

APPENDIX 20—SIGNIFICANCE CRITERIA AND ASSUMPTIONS

Table A20-1. Significance Criteria by Resource

Resource	Significance Criteria
Land and Water Resources	
Fire Management	Management actions or activities increase the costs related to the fire management program to the point where the overall effectiveness of the program is reduced.
Water Resources	<p>Proper Functioning Condition (PFC) cannot be attained or maintained as a minimum physical state, or if the Wyoming Bureau of Land Management (BLM) Standards for Healthy Rangelands Standard #2 was not obtainable.</p> <p>Management actions or activities accelerate erosion and runoff and thereby alter the physical characteristics of streams, wetlands and riparian areas, or degrade water quality beyond the designated use of the receiving stream.</p> <p>Any loss of wetlands or wetland function, or violation of the requirements of Section 404 permits.</p>
Wild Horses	Available forage is insufficient to sustain the appropriate management level (AML) of the herd, or the AML cannot be achieved or maintained.
Livestock Grazing	Management actions or activities cause a reduction in forage levels that would require livestock operators to reduce their permitted animal unit months (AUM).
Vegetation	<p>The viability of protected plant species is jeopardized, with little likelihood of reestablishment after disturbance, or actions result in the need to list a species under the Endangered Species Act (ESA).</p> <p>Reclaimed areas do not attain adequate vegetation ground cover and species composition to stabilize the site within 5 years from disturbance, or there is invasion and establishment of noxious weeds that contribute to unsuccessful revegetation.</p> <p>Loss of habitat function or habitat value in BLM sensitive species habitats.</p> <p>Significance of an impact is also dependent on the importance of the resource and the proportion of the resource that would be affected relative to its occurrence in the vicinity.</p>
Wildlife	<p>The viability of a federally protected species is jeopardized, or actions result in the need to list a species under the ESA.</p> <p>BLM sensitive species or native wildlife species considered as vital, high, or moderate by the Wyoming Game and Fish Department (WGFD) Mitigation Policy show increased mortality or decreased survival rates.</p> <p>Any loss of habitat function or habitat value in vital, high, or BLM sensitive species habitats.</p> <p>Long-term displacement of elk, mule deer, or pronghorn from crucial habitat or birthing areas within the planning area.</p>

Table A20-1. Significance Criteria by Resource (Continued)

Resource	Significance Criteria
Wildlife Continued	The significance of an impact is dependent on the importance of the resource and the proportion of the resource that would be affected relative to its occurrence in the vicinity.
Heritage Resources	<p>The physical alteration, destruction, or loss of a resource listed or determined eligible for listing in the National Register of Historic Places (NRHP), or considered important to Native American groups.</p> <p>The criteria used to determine the significance of impact on heritage resources include the effect on NRHP eligibility, future research potential, and (in some cases) effects to resources suitability for religious or traditional uses.</p>
Travel Management, Access, and Realty	<p>Management actions or activities compromise public health and safety.</p> <p>Restrictions for the preservation of sensitive resources limit reasonable public access and use of the planning area, cause economic hardship for developers, and/or cause adverse effects to state or private inholdings.</p>
Recreation Resources	<p>Management action or activities eliminate recreation use in any area.</p> <p>Management action or activities affect a user's experience.</p> <p>Management actions or activities compromise public health and safety.</p> <p>A level of development occurs that prevents meeting the recreation objectives for the planning area or that has a direct or indirect effect on wilderness suitability.</p>
Minerals and Alternative Energy Resources Management	<p>Management actions or mitigation requirements result in a greater than 25 percent decrease in development activity over the planning period.</p> <p>Management actions or mitigation requirements cause development of the resource to be infeasible or economically nonviable.</p>
Visual Resources	Activity or development occurs in an area that would be incompatible with the Visual Resource Management (VRM) classification objective.
Special Management Areas and Other Management Areas	<p>Development or activity occurs that would be incompatible with the Special Management Area (SMA) objectives and management prescriptions.</p> <p>Activity or development impairs the suitability of WSAs for preservation as wilderness, or adversely affects resources to the point that the current SMA no longer meets criteria for designation.</p>

Table A20-1. Significance Criteria by Resource (Continued)

Resource	Significance Criteria
Air Resources	<p>A violation of the National Ambient Air Quality Standards (NAAQS) or Wyoming Ambient Air Quality Standards (WAAQS), or the further aggravation of an existing air quality violation.</p> <p>Prevention of Significant Deterioration (PSD) increments for Class I or Class II areas are exceeded.</p> <p>Increased toxin concentrations are above designated thresholds.</p> <p>Atmospheric deposition impacts are above terrestrial voluntary guidelines (3-5 kg total nitrogen per hectare/year; 5 kg total sulfur per hectare/year) or above aquatic levels of acceptable change (10 percent change in acid neutralizing capacity).</p> <p>Visibility impacts to sensitive areas are above the designated 0.5 and 1.0 deciview (dv) change threshold.</p>
Socioeconomics	<p>This analysis evaluated the long-term trends to determine the approximate changes likely to occur in these variables under existing conditions. Annual deviations from the trend over this 20-year period are considered the threshold of what can be tolerated by the regional economy for these three variables. Any changes beyond these thresholds would likely cause significant impacts to local communities. See Section 4.12.1 for further details.</p>

Table A20-2. Assumptions by Resource

Resource	Assumptions
Land and Water Resources	
Fire Management	<p>A direct relationship exists between density of human use within the planning area and the frequency of person-caused fires.</p> <p>A direct relationship exists between fuel loads (standing and nonstanding vegetation) and potential fire size and intensity.</p> <p>The amount of area to be treated with prescribed fire is not expected to exceed 5,000 acres over the 20-year planning period.</p>
Water Resources	<p>Any substantial disturbance to the soils or changes in vegetative cover has an adverse effect on watershed health and water quality.</p> <p>Surface disturbances result in accelerated erosion and runoff, increasing sediment and nutrient loads to local channels.</p> <p>The degree of impact attributed to any one disturbance or series of disturbances is influenced by location within the watershed, soil type, time and degree of disturbance, existing vegetation, and precipitation.</p>
Wild Horses	<p>The Divide Basin Wild Horse Herd would continue to be maintained at the AML of 415 to 600 horses over the long term through gathering efforts.</p> <p>Except under Alternative 2, approximately 1 acre would be disturbed, and vegetation and forage removed, through constructing and using wild horse traps every 3 years for gathering.</p>
Livestock Grazing	<p>Livestock grazing would occur throughout the entire Jack Morrow Hills (JMH) coordinated activity plans (CAP) planning area.</p> <p>Anticipated grazing use would increase over the planning period to the fully permitted active use amount (26,830 AUMs) under Alternative 1, but would maintain the historic use (11,569 AUMs) under all other alternatives.</p> <p>Although some areas are more suitable for different classes of livestock, the impacts are assumed similar for all areas and therefore are not discussed separately.</p> <p>The rate of revegetation of disturbed areas varies by type of activity. Construction of fences, pipelines, water wells, troughs, and reservoirs would cause a loss of some soil and vegetation. Vegetation would be reestablished along fences and pipelines within 3 to 5 years, whereas water wells, troughs, and reservoirs would remain disturbed during their useful life and would be revegetated upon abandonment.</p>
Livestock Grazing Continued	<p>Except for Alternative 2, approximately 23 livestock water developments (e.g., pits, ponds, and water wells) would be constructed or rebuilt in the JMH CAP planning area over the 20-year planning period, disturbing approximately 23 acres. Under Alternative 2, only 11 livestock water developments would be constructed or rebuilt in the JMH CAP planning area over the 20-year planning period, disturbing approximately 11 acres.</p> <p>Prescribed burns and wildfires would cause a loss of vegetation for a period of 1 to 2 years and a change in vegetation for 15 to 30 years.</p>

Table A20-2. Assumptions by Resource

Resource	Assumptions
Vegetation	<p>Adequate vegetative ground cover and species composition for site stabilization would occur in 3 to 5 years.</p> <p>Brush reestablishment in disturbed areas would create a vegetative landscape similar to adjacent lands in excess of 20 years.</p> <p>Adequate forage is available for current wildlife objective numbers.</p> <p>All management actions associated with the protection of wildlife habitat and cultural resources have a direct benefit to vegetation management.</p> <p>All surface disturbing activities would require reclamation as per the Rock Springs District Reclamation Monitoring Plan, and new oil and gas leases would have stipulations for protection of threatened, endangered, and Wyoming BLM sensitive species.</p>
Wildlife	<p>The WGFD herd management objective for the Steamboat elk herd unit would remain at 500 under the No Action Alternative, and increase to the current objective of 1,200 under Alternatives 1, 2, 3, and the Proposed JMH CAP.</p> <p>Sufficient habitat exists to maintain WGFD big game objectives for portions of herd units within the planning area.</p> <p>A portion of key habitats within the planning area would have year-round activity occurring. The level of activity within the planning area would increase and additional activity would occur within portions of key habitats. Some wildlife adaptation to activities would occur within the planning area; however, this would not outweigh the effects of disturbance attributed to the lack of topographic escape and cover for elk and mule deer. As development and recreational activities increase throughout the planning area, increased fragmentation of habitats would occur.</p> <p>Disruptive activities in key habitats are expected to cause displacement of wildlife.</p> <p>Actions that improve watershed quality are directly related to improving wildlife habitat in riparian areas.</p> <p>Any substantial disturbances to the soils or changes in vegetative cover that have an adverse effect on watershed health and water quality would adversely affect associated fisheries.</p> <p>Elk and mule deer compete for birthing and crucial winter range habitat use.</p>

Table A20-2. Assumptions by Resource (Continued)

Resource	Assumptions
Wildlife Continued	<p>Greater sage-grouse populations will continue to decline in the planning area under the No Action Alternative and Alternatives 1 and 3. Greater sage-grouse population declines in the planning area will slow under Alternative 2 and the Proposed JMH CAP because of maintenance and/or improvement of habitat.</p> <p>Only 50 percent of the greater sage-grouse nesting habitat identified is expected to be suitable for nesting activities, and only the sagebrush vegetation within greater sage-grouse winter range is expected to be suitable for wintering habitat.</p> <p>The majority of oil and gas leases contain stipulations for a minimum of seasonal protection in sensitive wildlife habitats, and new oil and gas leases would have stipulations for protection of threatened and endangered and Wyoming BLM sensitive species.</p> <p>Livestock water development depletion calculations under each alternative are based on the following assumptions: 1) all are installed in year 1 of the 20-year planning period, 2) ponds average one-quarter acre in surface area, 3) evaporation rate from surface water equals the summer-time peak rate of one-quarter inch per day, 4) water would remain in the pond for 48 days, and 5) all would be developed in the Colorado or Platte River systems.</p> <p>It is assumed that each water development within the planning area causes a depletion to the Colorado or Platte River system because all water used for livestock pits, ponds, and water wells and/or water used for drilling and completion of wells within the Green River and Sweetwater River basins contributes to the surface flows of the Colorado or Platte Rivers or their tributaries.</p>
Heritage Resources	<p>The overall densities of archeological sites in the planning area would be approximately 3.2 sites per 640 acres (one section).</p> <p>Approximately one-third of the sites would prove to be significant in terms of NRHP criteria.</p>
Travel Management, Access, and Realty	<p>The majority of right of way (ROW) locations are the result of development in the area.</p> <p>Exchanges of public land for state lands in sensitive resource areas would be pursued, and access to state and private inholdings would be maintained.</p>
Recreation Resources	<p>Recreation activity levels would vary by each alternative and would be related to how much recreational opportunity would be created or lost because of other projected development and activities. The specific assumptions are presented in Section 4.12, Socioeconomics.</p> <p>Dispersed recreation use is assumed to increase under each alternative.</p> <p>OHV use is to remain constant or to increase for a few years and then remain constant or decline slightly.</p> <p>New large-scale recreation facilities or developments would not be constructed during the planning period. Existing recreation facilities may be upgraded or improved.</p>

Table A20-2. Assumptions by Resource (Continued)

Resource	Assumptions
<p>Recreation Resources Continued</p>	<p>Hunting for elk is to remain constant for all alternatives except Alternatives 1 and 2, where the number of hunting days is expected to increase slightly in early years because of dispersion of animals and decreased access, and begin to decline in the later part of the study period. Other big game hunting would remain constant.</p> <p>Greater sage-grouse hunting is expected to decline under the No Action Alternative and Alternatives 1 and 3, as populations continue to decline. Greater sage-grouse hunting is assumed to remain constant under Alternative 2 and the Proposed JMH CAP.</p>
<p>Minerals and Alternative Energy Resources Management</p>	<p>The effects discussed in the analysis are based on the estimated levels of development activity for the management actions that would be implemented under each alternative (Appendix 13).</p> <p>The BLM actions and land uses under each alternative would be required to comply with existing laws, regulations, guidelines, and standards for multiple use of public lands.</p> <p>The comparison of management alternatives assumes that increased resource mitigation generally results in increased costs for activities.</p> <p>Prescribed mitigation measures through lease stipulations would be successful and adjusted over time to meet resource objectives.</p> <p>Oil and Gas. A total of 221 wells would be drilled under the No Action Alternative; 264 wells under Alternative 1; 163 wells under Alternative 2; and 205 wells under Alternative 3 and the Proposed JMH CAP.</p> <p>All existing leases would see some development over the 20-year planning period. Development activities would be concentrated in the high development potential area.</p> <p>Under the Proposed JMH CAP, wells drilled on existing leases in Area 3 would happen during the first 11 years of the planning period (8-year maximum lease term, plus 3-year suspension release).</p> <p>Under the Proposed JMH CAP, the unleased portions of Areas 1 and 2 would be leased; once leases expire, they would be available to be released.</p> <p>To avoid drainage from state and/or private fluid mineral development, adjacent 160-acre spacing areas could be accessed by directional drilling (probably from state or private surface locations). It is also assumed that because there is a small amount of state and/or private mineral land within the planning area, only a minimal amount of drainage would be likely to occur.</p> <p>Up to 38 new production wells would be drilled in Nitchie Gulch, with a maximum well density of six wells per section. This development is expected to occur over the first 5 years of the planning period. Other producing units in the planning area (Buccaneer, Rim Rock, and Steamboat Mountain units) are developed at a density of 640 acres per well. Future exploratory activity would be widely spaced; however, development activity would most likely occur at a density of 160 acres per well.</p>

Table A20-2. Assumptions by Resource (Continued)

Resource	Assumptions
Minerals and Alternative Energy Resources Management (Continued)	<p>Ultimate gas recovery from existing gas wells is estimated to be 145.4 billion cubic feet. Approximately 24.3 billion cubic feet of gas is left to produce from these active wells. Based on the production history of wells in the planning area, the average estimated ultimate gas recovery is expected to be 2.3 billion cubic feet per well. Decline curve analysis indicates that the average well would produce about 2.3 billion cubic feet of gas over a lifespan of 26 years before declining to an uneconomic rate, which would then result in abandonment.</p> <p>The ratio of gas to oil-condensate production is assumed to remain similar to its present ratio. At this ratio, an average well would produce only 117 barrels of oil each year.</p> <p>Surface Disturbance. The amount of surface disturbance per well is based on standard industry practices and compliance requirements for existing regulations on surface-disturbing activities.</p> <p>Access Roads:</p> <ul style="list-style-type: none"> • 40 feet total width • 12- to 14-foot-wide travelway • 4.8 acres initial disturbance per linear road mile • 1.5 miles of road construction for exploration wells • 0.375 miles of road construction for development wells • 4.0 acres long-term disturbance per producing well (no stabilization or revegetation of barrow ditch) • 4.0 acres of access road stabilized per abandoned dry well, after 3 years • 4.0 acres of access road stabilized after abandonment of each producing well, after 3 years • Road standards would be in conformance with guidelines issued in BLM Manual 9113 (Roads) and Surface Operating Standards for Oil and Gas Exploration and Development (1989). <p>Drill Pads:</p> <ul style="list-style-type: none"> • 3.0 acres initial disturbance per average well pad • 0.7 acres long-term disturbance per producing well • 2.3 acres stabilized per producing well, after 3 years • 3.0 acres stabilized per abandoned dry well, after 3 years • 0.7 acres stabilized after abandonment of each producing well, after 3 years.

Table A20-2. Assumptions by Resource (Continued)

Resource	Assumptions
<p>Minerals and Alternative Energy Resources Management (Continued)</p>	<p>Pipelines and Powerlines:</p> <ul style="list-style-type: none"> • 6.0 acres initial disturbance per producing well • 5.5 acres stabilized per producing well, after 3 years • 0.5 acres long-term disturbance per producing well • 0.5 acres stabilized after abandonment of each producing well, after 3 years. <p>In general, oil and gas wells drilled in the depth ranges expected in the planning area require 1 to 1.5 acre-feet of water. Coalbed methane wells drilled to depths greater than 1,200 feet would require 0.75 to 1 acre-feet of water consumption.</p> <p>Coalbed Gas. No coalbed wells are expected to be drilled until after 2002. Under all alternatives, except for Alternative 2, a maximum of 50 coalbed gas wells in two exploration projects are projected. Each project would include up to 16 dewatering wells and 9 gas wells. Under Alternative 2, up to 25 wells in one exploration project is expected.</p> <p>The surface disturbance rates associated with drilling oil and gas wells are similar to surface disturbance at coalbed gas wells for access roads, drill pads, and pipelines and powerlines.</p> <p>Most of the planning area is subject to strict water quality discharge requirements to comply with the Colorado River Basin Commission regulations on salinity control. Because the area with high coalbed gas potential is located within the Colorado River Basin, these requirements are assumed to apply to all coalbed gas development projects that may occur in the planning area.</p> <p>All produced water would be reinjected into the subsurface in compliance with water quality regulations. Existing gas wells in the planning area could be converted to injection wells at the end of their productive life.</p> <p>Leasable Solid Minerals. No oil shale development is expected during the planning period.</p> <p>There is low potential for coal and brine development.</p> <p>Existing coal mines and known coal reserves south of the planning area are expected to meet the demand for coal (USDI 1996), but limited amounts of exploration may occur within the planning area, except under Alternative 2, to evaluate future coal development potential.</p> <p>If coal exploration occurs at all, it would likely occur in the last 5 to 10 years of the planning period, and the most probably location for exploration would be in areas open to coal exploration within the Coal Occurrence and Development Potential Area. The amount of disturbance is expected to be between 10 and 15 acres, and occur in a single season. It is expected that disturbed sites would be fully reclaimed within 3 years of disturbance.</p>

Table A20-2. Assumptions by Resource (Continued)

Resource	Assumptions
Minerals and Alternative Energy Resources Management (Continued)	<p>The Leucite Hills, including Boars Tusk and Steamboat Mountain, are known to contain potash, but development of this resource within the planning area is unlikely during the planning period given existing surface use constraints, poor accessibility, high development costs, and better availability of potash from existing sources outside the planning area.</p> <p>Locatable Minerals. Existing levels of mining claim activity from the gold placers in the Dickie Springs/Oregon Gulch area are expected to continue through the planning period.</p> <p>The potential for development of a gold mine in this area is low. However, a hypothetical gold mine will be used to evaluate the impacts that would be associated with a commercial gold discovery. A hypothetical mine could process as much as 320,000 tons per year of ore and disturb about 53 acres over an 11-year life.</p> <p>Except under Alternative 2, exploration for diamond occurrences in association with the Quaternary volcanic rocks (lamprophyres) at Steamboat Mountain may occur during the planning period. About 2 acres of disturbance would be anticipated from these activities.</p> <p>Based on current information and commodity prices, gold and diamonds are the only mineral types that have potential for development in the planning area.</p> <p>Salable Minerals. Except under Alternative 2, demand for suitable construction material in the planning area is expected to increase during the planning period commensurate with the increase in oil and gas development and the needs of the Wyoming Department of Transportation (WYDOT) for reconstruction of U.S. Highway 191 and State Highway 28.</p> <p>Reconstruction of U.S. Highway 191 and State Highway 28 would require about 25 acres of disturbance in addition to the 4 acres of existing disturbance associated with WYDOT's pit along State Highway 28.</p> <p>Development of the mineral material sites is expected within the latter 10 years of the planning period.</p> <p>With the surface use constraints that exist in this area and the abundance of usable clay products available from other sources, no development of this resource is expected within the planning area during the planning period.</p> <p>Alternative Energy. Alternative energy developments, such as wind farms and solar arrays, could be developed in the planning area as long as a proposed development is compatible with the planning criteria under the respective alternative. However, there are currently no specific proposals to develop these resources in the planning area, and future demand cannot be anticipated.</p>
Visual Resources	<p>VRM classifications would be incorporated into all project planning. Specific activities or developments that would not be compatible with VRM objectives would avoid those areas or would be modified and designed to meet the objectives. Activities or developments on state or private inholdings would not be significantly different such that proposed VRM classifications for surrounding public lands could not be achieved or maintained.</p>

Table A20-2. Assumptions by Resource (Continued)

Resource	Assumptions
Special Management Areas and Other Management Areas	<p>All areas existing and proposed as areas of critical environmental concern (ACEC) meet the relevance and importance criteria.</p> <p>WSAs would remain under wilderness review and wilderness designation or nondesignation would not occur during the planning period.</p> <p>The WSAs would continue to be managed under the Interim Management Policy and Guidelines for Lands Under Wilderness Review.</p> <p>Activities or developments on state or private inholdings would not be significantly affected by SMA management prescriptions, nor would they significantly affect the criteria necessary to maintain designations.</p>
Air Resources	<p>In examining whether the BLM activities in the JMH CAP planning area will result in the exceedance of air quality standards, the results of the 1999 modeling remain valid.</p>
Socioeconomics	<p>Total employment in any given year may deviate by 10 percent above the trend to 12 percent below the trend (+4,600 jobs to -5,400 jobs).</p> <p>Grazing use would remain near the 5-year historic average of 11,602 AUMs, (10,649 cattle and 953 sheep) except for Alternative 1, where it would gradually increase during the study period to the fully permitted active use of 26,830 AUMs (23,627 cattle and 3,203 sheep).</p> <p>Elk hunting is expected to increase, following recent hunting trends and assumptions on elk dispersion and access under Alternatives 1 and 3 for the first part of the study period.</p> <p>Under No Action, Alternative 1, and Alternative 3, greater sage-grouse hunting is expected to decline during the first part of the study period and then be eliminated as populations continue to decline. Greater sage-grouse hunting is expected to remain constant at current levels under Alternative 2 and the Proposed JMH CAP.</p> <p>Recreational use associated with antelope and mule deer hunting would stay constant at the 5-year historic average for all alternatives.</p> <p>OHV use would be expected to increase by 2.5 percent per year for the first half of the study period for the No Action Alternative and Proposed JMH CAP because of improvements proposed for the Sand Dunes Recreation Area and increased interest in the planning area. However, OHV use would not be expected to follow this trend during the later part of the study period under these alternatives. Under Alternatives 2 and 3, OHV use would be expected to remain constant at the 3-year historic average or begin to decline because of access limitations and no proposed improvements to the Sand Dunes Recreation Area.</p>
Socioeconomics Continued	<p>Other recreational uses would be expected to increase between 1 and 2 percent per year under the various alternatives based on the prescribed management action.</p> <p>For comparison purposes, average (gas) production in the three-county area would follow historic production trends over the last 20 years.</p>