area where visitors currently park and camp.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 2 encounters per day.

Group Size (avg.):
- The average group size would be 2-4.

Evidence of Use:
- Sounds of other people occasionally heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated.

Proposed Operational RSCs:

Access (types of travel):
- Under Alternative D, motorized travel is limited to OHVs on existing road, primitive roads and trails. The rest of the area would be accessible by foot. The predominant uses at this site are non-motorized.

Visitor Services/Info:
- An interpretive panel and site map at the parking area will assists visitors with area rules, regulations and ethics as well as viewing opportunities and cultural history.
- A parking and camping area on the north side of the Black Jack Butte Road access point would improve visitor safety and enhance the visitor experience while reducing impacts to natural resources at other SRMA access points.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence is low and infrequent.

Supporting Management Action and Allowable Use Decisions

Camping:
- The SRMA is open to overnight camping subject to the 16-day limit.

Comprehensive Trails and Travel Management:
- Under Alternative D, the area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Under Alternative D, cross country travel for the purpose of big game retrieval would be allowed between 10:00 a.m. and 2:00 p.m.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Firearm Use Restriction:
- The discharge of firearms for recreational target shooting is prohibited in developed recreation sites.

Lands and Realty:
- ROW avoidance areas are applied to the SRMA.
- ROW avoidance areas are applied to developed recreation sites.
- The SRMA is retained for long-term management.
- Developed recreation sites are retained for long-term management.

Forest Products:
- Under Alternative D, the BLM would allow for a full range of forest health treatments in the Sweet Grass Hills SRMA that may include the sale of wood products. The area would not be open for incidental personal use wood products.

Minerals:
- The BLM would not recommend an extension to the withdrawal from solid mineral entry and location. The withdrawal would be allowed to expire in 2017.
- The area would be closed to solid mineral leasing and mineral material sales.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- The area would include an NSO stipulation for oil and gas leasing. On existing leases, the BLM would work with operators to apply guidelines to any new activity which may threaten areas of traditional spiritual importance to Native Americans or aquifers that provide potable water.
- The SRMA would be an exclusion area for wind energy development.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be low priority. In the interim, under Alternative D, motorized travel is limited to OHV use on existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative D, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Develop a wildlife and habitat monitoring-management plan to maintain the diversity of native wildlife and plant species on which the area recreation is dependent.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

- Pursue partnerships with tribes and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the SRMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through November.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.10 Sweet Grass Hills ERMA
Alternative E (Preferred Alternative)

ERMA Outcome Objective

Protect and enhance the important values for which the ACEC/TCP was established as well as the overall natural setting of the ERMA while providing opportunities for a quality outdoor recreation experience.

Activities	• Hunting • Backcountry Hiking/Camping • Wildlife Viewing • Traditional Cultural/Religious Ceremonies
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Experience traditional religious ceremonies • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place • Experience traditional religious ceremonies Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is closed to OHV use until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.

Lands and Realty:
- ROW avoidance areas are applied to the ERMA.
- The ERMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- The ERMA is closed to oil and gas development under Alternative E.
- The ERMA is an exclusion area for wind energy development under Alternative E.

Minerals:
- The ERMA is closed to leasable and salable minerals and withdrawn from locatable minerals.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class II and managed under VRM Class II objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:
- Travel management for this area will be low priority. In the interim, motorized travel is classified as closed within the ERMA. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.

Special Recreation Permits:
- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

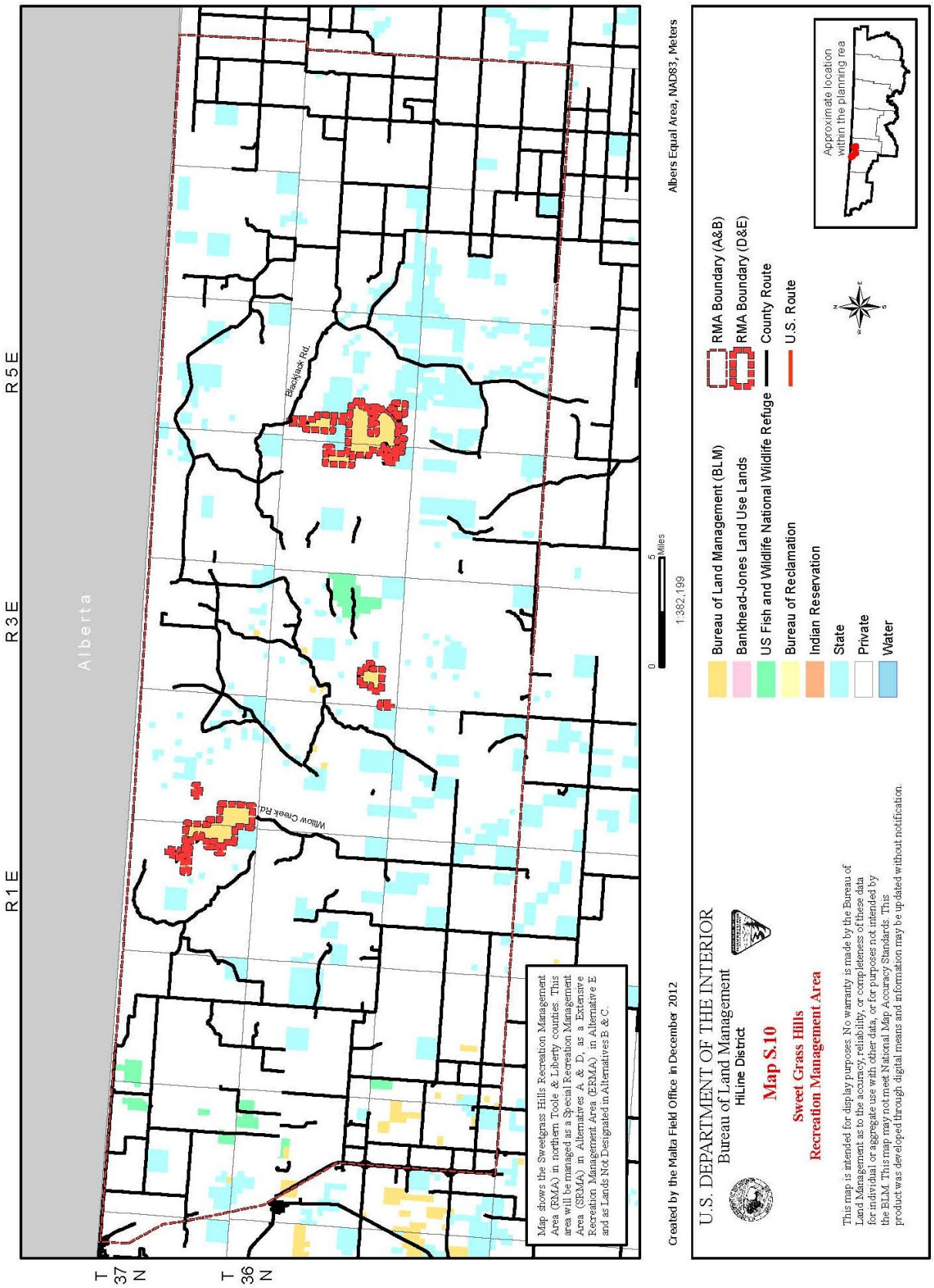
Best Management Practices to Guide Implementation-Level Planning and Management

Management:
- Reroute trails that that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:
- Pursue partnerships with user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:
- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:
- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation annually during the primary use season of mid-April through November.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.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Blackjack Rd.
Willow Creek Rd.
Map shows the Sweetgrass Hills Recreation Management Area (RMA) in northern Toole & Liberty counties. This area will be managed as a Special Recreation Management Area (SRMA) in Alternatives A & D, as a Extensive Recreation Management Area (ERMA) in Alternative E and as Lands Not Designated in Alternatives B & C.
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Created by the Malta Field Office in December 2012
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.10
Sweet Grass Hills
Recreation Management Area
This map is intended for display purposes. No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data, or for purposes not intended by the BLM. This map may not meet National Map Accuracy Standards. This product was developed through digital means and information may be updated without notification.
Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMA Boundary (A&B)
RMA Boundary (D&E)
County Route
U.S. Route
Approximate location within the planning rea

S.11 Thirty Mile OHV SRMA
Alternative D

Supporting Information

Important Values of the SRMA
- The area offers challenging, close-to-town, easy to access recreational opportunities.
- The RMA offers a variety of off-road riding opportunities for OHV recreationists of all skill levels.

Recreation Demand
- The primary customers are local OHV enthusiasts.

General Types of Visitors to be Targeted
- The visitor segment is identified as close-to-home, day-use OHV riders.

Ability to Manage Recreation Resources
- The SRMA is currently accessible via public routes that cross private and State lands. Some issues arise during wet conditions when SRMA users drive through the landowner's fields to get around low, wet spots in the road. The private landowner and State are willing to work with BLM to improve access to the site. Local and State OHV groups are possible partners who can help address these issues as well as develop other improvements and public educational programs for the SRMA.

SRMA Outcome Objective

Maintain and enhance the facilities and signage at Fresno OHV area as needed to meet recreational demands and comply with public health and safety requirements. Avoid damage to surrounding resources by enhancing and/or replacing boundary fences and markers.

Activities	• OHV Riding
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing your skills and abilities • For the challenge or sport • Enjoying the area's scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve natural resources of surrounding area by providing quality motorized recreational opportunities at a designated site Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Remoteness:
- The site provides an unstructured, open, OHV experience in a rugged, natural setting.

Visitor Facilities:
- The site has public access. Improved parking and signage will be developed to enhance the visitor experience and protect surrounding public and private lands.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 8 encounters per day.

Group Size (avg.):
- Participants would encounter a season average of up to 6 people per group.

Evidence of Use:
- Sounds of other people occasionally heard. Localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- The area is open to all types of vehicle use at all times anywhere in the area subject to the operating regulations and vehicle standards set for the in 43 CFR 8341 and 8342.

Visitor Services/Info:
- A simple brochure/map assists visitors. SRMA Boundaries are clearly marked. Rules, regulations and ethics clearly posted at SRMA parking area.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence is low. Parking, boundary and signage will be maintained. A traffic counter will be used to monitor the level of visitor use.

Supporting Management Action and Allowable Use Decisions

Comprehensive Trails and Travel Management:
- The area is classified as open to all types of vehicle use at all times anywhere in the area subject to the operating regulations and vehicle standards set for the in 43 CFR 8341 and 8342.

Lands and Realty:
- The SRMA is retained for long-term management.

Visual Resource Management (VRM):
- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.

Special Recreation Permits:

- SRPs will be required for any commercial, organized event or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

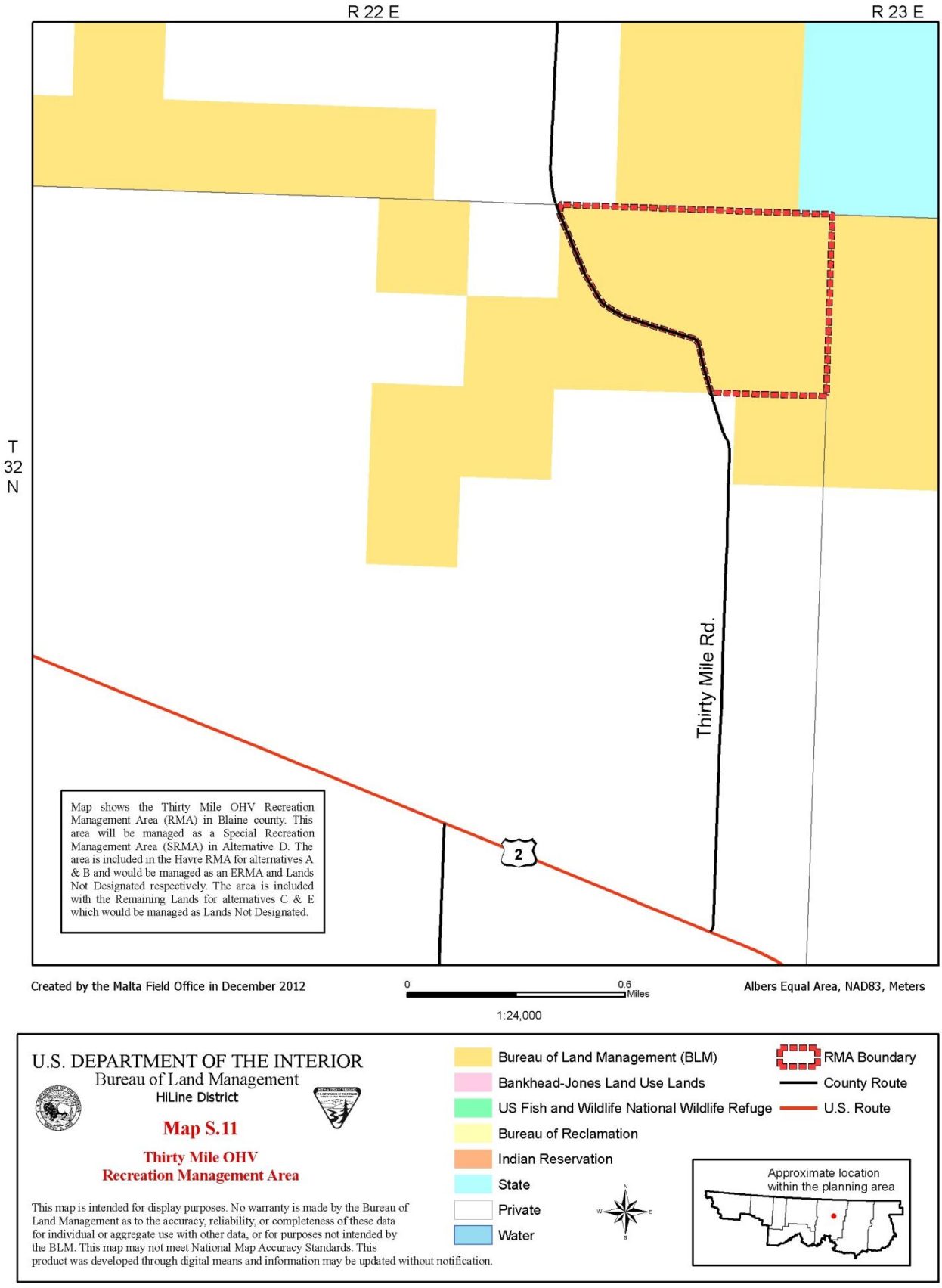
- Reroute trails that that create resource damage and trespass on private property.
- Develop additional access and/or improve current public access to the site to prevent impacts to private and public lands surrounding the SRMA.
- Improve and maintain boundary markings to avoid user conflicts and damage to surrounding resources.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Information and Education:

- Continue to provide a basic, simple SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.
- Pursue partnerships with State and local OHV groups to provide safety and Leave No Trace training for OHV recreationists using public lands.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October using traffic counters.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.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Thirty Mile Rd.
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Map shows the Thirty Mile OHV Recreation Management Area (RMA) in Blaine county. This area will be managed as a Special Recreation Management Area (SRMA) in Alternative D. The area is included in the Havre RMA for alternatives A & B and would be managed as an ERMA and Lands Not Designated respectively. The area is included with the Remaining Lands for alternatives C & E which would be managed as Lands Not Designated.
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U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.11
Thirty Mile OHV
Recreation Management Area
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Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMA Boundary
County Route
U.S. Route
Approximate location
within the planning area

S.12 Timber Creek Ridge ERMA Alternatives D and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the natural setting in and around the ERMA by providing a minimal amount of recreational facilities needed to meet recreational demands and comply with public health and safety requirements while reducing impacts to other resources in the area.

Activities	• Wildlife Viewing • Hunting • Camping
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a timing lease stipulation in the ERMA for the protection of wildlife resources, recreation activities and objectives.
- Under Alternative E, also apply a controlled surface use stipulation and the ERMA would be an avoidance area for wind development.

Minerals:
- The ERMA would be closed to mineral development under Alternative E.

Visual Resource Management (VRM):

- Under Alternative D, the ERMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Under Alternative E, the ERMA would be classified as VRM Class II and managed under VRM Class II objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be moderate priority under Alternative D and high priority under Alternative E. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative D, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Provide bathroom facilities during the high-use hunting season to protect public health and safety.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

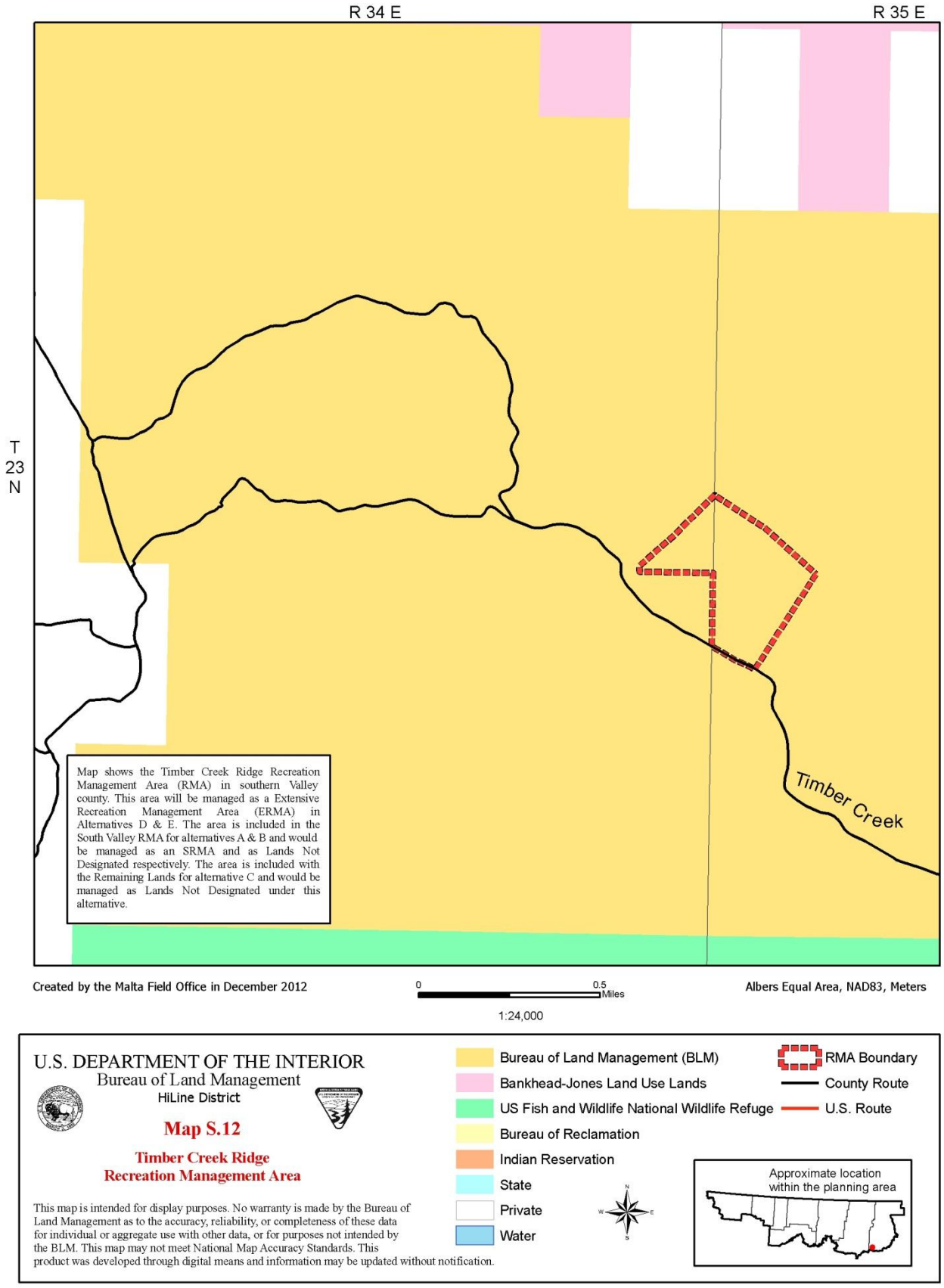
- Pursue partnerships with other agencies and user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through November.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.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Timber Creek
Map shows the Timber Creek Ridge Recreation Management Area (RMA) in southern Valley county. This area will be managed as a Extensive Recreation Management Area (ERMA) in Alternatives D & E. The area is included in the South Valley RMA for alternatives A & B and would be managed as an SRMA and as Lands Not Designated respectively. The area is included with the Remaining Lands for alternative C and would be managed as Lands Not Designated under this alternative.
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U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.12
Timber Creek Ridge
Recreation Management Area
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Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMA Boundary
County Route
U.S. Route
Approximate location
within the planning area

S.13 Troika Reservoir SRMA
Alternative D

Supporting Information

Important Values of the SRMA
- The area offers fishing and diverse wildlife and wetland ecology viewing opportunities that are easily accessed via maintained public roads.
- Montana Fish, Wildlife and Parks (FWP) helps maintain this popular sport fishery by periodically monitoring and re-stocking the fish in the reservoir.

Recreation Demand
- The primary customers are anglers, hunters, local families, bird watchers and local school groups.

General Types of Visitors to be Targeted
- The visitor segment is identified as school groups on day field trips, birdwatchers, and anglers.

Ability to Manage Recreation Resources
- The SRMA is currently fenced off from the surrounding rangeland to exclude cattle except during prescribed grazing treatments. This area has support and potential partnership opportunities with Montana Fish, Wildlife, and Parks to maintain and improve the health of the fishery and further develop and maintain visitor opportunities at the site.

SRMA Outcome Objective

Maintain and enhance the facilities at Paulo Reservoir RMA as needed to meet recreational demands and comply with public health and safety requirements. Establish the site as an annual outdoor classroom destination for the Glasgow Schools and other area schools.

Activities	• Outdoor Classroom/School Field Trips • Bird Watching/Wildlife Viewing • Fishing
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place • Fresh fish provides a healthy food source Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups Environmental: • Preserve the special landscape character of this place

	Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Proposed Recreation Setting Characteristics (RSCs)

Proposed Physical RSCs:

Naturalness:
- The site provides a variety of native upland and wetland plant and animal species.

Visitor Facilities:
- The site has public access via County and BLM roads. Parking, restroom and picnic facilities are provided. Future facilities proposed include an interpretive panel describing the unique wildlife and plant features of the area and an accessible parking pad, trail and fishing pier.

Proposed Social RSCs:

Contacts (avg.):
- Participants would encounter a season average of up to 2 encounters per day.

Group Size (avg.):
- The average size of the casual or bird watching group size would be 2-4 whereas the average outdoor classroom group size would be around 20.

Evidence of Use:
- Sounds of other people occasionally heard. A few small localized areas of vegetation alteration and compacted/bare soils are acceptable. Inappropriate recreation use is rehabilitated

Proposed Operational RSCs:

Access (types of travel):
- Motorized travel is limited to existing trails. The rest of the area would be accessible by foot. The predominant uses at this site are non-motorized.

Visitor Services/Info:
- A message board and brochure box at the restroom assists visitors with area rules, regulations and ethics as well as viewing opportunities.
- Addition of accessible parking, fishing and interpretive facilities will provide outdoor recreation and environmental education opportunities to a wider range of visitors.

Management Controls:
- A moderate degree of visitor and land use controls exercised. BLM on-site presence is low and infrequent except during outdoor classroom group visits.

Supporting Management Action and Allowable Use Decisions

Camping:
- The SRMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Over snow travel by snowmobiles is allowed.

Firearm Use Restriction:

- The discharge of firearms for recreational target shooting is prohibited in developed recreation sites.

Lands and Realty:

- ROW avoidance areas are applied to the SRMA.
- ROW avoidance areas are applied to developed recreation sites.
- The SRMA is retained for long-term management.
- Developed recreation sites are retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:

- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the SRMA for the protection of the recreation activities, recreation outcomes and the RSCs.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class III and managed under VRM Class III objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be moderate priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Continue to work with FWP to maintain and improve the health of the recreational fishery.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic SRMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the SRMA objectives and RMA opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October.
- If future monitoring indicates that social RSCs are not being achieved, resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.

S.13 Troika Reservoir ERMA
Alternatives C and E (Preferred Alternative)

ERMA Outcome Objective

Maintain and enhance the facilities at Troika Fishing Reservoir as needed to meet recreational demands and comply with public health and safety requirements.

Activities	• Camping • Fishing
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance • Provide bathroom and camping facilities close to prime big game hunting areas Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:
- ROW avoidance areas are applied to the ERMA.
- The ERMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the ERMA for the protection of area resources.
- Apply stipulations for wind development for protection of area resources.
- Closed to fluid mineral leasing.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class II and managed under VRM Class II objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be moderate priority under Alternative C and high priority under Alternative E. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative C, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

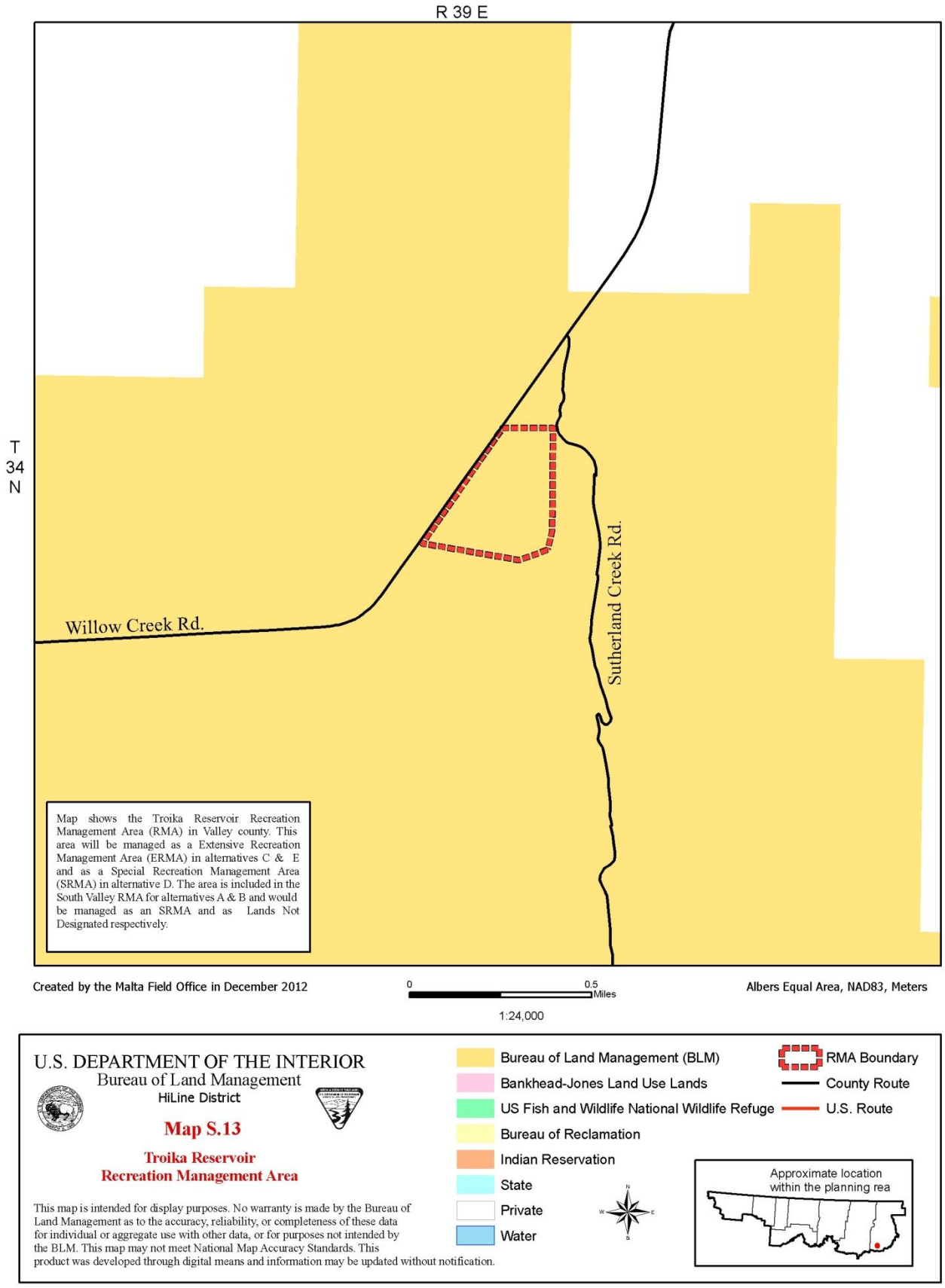
- Pursue partnerships with other agencies and user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through November.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.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Willow Creek Rd.
Sutherland Creek Rd.
Map shows the Troika Reservoir Recreation Management Area (RMA) in Valley county. This area will be managed as a Extensive Recreation Management Area (ERMA) in alternatives C & E and as a Special Recreation Management Area (SRMA) in alternative D. The area is included in the South Valley RMA for alternatives A & B and would be managed as an SRMA and as Lands Not Designated respectively.
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U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.13
Troika Reservoir
Recreation Management Area
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Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMA Boundary
County Route
U.S. Route
Approximate location
within the planning rea

S.14 Wards Dam ERMA
Alternative D

ERMA Outcome Objective

Maintain and enhance the facilities at the Wards Dam Watchable Wildlife Area as needed to meet recreational demands and comply with public health and safety requirements. Establish the site as an annual outdoor classroom destination for the Opheim Schools and other area schools.

Activities	• Outdoor Classroom/School Field Trips • Bird Watching/Wildlife Viewing • Waterfowl Hunting
Experiences	• Releasing or reducing some built up mental tensions • Enjoying frequent access to outdoor physical activity • Developing outdoor knowledge, skills and abilities • Outdoor classroom setting • Enjoying the areas wildlife, scenery, views and aesthetics
Benefits	Personal: • Improved physical fitness/better health maintenance • Restored mind from stress/tension/anxiety • Improved outdoor recreation skills • Living a more outdoor-oriented lifestyle • Improved balance of work and play in my life • Greater awareness of this area as a special place Community/Social: • Lifestyle improvement or maintenance • Easily accessible outdoor classroom setting for local schools and youth groups Environmental: • Preserve the special landscape character of this place Economic: • Greater value-added local services • Increased desirability as a place to live or retire

Supporting Management Action and Allowable Use Decisions

Camping:
- The ERMA is open to camping and overnight use.

Comprehensive Trails and Travel Management:
- The area is classified as limited to existing roads, primitive roads and trails until subsequent site-specific travel management planning occurs.
- Hand-held, wheeled carts are allowed for the direct retrieval of big game.
- Over snow travel by snowmobiles is allowed.

Lands and Realty:
- ROW avoidance areas are applied to the ERMA.
- The SRMA is retained for long-term management.

Stipulations for Oil and Gas Leasing and Other Surface-Disturbing Activities:
- Apply a no surface occupancy stipulation on surface occupancy and surface-disturbing activities in the ERMA for the protection of the recreation activities and objectives.

Visual Resource Management (VRM):

- The SRMA would be classified as VRM Class IV and managed under VRM Class IV objectives.
- Apply BMPs to surface-disturbing activities to minimize the impact of these activities to the extent possible.

Implementation-Level Decisions Included in this RMP Revision

Comprehensive Trails and Travel Management:

- Travel management for this area will be low priority. In the interim, motorized travel is limited to existing roads, primitive roads and trails. A site-specific travel network of roads and trails available for public use and any limitations placed on that use will be included in the subsequent travel management planning for the area.
- Maintain the existing road, primitive road and trail system and construct new routes only to connect to new visitor facilities or to address issues of visitor safety or resource damage.
- In Alternative D, motorized off-road travel will be allowed for retrieval of a big game animal that is in possession, in a minimum timeframe utilizing the most direct route while minimizing resource damage, between the hours of 10:00 a.m. and 2:00 p.m.

Special Recreation Permits:

- SRPs will be required for any commercial or organized group activities that are not authorized under an MOU or letter of agreement.

Best Management Practices to Guide Implementation-Level Planning and Management

Management:

- Reroute trails that that create resource damage and trespass on private property.
- Develop a wildlife and habitat monitoring-management plan to maintain the diversity of native wildlife and plant species on which the area recreation is dependent.
- With stakeholder involvement, apply adaptive management (e.g. Limits of Acceptable Change) which focuses on a cycle of *designing-implementing-monitoring-evaluating-adjusting* implementation actions to respond to future recreation issues and the results of monitoring.

Administration:

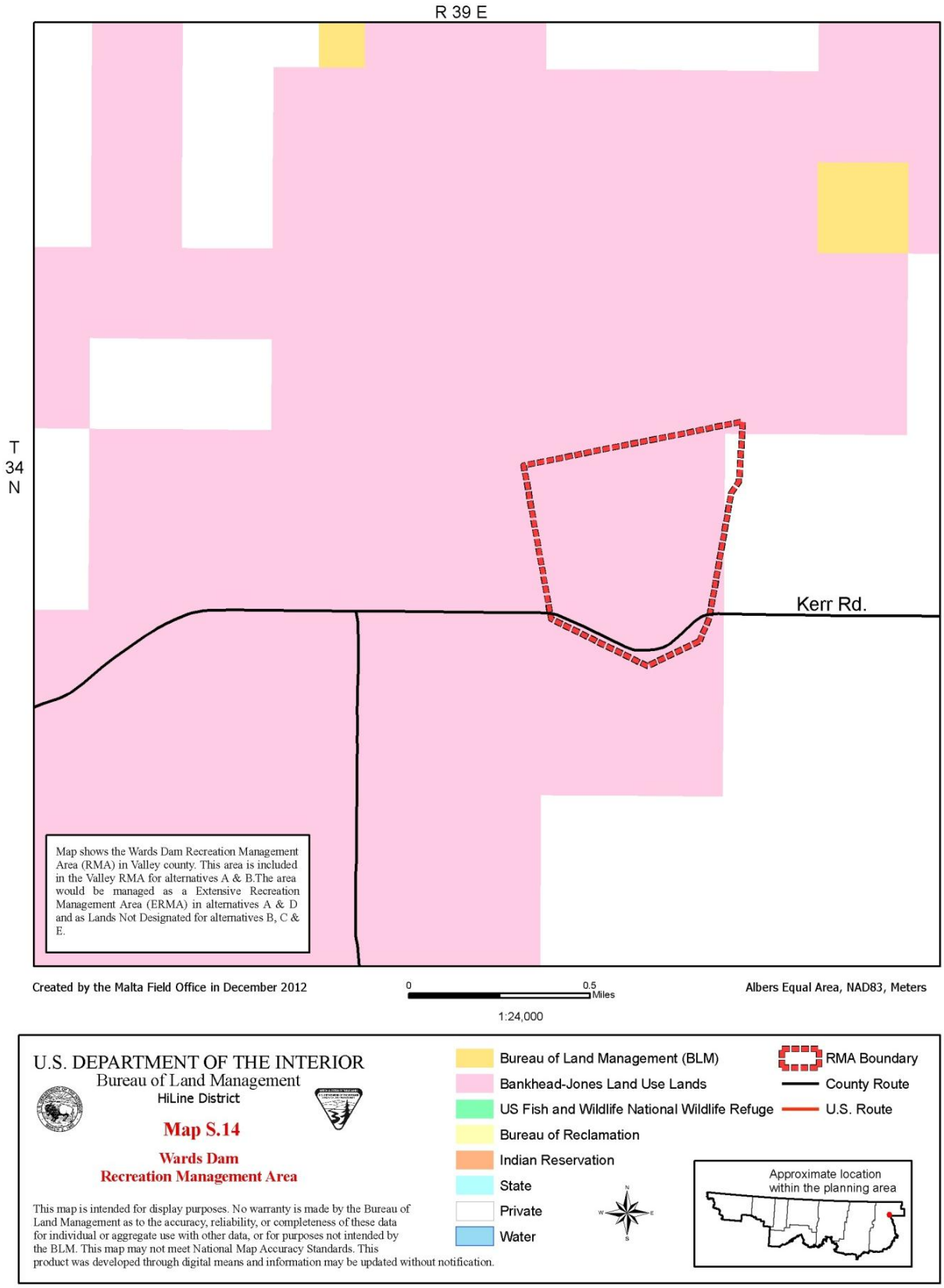
- Pursue partnerships with local schools and other user groups to develop visitor facilities and to assist with maintenance and monitoring activities. Develop a Memorandum of Understanding or Letter of Agreement, as appropriate, between BLM and partners that outlines administrative roles and responsibilities.

Information and Education:

- Provide a basic ERMA brochure/map including information on: targeted outcomes, RSCs, estimated times, ethics, wildlife protection, private-public land ownership and stewardship information; to help preserve the recreation opportunities and the special landscape character of this place.
- Provide interpretive signage to support the ERMA objectives and opportunities.
- Market the area locally. Local marketing involves tailoring information and maps to the needs and wants of local customers and providing information at local outlets and on-site locations only.

Monitoring:

- Monitor outcome attainment and preferences through customer assessments (e.g. focus group interviews or visitor studies) on five year intervals or as funding allows. Monitor activity participation and RSCs annually during the primary use season of mid-April through October.
- If future monitoring indicates that resource damage is occurring or user conflicts need to be addressed, the HiLine District may create an allocation system or apply group size limits for private and commercial recreation use.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Kerr Rd.
Map shows the Wards Dam Recreation Management Area (RMA) in Valley county. This area is included in the Valley RMA for alternatives A & B.The area would be managed as a Extensive Recreation Management Area (ERMA) in alternatives A & D and as Lands Not Designated for alternatives B, C & E.
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U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
HiLine District
Map S.14
Wards Dam
Recreation Management Area
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Bureau of Land Management (BLM)
Bankhead-Jones Land Use Lands
US Fish and Wildlife National Wildlife Refuge
Bureau of Reclamation
Indian Reservation
State
Private
Water
RMA Boundary
County Route
U.S. Route
Approximate location within the planning area

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