1226

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.net>

11/24/2008 04:48
PM

To <BBRMP_WYMail@blm.gov>

cc

Subject Scoping comments for Bighorn Basin RMP

Dear Mr. Hiner,
Thank you for accepting our attached comments.

Deb Thomas, Organizer
Powder River Basin Resource Council
Clark Resource Council
Pavillion Area Concerned Citizens
920 Road 1AB
Clark, WY 82435
307-645-3236
(See attached file: Draft Scoping comments for BHB RMP 11-19-08 (2).doc)

ENCOURAGING RESPONSIBLE DEVELOPMENT TODAY ~ FOR TOMORROW

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POWDER RIVER BASIN
Resource Council

November 19, 2008

Bureau of Land Management
Bighorn Basin RMP
ATTN: Caleb Hiner
P.O. Box 119
202 South 23rd Street
Worland, Wyoming 82401

RE: Scoping comments for Bighorn Basin RMP

Dear Mr. Hiner,

Thank you for the opportunity to submit scoping comments on the proposed Big Horn Basin Resource Management Plan. These scoping comments are submitted by the Powder River Basin Resource Council, Clark Resource Council, the Oil and Gas Accountability Project and the Western Organization of Resource Councils to help improve the management of all valuable resources in the Bighorn Basin.

The Big Horn Basin Resource Management Plan (RMP) must address development of mineral resources in the basin, while effectively protecting the land, water and air quality in addition to citizens' health, livelihoods and private property rights. Measures to *prevent, reduce and mitigate* degradation to air quality, ground and surface water quality, soil and vegetation must be incorporated into the plan. Baseline air, water and soil quality data must be collected and monitoring plans established to preserve the integrity of our resources, assess changes and, when necessary, take action to restore them in a timely fashion. Preventing impacts to all waters of the state must be given the highest priority in this RMP. Documentation of the content of drilling and hydraulic fracturing constituents must be required as it is necessary to maintain worker and resident safety. A Health Impact Assessment (HIA) must be conducted as an integral part of the Bighorn Basin EIS. The integrity of agricultural and grazing opportunities as well as wildlife must also be safeguarded to protect the long-term economic success of our state.

The recently completed *Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans* may prove to be a valuable guideline to craft best management practices for energy development in the Bighorn Basin as well as elsewhere in Wyoming. Likewise, the newly released Colorado assessment, *Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper,* is an excellent primary reference to better manage public health in the Bighorn Basin. Please also review the references throughout and those provided for your use on the disc accompanying this document.

We request that you consider the following comments and refer to the recommended resources to assist the BLM to establish the best development practices in Bighorn Basin RMP and to maximize the effectiveness of the area's management for years to come.

Baseline data collection and monitoring programs must be established

The importance of baseline data collection cannot be emphasized enough.
Without a baseline for comparison, impacts from changes to the management of land, air and water in the Bighorn Basin will be impossible to quantitatively assess. Negative impacts are less likely to be evaluated and addressed in an adequate and timely fashion.

Baseline data, well-conceived monitoring programs, action thresholds and responsive action plans must be established for air, surface water, riparian areas, ephemeral channels, fisheries, groundwater, soils, cultural resources, vegetation, and wildlife.

Concerns with Public Health: Request for a Health Impact Assessment

As explained by Witter et al. in the *Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper* publication, we, likewise, request the completion of a Health Impact Assessment as a consideration for this RMP/EIS and compliance of oil and gas developers with applicable Federal laws from which they are currently exempt to better protect the environment and to safeguard human health.

> "Oil and gas exploration and production activities have been exempted from standards created to protect health under a number of Federal statutes, including provisions of the Clean Air Act (CAA), the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or the Superfund Act), and the Emergency Planning and Community Right to Know Act (the Toxics Release Inventory or TRI). These laws are designed to protect the health of the American population by ensuring clean air and water. (Mall 2007)
>
> "Because the oil and gas drilling industry is not obliged to comply with certain federal health and environmental regulations (Mall, 2007), there has been virtually no publicly available monitoring of air or water contamination due to the activities of oil and gas drilling and extraction. As drilling for oil and gas moves closer to human populations, hazards associated with these industries are more likely to have a direct effect on the health of those living, working and going to school in proximity to the drilling and production sites. Anecdotal evidence of health effects due to increased drilling has begun to surface. (Oil and Gas Accountability Project) However, in the absence of environmental monitoring data regarding exposure levels and medical evaluation of complaints, it has been scientifically difficult to establish causal relationships between oil and gas activity and health effects. Gaps in the medical literature are profound, as reflected in the literature review that is attached to this white paper. There is a paucity of published literature that directly addresses the health effects of oil and gas exploration and production. However there is a sizeable scientific literature linking many of the exposures to adverse health outcomes in humans.
>
> "The National Environmental Policy Act (NEPA) established the Environmental Impact Statement (EIS) as a means for environmental analysis in the United States. When industrial development involving federal resources is proposed, the federal government is tasked to consider effects on the "human environment." In practice, EIS have traditionally focused on environmental effects, with little consideration of public health effects. When public health is considered, simple compliance with regulatory statutes such as the CAA and CWA are commonly used as a proxy for more substantive analysis. Since industrial projects often have impact on the environment in ways that directly or indirectly affect the health and psychosocial structure of local populations, there is a growing recognition that EIS should include a Health Impact Assessment (HIA) in many cases. (Wernham 2007) This white paper is intended to examine the rationale for an HIA as part of the permitting process for oil and gas drilling on the Western Slope of Colorado and other areas with intensive industrial development. As precedent,

> an integrated HIA/EIS published in 2007 described the impact of oil development on Alaska's North Slope on the local Inupiat populations. (Wernham 2007) The HIA findings predicted impact on health and social structure. The report provided recommendations for mitigation of these effects, thereby improving the probability that oil development could proceed with less adverse impact on the people who live in the region" (Witter et al. 2008).

Given this information, we request that the BLM complete a Health Impact Assessment as a major component of the Bighorn Basin EIS/RMP and require oil and gas operations in Wyoming to comply with all Federal regulations/legislation from which they are currently exempt, especially the Safe Drinking Water and Clean Water Acts. Greater protection must also be given to individual well and irrigation sources even if they do not serve great numbers of people.

Require Full Disclosure
Full disclosure of the content of drilling and hydraulic fracturing constituents must also be required for all APD's issued on both private and public surface under the Bighorn Basin RMP as it is necessary to maintain worker, resident and environmental safety. It is impossible to effectively mitigate groundwater contamination, spills or incidence of human exposure if the constituents are unknown. If companies refuse to reveal their drilling and stimulation fluid components, they must not be introduced into the groundwater system.

Mandate operations conducted in the state of Wyoming meet the Federal guidelines from which oil and gas are currently exempted.
Wyoming must set an example by producing energy in the most beneficial way for the state now and for the future. Special regard must be given to protect Wyoming's other valued resources and public health. The Bighorn Basin RMP must mandate that oil and gas companies comply with all existing Federal and state legislation including the elements of the Clean Air Act, Clean Water Act, the Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation, and Liability Act, and the Emergency Planning and Community Right to Know Act (the Toxics Release Inventory) from which the industry currently enjoy exemptions. Given the information that has been collected regarding groundwater and contamination since this date, this enforcement decision, now left to the states, must be made with consideration of the potential for serious adverse effects to public health and irreversible damage to subsurface water reserves. Please note especially the constituents listed in the Crosby well 25-3 in Clark, Wyoming available on the reference disc provided.

Groundwater Resources:
See accompanying disc for 2004 EPA evaluation Chapter 1 and decision to exempt oil and gas from these acts as well as the decision for discontinuation of diesel fuel use for drilling and hydraulic fracturing. See also the report from an Ohio aquifer assessment and sampling of New Mexico drilling pits.

Crosby 25-3 Well – Windsor Energy, Park County Wyoming: Analysis of Products Used for Drilling. TDEX. February 25, 2008

Cooperating Health Agencies
Cooperating agencies should be involved from the scoping process onward to help create the best monitoring and response plans possible. The Wyoming Department of Health, particularly the Community and Public Health Department should take a primary leadership role and local county public health divisions should be invited to share their expert opinions and help monitor and track health effects that may be associated with development in the Bighorn Basin.

Air quality:
Air quality is a foremost concern in both urban and rural communities. As we have seen, Wyoming is no exception. Increasing levels of NO_x, ozone and particulate matter have been documented in areas around the state. Recently, levels of ozone exceeding federal EPA National Ambient Air Quality Standards have drawn considerable attention to public health impacts in Sublette County. While air pollutants have associated adverse effects individually, the cumulative effects of poor quality air are harder to measure and may be even more serious.

Potential effects can include mortality associated with respiratory symptoms, cardiovascular disease and chronic obstructive pulmonary disease (COPD). Excess instances of hospitalization, emergency room visits, aggravation of respiratory symptoms and illness, altered lung function, infant mortality and low birth weight. Sensitive subpopulations include the elderly, children, outdoor exercisers and those with preexisting respiratory or cardiovascular disease.

Both the individual effects and collective impacts of declines in air quality must be considered in the Bighorn Basin RMP. Children, geriatric residents, outdoor recreationist, tourists, oil and gas field workers, agricultural and other outdoor workers are all at increased risk from degraded air quality in the Bighorn Basin. Pollutant sources, effects, potential for concentration increases with respect to climatic events (ie temperature inversions) and mitigation must be understood as a precaution to protect public health. Several air pollutants, their sources, potential impacts and relevance to the RMP have been described below.

According to the recent publication of *Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper:*

> "Air surrounding oil and gas production areas is particularly susceptible to toxic emissions. Fugitive natural gas emissions may contain many contaminants, such as methane and other hydrocarbons (ethane, propane, butane), hydrogen sulfide (H2S), and water vapor. These emissions can come from production sites, disposal pits or pipelines. In Garfield County, for example, many of these sites tend to be near population centers and adjacent to streams and other bodies of water (see Garfield County map on page 12 below). Some natural gas wells produce a condensate that can contain complex hydrocarbons and aromatic hydrocarbons such as benzene, toluene, ethyl benzene and xylene (BTEX). Natural gas flaring can produce many hazardous chemicals including polycyclic aromatic hydrocarbons (PAHs, including naphthalene), benzene, toluene, xylenes, ethyl benzene, formaldehyde, acrolein, propylene, acetaldehyde and hexane. Glycol dehydrators, used to remove water from natural gas, can produce BTEX leaks into the air" (Witter et al. 2008)

Nitrogen Oxides (NO_x)

NO_x Sources:

> Major outdoor NO_x, mainly NO_2, emission sources include vehicular traffic (as a result of the combustion of diesel and gasoline), industrial activities, power generation and natural gas combustion.
> Primary indoor sources include gas appliances, tobacco smoke and outdoor to indoor air infiltration in high traffic or industrial areas.

NO_x Impacts:

> Among other concerns, NO_x impacts include contributing to ground level ozone generation. High and low levels of NO_x have also been associated with respiratory problems and aggravation of

Chronic Obstructive Pulmonary Disease (COPD). Indoor NO_2 exposure studies have associated greater NO_2 exposure from gas stoves in the home with increased asthma symptoms in children (Belanger et al. 2006).

Relevance to the Bighorn Basin RMP:

Among other sources, increased vehicular travel, drilling operations, great numbers of diesel and gas compressor stations, and natural gas power substations have the potential to greatly increase NO_2 emissions in areas of development.

NO_2 Resource/reference:

Belanger et al. 2006. Association of indoor nitrogen dioxide exposure with respiratory symptoms in children with asthma. *American Journal of Respiratory and Critical Care Medicine.* 173(3): 297-303.

Organic Solvents/Volatile Organic Compounds (VOC's)

VOC Sources:

VOC's are a category of pollutants which include compounds such as chloroform, BTEX, and formaldehyde. VOC's can be both primary and secondary pollutants. Major sources of VOC's include biomass and fossil fuel combustion, traffic, construction materials, household chemicals, solvents, industrial activities and biogenic sources (vegetation).

VOC Impacts:

Acute and chronic impacts include headache, dizziness, upper respiratory tract infection, nausea and cancer. Many VOC's are associated with adverse reproductive effects. VOC's also contribute to ground level ozone formation.

Relevance to the Bighorn Basin RMP:

Increased diesel and gasoline combustion associated with industry traffic, compressor stations, power generation, venting and flaring of natural gas, drilling and stimulation fluids, mud pits, oil, gas and condensate production, purification (refining, water and carbon dioxide removal) will contribute to elevated levels of VOC's in the Bighorn Basin.

VOC Resource/references:

Schettler et. al. Generations at Risk: Reproductive Health and the Environment. Cambridge: MIT Press, 1999.

Ozone (O_3)

Ozone Sources:

Ground level ozone is a secondary pollutant formed from highly non-linear, complex chemical reactions between VOC's and NO_x in the presence of heat and sunlight in the lower layers of the atmosphere. Ozone follows both diurnal cycles related to sunlight, temperature and traffic patterns as well as seasonal cycles with peaks in months of high heat and sunlight. Temperature inversions can worsen instances of ozone formation. 'Climate change may increase the frequency and intensity of ozone episodes" (Knowlton et al 2004).

Ozone Impacts:

Ozone is a phytochemical oxidant that was first associated with damages to vegetation. Ozone is also reactive with materials and other biological material including the lining of the lungs. Ozone is associated with hospital admissions, respiratory or asthmatic symptoms, abnormal lung development and mortality. Due to the nature of the co-pollutants associated with ozone, it is often hard to separate the effects of the co-pollutants (motor vehicles and industry) from ozone. "Although new National Ambient Air Quality Standards (NAAQS) for ozone is 75 ppb, the EPA acknowledges that for O_3 (and PM2.5) levels substantially below NAAQS are still associated with increased mortality, cardiovascular events, and respiratory problems" (Witter et al. 2008)

Relevance to the Bighorn Basin RMP:

As precursors for ozone increase due to industrial activities in the Bighorn Basin, ozone levels are likely to rise. Sublette County ambient air monitors have detected ozone levels exceeding National Ambient Air Quality Standards on several occasions. Under such conditions recommendations to modify human behavior are made as health precaution. Outdoor exercisers must be asked to remain indoors and children must not be permitted to go outside for recess. A system of conveying ozone alerts to rural landowners must be considered.

Ozone Resource/references:

Jaffe, Mark. 'From Calif. to Denver: Ozone woes become regional.' *The Denver Post.* November 1, 2008.

Knowlton et al. 2004. Assessing ozone-related health impacts under a changing climate. *EHS.* 112(15): 1557-1563.

Merril, Chris. 'Pinedale people fume on Ozone.' *Casper Star Tribune.* November 4, 2008.

Witter, Roxana, Kaylan Stinson, Holly Sackett, Stefanie Putter, Gregory Kinney, Daniel Teitelbaum, Lee Newman. Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper. September 15, 2008.

Particulate matter both $PM_{2.5}$ and PM_{10}

$PM_{2.5}$ and PM_{10} Sources:

Particulate matter can arise from fine matter of any variety, notably dusts, fossil fuel combustion (especially diesel), industrial activities, and smoking. The size, shape, density and aerodynamics of particles (as well as the geometry of the respiratory tract and respiration rate) determine the depth of lung penetration, ability for the lung to remove the particle and the severity of short and long-term impacts of particles in the lung. $PM_{2.5}$ includes all particles of 2.5 microns or less. PM_{10} includes all particles of 10 microns or less. Thus, a measure of PM_{10} would include the $PM_{2.5}$, and $PM_{2.5}$ includes all ultrafine particles. In the attempt to lower black smoke PM_{10} particles from diesel exhaust, more $PM_{2.5}$ is now generated.

$PM_{2.5}$ and PM_{10} Impacts:

$PM_{2.5}$ is now considered more severe than PM_{10} based on shear particle size alone. $PM_{2.5}$ can penetrate more deeply into the lung creating irritation and also making it harder to remove. If particles carry other harmful chemicals, these too will be transported deeper into the lung. Heavy metals, organic compounds, sulfates and the properties such as acidity can compound the negative effects of the particle carriers. Particulate matter is associated with hospitalization,

mortality and respiratory symptoms. In a study of schoolchildren who ride diesel school buses, increased exposure to diesel exhaust was associated with greater incidence of respiratory symptoms and asthma (Wargo 2002). The trucking industry has seen numerous studies that associate adverse outcomes including lung cancer with diesel exhaust exposure of truck drivers (Steenland et al. 1990, 1998). Even more striking, instances of increases in mortality associated with poor air quality and particulate matter have been noted (Dockery et al 1993 and Samet et al. 2000).

Relevance to the Bighorn Basin RMP:

Particulate matter of many kinds is generated by mineral development activities. Road dust from granite and scoria will likely increase as is has in the Powder River Basin and the Jonah Field. Scoria, or silicate dust, is of particular concern for outdoor industry and agricultural workers due to the structure which can result in adverse lung conditions, silicosis or mortality. Precautions to limit diesel emissions and mitigate road dust must be taken to protect resident and especially worker health.

$PM_{2.5}$ and PM_{10} Resource/references:

Dockery et al. 1993. An association between air pollution and mortality in sin U.S. cities. *New England Journal of Medicine.* 329: 1753-1759.

Ezzati and Kanmen. 2001. Indoor air pollution from biomass consumption and acute infections in Kenya: an exposure-response survey. *Lancet.* 358: 619-624.

Samet JM et al. 2000. Fine particulate air pollution and mortality in 20 US cities, 1987-1994. *New England Journal of Medicine.* 343: 1742-1749

Steenland, Kyle et al. 1990. Case-control study of Lung Cancer and Truck Driving in the Teamsters Union. *American Journal of Public Health.* 80(6): 670-674)

Steenland, Kyle et al. 1998. Diesel Exhaust and Lung Cancer in the Trucking Industry: Exposure-Response Analyses and Risk Assessment. *American Journal of Industrial Medicine.* 34:220-228.

Wargo, John. 2002. Children's Exposure to Diesel Exhaust on School Buses. Environment and Human Health Inc. North Haven, CT.

Air Quality Baseline data

At minimum, baseline data must include the seven criteria air pollutants:

- Nitrogen Oxides (NO_x)
- Sulfur Dioxide (SO_2)
- Particulate matter both $PM_{2.5}$ and PM_{10}
- Ozone (O_3)
- Lead (Pb)
- Carbon Monoxide (CO)

Additionally other compounds including:

- Hydrogen Sulfide (H_2S)
- Methane (CH_4) (powerful greenhouse gas)

- Triethyleneglycol (used in gas dehydration plants)
- Polycyclic Aromatic Hydrocarbons (PAH's)
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- Volatile Organic Compounds (VOC's)
- BTEX's/ diesel range organics (Benzene, Toluene, Ethylbenzene, Xylene)
- Semivolatile Organic Compounds (SVOC's
- Hazardous Air Pollutants (HAP's)
- Heavy metals

Other compounds or elements of potential concern as determined through relevant literature, industry usage or substantiated public concern.

Ground Water Quality: The Paramount Concern

Ground water for domestic and agricultural uses makes rural living possible in many areas around the globe. This is particularly true of the Bighorn Basin. Without quality ground water and reservoir systems, many of the agricultural activities in the Basin would be stunted or halted. Fresh water sources are becoming ever more limited making clean ground water an increasingly valuable resource.

Given the nature of deep gas and oil extraction, in-situ uranium development and other potential mineral extraction processes, ground water quality protection is of paramount concern. The extreme cost, difficulty and limited result/effectiveness of ground water clean-up efforts should be sharply noted and every opportunity taken to prevent contamination. The superfund sites associated with the Massachusetts Military Reservation on Cape Cod or that of Rocky Mountain Arsenal near Denver are examples of very expensive, time consuming groundwater clean-up programs with relatively limited groundwater remediation given the effort.

Many groundwater contamination plumes must simply self-attenuate as chemicals move through the system or are degraded. This process is dependent on subsurface geology, the compounds of contamination, pH and temperature of the water and groundwater recharge and flow rates. Realistically, much groundwater contamination is irreversible on a human timescale. Therefore, all possible care to prevent aquifer contamination must be taken in this RMP for the protection of the state's water resources now and in the foreseeable future. Documentation of concerns associated with groundwater contamination and the oil and gas industry are mounting in the U.S., Canada and around the globe. The constituents in drilling and hydraulic fracturing fluids must be revealed and regulated to allow for energy development without imperiling our precious water supplies. Hundreds of millions of gallons of these fluids are pumped into the earth each year and BLM has an obligation to require energy producers to reveal the content of these fluids, require an intimate understanding of the subsurface geology and aquifer flow rates before drilling and stimulation activities take place.

Ground Water baseline data collection

The following ground water parameters must be assessed before changes in resources management/development ensue:

- pH
- Temperature
- Total Dissolved Solids (TDS)
- Total Suspended Sediments (TSS)
- Ions and Polyatomic ions (Iron, Sodium, Calcium, Magnesium, Potassium, Carbonates, Bicarbonates, Sulfates, Nitrates)

- Iron bacteria
- Heavy metals including Lead, Mercury (Methyl mercury, elemental mercury and mercury ions)
- Arsenic
- Selenium
- Polycyclic Aromatic Hydrocarbons (PAH's)
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- BTEX's/ diesel range organics (Benzene, Toluene, Ethylbenzene, Xylene)
- Methane
- Volatile Organic Compounds (VOC's)
- Semivolatile Organic Compounds (SVOC's)
- Radionuclides
- Chlorinated compounds/pesticides

Other compounds or elements of potential concern as determined through relevant literature, industry usage or substantiated public concern

Baseline conditions for private water and stock wells must be established and monitoring wells established.

Resources:
Constituents found in groundwater in association with oil and gas development from drilling and stimulation (hydraulic fracturing products):
http://www.endocrinedisruption.com/products/chemicals_used_in_natural_gas_development.html

Articles illuminating concern with groundwater from oil and gas development show that incidence are not isolated.

The original ProPublica investigatory article by former Wall Street Journal reporter, Abraham Lustgarten describes the potential for ground and surface water pollution associated with deep gas drilling and hydraulic fracturing fluids and pits. This article illuminates that such occurrences are not isolated events and discusses how EPA exempted oil and gas operations from federal legislation in place to protect human health and the environment, leaving the states responsible for taking such protective measures. This article was picked up by Business Week and the Denver Post. A slideshow of photos from the Pinedale Anticline has also been published online.

Original ProPublica Article:
http://www.propublica.org/feature/buried-secrets-is-natural-gas-drilling-endangering-us-water-supplies-1113/

Slideshow of the pinedale anticline:
http://www.propublica.org/

Business week's coverage of the issue:
http://www.businessweek.com/magazine/content/08_47/b4109000334640.htm?chan=magazine+channel_in+depth

Denver Post's Coverage of the issue:
http://www.denverpost.com/breakingnews/ci_11001835

Surface Water Quality:
Surface water bodies are a vital resource in the arid climate of the Bighorn Basin as are the fisheries that are supported by many of these tributaries and ephemeral streams. Extreme care to preserve the waters and fisheries of the Bighorn Basin must be taken. Both treated and untreated discharges to waters, reservoirs and soils must be carefully monitored to prevent stream degradation from erosional runoff, sediment loading and 'non point' seeping from discharge locations and holding areas of produced water.

The following water quality data must be collected from all surface water sources before adjacent development or discharge is allowed to occur:

- pH
- Temperature
- Total Dissolved Solids (TDS)
- Total Suspended Sediments (TSS)
- ions (Iron, Sodium, Calcium, Magnesium, Potassium, Carbonates, Bicarbonates, Sulfates, Nitrates)
- Coliform Bacteria
- Iron bacteria
- *E. coli*
- Arsenic
- Selenium
- Lead
- Mercury (Methyl mercury, elemental mercury and mercury ions)
- Polycyclic Aromatic Hydrocarbons (PAH's)
- methane
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- BTEX's/ diesel range organics (Benzene, Toluene, Ethylbenzene, Xylene)
- Methane
- Volatile Organic Compounds (VOC's)
- Semivolatile Organic Compounds (SVOC's)
- Radionuclides
- Chlorinated compounds/pesticides

Other compounds or elements of potential concern as determined through relevant literature, industry usage or substantiated public concern.

Discharges and protection of Streams, Ephemeral Drainages, Water Bodies and Fisheries
Streams and fisheries are tied to the livelihood of much of the state. Without clean water sources, irrigators struggle to grow crops successfully. Ephemeral drainages can provide water and forage and are a vital asset to a ranch or farm. Riparian areas are important for wildlife and domestic livestock as well. Preserving stream, pond and lake health is important for sustaining our fisheries. Angling and other water related recreation activities are important to residents, visitors and bring in considerable economic income for the state. According to a recent U.S Fish and Wildlife survey, over 200,000 anglers cast their lines in our state each year.

Therefore, baseline data to preserve our waters, riparian areas, fisheries and ephemeral drainages is imperative. All streams of class 3B or better must undergo an overall baseline assessment prior to adjacent development or direct discharge including but not limited to:

- Macro and micro invertebrate analysis
- Fish and amphibian population sample
- Stream flow and velocity measurements
- Channel assessment
- Water parameter analysis with particular attention to salts and hydrocarbons

All other water bodies or channels with classifications between 3C and 4C including wetlands, ponds and ephemeral stream channels that may be affected by development or receive produced water discharge must also be assessed for channel characterization, baseline soil and water quality and invertebrate communities if water is present.

The Wyoming Game and Fish and U.S. Fish and Wildlife Service should take a role in establishing or sharing existing baseline data with the BLM and monitoring of the streams and fisheries over the course of the project.

References:

U.S. Fish and Wildlife Service. 2008. Wildlife Watching in the U.S.: The Economic Impacts on National and State Economies in 2006 Addendum to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

Andrew, Anita S. et al. 2005. Origin of salinity in produced waters from the palm valley gas field, Northern Territory, Australia. Applied Geochemistry. 20:727-747.

Rice, C.A., M. S. Ellis, and J. H. Bullock, Jr. 2000. Water co-produced with coalbed methane in the Powder River Basin, Wyoming: preliminary compositional data. USGS Open-file report 00-372.

Rice, C.A. 2003. Production waters associated with the Ferron coalbed methane fields, central Utah: chemical and isotopic composition and volumes. *International Journal of Coal Ecology.* 56 (1-2):141-169.

The Ruckelshaus Institute of Environment and Natural Resources. 2005. Water Production from Coalbed Methane Development in Wyoming: A Summary of Quantity, Quality and Management Options. University of Wyoming.

Water Handling

Flooding of water onto private landowners from outfalls or reservoirs must be prevented and landowners should have an active role in determining how water is put to beneficial use on their property. Residents should also have the authority to require water be piped to another location for beneficial use and not discharged into property including their bottomlands or drainages if they or downstream landowners do not desire it. Likewise, residents that would like produced water for use on their property must be afforded access to such water and must prevent it from trespassing and causing harm to their neighbors. Water handling practices including reinjection, water treatment, water piping, true beneficial use to the specification of the landowner and carefully managed storage must all be considered. Hamilton Dome has been reinjecting a portion of its water since the late 1970's successfully and with no unrealistic economic burden. The Ruckelshaus Report included in the reference disc estimates the cost of discharge,

reservoir construction and reinjection and the assertion by developers that reinjection is impractical based on economics is not validated. Other states and countries require reinjection for ALL produced waters and viable energy development continues.

Resources:

The Ruckelshaus Institute of Environment and Natural Resources. 2005. Water Production from Coalbed Methane Development in Wyoming: A Summary of Quantity, Quality and Management Options. University of Wyoming.

Schneider, Thomas J. 2001. Coalbed methane produced water reinjection.

Soil Quality

Soil quality must be assessed appropriately based on the intended or current use of the land and/or potential impacts to the area. Soils must be sampled by soil horizon or between logically established depth zones. Soil samples should be kept distinct by depth or soil layer and the data applied in a manner relevant to the sample situation. For example agricultural soils will be sampled and data applied with a different understanding than samples taken to determine the range of a leaking underground storage tank, rogue hydraulic fracturing fluids or a toxic spill. Major concerns should be reduction of impact to soils from salts, hydrocarbons, drilling and hydraulic fracturing fluid constituents and inundation from direct discharge, flooding or rogue waters from produced water use or storage. Drilling and other various pits must be reported, locations documented with GPS, lined and soils tested before development and after reclamation is complete. Closed loop systems must be required.

At minimum, soil should data should include the following:

- Establishing a general soil horizon profile through a pit or through core sampling
- Texture of each horizon (composition of clay, silts and sands)
- Structure of each horizon

The following chemical analyses should be conducted for *each* soil horizon or established depth.

- pH
- Ions and Polyatomic ions (Iron, Sodium, Calcium, Magnesium, Potassium, Carbonates, Bicarbonates, Sulfates, Nitrates)
- Iron bacteria
- Heavy metals including Lead, Mercury (Methyl mercury, elemental mercury and mercury ions)
- Arsenic
- Selenium
- Polycyclic Aromatic Hydrocarbons (PAH's)
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- Volatile Organic Compounds (VOC's)
- BTEX's/ diesel range organics (Benzene, Toluene, Ethylbenzene, Xylene)
- Methane
- Semivolatile Organic Compounds (SVOC's)
- Radio nuclides

Other compounds or elements of potential concern as determined through relevant literature, industry usage or substantiated public concern

Soil salinization

An abundance of literature abounds on soils, salinity and various methods of reclamation. Many investigations have noted vegetation impacts from altered soil conditions and toxicity related to saline-sodic irrigation water application" (Vance et al 2008). Also "multiple year applications of saline-sodic water produced consistent trends of increased soil EC and SAR values to depths of 30 cm, [and] reduced surface infiltration rates…" (Vance et al 2008). Constant water flow and flooding have caused soil to become anaerobic and resulting in vegetation changes. (Vance et al 2008). "Significant differences ($p \leq 0.05$) were determined between irrigated and non-irrigated areas for EC, SAR, infiltration rates… at most sites." (Vance et al 2008). Soil salinization from oil-and gas-production activities may influence native flora and fauna (Aschenbach 2006) and may impede natural vegetation or agriculture in the area afterwards. "CBM saline produced water discharges constitute extreme risks and impacts to the entire ecosystem" (Schneider 2001).

The very serious and often irreversible impacts of soil salinization may not be fully understood by the BLM or operators in the Powder River Basin. Therefore, as extensive explanation is provided to illustrate impacts of CBM water discharge on soils and vegetation. Please see Appendix 1.

References:

Brady, Nyle C. and Ray R. Weil. The Nature and Properties of Soils. 13th ed. New Jersey: Prentice Hall, 2002. (Several chapters are provided on the attached disc in pdf form)

Chhabra, R. 2005. Classification of Salt-Affected Soils. *Arid Land Research and Management.* 19: 61-79.

Ganjegunte GK, Vance GF, King LA. 2005. Soil chemical changes resulting from irrigation with water co-produced with coalbed natural gas. Journal of Environmental Quality. 24(6): 2217-27.

Ganjegunte GK, King LA. Vance GF. 2008. Cumulative Soil Chemistry Changes from Land Application of Saline–Sodic Waters. Journal of Environmental Quality. 37:S-128-S-138.

Patz, M.J. , K.J. Reddy and Q.D. Skinner. 2006. Trace elements in coalbed methane produced water interacting with semi-arid ephemeral stream channels. Water, Air, and Soil Pollution 170: 55-67.

Vance GF, King LA, Ganjegunte GK. 2008. Soil and Plant Responses from Land Application of Saline–Sodic Waters: Implications of Management. Journal of Environmental Quality. 37:139-148.

Vegetation

Baseline vegetation studies documenting species composition, percent cover by species, forage species present, threatened or endangered species and vegetation health must be conducted in areas of development to aid in reclamation and restoration of soils and vegetation. Vegetation assessments must also be conducted in areas that will see produced water discharge and below reservoirs. Particular care to avoid introduction and propagation of invasive, non-native, non-forage or salt tolerant species should be taken and specific management practices established to address the spread of noxious or unfavorable vegetation.

Reference:

Ladenburger, C.G., A.L. Hild, D.J. Kazmer and L.C. Munn. 2006. Soil salinity patterns in Tamarix invasion in the Bighorn Basin, Wyoming, USA. *Journal of Arid Environments.* 65:111-128.

Aschenbach, T.A. 2006.Variation in growth rates under saline conditions of Pascopyrum smithii (Western wheatgrass) and Distichlis spicata (Inland saltgrass) from different source populations in Kansas and Nebraska: Implications for the restoration of salt-affected plant communities. Restoration Ecology. 14: 21-27.

Chourdhuri, G.N. 1968. Effect of Soil Salinity on Germination and Survival of Some Steppe Plants in Washington. *Ecology*. 49: 465-471.

Chrispeels, Maarten J. and David E. Sadava. Plants, Genes, and Crop Biotechnology. Sandbury MA: Jones and Bartlet Publishers, 2003. p. 140-170, 518-536.

Jacobsen, Thorkild. Salinity and Irrigation Agriculture in Antiquity. Bibliotheca Mesopotamica, Vol. 14. 1982. pp 6,-15, 53-55. (Research conducted in 1957-58).

Cultural Resources

Current management of the cultural, historic, archeological and paleontological resources must be updated. Degradation of artifacts, rock art, fossil rich area and other historical resources must be prevented. Each resource should be documented photographically and location marked with GPS before development begins. However, publishing of such documentation or increasing road access could actually result in more damage to site locations. Great care to protect the integrity of these irreplaceable and historically invaluable resources must be taken. Buffer zones around each site must be established and staff dedicated to resource protection must be designated. Management of these resources should be proactive and tribal involvement should be sought. Also, the expertise among your staff must be heeded and staff given the resources and freedom to create a truly protective management program for cultural resources in the area.

The section on cultural resources in the 2007 Casper Resource Management Plan is an excellent baseline for cultural resource protection upon which the Bighorn Basin RMP can build. The sound elements of this plan should be emulated and improved upon in this RMP.

The Casper ROD can be accessed at:
http://www.blm.gov/rmp/casper/documents/cfo_rod_armp/cfo_rod_armp.pdf

Native American Concerns

The appropriate tribes must be contacted and invited to be involved as cooperators in the development of this RMP especially with respect to the historical value of the cultural resources in the area.

Wildlife

Wildlife resources are an extremely vital asset for our state and also for our state and national economies. According to a recent U.S. Fish and Wildlife survey publication, 87.5 million people spent $122.3 billion dollars hunting, fishing and watching wildlife nationwide. In Wyoming, 762,000 people hunted, fished and/or watched wildlife. Of these 643,000 engaged in wildlife watching. Preserving our open spaces and maintaining our wildlife populations is necessary not only to responsibly steward an ever shrinking global treasure, but also to sustain our economy beyond the fluctuations of energy development.

Baseline data on the wildlife populations in the area including large and small mammals, migratory and resident fowl, reptiles and amphibians must be collected or obtained from the Wyoming Game and Fish

and/or the U.S. Fish and Wildlife Service. These agencies should be cooperators in the management of the area and take the primary role in monitoring changes in animal behavior, population declines or other impacts to species in the Bighorn Basin. Many studies have been done on the impacts of various species from oil and gas development including: Dr. David E. Naugle, Brett L. Walker, and Kevin E. Doherty's work on sage grouse, Sawyer et al. 2006 on mule deer, Sorenson et al. 2007 on caribou in Alberta, Inglefinger and Anderson 2004 on various birds, Zou et al. on produced waters and West Nile virus. Please contact David Naugle at the Univeristy of Wyoming for more references on wildlife impacts and the complete citations for those mentioned here.

References:

U.S. Fish and Wildlife Service. 2008. Wildlife Watching in the U.S.: The Economic Impacts on National and State Economies in 2006 Addendum to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

Sage Grouse References:

Aldridge, C. L., and M. S. Boyce. 2007. Linking occurrence and fitness to persistence: a habitat-based approach for endangered greater sage-grouse. Ecological Applications 17:508-526.

Doherty, K.E., D.E. Naugle, B.L. Walker, J.M. Graham. 2008. Greater sage-grouse winter habitat selection and energy development. Journal of Wildlife Management *In Press*.

Holloran, M. J., R. C. Kaiser, and W. A. Hubert. 2007. Population response of yearling greater sage-grouse to the infrastructure of natural gas fields in southwestern Wyoming. Completion report. Wyoming Cooperative Fish and Wildlife Research Unit, Laramie, WY, USA.

Moynahan B. J. 2004. Landscape-scale factors affecting population dynamics of greater sage-grouse *(Centrocercus urophasianus)* in northcentral Montana, 2001–2004. Dissertation, The University of Montana. Missoula, USA.

Moynahan, B.J., M.S. Lindberg, and J.W. Thomas. 2006. Factors contributing to process variance in annual survival of female greater sage-grouse in north-central Montana. Ecological Applications 16:1529-1538.

Naugle, D. E., C. L. Aldridge, B. L. walker, T. E. Cornish, B. J. Moynahan, M. J. Holloran, K. Brown, G. D. Johnson, E. T. Schmidtmann, R.T. Mayer, C. Y. Kato, M. R. Matchett, T. J. Christiansen, W. E. Cook, T. Creekmore, R. D. Falise, E. T. Rinkes, and M. S. Boyce. 2004. West Nile virus: pending crisis for greater sage-grouse. Ecology Letters 7:704-713.

Naugle, D. E., B. L. Walker, and K. E. Doherty. 2006. Sage-grouse population response to coal-bed natural gas development in the Powder River Basin: interim progress report on region-wide lek-count analyses. Unpublished Report, University of Montana, Missoula, USA.

Walker, Brett et. al. 2004. From the Field: Outbreak of West Nile virus in greater sage-grouse and guidelines for monitoring, handling, and submitting dead birds. Wildlife Society Bulletin. 32(3): 1000-1006

Walker, Brett et. al. 2007. *Greater Sage-Grouse Population Response to Energy Development and Habitat Loss*, J. Wildlife Management. 71: 2644.

Walker, Brett et. al. 2007. West Nile Virus and Greater Sage-Grouse: Estimating Infection Rate in a Wild Bird Population. Avian Diseases. 51:000-000.

Western Association of Fish and Wildlife Agencies. Memo: Multi-state Sage-grouse coordination and research based recommendations. January 28, 2008. *Using the Best Available Science to Coordinate Conservation Action that Benefit Greater Sage-Grouse Across States Affected by Oil & Gas Development in Management Zones II-II (Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming).*

Zou, Li, Scott N. Miller, and Edward T. Schmidtmann. (2006). Mosquito larval habitat mapping using remote sensing and GIS: implications of coalbed methane development and West Nile virus. *Journal of Medical Entomology.* 43(5): 1034-1041.

Monitoring

As baseline data is established for all of the above, monitoring programs must be established to assess changes in the resource. Monitoring must continue throughout the life of the development projects. Response thresholds and action plans for each resource must be created and the BLM must actively engage in the monitoring and management process.

Water and soil data should be collected no less than once per year in the first five years of development at a site.

If concerning changes are documented in the data, then data collection should become more frequent and remedial actions taken to address the concern.

Staff, Inspection and enforcement

For such baseline data and monitoring program to be possible or successful, proper inspection and enforcement staff must be hired for the duration of the development. A plan of this importance and detail must have knowledgeable staff dedicated to the protection of air, soil and water resources. Data must be incorporated into a publicly database that is maintained on a quarterly basis. Without the necessary staff and resources, even a well-designed and well-meaning management plan will fail.

The BLM needs the staff and resources to operate beyond the realm of permitting to ensure proper management of our public resources.

To ensure proper adherence to the management plan when it is adopted, specific BLM personnel must be delegated in the Bighorn Basin and charged with duties to monitor compliance, track reclamation, communicate with developers, landowners, grazing permit holders to ensure the best reclamation and land use outcome possible.

Experiences in the Powder River Basin

For example, given its human and monetary resources, the BLM simply cannot keep up with scheduled environmental inspections in the Powder River Basin in light of the rapid development and incentives to continue permitting. In fact, common agency practices are such that:

> "[t]he BLM Field Offices are able to inspect active wells once every 2-10 years on average and inspect active wells for environmental compliance once every 4-59 years" (WORC 12).

According to internal inspection report summaries even though BLM has lot on its plate, they recognize the importance of inspections, but lacked the personnel to complete necessary inspections and enforcement even before the CBM play took off. According to internal annual Inspection Strategy Summaries from the BLM Buffalo Field Office (BFO) as early as 2003,

> '[h]igh priority environmental [inspections] on abandoned and OSITA [oil shut-in temporary abandonment] conventional wells will not be accomplished due to the same issues' (BLM BFO Inspection Summaries).

However, BLM is aware of the importance of such inspections.

> '[b]ased on experience and complexity/controversy, we also need to try to accomplish environmental inspections on 100% of the coal bed methane (CBM) project plans of development (PODs) within a year of approval and development.'

The BLM BFO also stressed that

> 'BOP [blowout prevention] inspections on CBM is essential due to the potential for blow outs that have occurred on Fee minerals and for higher pressures expected due to the drilling in drainage areas where water tables have been pumped down to maintenance level' (BLM BFO Inspection Summaries).

Unfortunately by FY 2004, with little more than 30 individuals in all sectors of permitting and inspections and with thousands of wells being permitted each year, BLM did not have the appropriate staff and resources to conduct necessary inspections of new PODs, or monitor Conditions of Approval for development.

> 'Due to the extensive workload in CBNG well permitting (3000 APDs) in FY04, all high priority environmental inspections will not be completed' (BLM BFO Inspection Summaries).

And in a 2004 Inspection Summary the BLM writes that

> "[o]ther issues that may impact ability to complete planned numbers [of inspections] are: staff turnover, filling of vacant positions, experience level of new employees (training)" (BLM BFO Inspection Summaries).

The number of full time surface compliance technicians at the BLM BFO has hovered between one and zero over the past five years with oil and gas inspectors gravitating near a dozen. The Powder River Basin spans eight millions of acres and with over 51,000 CBNG and 3,200 conventional wells projected for this area by 2012 (Kniola and Gil 2005), no way exists for so few staff to conduct inspections and enforce compliance in the region.

Of the inspections conducted, non-compliance is alarmingly high. According to a study done on surface compliance in the Powder River Basin in 2005 by Kniola and Gil, 530 of 628 wells and facilities inspected were out of compliance. Action to correct such violations and revenue collected by the state for excess damages are rare giving operators little incentive for high performance. Only one operator out of 20 was found to be compliant with both wells and facilities on the locations inspected (Kniola and Gil 2005).

The Bighorn Basin RMP also encompasses the land and minerals involving over four millions acres. Thus, it is imperative that staff and resources be delegated in addition to staff added to issue permits.

Inspections and Enforcement References:

BLM BFO Inspection Strategy, Comments Summaries FY2003-FY2008

Kniola, Benjamin E. and Julian Serafin Gil.Surface Compliance of Coal Bed Natural Gas (CBNG) Development in North Central Wyoming. 2005.

Law and Order in the Oil and Gas Fields: A Review of Inspection and Enforcement Programs in Five Western States. A report by the Western Organization of Resource Councils. November 24, 2004.

Bonding

To ensure the best treatment of the Bighorn Basin, meaningful reclamation bonds for each pod must be determined by a professional engineer and collected in order to ensure successful reclamation. This must also include bond considerations for reclamation of discharge locations, stream channels and outfalls.

Maintain land designations and establish buffer zones to prevent hard boundaries between heavily developed and undeveloped land.

The twelve WSA's, nine ACEC's, two areas of Special Designation and seven SRMA's should maintain their current status and special care should be taken to preserve the qualities that warrant such designation. Special attention to areas such as Bobcat Draw, Carter Mountain, Clark's Fork Canyon, Badger Basin, Newton Lakes and Upper Owl Creek must be protected as well as other scenic and valuable areas of the basin. Buffer zones around such designated area must be established to prevent harsh boundaries between land use designations.

Split Estate: BLM must demand protection of private property

According to the BLM, around 3.2 million acres of Federal surface will be considered in this plan as well as 4.2 million acres of Federal minerals. This leaves around 1 million acres of split estate whose surface owners –whether they are state or privately held– should receive added protection during the development of the subsurface Federal minerals. Maintenance and improvement o Wyoming residents' health, land and livelihood must be the focus of this RMP.

Split estate concerns have been improved by modest legislation in recent years; however, conflicts, concerns and anxieties about split estate negotiations still arise. The BLM must provide surface owners with portions of Federal subsurface minerals with information and resources regarding split estate. At the very least, access to the very best surface treatment, minimized industrial footprint, proper water

storage, handling and availability for beneficial use, elimination of water trespass from either Federal or private land onto areas where it is not wanted and excellent reclamation requirements must be available to all surface owners without litigation, excessive negotiation or frustration. Thoughtfully planned meetings to unite mineral developer and landowner visions regarding land and water use, land entry/access and other areas of concern must be conducted. Such meetings should explore the needs and jobs of both developers and landowners so that seemingly arbitrary concerns or practices can be understood and given relevance to all parties. Developers AND their subcontractors should be present at such meetings and developers should be educated in the common courtesies of western lands, e.g. leave a gate how you find it, leave no trace, be respectful of the land, wildlife and livestock.

Action to prevent spillover effects from groundwater contamination, air contamination, land devaluation and water trespass from adjacent surfaces with development onto other private surfaces must be taken and incidence of harm handled swiftly and justly.

The BLM has a great opportunity and arguably an urgent responsibility to mitigate the impacts of split estate in Wyoming. It is within the right of the BLM to demand better surface treatment for public and private lands within the Bighorn Basin and the BLM should step up and set an extraordinary example with the Bighorn Basin RMP to do so.

References:

PeeGee Ranch v Devon Energy Production Company, L.P Campbell County Civil Action No. 26607. State of Wyoming Sixth Judicial District. March 19, 2007.

Runge, Carlisle Ford.1984. Energy Exploration on Wilderness; "Privitization" and Public Lands Management. *Lande Economics*. Vol. 60, No. 1, 56-68.

Sax, Joseph L. 1971. "Takings, Private Property and Public Rights." Yale Law Journal 81: 149-186.

Southern Ute Indian Tribe vs Amoco Production Company. United States Supreme Court decision on June 7, 1999 of No. 98–830.

Williams v. Maycock. Wyo Const at 8 -1 even CBM water determined in Williams Production RMT Company v. Willam P. Maycock, II, Sith Judicial District, Civil Action No. 26099 – Oct. 11, 2005.

Cumulative impacts and best management practices

As more and more areas of the state are industrialized, each contiguous region becomes more and more valuable. This means careful management of areas in the Bighorn Basin is vital due to the ecological significance of its position, its unique formations and archeological and paleontological resources and the increasing value of its biological resources. This may also means more species have likely become dependent on the area for habitat as surrounding areas have seen disturbances from industrialization. However, bioregions are never entirely isolated and the dynamism of nature must be considered in management decisions. Species will move across the landscape coinciding with successional changes in that landscape whether these stages are human or nature induced (Schmitz 2005). You cannot simply set aside a parcel of land in isolation and expect the populations to stay within the geopolitical borders established. To maintain effective habitat, it must be actively maintained or replaced at the same time as other portions of the habitat are exploited (Schmitz 2005).

Phased development cannot be successfully implemented with an oversimplified time table. Such management endeavors require baseline data, planning and diligent monitoring for success. Development between areas must be punctuated by a significant time buffer to be determined by a pre-determined level of reclamation success, forage species recovery and wildlife re-colonization. Adaptation of the populations to the development and potential recovery of vegetation from development cannot be prescribed with inflexible timelines. Such re-colonization and re-vegetation must be assessed and monitored locally. Once ground cover and forage vegetation are recovering and wildlife populations have returned to the area in sufficient numbers as prescribed by the management plan, the next area may be opened for that phase of development. Reclamation and restoration may involve fencing around reclamation areas & livestock rest in certain areas during the process. Without such provisions, habitat will be consumed more quickly than usability or use is reestablished, which will result in a devastating reduction in biodiversity, creating instability in the entire ecosystem (Schmitz 2005).

An excellent reference for phased development is the recently released *Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans*. Please review this document and incorporate the relevant elements into the best management of the Bighorn Basin.

Another publication called *Integrating Biodiversity Conservation into Oil and Gas Development* put forth by the Energy and Biodiversity Initiative, a collaboration of energy companies and conservation organizations is an excellent resource with examples of development coinciding with efforts to conserve regional and local biodiversity. This document is can be found in the accompanying reference materials.

Biological diversity is crucial for habitat stability and maintenance of biological populations in an area. The diversity-stability hypothesis – the link between species diversity and ecosystem stability – was formally presented by Robert McArthur in 1955 (Schmitz 2005). Habitat fragmentation results in a loss of species which in turn leads to a simplification of an ecosystem which reduces resilience (the ability of the system to return to the original or an alternate stable state following a disturbance per unit time, or rate of rebound) and resistance (the ability to withstand a disturbance) making the entire system fragile. Given the limited redundancy, (number of species that perform in the same niche creating a more diverse and, therefore, more stable food web) water scarcity and highly erosive soil in an arid ecosystem, this area is innately fragile and, thus, highly impacted by disturbances. Recovery time to such disturbances may be slow or impractical which is not adequately addressed in the tri-phased development considerations in the EA.

Also, techniques such as directional drilling can be used to reduce the footprint of energy development extensively. *Drilling Smarter: Using Directional Drilling to Reduce Oil and Gas Impacts in the Intermountain West* is an excellent resource providing concrete examples and valid recommendations. A recent article in *Field and Stream* also illuminates the feasibility of directional drilling and its positive impacts on wildlife habitat, but notes a lack of governmental will to require its use.

This failure could not only severely impair the elk, but many other species and biological intricacies in the area. In conjunction with water loss in the area, mismanagement has the potential to diminish ecosystem functioning. There are many ecosystem services of biodiversity which are unmarketable and, therefore, difficult to assign a market value. Such services include climate control, disturbance recovery, water regulation, erosion control, soil formation and stabilization, nutrient cycling, recreation and genetic resources (Schmitz 2005). More significantly, their loss could spill over to affect area

landowners and the local water ways, especially the Powder River. Please see the references on the accompanying disc for many of these resources.

Resources:

Bureau of Land Management. Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans. November 7, 2008.

Herring, Hal. 2008. A New Direction. *Field and Stream.* December 2008-January 2009. p 34-35.

Integrating Biodiversity Conservation into Oil and Gas Development. 2003. Energy and Biodiversity Initiative.

Recommendations for Development of Oil and Gas Resources within Crucial and Important Wildlife Habitats, over 100 pages on how to develop with wildlife habitats. 2004. Wyoming Game and Fish Department.

Schmitz, Oswald. 2005. Lecture. Environmental Problem Solving. Yale University Fall 2005.

Management practices to reduce impacts associated with oil and gas development in the Fortification creek special management. Bureau of Land Management.

Molvar, Erik M. 2003. Drilling Smarter: Using Directional Drilling to Reduce Oil and Gas Impacts in the Intermountain West. Biodiversity Conservation Alliance.

Oil and Gas

The foreseeable effects of oil, gas and coalbed methane development in the basin must be anticipated and potential concerns addressed proactively. While oil and gas development bring revenue and jobs to the state, other sectors of the economy are also very important and must be encouraged. In three counties affected by this RMP, oil and gas does not make the top five list for employers in the region. According to the 2008 draft version of *An Economic Profile of the Shoshone National Forest,* employment information for Park, Freemont and Hot Springs Counties indicate that in 2005 45,343 jobs were held. Of these, the five largest employers 'were Government (20 percent), Retail Trade (12 percent), Accommodations and Food Service (9 percent), Health Care and Social Assistance (9 percent), and Construction (8 percent). Combined, these five sectors represent 59 percent of total employment in the region.'

It is BLM's obligation and responsibility to consider first the people and lands of Wyoming for *both* the short and long-term success of the state and the preservation of Wyoming's land and livelihood. It is not acceptable to develop public or private lands for oil and gas without the utmost mindfulness and requirement of the best development and reclamation practices available.

Also, the revenues from wildlife, hunting and fishing, tourism and other benefits of undeveloped land such as natural services such as aquifer recharge, water purification, erosion control etc must be considered.

Reference:

Taylor, David T., Thomas Foulke and Roger H Coupal. An Economic Profile of the Shoshone National Forest: Prepared in support of the Shoshone National Forest plan revision process (draft). May 20, 2008.

Uranium, more Bentonite and other mineral development
In-situ and other forms of uranium mining as well as bentonite, hardrock mining or shale formation developments may also develop in the Bighorn Basin. Considerations for impacts of these operations must be taken and the unique impacts of each development type researched, understood and anticipated. The same baseline considerations, monitoring and inspection and enforcement must be taken as mentioned above for oil and gas with particular attention to groundwater and soils.

Reclamation and bonding
Reclamation is difficult in general, but even more so in an arid environment. Creating appropriate bonding, reclamation requirements and designated inspections and enforcement staff to over see development from start to finish will improve the resource management plan. Appropriate seed mixes, watering, livestock rest, fencing, and combat of invasive species must be undertaken and reclamation and vegetation experts must be consulted. The most important element of reclamation is reducing the industrial footprint from the start to require the least amount of reclamation work after development activities have halted. Bonding for the cost of reclamation will ensure that the state and taxpayers do not foot the reclamation bill if a company faces financial failure.

A wonderful local resource published by the Lake Desmet Conservation District is available in their office and contains articles by a number of respected authors from various areas of expertise. This and other local knowledge should be consulted to create a very prescriptive reclamation plan for the Bighorn Basin.

References:
Sharing Solutions for Successful Plantings in the Northern Great Plains: A Resource Guide. Science Summit, sponsored by Lake Desmet Conservation District. May 2003.

Kotzer, Eli. 2005. Artificial kidneys for the soil — solving the problem of salinization of the soil and underground water. *Desalination.* 185: 71-77.

Konukcu, F., J.W. Gowing and D.A. 2005. Rose. Dry drainage: A sustainable solution to waterlogging and salinity problems in irrigation areas? *Agricultural Water Management.* In Press, Corrected Proof, Available online 21 November 2005.

Prathapar, S.A. et al. 2005. Mechanically reclaiming abandoned saline soils in Pakistan. *Irrigation and Drain.* 54: 519-526.

Zahow, M.F., and C. Amrhein. 1992. "Reclamation of saline sodic soils using synthetic polymers and gypsum," *Soil Science Society American Journal,* 56: 1257-1260.

Cumulative Effects
The effects of development are often segregated by arbitrary geopolitical boundaries (states counties, surface ownership etc…), mineral ownership or both. However, ecological impacts do not stop at the borders of our state or federal lands, nor does development on private land remain isolated from impacts on neighboring properties or public lands. Devaluation of property from adjacent development, water trespass, air quality degradation and groundwater pollution and habitat fragmentation also do not stop at

state lines, county lines or fence lines. The larger geologic, ecologic and impacts must be considered cumulatively over regions, throughout the state and throughout the western landscape.

While each Plan of Development (POD) gives some necessary local consideration to development, the cumulative impacts of all the POD's combined must be anticipated, considered and monitored. Not all areas of land are equally valuable for forage resources or water access for wildlife and cattle. Not every acre of a ranch is as equally productive as the next. Small percentages of surface disturbance in each POD add up to be far more than the total acreage depending on what area is disturbed and its potential likelihood to be restored to its original condition after development activities cease. Such local and cumulative impacts must be considered and collaboration among agencies, counties, and states must be taken beyond the formalities of the NEPA (Nation Environmental Policy Act) process and delve into meaningful sharing of information experience and expertise. Organizational efforts such as the Interagency Work Group (IWG), must be revitalized, given proper staffing and used to benefit both Wyoming and Montana. The BLM field offices involved with development in the Powder River Basin, the Jonah Field and the Pinedale Anticline have a wealth of experience and collective knowledge. Use it. Do not repeat missteps in management in the Bighorn Basin when they can be avoided.

Conclusion
We respectfully submit these comments and expect that you will use the resources mentioned and provided with this document beneficially as you create an outstanding Resource Management Plan for the Bighorn Basin.

Development can be done right and it is your job to ensure that stewardship of the *public* resources including the development of *public* minerals is done with the utmost care and thought for our current and future well-being and with respect for our private property and health.

Wyoming deserves to be more than an example to which other states look to avoid the unpleasant and preventable side effects of energy development. Our residents, out state and our country deserve better. The legacy of wise stewardship of all of our public resources –land, water, air, wildlife, livelihood and minerals– that you leave in the Bighorn Basin will long outlive the pending development and ephemeral state and federal revenues which will be generated from mineral development in the Bighorn Basin. Make the Bighorn Basin Resource Management Plan the example to which our state and others can look to emulate.

We value the enormous and involved task which the BLM is beginning and would like to collaborate to improve this management plan in any way possible.

Sincerely,

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1226

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Billings, Mt. 59101

Major References for use in the Bighorn Basin RMP:

Bureau of Land Management. Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans. November 7, 2008.

Record of Decision and Approved Casper Resource Management Plan. 2007.

Schettler et. al. Generations at Risk: Reproductive Health and the Environment. Cambridge: MIT Press, 1999.

Taylor, David T., Thomas Foulke and Roger H Coupal. An Economic Profile of the Shoshone National Forest: Prepared in support of the Shoshone National Forest plan revision process (draft). May 20, 2008.

Witter, Roxana, Kaylan Stinson, Holly Sackett, Stefanie Putter, Gregory Kinney, Daniel Teitelbaum, Lee Newman. Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper. September 15, 2008.

Appendix 1. The effects of salt and water on soils and vegetation.

"Understanding the nature of soil salinity is beneficial to discuss impacts of CBM discharge. Salinization is the build up of sodium, calcium, magnesium, sulfate, carbonate, and other salts in the topsoil. Today, salinization is the largest land degradation concern, especially in arid and semi arid lands (van Asten et al. 2003, Farifteh et al 2005). Salinization tends to occur more in arid or semi arid locations where water evaporates quickly before dissolved salts can be carried deeper into the soil (Chrispeels and Sadava 279). Salt crystals remain on or just below the surface, causing soil degradation that, in extreme cases, may render soil unfit for vegetation growth. When the soil is no longer moist and organic, but dry and dust-like, it can wash or blow away easily.

Colloids are soil particles with surfaces that carry charges. It is on these surfaces that cation exchange occurs and nutrients move through the system (Bray and Weil 316-17). Salts can reduce pore space and adsorb to colloidal clay particles reducing cation exchange capacity, nutrient cycling and causing soil impermeability due to this aggregation (Thomas and Middleton 1993, Jacobsen and Adams 1958). This inhibits future rainfall and water from reaching the root zone. Sealed soils can also cause runoff erosion adversely affecting streams and stream channels.

Salinity concentrations at 0.1 percent become harmful to crops and between 0 .5-1.0 percent, the land must be abandoned (Jacobsen 6). Plants can be roughly categorized into four salt-tolerance levels measured in decisiemens per meter (dS/m). The most tolerant survive up to 12 dS/m, moderately tolerant, 8 dS/m, moderately sensitive around 4 dS/m and sensitive 2 dS/m or less (Brady and Weil 432). The lifecycle stage of the plant determines the extent of influence by salinization (Chourdhuri 1968). Salts may affect germination by retarding water intake due to increased osmotic pressure on the seed. The salt ions are more toxic to the seedling and/or embryo as it develops (Chourdhuri 1968). Established plants handle salinization better than seedlings or germinating plants (Chourdhuri 1968). The ability of plants to adapt to saline conditions depends on rate of concentration change. Gradual increases prove less toxic than do sudden ones. Some plants have better ability to adapt than others, but with abrupt increases in salinity nearly all plants die (Chourdhuri 1968).

The ratio of calcium, sodium and magnesium ions can be just as important as the concentrations themselves (Brady and Weil 430). Proper calcium balance helps the plant differentiate between competing ions (Brady and Weil 430). Sodium competes for plant uptake with the essential element potassium, making it difficult for plants to get the potassium they need when excess sodium is present (Brady and Weil 430). Ionic abundance of calcium and magnesium over-load the cation exchange sites in the soil and reduce the nutrient availability of vital elements like phosphorus (Brady and Weil 413-427).

Physical symptoms of salt on plants include halted growth, dwarfing of plants, leaf discoloration (dull bluish green), leaf scorching and premature leaf loss (Brady and Weil 431). Salinity can be toxic to beneficial soil microorganisms necessary for soil health and plant growth (Thomas and Middleton 1993). Parasites breeding in waterlogged saline soils (Thomas and Middleton 1993) can increase the risk of vector born diseases like West Nile (Zou et al. 2006). The declining sage grouse population is particularly susceptible to West Nile (Ruckelshaus 22)…"

"Several variables determine the classifications of salt affected soils. These are quite valuable for understanding the subtleties among soil conditions (Chhabra 2005). The exchangeable sodium

percentage (ESP), sodium adsorption ratio (SAR), electrical conductivity (EC), and pH are all parameters useful for classifying saline soils. The terms salinity, alkalinity, and sodicity are *not* exclusively interchangeable (Chhabra 2005). Distinctive classifications exist for saline, saline-sodic and sodic soils.

Saline soils have an EC greater than 4 dS/m, but have an SAR of less than 13 and a pH less than 8.5. The exchange complex is dominated by calcium and magnesium ions and a white salt or alkali crust can often be seen on the soil surface (Brady and Weil 427). The combined classification of "saline-waterlogged soils" is a serious paradoxical soil condition that occurs often in arid areas. Soils that have become saline, even when excess water is present may prove useless for agriculture. In the presence of adequate water, excess salts inhibited plants from up-taking water they needed to survive and consequently wilted and died (Chourdhuri 1968).

Saline-sodic soils have an EC greater than 4 dS/m and SAR greater than 13. Plants are affected by both excess salts and sodium concentrations (Brady and Weil 427). These soils exhibit mild qualities of both saline and sodic soils. These soils are subject to rapid changes especially if the SAR of the leaching water is high. In this case the salinity will drop due to the solubility of the sodium and the ESP will increase, causing the soil to become sodic (Brady and Weil 427).

Sodic soils are the most concerning of the salt affected soils. Sodic soils have an EC of less than 4 dS/m, SAR above 13 and pH that exceeds 8.5 or may even climb above 10 due to carbonate levels. Not only do salt concentrations hinder plant growth but also diminish soil structure. Soil aggregates break up and clog pores as they move through the soil horizons. Water conductivity and infiltration are inhibited in sodic soils. Plant growth is constrained by the sodium, hydroxide and carbonate levels, poor physical soil conditions and limited soil permeability (Brady and Weil 427). Soil structure breakdown can limit air movement and oxygen availability in soils (Brady and Weil 430). Soil organic matter disperses and moves upward causing a blackened soil surface called black alkali (Brady and Weil 428).

Minimal leaching in arid environments lessons soil acidification which causes baseline soil pH to increase (Brady and Weil 413). When the pH rises above 8.5, soil stability is lost and soil aggregates begin to deteriorate (Brady and Weil 420). The soil colloids disperse and block the soil pores inhibiting drainage and downward infiltration of water (Brady and Weil 420). Thus the water flows across the surface causing erosion until it finds an area where soil can be infiltrated or pools in a low lying area. High pH causes nutrient deficiencies for plants and changes osmotic potential making it harder for roots to extract water from the soil (Brady and Weil 430)" (Roberts 2007).

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"Sue Forst" <sueforst@msn.com>

11/25/2008 12:01 AM

Please respond to "Sue Forst" <sueforst@msn.com>

To <BBRMP_WYMail@blm.gov>

cc "Louise Brouillette" <Louise_Brouillette@enzi.senate.gov>, "Alan Jones" <aljones@house.wyoming.com>, "Elaine D. Harvey" <harvey00@tctwest.net>, "Pat Childers" <childers@house.wyoming.com>, "Ray Peterson" <rpeterson@senate.wyoming.com>, "Henry H. R. Coe" <hcoe@wyoming.com>, "David D. Freudenthal" <governor@state.wy.us>, "Keren McCreery" <karen_mccreery@enzi.senate.gov>, "Michsel B. Enzi" <senator@enzi.senate.gov>, "John Barrasso" <Senator_JBarrasso@barrasso.senate.gov>, <cody_wymail@blm.gov>

Subject Bighorn Basin RMP

To: Caleb Hiner
Subject: Bighorn Basin RMP
Date: 11/24/08

cc: Mike Stewart, Cody BLM Office and other Elected Officials

Although we would prefer there be NO oil & gas development in the Bighorn Basin, we are realistic enough to know that this is probably not an option at this time. When the development begins the following actions must be required to ensure the safety of the public and all living things, a viable ecosystem survives, and the historical, geological, and paleontoligical significance of the area is disturbed as little as possible.

Require Emergency Management Plans must be in place prior to development beginning to ensure the safety of the public, the wildlife and the environment.

Bonding must be set high enough to ensure funds are available to do restoration after any projects are completed and to ensure

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compensation to the public and the State of Wyoming should a disaster occur.
Base Line Studies for air, water soil, wildlife, archeological, paleontological, etc., must be completed before the development begins by qualified non-biased scientists. Results must be made available to the public.
Baseline studies should include:

- Redefining the visual -- the open spaces classifications. The current classifications are no longer valid for the 21st century.
- Require detailed studies for water quality.
- Require detailed studies for air quality.
- Require study showing trends for recreational use.
- Comprehensive studies of archeological and paleontological resources and their cultural classifications.
- Require more in-depth studies on soil and native plant classifications that will certainly be destroyed. Areas containing endangered or threatened species of any kind must be off limits for decelopment and must be protected.
- Require strict monitoring of the seasonal aspects of the nesting and birth of sage grouse, raptors, Brewers sparrow, sage sparrows and sage thrashers: also the deer, wild horses, and the antelope that live in the area.

Require a complete paleontological survey of all areas to be disturbed or impacted to provide a baseline study. The project has a Class 5 Classification (that is the highest possible classification on a scale of 1 to 5). The Federal Land Policy and Management Act of 1976 was enacted to "prevent unnecessary and undue degradation of the land resources". A field survey should be required to prevent such degradation, with ongoing, on-site monitoring for paleontological resources by a certified paleontologist for the duration of the project. In the event of the discovery of significant paleontological resources, work must top immediately at the site, the BLM must be notified, and action must be taken to protect or remove the resources within 10 working days. Work may not resume at the location until officially approved by the BLM.
Wildlife Protection:

- Place seasonal restrictions on drilling and surface disturbance during sage grouse mating, nesting and brooding periods within a two mile radius of identified leks and/or within core sage grouse use areas as identified by studies conducted by the State of Wyoming's coalitions.
- Impose "No Surface Occupancy" limits on all lands within one-quarter mile of sage grouse leks and within three quarter miles of raptors nesting sites.

Best Management practices must be followed.
Frequent and conscientious monitoring of the operations is critical. When violations are found immediate action must be taken and work halted until the problems are resolved.
Plans to restore the area to its original condition must be in place prior to the start up and funds allocated to pay for this restoration.
Latest technologies must be utilized, i.e., directional drilling to lessen the number of well sites, etc.
Serious consideration must be given to the survival of all living things in the effected areas.
Preservation of the archeological, paleontologigal and historical

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integrity of the effected area must be ensured.
The importance of viewscapes and open spaces must be considered a natural resource that has significant benefit for the American public.
Long-term economic benefits/detriments to the community should be weighed against short-term profits for a few.
Quality of life concerns must be considered carefully so we have an environment of value to pass on to our children and grandchildren.
There should be an expansion all of the Herd Management Area (HMA) to the original and historic land that was granted to horses and burros in the Wild Free and Roaming Horse in Burrell Act of 1971. HMAs have been "zeroed out" or taken away from the horses for livestock and oil and gas companies use. HMAs should be allocated for the primary use of wild horses. Animal Unit Month (AUM) numbers should be increased to allow at least 150 to 200 adult wild horses in the McCullough Peaks area and proportionally in other wild horse areas in the Bighorn Basin.
No mares or stallions should be brought from outside the McCullough Peaks HMA, and other wild horse areas, for breeding or any other reason.
There should be no gilding of stallions of any age.
There should be no gatherers in the months from February to July due to pregnant mares and the safety of newly born foals.
The horses that are gathered should be adult horses and that a should be at least two years old, not yearlings that the BLM now considers adults.
Genetic testing should take place so we would know the DNA of the McCullough Peaks Mustangs and therefore be able to scientifically cull the correct horses and leave the ones with genetic ties.
The impact that comes with the drilling of gas and oil wells will certainly disturb all wildlife, including the wild horses, birds, and other creatures that live in the Bighorn Basin along with the habitat they now enjoy. Removing the horses temporarily from the impact of drilling, traffic, etc., associative with the project should be actively considered.
In the future, public comment periods should be longer due to the importance of the decisions that will be governing our public lands for the next 20 years.. The Public should be notified at the beginning of the comment period, not at the end, so they have time to make inforned comments.
20 years is much too long for the RMP to be in use. A better time frame would be 7 to 10 years. Times are changing much too quickly to have the RMP implemented for 20 years.

Rudolph A. Forst
70 Appaloosa Lane
Cody, WY 82414

alforst@msn.com

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"Huemoeller, Kelley (Barrasso)" <Kelley_Huemoeller@Barrasso.senate.gov>	<BBRMP_WYMail@blm.gov>	To cc
11/25/2008 07:37 AM	From Senator Barrasso's office:	Subject

Caleb,

I just want to verify that the formal comment period ended on November 17, 2008. I have a constituent who is inquiring about the plan and is commenting there is a lack of farmland due to residential development and suggests the BLM should land to help alleviate this problem. Any comments you have to this would be helpful for me to add to my response.

Thanks,

Kelley Huemoeller
Assistant to the Chief of Staff
U.S. Senator John Barrasso
Washington, D.C.
202-224-2957

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"Keith Hamilton"
<hri@tctwest.net>

To

11/24/2008 04:53 PM

<BBRMP_WYMail@blm.gov>

cc

Subject

Scoping comments

The following are my comments in regards to the BLM RMP revision plan:

1. The Plan needs to support the Multiple Use concept and allow for many types of activities, i.e. grazing, mining, logging, recreation, oil and gas development, etc. If managed properly there is room for everyone.

2. The present grazing AUM's need to be maintained and stocking rates need to be established between the permittees and the range cons and should be based on available forage.

3. Road maintenance issues need to be considered. One road in particular that needs attention is the Alkali Road. Recreational users have gotten so tired of the present unmaintained road that they moved over off of the road on the grass and have created their own road in our Sheep Springs allotment pasture. The natural resource in the area is being further destroyed by allowing this to happen.

4. When road closures and travel management issues are considered the permittees need to still have the ability to use roads that are necessary for water and fence maintenance. Also, certain roads need to be used for range monitoring and to salt livestock. It would be desirable if the permittees were consulted during the road closure process.

5. Species and water quality concerns need to be addressed based on science and not merely on speculation and guessing.

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Bighorn County Commissioner
Keith Grant

1400 rd 11
Lovell Wy.
Nov.18, 2008

To: Eddie Bateson, Mike Roberts, Mike Stewart, and Caleb Hiner; Bureau of Land Management

Re: Scoping Comments for the Bighorn Basin Resource Management Plan Revision

Multiple Use Sustained Yield

In a socially and economically and environmentally sound outcome.
A landscape working in harmony in a multiple use concept, utilizing the renewable resources and extracting minerals, intertwined with recreational enjoyment for the benefit of all. A balance between nature and man, measured by the 3 criteria, of multiple use, sustained yield and economic impact.

Public Process

The public should be informed early and adequately of all opportunities for public involvement. The BLM should consider all comments from the public, and should strive to incorporate those comments from Bighorn Basin residents.

Of particular concern is the public participation plan for the BBRMP. Bighorn Basin residents have the right and responsibility to participate throughout this public process. Caleb Hiner of the BLM has told attendees of the scoping meetings that comments received from the public after the scoping comment deadline would be recognized and considered. It is important for the BLM to communicate in writing the details of the public participation plan, including how public comments will be considered, how feedback will be provided, and how the public will be able to participate in the process after scoping is over.

Flexibility of Plan

Due to unforeseen changes in the political and environmental landscapes, and to the unknown effects of our changing climate, some residents of the Bighorn Basin would like management plans dealing with the next 15–20 years to have a degree of flexibility for adaptation to changing environmental conditions. The plan should assess an array of models of future climatic and

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environmental conditions.

Social and Economic Effects

There is concern that western culture is being destroyed or detrimentally changed. Decreased livestock grazing on public lands is causing working ranchers to sell to developers and "hobby" ranchers. This has compounding effects on the rest of the local economy. The BLM should consider the benefits of increasing grazing on public land, and should educate the public on the subject. BLM should actively pursue acquiring access to all BLM lands. Conservation Easements should be actively pursued in order to protect open spaces and wildlife habit.
Oil and gas development provides many socioeconomic benefits and challenges to the citizens of Wyoming. Although oil and gas production is not the only factor influencing the change in population in the Bighorn Basin, the industry fundamentally influences the region's population. Considering the "boom and bust" history of the oil and gas industry, and the current oil and gas industry "boom," the BLM should analyze how long-term population trends and employment rates will affect the Bighorn Basin. Appropriate urban development should be considered in the BBRMP. The analysis should include projections of the Bighorn Basin's socioeconomic situation in the event of a decline in the oil and gas industry as well.

Tourism

Tourism in the Bighorn Basin is an important industry. It relies heavily on Wyoming's natural resources. The BLM should analyze the effect that the BBRMP will have on the tourism industry, especially with regard to viewsheds, wildlife, vegetation, and recreation. Long-term socioeconomic effects should also be considered. For example, if the tourism rate can be quantified and modeled, we will have information to predict how the unemployment rate will be affected.

A program involving interpretive signs could help educate tourists about preserving the Bighorn Basin and enhance the tourists' experience.

Soils

The BBRMP should carefully consider potential soil erosion. The Bighorn Basin is characterized by shallow to very deep soils derived mainly from soft sedimentary rocks such as siltstone and very fine-grained sandstone interbedded with soft mudstone. These soils are easily eroded by wind and water.
Gully and sheet erosion commonly occurs on hillsides along ephemeral and intermittent streams. Sparse vegetation increases the likelihood of gully and sheet erosion. Many of these shallow and moderately deep soils (less than 40 inches thick) have low saturated hydraulic conductivity and high or very high runoff hazard on slopes greater than 6 percent. Over 80 percent of the soils in the Bighorn Basin have a soil loss tolerance of 3 tons/acre/year or less. Arid climate and low vegetative production produces little soil protection and accelerated soil erosion and resultant

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sedimentation.

Residents are concerned about erosion rates. They are specifically concerned with the resultant sedimentation into Bighorn Lake. High rates of sedimentation are decreasing stream flow rates, destroying fish habitats, and diminishing recreation resources. The BLM should analyze measures to decrease soil erosion. Examples of measures include minimizing runoff by regulating proper erosion control on roads and drilling pads, and using fire properly as a management tool. By encouraging mining operations to build retention ponds and other erosion control methods when reclaiming open pit mining operations.

Wildlife

A balance between wildlife and livestock should be analyzed to promote all parts of Wyoming's culture and environment. Development, fragmentation and destruction of habitats, disruption of migration routes, and management of game and non-game species should be considered in the BBRMP. The effects of changing agricultural landscapes on wildlife also should be considered. Preservation of open spaces is key to preserving wildlife habit and working ranches that provide much of the needed wildlife habit.

Our changing climate may have great effects on our wildlife habitats. The BLM should consider future habitat changes in the BBRMP.

Wild horses, although non-native, are considered by some to be a part of western heritage. The size of wild horse management areas should be considered. As part of the wild horse management plan, the use of contraceptives should be considered. Additionally, the BLM should consider replacing helicopters with riders to round up horses in order to reduce stress and injury.

Wolf and bear habitats should be considered in the BBRMP. Management of sage-grouse continues to be a major issue in Wyoming. All wildlife should be considered when planning for multiple uses of public lands.
The effects of oil and gas development on wildlife should be considered, and baseline wildlife data should be available.

Wetlands, Riparian Areas, Vegetation, Noxious Weeds, and Reclamation

While the impacts to wetlands, riparian areas, and vegetation are proportional to the amount of land that is disturbed, noxious weeds introduced to disturbed areas can spread to adjacent land and negatively impact local agriculture and livestock operations. Baseline information and future modeling regarding native, non-native, invasive, and noxious species should be provided, and reclamation and mitigation procedures should be clear. Innovative weed control methods such as chemical pathogens should be reviewed and considered. More restoration projects should be considered.

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Of particular interest are salt cedars. Salt cedars are invasive plants that consume huge amounts of water and change soil composition by accumulating large quantities of salt. Due to their huge water consumption and high salt tolerance, salt cedars out-compete native plants like cottonwoods and willows. This affects the entire ecosystem, and it damages grazing areas. The BLM should include specific analyses and plans regarding these plants.

The effects of grazing on wetlands and riparian areas should be considered.

Hydrology: Groundwater and Surface water

Regulations should be considered to minimize pollution and to mitigate impacts by development. Baseline water quality data should be available to facilitate future monitoring analyses.
Development of water discharge from wells for cattle and wildlife use should be considered. Work cooperatively and coordinate with the WY State Engineer Office and DEQ regarding water issues, as they are the regulatory authorities and legal agencies over all water in the state. Coordinate with county officials on any and all water issues relative to Coal Bed Methane discharge water, oil field discharge water, or any water extracted as a result of mining or mineral activity. Work with the conservation districts to monitor, analyze, evaluate, improve and/or maintain water quality in the streams.
Allow discharge water to flow over BLM land if requested by the downstream users and/or grazing lessee
Work with DEQ to streamline this process.

Fisheries

Plans to preserve native habitats and fight the introduction of non-native species should be considered. Erosion of soils and sediment delivery to waterways are major issues affecting fish populations which warrant consideration.

Grazing

The BLM should address grazing as a key issue. The effect of the revised BBRMP on grazing could directly or indirectly affect many other components of the Bighorn Basin, including landowners, vegetation, wildlife, surface water, groundwater, soils, and socioeconomics. As part of the grazing issue, the process of renewing grazing permits should be reviewed and streamlined if possible. Reinstate the Annual Unit Months (AUMs) that are being carried as suspended on the permits. Allow for flexibility in AUM use, to be determined between the BLM Range-Con and permittee based on forage availability. There shall be no net loss in permitted AUMs, but the actual use may vary annually based on vegetative supply, weather and range conditions.
Streamline the process to refurbish reservoirs and/or install water tanks and pipelines across the land for the improvement of water distribution for livestock and wildlife. I have heard that DEQ regulations are part of the problem of getting permits to reclaim old ponds and reservoirs? They also have a regulation that prohibits them from doing any thing that adversely affects Wyoming

agriculture.

Regulations on grazing specific to riparian areas should be reviewed and given careful consideration.

In addition to grazing issues, the BLM should address how range improvements and lessee allotments will be affected by the proposed plan. Any temporary or permanent changes in land use need to be mitigated and/or disclosed.

Open Space Preservation

The BLM should consider setting aside certain lands as pristine and off limits to industrial, housing, and oil and gas developments. Directional drilling should remain a priority to minimize the development of unnecessary pads.

Public land grazing is an issue closely related to open space preservation. The BLM should consider the benefits of increasing public land grazing, and the potential changes in land use patterns on adjacent properties as a result of BLM grazing management. The viability of ranching is directly related to public land grazing administration. Conservation Easements should be actively pursued to ensure open spaces survive.

Working Landscapes

Ranchers and farmers can be great stewards of the land. Working landscapes help maintain open spaces when they are properly used. The benefits of keeping working landscapes from being subdivided and developed should be considered in the BBRMP.

Land Use Planning

Appropriate management of watersheds should be considered. Topics such as wildlife migration, nesting, calving, and nursery areas, and preservation of open spaces should be analyzed. BLM should actively pursue conservation easements and access easements as a means of preserving open spaces. With public and local government help several funding sources are available. Subdivision development should be regulated appropriately to preserve the environment while allowing for growth BLM's planning should consider local land use plans as near as possible to be able to coordinate land usage.

Wilderness

The effects on wilderness areas of grazing, recreation, oil and gas development, industrialization, and housing developments should be considered.
Wilderness Study areas should be reevaluated and removed if they have not been acted on by Congress within ten years and not left as defacto wilderness.

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Fire

The management of fuels is an important issue. As logging and grazing on public lands has decreased, fuels have increased. The BLM should analyze the benefits of new alternatives to fire management in the RMP.

Aesthetics

The view shed is important to Bighorn Basin citizens, and any short and long term impacts should be characterized and presented. The view shed is not only important as an aesthetic factor, but it is also a consideration for the tourism industry, and it is therefore a socioeconomic issue. The BLM should consider providing a Geographic Information System (GIS) analysis showing impacts to view sheds from different key locations to help residents better understand potential impacts from development on public lands. Well sites should blend into the view shed as much as possible. (sand stone painted structures ?)

Recreation

Recreation is one of the most important issues to Wyoming's citizens and tourism industry. Hunting and fishing opportunities should be maintained. However, the environmental effect of motorized and non-motorized recreation in road less areas should be thoroughly analyzed, and appropriate measures to protect vegetation, soil, and wildlife should be emplaced. Improvement of existing roads could curtail improper use of road less areas. The BLM should consider increasing their efforts to monitor improper recreational use of public lands. Potential impacts of all recreation to big game, including impacts on winter range, should be considered as well. The BLM should implement a public education program to explain the various perspectives regarding motorized and non-motorized recreation. Trails should be better marked to increase public awareness of proper use. Set aside a less productive area near towns for off highway vehicle (OHV) use as a playground. Allow for competitive type tracks or trails and an area for general riding and hill climbing to be set up. A condition could be for a local club to oversee and take control of the management, including clean-up and general maintenance.

Set aside an area for a shooting range near each urban area. A condition of this may be contracting with a local gun club, sportsman club or similar organization for the management and oversight. The contract or lease should be long term, so a permanent type shooting range, club house, and/or equipment can be installed to ensure the safe and responsible handling and use of firearms

Include an OHV management plan, designated use areas, non-use areas and designated trails. Plan should allow for permittee to use OHV in non-use areas for activities associated with the permitted use, such as installation, inspection, or maintenance of fencing, pipeline, livestock, and any other use associated with the permitted activity

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Roads

Bighorn Basin residents consider the number of roads as an important issue. The BLM should review the plan for roads while considering the Wyoming public's interests. Roads should be marked to inform the public of proper motorized and non-motorized use.
Loop trails for ATV's should be considered as our population ages more and more folks are enjoying public lands on ATV's. If ATV roads are provided and well marked we will have less illegal off road travel.

Oil and Gas Leasing

The rate at which oil and gas development will likely take place should be considered in the BBRMP. Appropriate development should be regulated by the BLM to protect the Bighorn Basin's environment while maximizing its resources.

Mining

Mining, and bentonite mining in particular, is an issue in the Bighorn Basin. Strict management of mining should be considered so that discontinued mining areas are properly remediate. A balance should be found between mining and habitat preservation and enhancement. Opportunities for ponds and erosion control should be explored when reclamation of mined areas occur. (Mike Stewart told me DEQ would not allow reclamation ponds! Under State Statute 35-11-103 iii "Contouring" "means grading or backfilling and grading the land affected and reclaiming it to proposed future use with adequate provisions for drainage. Depressions to accumulate water are not allowed except if approved as part of the reclamation plan."
Do not restrict the development of minerals to the point the economic impact makes it financially unfeasible. Time periods of operation should not be limited to only a couple of months per year. Streamline the permitting process to 60 days or less. The current permit time of 6 months to years is unacceptable and has a significant negative economic impact.

Law Enforcement

Contract with and authorize County Sheriff Departments to enforce BLM regulations relative to the general public, such as illegal recreational use, vandalism, off road use, litter, etc. This could be more efficient and effective than employing additional BLM enforcement officers. Many times cooperation among government agencies can work for the common good and be beneficial to the public.

1230

Thank You for this opportunity to comment on the BLM's RMP process and to share some of my views of Desired Future Conditions for the public lands.

Thank You

Keith Grant

1231

Written Comment Sheet

Please submit this comment form in person or by mail on or before **NOVEMBER 17, 2008** to:

Bureau of Land Management
Bighorn Basin RMP
ATTN: Caleb Hiner
P.O. Box 119
101 South 23rd Street
Worland, WY 82401

Electronic comments are encouraged and can be submitted at: BBRMP_WYMail@blm.gov.
All comments must be received or postmarked by November 17, 2008. For more information contact BLM RMP Project Manager, **Caleb Hiner** at 307-347-5100 or via e-mail at BBRMP_WYMail@blm.gov.

NAME: Michael H Hudson	**E-MAIL:**
ORGANIZATION:	
ADDRESS: 757 Hwy 14A	
CITY/STATE/ZIP: Powell, WY 82435	

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PLEASE PRINT **DATE:** 14 Oct 08

My first comment is to make sure there are stipulation in place to protect habitat and minimize surface damage when drilling, especially for gas. It appears to me that the energy companies that have leases on Federal ~~land~~ land can do anything they desire to make a profit. I do not want to see the Bighorn Basin raped and exploited the way some areas in other parts of WY are.

My second comment does not really apply to the Bighorn Basin Management. The BLM Wild horse plan is not working and needs to be changed. Useless wild horses in feedlots and sanctuaries are not sacred and are only using up funds that could be put to better use. Get rid of them!

(over)

1231

BB RMP Scoping Comment Form
Comments must be received or postmarked by November 17, 2008

The BLM has many good programs at work in the Bighorn Basin. Keep up the good work.

1232

Written Comment Sheet

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Bighorn Basin RMP
ATTN: Caleb Hiner
P.O. Box 119
101 South 23rd Street
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NAME: Dee Rogers	**E-MAIL:**
ORGANIZATION: Historic Preservation Board	
ADDRESS: 801 Hillcrest	
CITY/STATE/ZIP: Worland	

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PLEASE PRINT **DATE:** Nov - 08

Native Rock Art is one of the oldest historic resources in the United states It is imperative that B L M puts these historic sights in the new Resource Management plan. These sights need protection future educational opportunities Native history and public enjoyment.

1233

Written Comment Sheet
Big Horn Basin RMP

William Lee Hill
1125 Wilson Drive
Worland, WY 82401
bhill@rtconnect.net
November 9, 2008

To Caleb Hiner

During the first week of November, I attended the evening meeting for the Big Horn Basin RMP in Worland, WY. I filled out my comment sheet on November 9, 2008.

I reflected on my comments until November 12, 2008 and decided to go on up to the Worland Office to pick up a new form to moderate my rather terse remarks.

It was at that time I discovered there are no RMP comment sheets available at the front desk of the Worland BLM office during a published comment period. Perhaps that is because you have consultants running this process rather than the agency.

I did not want to comment on the Internet, or I would have done so. Other than that, here are my comments, recommendations, and observations as a hard core user of public land.

Geology….The Basin has some of the best geology in the World, but little has been done with interpretive sites on BLM lands. The Red Alkali scenic byway road is defined by geology, but there is not one reference as to the wonder of that environment, except the track site. Perhaps we can do something here.

Fire….When two government agencies watch the 2008 gun barrel fire burn itself out, and still have a suppression bill of $164 per acre, I think your suppression costs are out of control. Is what you protected, worth more than the suppression cost? (11 million) Are you helping people that are not helping themselves to create a defensible fire space? Living in a forest has a definable risk and people should accept it. I'm a little tired of paying for the risk that others take.

Controlled burns….You conducted Fall burns throughout the multi-year drought that plagued the Basin. You may have used your budget, but some of your burns do not appear to a show a vegetative response commensurate with the effort and expense to burn a biomass load that hardly existed during those years. Spring moisture was also deficient to maximize the vegetative response.

1233

Public access….Exclusion of the public is not management.
Continued public access for the motorized and non-motorized customer is critical. You must maintain public land by use and not preservation.

Signing needs to be improved to define what is permissible. If a road is open, say so. If it is closed say so. What I observe, land misuses take place and it is apparent to about everyone except the agency.

I mention the Archeological site and the road across BLM to the Cold Spring Road. (I noted 15 years of progressive misuse) When the resource damage became so apparent the agency REACTED vs. enacting simple management (communication) before the damage was done.

Also note that the compliance you received from your public was nearly complete after signing, blocking trails, and establishing parameters. A little direct communication and field presence, first, would have gone a long way.

Livestock….I have no problem with public land grazing. I have noted that the agency does not follow its own recommendation on salting a quarter mile from water. On occasion, you'll even see salting on reservoir embankments. I have also noted that the livestock producers salt on roads causing interaction, (not always friendly) with the public and livestock. I have also noted that some livestock producers will install a salt block on camp sites used by the recreating public, and that is probably not by accident. If a member of the public notices this, perhaps the agency should notice too. Some of the permitted are pretty flexible as to percent and duration of use. A little more direct contact and supervision with the permitted is needed.

The Renner water development site…You can see the reflection from the galvanized metal guzzler for thirty miles. You require that other users camouflage developments, you need to comply. I think you should sand blast it or paint it.

Bentonite….I support mining of any kind as long as reclamation is appropriate for the eco-system it affects. The latest permitted bentonite mine just south west of Ten Sleep, WY is very exposed and visible to the highway. You need to bury these permits out of public view as you have in the past.

Finally, the agency has decided to hire a consultant to do the administrative work on the RMP so as to keep employees in the field. BLM employees are not in the field now to an extent that anyone would notice. The employees that are out there know who you are. By employing a consultant, you have just embarked on another degree of separation from your public. It did not work for your Forest Service cousins either.

1233

The agency folks need to write the RMP, and the supervisory staff needs to make sure that the BLM staff is out there on the ground to enact the RMP with an informed public that uses it. Writing the RMP and managing the RMP is your mission.

To the credit of BLM employees, a spider web of law, regulations, policy, and agency dictates coupled with hard core Wyoming mineral interest politics, and special interest lawyers make their job harder to do that it should be.

My final recommendation would be this. Every BLM employee should put their feet on the land every week, and while they are out there, meet the users of the resource. The land and the people are real. Talking with user and really knowing them will result in viable management solutions.

That is the best RMP that you'll ever write or have to administer.

William Lee Hill

Worland Area Manager
State BLM director
Washakie County Commissioners
State Senator
State Representative
US Senators
US Representative.

1234

11 November 2008

Mr. Caleb Hiner, RMP Project Lead
Bureau of Land Management
P.O. Box 119
Worland, WY 82401-0119

Dear Mr. Hiner,

I am writing regarding the revision of the BLM Resource Management Plans for the Bighorn Basin. The Bighorn Basin is one of my favorite places and I hope that the BLM's plan will consider and emphasize the following values that are important to me:

1. Protection of habitat for sage grouse and other important wildlife species.
2. Areas of proposed wilderness including the McCullough Peaks, Bobcat Draw and Red Butte. I would encourage wilderness protection for these areas.
3. Protection for non-destructive recreational uses of lands along the western slope of the Bighorn Mountains. To me these are some of the most spectacular canyons in Wyoming.
4. General recognition that wilderness values and conservation are important in the Bighorn Basin given that it is a spectacular place rich in wildlife habitat, archaeological resources, visual beauty and recreational opportunity.

Thanks for your consideration.

Sincerely,

Ken Driese
500 South 11th St.
Laramie, WY 82070
(307) 742-3797
kdriese@uwyo.edu

1235

Written Comment Sheet

Please submit this comment form in person or by mail on or before **NOVEMBER 17, 2008** to:

Bureau of Land Management
Bighorn Basin RMP
ATTN: Caleb Hiner
P.O. Box 119
101 South 23rd Street
Worland, WY 82401

Electronic comments are encouraged and can be submitted at: BBRMP_WYMail@blm.gov.
All comments must be received or postmarked by November 17, 2008. For more information contact BLM RMP Project Manager, **Caleb Hiner** at 307-347-5100 or via e-mail at BBRMP_WYMail@blm.gov.

NAME: LARRY JORDAN	**E-MAIL:**
ORGANIZATION:	
ADDRESS: 3487 Rd 28 - P.O. Box 8	
CITY/STATE/ZIP: GREYBULL, WYO.	

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PLEASE PRINT **DATE:** 12 NOV 08

I BELIEVE MORE RECREATIONAL AREA'S SHOULD BE SET ASIDE FOR DIRT BIKES ATV'S ETC. PLACES THAT FAMILY'S CAN USE FOR OFF ROAD MOTORIZED USE AND NOT BE HARRASED. ONE LOCATION IN THIS ENTIRE AREA IS FAR TO LITTLE. THERE ARE SOME VERY GOOD SPACES THAT COULD BE UTILIZED FOR THIS PURPOSE: HILLS BETWEEN BASIN AND GREYBULL, EAST SIDE OF BASIN GARDEN'S ROAD AND SHEEP MOUNTAIN ETC.

I BELIEVE PUBLIC ACCESS IS VERY IMPORTANT. AND SHOULD NOT BE RESTRICTED UNDULY.

1236

I'm realistic enough to know that manpower is not available to achieve a lot of goals

To: Big Horn Basin RMP
ATTN: Caleb Hiner
PO Box 119
Worland, WY 82401

From: Dorothy Milek
836 Mondell St.
Thermopolis, WY
82443
November 12, 2008

Cody & Worland RMP Revision Comments

The three necessary things to sustaining life are WATER, AIR, LAND. What affects one of these "resources" affects all of them, but too many humans on this planet have no conception of this idea.

GENERAL TOPICS

Any planning must follow the three Multiple Use Act criteria, which as I understand it, are

1. Multiple Use
2. Sustained Yield
3. Economic Impact

Whatever we write here or whatever the BLM does is going to hinge on Congressional action on the Omnibus Federal Lands Bill and whatever direction the incoming administration and congressional members take.

Number 2 Sustained Yield should be the priority of any planning. Our glutinous use today of natural resources will not allow future generations to enjoy the benefits of our resources. Protection should supercede uses which will cause major deterioration of land, water and air.

Any planning must consider local land use plans per FLPMA (43 U.S.C. 1712, Section 202, C, 9). Local planning, if truly considered, helps mitigate the effects of unmanageable/unwise decisions at the national level such as the 160-acre homestead act boondoggle which was passed by people unfamiliar with the West. Today that should be no excuse, but those blinders continue to hamper wise legislation.

Local outlook needs to be balanced by a "good of the nation and future generations" thinking.

Any and all projects must be a joint effort by all concerned: federal, state, county and private holdings and agencies.

"Wilderness Study Areas" should not be perpetuated beyond ten years from the original date when they were set aside.

1236

Milek, page 2

Extreme care must be taken when any sales of BLM land are considered. Restrictions should be imposed on future use of land that is adjacent to land in the public realm. Perhaps such lands can be sold with 50 year restrictions on their use. Especially to be prohibited are sales to those who are speculators.

LAND USE

MINERALS AND GRAZING:

Any plan must be flexible enough to take into consideration changes in patterns of weather. For instance drought should change the management of land for grazing and large-scale mineral development with the accompanying dust which comes with large acreage soil disturbances.

Rehabilitation of soil should be a major feature in any proposed mineral development. Rehabilitation should take place in pace with the disturbances. It should not be put off until work is completed. Too often a company goes bankrupt and the taxpayer is left holding the bag for reclamation. Reclamation should be an ongoing process. Water resources for reclamation should be taken into consideration when a permit is granted.

More publicity should be generated on planned activities which affect the surface of large numbers of acres. An example: the bentonite activity in Major Basin.

Some type of mitigation should be allowed for grazing permitees whose permit lands are affected by mineral development.

Water distribution and small-scale storage for wildlife and livestock use should be encouraged.

LAW ENFORCEMENT:

Local law enforcement should be used to enforce BLM regulations. The hiring of special BLM law enforcement people is waving a red flag on the growth of government and the growing restrictions of public land use, merited or not.

RECREATION:

Establish more formal trails on BLM lands which lead to interesting natural or manmade features.

Improve signage for boundaries of BLM lands.

Limit as much as possible closed trails. Do not limit public non-motorized use off of trails.

Encourage working relationships with local organizations, including non-recreational ones. (To help the budget, perhaps volunteers could be used to visit such groups in informal modes, not to answer questions but to accept questions which can be passed on to BLM staff.) Increase visibility of BLM staff, especially those who are native to the area, not necessarily "professional" staff.

Encourage organization of clubs for specialized recreational purposes. Determine what specific recreational use sites are needed and establish them. Contract with recreational clubs for the maintenance of such sites.

FOREST MANAGEMENT:

Logging, timbering and woodcutting in dead or dying tree areas should be permitted prior to use of fire as a management tool. To allow for loading wood, unless it is a downhill slope to established roads, simple, two-track roads should be cut through trees, if possible, with turnarounds at the end. Encourage the use of livestock such as horses in the removal of wood, helicopters if the sites would allow safe flight.

VEGETATION:

Preferred methods of pest and disease management should be those which do not use long-lasting chemicals which will affect water or soil quality. Noxious weed control is especially important when the topsoil is disturbed in large-scale surface mineral extraction. Several year weed control should go along with continual reclamation work.

Flexibility in dealing with "bad" plants should be exercised. Species such as sagebrush, Russian olive trees and junipers should not be subjected to wholesale eradication but must be considered on a site specific basis for their use for shelter and food for wildlife and erosion control.

WILDLIFE:

Wildlife is an integral part of the landscape of Wyoming. Hunting, photography and viewing of wildlife is important to the economics of Wyoming. This is due largely to the large open spaces of public land and is also determined by those landowners who have open spaces and land along waterways in Wyoming. Again private and all governmental entities must work cooperatively to protect wildlife as an important natural resource affecting our state economically and aesthetically.

But, consideration must be given to the safety and health of resident and visitor alike in the realm of animal-transmittable-to-humans diseases and pests. Species which pose a threat to humans and livestock must be kept at manageable levels. In-office computer models will never take the place of on-the-site evaluations by professional and lay persons alike when determining operations concerning wildlife.

Scientists and educators have for years promulgated the theory of evolution, but applications of the theory break down in practical applications. Is it possible or practical to save all species on the earth today? The evolutionary theory must be taken into consideration when determining the possibility of loss of some species.

HISTORICAL AND PALEONTOLOGICAL:

Protection of such sites should be guaranteed, but only if investigation proves that the site contains sufficient artifacts or fossils to warrant such protection. And, a time limit should be set on the start to finish work that will be allowed for proof of value.

WATER

As with land, all agencies--federal, state and local, and private citizens need to work cooperatively to ensure that water quality and levels are established and maintained on public lands. This, too, is intricately tied into the land and soils. In the badland and rocky types of soil found in so many places throughout the West, the use of plants and proper soil-work can help control erosion which leads to inherent water quality deterioration. Any plan has to be based on individual sites. The one-coat-fits-all mentality has to be changed.
On the other hand, just as wildlife is evolutionary, so are soils and water and perhaps some soils need to erode to introduce the next evolutionary phase. Man-made erosion should probably be prevented as much as possible. Again weather conditions can also introduce unknown qualities into water conditions.

Mineral water discharge issues should be determined on a site-by-site basis.

Locally, in Hot Springs County, warm or hot water sources which probably tie in to the flow and quality of the hot springs in Wyoming's Hot Springs State Park need to be protected. The springs and park are a major factor in the tourist economy of the county and for many visitors and residents alike for the possible health benefits of the water. A protection zone for the springs has been requested of the Wyoming State Engineer's office. Any hot or warm water springs on BLM land should be capped and closed in and future drilling prohibited within the protection zone.

AIR

Probably this is the trickiest of all resources to protect. Any operations, whether in-house agency sponsored, other government levels sponsored, or those of the private business and recreation sectors, allowed on BLM land should have safeguards for the mitigation of dust. Again this is so closely tied to water and weather that it has to be monitored closely and at times work suspended on projects due to wind or storms.

GOALS AND DESIRED CONDITIONS

Education at all levels to make United States citizens understand that most of our natural resources are NOT replaceable and NOT renewable. Set priorities according to their importance to life (air, water and land–breathing, drinking water and eating) or culture and economics. Economics can give us the food, shelter and lifestyle we *want*, but only good husbandship of air, water and land can give us the food and shelter we *need* to survive. As a nation of free people we have the ability to chose "Waste not, want not." If we chose unwisely our children and grandchildren may "want."

1237

George & Frances Alderson
112 Hilton Avenue
Baltimore, Maryland 21228

November 13, 2008

BLM, Worland Field Office
Attn: RMP Project Manager
PO Box 119
Worland, WY 82401

Dear Project Manager:

Please include this letter as our comment in response to your Notice of Intent published in the Federal Register for October 17, 2008, concerning new RMPs for the Bighorn Basin. I (George) am retired from a career in federal land management, during which I had work assignments in Wyoming as well as other western states.

Wilderness: The "no more wilderness" policy adopted by former Secretary Gale Norton will undoubtedly be rescinded in the coming months, and BLM will be free to recommend additional areas for wilderness status. We urge BLM to recommend wilderness designation for all of the citizen-proposed units known as Alkali Creek, Bobcat Draw Badlands, Buffalo Creek, Cedar Mountain, Honeycombs, Medicine Lodge, McCullough Peaks, Owl Creek-Castle Rocks, Paint Rock Creek Canyons, Pryor Mountains, Red Butte, Sheep Mountain and Trapper Canyon. Most of these consist of BLM's wilderness study areas with contiguous roadless lands; one is a free-standing unit.

BLM should review the wilderness characteristics of those areas and designate new WSAs or "wilderness characteristics areas". The EIS should include a map showing these areas, as was done in several Utah RMPs (such as Vernal, Moab, Monticello). This will help the public consider alternative management concepts at the draft EIS stage.

Oil and gas: In areas to be leased for oil and gas development, the plan should include measures to reduce the impacts that degrade wildlife habitat, including:

- Proceed with leasing on a phased basis, so resident wildlife always have a place of refuge. Each tract should be reclaimed to effective wildlife habitat before the next tract is leased and developed. This would make good use of the vaunted reclamation capability of the oil/gas industry.
- Reserve crucial wildlife areas with "no surface occupancy" stipulations, including ungulate winter range and calving areas, sage grouse leks with a 3-mile radius, and essential migration routes for ungulates.
- Require drilling to be concentrated on widely spaced drill pads, using directional drilling. This reduces the impacts of roads, drill pads, waste pits, pipelines and other facilities.

1237

Off-road vehicles: The plan should reduce ORV travel routes to a sustainable system by closing unauthorized, user-created routes. ORVs should be barred from riparian habitat, WSAs and proposed wilderness areas.

Livestock grazing: The plan should identify areas where grazing has degraded the vegetation and wildlife habitat. Grazing levels should be reduced to sustainable stocking rates, and livestock should be excluded from riparian areas.

Extend comment period: We petition BLM, pursuant to 4 USC 555(e), to extend the comment period for the scoping phase of the Bighorn Basin RMP project. The 30 days allowed here is not adequate, because an unusually large area of public land is affected, and the public needs more time to work up recommendations for BLM's consideration. We have participated in scoping for many RMPs in several states. The public is usually given 90 days at the scoping stage and 90 days at the draft plan stage.

Thank you for considering our views. Please keep us informed of further action on this project.

Sincerely,

George & Frances Alderson

George & Frances Alderson

2

Comment Document 1238 has been intentionally removed.

1239

11-14-08

BLM
Bighorn Basin RMP
Attn: Caleb Hiner
.P.O. Box 119
Worland, WY. 82401

Mr. Hiner:

The permit for federal well 26-2, or any other gas well, should not be issued when near any residential properties due to many reasons. There is an abundance of pollution from previous wells drilled in the Clark Community that has not been cleaned up, nor is likely to be cleaned up due to the underground concentration, and migration of carcinogenic chemicals as stated by the Terracon Report dated 10-14-08. Underground in the water supply in Clark there is over seventy-two million gallons of contaminated water that is spreading to private wells. What has happened in Clark is happening all over Wyoming, Colorado and other states. This pollution, and the infrastructure supporting these gas wells have devalued private property substantially for those with property near the well heads, or the central plants, and is a threat to the health of the citizens. Thousands of gallons of carcinogenic drilling chemicals are used for each well drilled. Mr. Hiner what are the cumulative effects of all this drilling on the community, the water quality, and property owners of Clark, and elsewhere throughout the states? Mr. Hiner what are the exact chemicals, and concentrations used in the drilling chemicals? Mr. Hiner if these questions cannot be answered with one-hundred percent certainty, then no permits should be issued, it is that simple. There should always be a large buffer-zone between this type of industrial activity and residences, as the 2006 well blowout in Clark, Wy. has shown. And if that isn't possible, then compensation should be paid to the property owners for the loss of property value.

Every level of government is to uphold the U.S. Constitution, which in turn is to serve the people, that is each departments primary mission. Unfortunately, too many in government employ have lost sight of this. The departments that have approved the previous wells in Clark, and elsewhere have violated the fifth and fourteenth amendments in the U.S. Constitution by taking property (in the form of value) without due process. Previously, the BLM absurdly approved and signed a 'Finding of No Significant Impact' for the pipeline used to implement this polluting industry among residential properties. The BLM then claimed they had nothing to do with the gas wells in Clark. That would be like a driver for a getaway car used in a bank robbery to claim that he didn't have anything to do with robbing the bank! The law states that the driver, just as the BLM was participatory in the crime and thus responsible. Mr. Hiner is the BLM and other government departments above the law? Each new well near a residence will undermine property value, and citizens health from the pollution added to the water and air. Mr. Hiner do you and the BLM support the U.S. Constitution? Since there is no provision in the Constitution for a Dept. of Interior, or many other Federal Departments, your actions have shown your disregard for the Constitution, and property rights of citizens. Mr. Hiner when will the property owners be compensated for their property value losses, due to the failure of the BLM and other agencies to uphold the U.S. Constitution?

1239

Awaiting your reply,

Phil Baird

Phil Baird
(77 Bigview rd. Clark, Wy.)
P.O. Box 2546
Cody, WY. 82414

1240

Written Comment Sheet

Please submit this comment form in person or by mail on or before **NOVEMBER 17, 2008** to:

Bureau of Land Management
Bighorn Basin RMP
ATTN: Caleb Hiner
P.O. Box 119
101 South 23rd Street
Worland, WY 82401

Electronic comments are encouraged and can be submitted at: BBRMP_WYMail@blm.gov.
All comments must be received or postmarked by November 17, 2008. For more information contact BLM RMP Project Manager, **Caleb Hiner** at 307-347-5100 or via e-mail at BBRMP_WYMail@blm.gov.

NAME: ALAN JONES	**E-MAIL:** aljones@wyoming.com
ORGANIZATION:	
ADDRESS: 636 SAWTOOTH COURT	
CITY/STATE/ZIP: POWELL, WY 82435	

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PLEASE PRINT **DATE:** 11/14/2008

THESE ARE PUBLIC LANDS. THEY MUST REMAIN AVAILABLE TO THE PUBLIC, WITH THEIR FOR ENERGY EXPLORATION, RECREATION OR WHATEVER. WITH PROPER MANAGEMENT AND OVERSIGHT OVER THE VARIOUS USERS, THE QUALITY CAN BE AND SHOULD BE MAINTAINED.

1240
SURVEY FORM

Big Horn County, Hot Springs County
Park County, Washakie County
Issue rating for Bureau of Land Management
Bighorn Basin Resource Management Plan.

The purpose of this survey is to rate the importance of issues related to the 2008 Bighorn Basin Resource Management Plan (RMP). Obviously there are no right or wrong priorities. This survey will allow the counties and their contractor Ecosystem Research Group (ERG) to more efficiently focus on priority issues important to the public. It will also help us to determine how the BLM might prioritize your areas of concern in the upcoming RMP. Please rate the top ten issues from the table below that are of the most importance to you. Rate the issues based on importance using a scale of 10 to 1 (**10 being the most important and 1 being least important**). On the back of this form, in a couple of words, please describe problems and solutions associated with each of your 10 chosen issues. This census of priorities allows us to help determine how well the BLM has addressed your areas of concern in the latest RMP.

We will keep all contact information confidential and we ask that you include at least your name to ensure accurate polling. If you would like more time for your comments, this form can be mailed to; BBRMP Comments, c/o Meredith Holden, PO Box 8214, Missoula, MT 59807. A printable version of this survey will also be available on the web. You may access that page by visiting www.ecosystemrg.com, clicking on Project Websites and following the link under "Bighorn Basin RMP." We would like to have your comments by November 13, 2008. If you have any questions you may contact Gregory Kennett by phone at (406) 721-9420.

Name: ALAN JONES
Email: ajones@wyoming.com
Address: 636 SAWTOOTH COURT, POWELL, WY 82435

Rate the top 10 issues using a scale of 10 to 1 (**10 being the most important**). Again, we ask that you only rate and make comments on the 10 issues that are of the most importance to you.

Rating	Issue	Rating	Issue
	Cultural		Air quality
	Social impacts (sense of community lifestyle changes, way of life)		Working landscapes (farm and ranch) preservation
7	Wildlife habitat		Restoration (how aggressively should BLM restore habitat)
	Economics		Riparian areas
	Municipal services (physical infrastructure, water, sewer, etc.)	8	Roads (too many, too few, quality)
	Tourism		Threatened and Endangered Species
2	Fire (risk, management, hazard, etc.)	4	Vegetation management (timber harvest etc.)
	Fisheries	3	Water quality and yield
6	Grazing (public land)		Wilderness
5	Mining		Public process
	Full oil and gas leasing		Social services (health care, schools, government assistance, law enforcement, etc.)
10	Some moderate level of energy development		Weeds
	No energy developments	1	Land use planning
	Open space preservation		Aesthetics (visual quality of local landscapes)
9	Recreation (motorized, snowmobiling, OHV, etc.)		Other (please specify)
	Recreation (non motorized, fishing, backpacking, etc.)		

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Comments Page

These are public lands. They must remain available to the public, whether for energy exploration, recreation or whatever. With proper management and oversight over the various uses, the quality can and should be maintained.

1241

Written Comment Sheet

Please submit this comment form in person or by mail on or before **NOVEMBER 17, 2008** to:

Bureau of Land Management
Bighorn Basin RMP
ATTN: Caleb Hiner
P.O. Box 119
101 South 23rd Street
Worland, WY 82401

Electronic comments are encouraged and can be submitted at: BBRMP_WYMail@blm.gov.
All comments must be received or postmarked by November 17, 2008. For more information contact BLM RMP Project Manager, **Caleb Hiner** at 307-347-5100 or via e-mail at BBRMP_WYMail@blm.gov.

NAME: Fred Muffley	**E-MAIL:** MMuffley@tritel.net
ORGANIZATION: Private	
ADDRESS: 1150 Lane 11 1/2	
CITY/STATE/ZIP: Powell WY 82435	

Comments submitted to BLM for use in this planning effort, including names and home addresses of individuals submitting comments, are subject to disclosure under the Freedom of Information Act (FOIA) (5 U.S.C. 522). Written comments received during the public scoping process may be published as part of the environmental analysis process. After the close of the public scoping period, public comments submitted, including names, e-mail addresses, and street addresses of respondents, will be available for public review at the BLM Worland Office during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday (except federal holidays).

PLEASE PRINT **DATE:** 11-14-08

BLM
With regard to your process I really believe that the BLM should allow full oil & gas leasing. The country needs these products & our people need the jobs. It should be done responsibly but, should be done. These lands belong to us & I feel it is wrong to keep the public out, We all should be able to recreate there including 4 Wheelers, bikes, horse riding, biking ect. There are probably enough roads but new roads should be allowed when there is a need. If the public does dammage to an area the Blm. should ~~prosecute~~ enforce the law
Thanks for listening. Fred Muffley

1241
SURVEY FORM

Big Horn County, Hot Springs County
Park County, Washakie County
Issue rating for Bureau of Land Management
Bighorn Basin Resource Management Plan.

The purpose of this survey is to rate the importance of issues related to the 2008 Bighorn Basin Resource Management Plan (RMP). Obviously there are no right or wrong priorities. This survey will allow the counties and their contractor Ecosystem Research Group (ERG) to more efficiently focus on priority issues important to the public. It will also help us to determine how the BLM might prioritize your areas of concern in the upcoming RMP. Please rate the top ten issues from the table below that are of the most importance to you. Rate the issues based on importance using a scale of 10 to 1 (**10 being the most important and 1 being least important**). On the back of this form, in a couple of words, please describe problems and solutions associated with each of your 10 chosen issues. This census of priorities allows us to help determine how well the BLM has addressed your areas of concern in the latest RMP.

We will keep all contact information confidential and we ask that you include at least your name to ensure accurate polling. If you would like more time for your comments, this form can be mailed to; BBRMP Comments, c/o Meredith Holden, PO Box 8214, Missoula, MT 59807. A printable version of this survey will also be available on the web. You may access that page by visiting www.ecosystemrg.com, clicking on Project Websites and following the link under "Bighorn Basin RMP." We would like to have your comments by November 13, 2008. If you have any questions you may contact Gregory Kennett by phone at (406) 721-9420.

Name: Fred Muffley
Email: mmuffley@trilel.net
Address: 1150 Lane 11½ Powell wy

Rate the top 10 issues using a scale of 10 to 1 (**10 being the most important**). Again, we ask that you only rate and make comments on the 10 issues that are of the most importance to you.

Rating	Issue	Rating	Issue
	Cultural		Air quality
	Social impacts (sense of community lifestyle changes, way of life)		Working landscapes (farm and ranch) preservation
4	Wildlife habitat		Restoration (how aggressively should BLM restore habitat)
2	Economics		Riparian areas
	Municipal services (physical infrastructure, water, sewer, etc.)	8	Roads (too many, too few, quality)
3	Tourism		Threatened and Endangered Species
	Fire (risk, management, hazard, etc.)		Vegetation management (timber harvest etc.)
	Fisheries		Water quality and yield
6	Grazing (public land)	7	Wilderness
5	Mining		Public process
10	Full oil and gas leasing		Social services (health care, schools, government assistance, law enforcement, etc.)
	Some moderate level of energy development		Weeds
	No energy developments		Land use planning
	Open space preservation		Aesthetics (visual quality of local landscapes)
9	Recreation (motorized, snowmobiling, OHV, etc.)		Other (please specify)
	Recreation (non motorized, fishing, backpacking, etc.)		

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Comments Page

The BLM should manage to promote oil & gas exploration. Our area is depressed & we need the jobs & energy.

The area should be managed to allow for people to recreate in, including 4 Wheelers, bikes horses & trails to hike in. If there is damage to the lands the BLM should agressively protect the land normal use should be allowed by all.

There are probably enough roads but for new energy development some might be required

No more wilderness or wilderness Study areas please.

1242

140 Deer Trail
Ten Sleep, WY 82442
307-366-2824
dcorme@tctwest.net
November 14, 2008

Mr. Caleb Hiner, Project Leader
Bighorn Basin Resource Management Plan
P.O. Box 119
Worland, WY 82401.0119

Dear Caleb,

I very much appreciated visiting with you and the other BLM staff members involved with the revision of the Bighorn Basin Management Plan at the public meeting your office hosted in Worland. In recent years, I have received much valuable technical expertise and advice from your Worland BLM staff regarding land management concerns of the subdivision where I live near Ten Sleep. Generous contributions of time and knowledge from these specialists have helped our members address issues of water quality, riparian wildlife habitat, weed control, and wildfire suppression. I feel confident the revision of the Bighorn Basin Resource Management Plan has been entrusted to very caring and capable hands, dedicated to the protection and preservation of this basin and mountain foothills environment so unique to Wyoming.

The Bighorn Basin is recognized as one of the last remaining relatively undisturbed sagebrush steppe ecosystems in North America, containing rare plant communities that support many species of resident and migrating wildlife. Elk, mule and white-tail deer, bighorn sheep, pronghorn antelope, wild mustangs, mountain lions, bobcats, coyotes, foxes, jackrabbits, black-tailed prairie dogs, and numerous species of small mammals, including rare species of bats, can be seen in the Basin. Golden eagles, bald eagles, merlin falcons, prairie falcons, ferruginous hawks, northern goshawks, burrowing owls, and other raptor species nest and forage here. Also found are sage grouse and many species of songbirds dependent upon the sagebrush steppe habitat. Yellowstone cutthroat trout and other native fish species are found in the Bighorn River and streams leaving the surrounding mountain ranges.

I believe this valuable ecosystem should be managed with thoughtful foresight, to ensure the sustainability of its biodiversity of plant and animal life for the benefit and enjoyment of generations to come. Recognizing the importance of increased scientific knowledge of the natural history of the ecosystem, the Draper Museum of Natural History within the Buffalo Bill

1242

Historical Center in Cody, is planning a series of wildlife monitoring data collection studies in the Basin, enlisting the help of citizen volunteers.

The majestic mountain ranges surrounding the Bighorn Basin naturally command our immediate attention, but upon closer investigation, many of us are drawn to the topography of this vast sagebrush steppe and its surrounding mountain foothills. The colorful high desert badlands contain hoodoos, pinnacles, spires, and buttes. Outstanding examples of anticlines, synclines, and faults can be seen and studied. Spectacular canyons, deep caves, and juniper escarpments are found in the foothills. Fossil sites of world renown are located in the Basin. Attracting geologists and paleontologists from all over the world, I hope the integrity of these outstanding features will always be protected.

As a member of the Wyoming Wilderness Association, I have a special interest in the proposed Wilderness Study Areas, the adjoining Citizen's Proposed Areas, and the Areas of Critical Environmental Concern. Some of these areas contain a wealth of prehistoric sites dating back 12,000 years or more. Important archeological sites containing pictographs, petroglyphs, rock shelters, tepee rings, and stone tools have been documented, with others yet to be discovered. I believe these Areas should continue to be managed as wilderness, retaining the stark beauty of their unique topography, their superb wildlife habitat, their isolation and solitude. In our increasingly urbanized world, the spiritual renewal found in such wild places cannot be duplicated anywhere else. Paul Rau, BLM Outdoor Recreation Planner, expressed interest to me in leading small groups of wilderness enthusiasts through some of the Study Areas, allowing more of the public to access and experience their beauty and remoteness. I feel such outings would be very well-received and provide us an opportunity to learn more regarding the management of our public lands.

Thank you for the opportunity to add my comments to the many you will be receiving concerning the revision of the Bighorn Basin Management Plan.

Sincerely,

Diane Orme

Diane Orme

1243

Written Comment Sheet

Please submit this comment form in person or by mail on or before **NOVEMBER 17, 2008** to:

Bureau of Land Management
Bighorn Basin RMP
ATTN: Caleb Hiner
P.O. Box 119
101 South 23rd Street
Worland, WY 82401

Electronic comments are encouraged and can be submitted at: BBRMP_WYMail@blm.gov.
All comments must be received or postmarked by November 17, 2008. For more information contact BLM RMP Project Manager, **Caleb Hiner** at 307-347-5100 or via e-mail at BBRMP_WYMail@blm.gov.

NAME: Michael Scherman	**E-MAIL:**
ORGANIZATION:	
ADDRESS:	
CITY/STATE/ZIP: Big Horn County Resident	

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PLEASE PRINT **DATE:** Nov 14, 2008

Please See Reverse Side →

1243

BB RMP Scoping Comment Form
Comments must be received or postmarked by November 17, 2008

A summation of my input is to utilize wisely the multiply use concept on public lands in a manner to enable us to pass along our B.L.M. lands to future generations in as good or better condition as we received the land and what it produces. Managing different land areas for varied priorities depending on what they have to offer is essential. Change is a catalyst for improvement for which we are always striving to accomplish. Currently, some of my specific thoughts to achieve the multiple use goal are generated by observation, need and past experience as a public servant. First, I believe overall we are headed in a positive direction! Extremism in any direction should be avoided. Biological resources top my list. But, make no mistake I believe all the topics are important, credible and deserve attention. 1) Specifically, I believe B.L.M. should play a stronger role in our wildlife conservation/management. I would like B.L.M. to take a stand with the Wyoming Game and Fish to reduce or eliminate the harvesting of females in big game species such as deer, elk and antelope on many of the B.L.M. lands in the Basin Area. There has been a sharp reduction in herd size over the past years. Reduced harvesting of the females for a limited period of time in each species will help enhance herd numbers, improve hunting and will not hurt the carrying capacity. I do not feel the excuses given by Game and Fish to keep harvesting more and more females is valid! 2) In this same category, timber harvesting by clear cut or rotational selective cut is a wise use of our renewable resources. Likewise, the use of downfall, burned over areas and bug kill perhaps could be better used by the public for firewood or other purposes. 3) The Wild Horse program is heartfelt by some. I would suggest the numbers maintained in the herd should be set and adhered to! 4) I strongly support B.L.M.'s Planned/Prescribed Fire management. The diverse benefits of prescribed fire is of tremendous importance! Mosaic burn patterns are beneficial to wildlife and other purposes. Type conversion is another important use! Sometimes seeding after a fire would be beneficial. 5) On the other hand, I generally disagree with a "let burn policy" of unplanned /Wildland Fire in most areas!!! The devastation is too great, there is unplanned loss many times of our natural resources and the suppression cost to tax payers is greater when a wildfire is allowed to grow to larger acreages. This also increases the potential to loss of life, property and natural resources which cannot be replaced such as archeological artifacts. 6) Land Resources is my next topic. I vote yes for proper grazing on B.L.M. lands! 7) Renewable Energy is also a yes along with responsible drilling. Wind turbines and Hydroelectric are costly, but needed! 8) Recreation - I hope we all vote yes! (9) Rights-of-Way is next. We all need state maintained highways to cross public lands to get from state to state and county to county. I do not think we need County Government grading federal roads by contract for B.L.M.! I do not feel it is appropriate for County Government to be grading roads across private ground to access public lands or to be on B.L.M. lands grading roads period! This is a federal responsibility/liability! I don't believe we need more access roads to B.L.M. lands in the Basin area at this time. If not accessible by car, we have the right to walk or ride a horse to most B.L.M. lands that are not surrounded by private property. 10) I should conclude with Social and economic issues. 11) Health and Safety are a must. Law enforcement needs more attention through financing more officers. Clean water must be a priorty where possible. Tribal Treaty Rights are a responsibility to honor

Thank You!

1244

C. Robert Wells
708 W. Jewel Avenue
Kirkwood, Missouri 63122

14 November 2008

Bureau of Land Management
Attn: RMP Project Manager
PO Box 119
Worland, WY 82401

Dear Sir or Madam,

These comments are for the scoping phase of your forthcoming Bighorn Basin resource management plan. This area is of national interest, containing wildlife habitat and wild lands that belong to all of us.

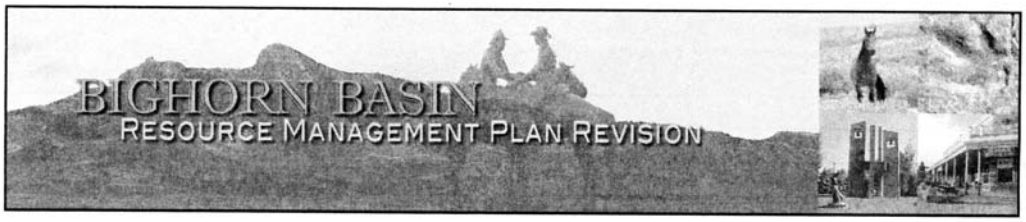
BLM must think ahead to future needs for protected land. Here in Missouri we already protect eight wilderness areas, and more are under consideration. The Bighorn Basin plan should include protection for the proposed wilderness areas submitted by Wyoming conservation groups. BLM's wilderness study areas are inadequate, omitting many thousands of acres that have wilderness values worthy of protection. A map in the draft plan should show the locations of all the proposed wilderness areas.

On lands where oil leasing is allowed, it should be phased in. Each tract should be restored to properly functioning wildlife habitat before the next is developed with roads and drill pads. Oil wells should employ directional drilling from a few widely spaced drilling sites, to minimize surface disturbance.

Thank you for considering my views.

Sincerely,
C. Robert Wells

1245



Written Comment Sheet

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Bighorn Basin RMP
ATTN: Caleb Hiner
P.O. Box 119
101 South 23rd Street
Worland, WY 82401

NOV 17 2008

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All comments must be received or postmarked by November 17, 2008. For more information contact BLM RMP Project Manager, **Caleb Hiner** at 307-347-5100 or via e-mail at BBRMP_WYMail@blm.gov.

NAME: Andy Whiteman	**E-MAIL:** andy@cityofcody.com
ORGANIZATION: City of Cody	
ADDRESS: 1338 Rumsey Avenue	
CITY/STATE/ZIP: Cody, WY 82414	

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PLEASE PRINT **DATE:** Nov 14, 2008

The City of Cody has an interest in BLM lands and properties that are contiguous to the corporate boundaries of the City. We wish to be informed of potential development, acquisition opportunities or any other use of these BLM properties that may impact city services.

Andy Whiteman
City Administrator