

**United States Department of the Interior**  
**Bureau of Land Management**  
**Environmental Assessment DOI-BLM-MT-0010-2013-0015-EA**

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**Wyo-Ben, Inc.**  
**1M Amendment 2**  
**Plan of Operations**  
**MTM 105421 and**  
**State of Montana Mined Land Reclamation**  
**Permit No. 1771**

**Carbon County, Montana**

**Bureau of Land Management**  
**Billings Field Office**  
**and**  
**Montana Department of**  
**Environmental Quality**

**August 12, 2014**

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## **Abbreviations and Acronyms**

ABP	Acid-Base Potential
ACC	American Colloid Company
AQRV	Air Quality Related Values
ASA	American Society of Agronomy
ASOS	Automated Surface Observing System
AUM	Animal Unit Month
BCR	Birds of Conservation Concern/Bird Conservation Area
BiFO	Billings Montana Field Office
BLM	Bureau of Land Management
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulation
dB	Decibels
DEQ	Department of Environmental Quality
EA	Environmental Assessment
EC	Electrical Conductivity
EIS	Environment Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FWP	Fish, Wildlife and Parks
FWS	Fish and Wildlife Services
LQD	Land Quality Division
MAAQS	Montana Ambient Air Quality Standards
MT	Montana
MEPA	Montana Environmental Policy Act
MOMA	Montana Opencut Mining Act
MOU	Memorandum of Understanding
MSHA	Mine Safety and Health Administration
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service

NRCS	Natural Resource Conservation Service
OHV	Off Highway Vehicle
PEIS	Programmatic Environmental Impact Statement
PMWHR	Pryor Mountain Wild Horse Range
PMWMC	Pryor Mountain Wild Mustang Center
POO	Plan of Operations
PSD	Prevention of Significant Deterioration
RFD	Reasonable Foreseeable Development
RMP	Resource Management Plan
ROD	Record of Decision
SAR	Sodium Absorption Ratio
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
TSP	Total Suspended Particulates
USDA	United States Department of Agriculture
USFS	United States Forest Service
VRM	Visual Resource Management System
WBI	Wyo-Ben, Inc.
WY	Wyoming
WYDEQ	Wyoming Department of Environmental Quality



# Chapter 1 Purpose and Need

## 1.1 Introduction

Wyo-Ben, Inc. (WBI) has submitted a plan modification application (1M Amendment 2) to its existing Plan of Operations (POO) MTM 105421 and State of Montana (MT) Mined Land Reclamation Permit No. 1771 for mining bentonite in Carbon County (**Figure 1**).

This WBI project area lies within a larger mining region in which WBI and American Colloid Company (ACC) mine bentonite. The 1M Amendment 2 project area lies immediately west of and adjacent to WBI's existing 1M (Permit No. 1771) mine area. Mine-related disturbances in this area are north and east of the Kinder-Morgan Pipeline Road, south of the Bear Canyon access road and immediately north of the MT-Wyoming (WY) state line. The project area lies within the lower reaches of the Sage Creek and Bear Canyon watersheds.

WBI locates its Corporate Office in Billings, Montana and its Wyoming Headquarters in Greybull, Wyoming. It has been mining bentonite in the Warren, MT area under State of Montana Mined Land Reclamation Permit No. 1771 since January, 2000. Active areas have been mined and reclaimed over the years and additional acreage was added with a single amendment (1M Amendment 1) to the original permit in December, 2006. Permit 1771 currently contains 246.2 acres (includes 6.2 acres of permitted haul and access roads) with 84.7 acres disturbed by mining. All 84.7 acres have been reclaimed through seeding and WBI has submitted a bond release request to the MT DEQ for 45.0 reclaimed acres associated with Permit No. 1771. Approval of this bond release request is pending MT DEQ review.

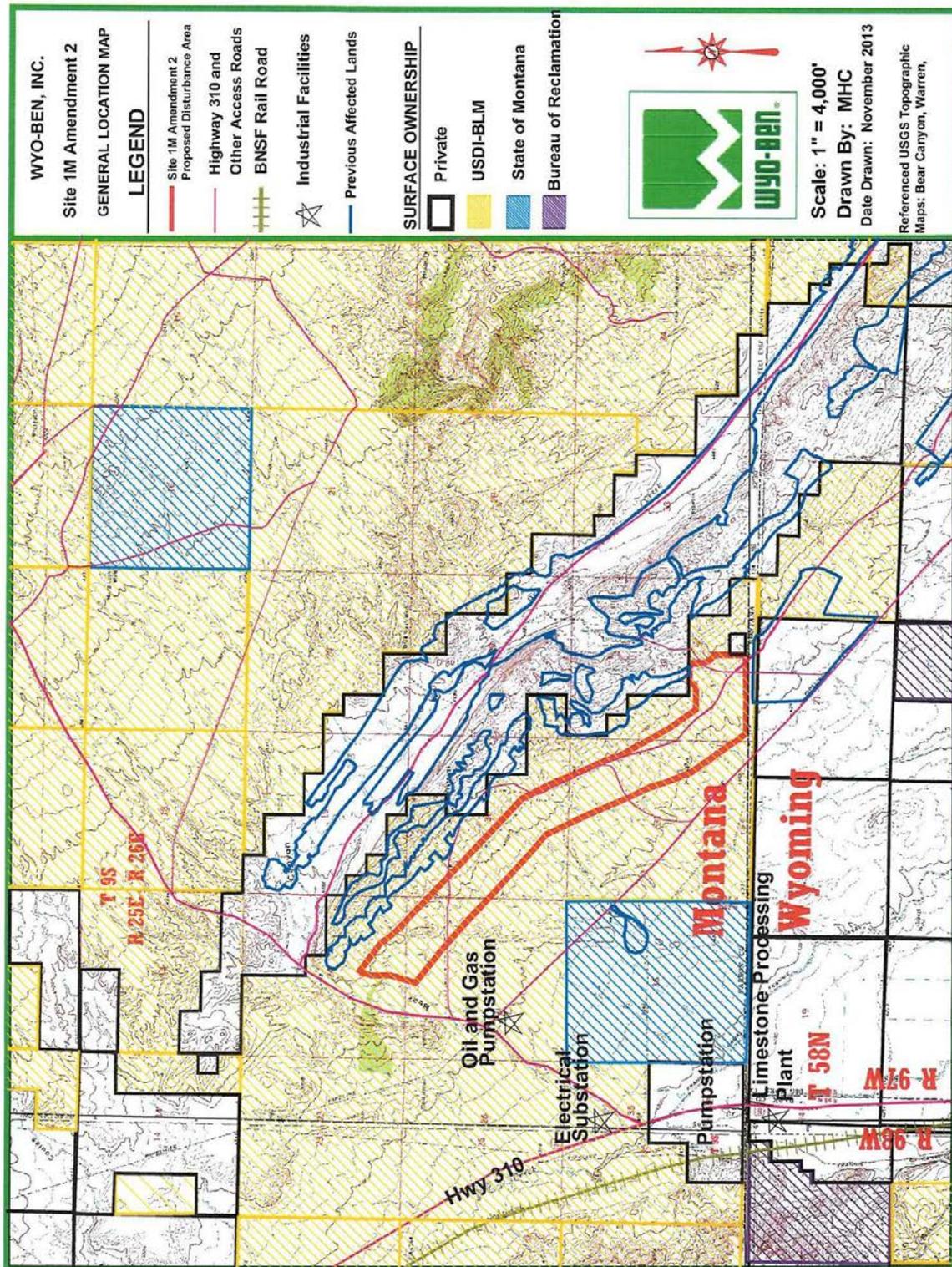
All of the lands within 1M Amendment 2 are federally owned and administered by the Billings Montana Field Office (BiFO) of the Bureau of Land Management (BLM) (Table 1). This plan modification, if approved as submitted, would add 940.0 acres to Permit No. 1771 lands, of which 554.7 acres are proposed to be newly affected. Only lands specifically designated for mining or mine related purposes in WBI mine plans submitted with the 1M Amendment 2 modification would be disturbed. Those areas are considered to be a part of the BLM's POO for the mine if approved, or if approved as modified via the decision resulting from this Environmental Assessment (EA).

**Table 1: Surface ownership within WBI's Proposed 1M Amendment 2**

Surface Ownership	Amendment No. 2	Proposed Disturbed area
BLM	940.0 acres	554.7 acres

**Figure 1: Location map for WBI's 1M Amendment 2, Carbon County, MT**

Map showing the location for the prop



## **1.2 Agency Roles and Responsibilities**

The WBI 1M Amendment 2 area would be jointly regulated by the BLM and the Montana Department of Environmental Quality (MT-DEQ). BLM and MT-DEQ have determined that a single EA would be prepared to satisfy requirements of both the National Environmental Policy Act (NEPA) and Montana Environmental Policy Act (MEPA).

Preparation of this EA was done by Shell Valley Consulting Associates, Inc. a third party contractor acting under supervision and direction of the BLM. Both the BLM and MT-DEQ have acted as co-leads, wherein both agencies were responsible for developing alternatives, coordinating with the proponent, conducting analyses, collecting public comments, and conducting consultations. The co-lead also ensures that the analyses and resulting document fulfills each agency's needs as required by Federal and State acts, laws, and regulations that pertain to the project.

### **1.2.1 Bureau of Land Management**

Federal regulations which provide for locatable mineral exploration and development on BLM administered public lands are found at 43 CFR 3809 and are commonly referred to as the "3809" surface management regulations. These regulations are authorized by the Mining and Mineral Policy Act of 1970, and the Federal Land Policy and Management Act of 1976. These laws recognize the statutory right of mining claim holders to develop federal mineral resources under the General Mining Law of 1872. Federal authority to regulate locatable minerals, under the surface management regulations, extends only to federally owned surface or to some split estate lands, obtained under the Stock Raising Homestead Act. Bentonite is a clay mineral and has been determined to be locatable under the general Mining Law of 1872. The rights to explore, develop and mine bentonite on these lands are obtained by filing and maintaining mining claims as provided for under the General Mining Law and subsequent regulations (43 CFR 3830).

The 3809 regulations require mining claimants and /or operators to submit a POO for BLM's review and approval on disturbances greater than 5 acres. The POO must contain detailed information about the proposed mining and reclamation and associated protective measures to prevent "Unnecessary or Undue" degradation to federal lands. The operator must also comply with the performance standards set forth in 43 CFR 3809.420.

Regulations at 43 CFR 3809.411 direct the BLM to prepare an environmental review under NEPA for any new POO or substantial modifications to existing Plans. Surface management regulations also require the operator to submit a bond sufficient to cover 100% of the estimated cost of reclamation on BLM lands.

The following authorities are used to process and evaluate bentonite mining applications: the NEPA of 1969; the Environmental Quality Improvement Act of 1970. These acts and policies provide BLM with the authority to manage and administer public lands. Additional guidance and regulations are set forth in the 40 CFR 1500 regulations

(Protection of Environment), 43 CFR 1601 (Planning, Programming and Budgeting), and 43 CFR 3809 (Surface Management).

### **1.2.2 State of Montana Department of Environmental Quality**

Bentonite and gravel mining operations in Montana are regulated and controlled under authority of the Montana Opencut Mining Act (MOMA). This law and its approved rules place operational guidance and limitations on a project during its life, and provides for reclamation of land subjected to opencut materials mining. The basic post-mining reclamation standard is that the land would be stable and meet its beneficial use which is usually designated by the landowner.

Under the Act, all lands, including federally owned lands are regulated and must comply with its requirements. The MT-DEQ and the BLM have signed a Memorandum of Understanding (MOU) agreeing to jointly regulate mining on Federal land under BLM jurisdiction. That MOU is presently being modified to account for recent changes in both State and Federal laws, but those MOU discussions would not interfere with the agencies' ability to analyze and render a decision on WBI's 1M Amendment 2 application.

The Act requires that a reclamation bond, cash deposit or other financial instrument be submitted to the State to cover the complete cost of reclaiming the site to its approved, post-mining land use. The permit or amendment decision is based upon whether or not the proponent has met the requirements of the MOMA, pursuant rules, and other laws pertaining to the proposed action.

### **1.3 Purpose and Need for the Proposed Action**

The purpose of the proposed action is to provide for a continuation of orderly, efficient, and environmentally responsible mining of the bentonite resource. These lands are open to mineral entry, and valid mining claims have been filed on them. The mining claimant has the right to mine and develop the mining claims as long as it can be done without causing unnecessary or undue degradation and is in accordance with pertinent laws and regulations (General Mining Act of 1872).

Bentonite is an important industrial mineral. The proposed action is needed to meet customer clay needs. Bentonite has unique chemical and physical properties and is called "the clay of 1,000 uses". Use depends on bentonite quality. Principle markets include metal casting for the formation of sand molds, iron ore pelletizing, well drilling, clumping cat litter, pharmaceutical and cosmetic industries, pelletizing aids in animal feeds and carrier for agri-chemicals. Environmental products include liners for landfills, waterproofing panels, groundwater products, bentonite-based flocculants to remove emulsified oils and heavy metals from waste water, bentonite-based grout and many others.

### **1.4 Consistency with Land Use Plan**

The proposed action analyzed in this document is within the geographic area covered by the Billings Resource Area, Resource Management Plan (RMP), approved 1984, and is in conformance with that plan. Mineral exploration and development in the Resource Area

would continue to be administered through existing surface and mineral management regulations (43 CFR 3800 and 43 CFR 3809).

### **1.5 Other Relevant Environmental Documents**

- EA for Wyo-Ben, Inc. Montana 1, POO MTM 105421, January 24, 2000.
- EA for Wyo-Ben, Inc. Montana 1, Amendment 1, Modification to POO MTM 105421, 2006.
- FEIS, Proposed Opencut Mining Contract for Wyo-Ben, Inc., Montana Department of State Lands, 2000.

### **1.6 BLM Decisions Required**

BLM decision options regarding WBI's proposed 1M Amendment 2 plan modification include approving it as submitted, approve it subject to mitigation, or deny or withhold approval of the application if it is found that the proposal would result in "unnecessary or undue" degradation of public lands (No Action Alternative). The BLM's decision would be written in the Decision Record (DR) following completion of the EA process.

### **1.7 MT-DEQ Decisions Required**

The MT-DEQ decision options would include approving WBI's proposed 1M Amendment 2 as submitted, approving as modified, or denying it if found not to be in compliance with MOMA.

### **1.8 Federal, State and Local Permits; or Required Consultations**

Mined Land Reclamation Permit No. 1771, as amended

MT-DEQ Opencut Bureau authorizes activities on private, state, and federal lands such as sand and gravel and bentonite mining as required by MOMA.

BLM POO MTM 105421, as amended

The BLM's BiFO authorizes mining activities on federal surface estate, pertaining to locatable minerals such as bentonite via the authority found in federal regulations at 43 CFR 3809 "Surface Management of Mining Claims Under the General Mining Laws".

Storm Water Discharge Permit

MT-DEQ authorizes construction activities that may impact state waters under the General Permit for Storm Water Discharges Associated Construction Activity Permit. WBI is authorized for storm water discharges under storm water discharge permit MTR000505 to include the 1M Amendment 2 project area.

State Historic Preservation Office Consultation

A Class III Cultural Resource Inventory of the project area (Merritt and Mostek, 2012) located one site (24CB2273) that BLM has determined to be eligible for listing on the National Register of Historic Places. Montana State Historic Preservation Office (SHPO) concurred with BLM's determination and WBI has agreed to avoid this site and site

24CB2270 (Not Eligible). Both of these avoidances include the sites' proper and 50 foot no-disturbance buffers.

### **Tribal Consultation**

Letters requesting comments were sent to the Crow, Northern Cheyenne, Blackfoot, Eastern Shoshone, and Northern Arapaho tribes in July 2013. No responses were received. If any locations of traditional gathering areas or areas of religious or cultural concern to Native Americans are subsequently identified, they would be considered during the implementation phase. The BLM would take no action that would adversely affect these areas or locations without appropriate Native American consultation.

Follow up phone calls were initiated with the tribes, and the Crow Tribe indicated their interest in visiting the site with BLM personnel. On April 24, 2014 the Crow Tribal Historic Preservation Officer Emerson Bull Chief visited several of the cultural sites with BLM personnel and concurred with proposed avoidance strategy.

### **1.9 Issue and Concerns**

**External Comments:** The preliminary Environmental Assessment was released for public review on February 10, 2014 for 30 days ending on March 12, 2014. Two public comments were received during that time frame: one from the proponent providing clarification on their PoO and the supporting analysis, and one from a private citizen concerned with several aspects of noxious weed management as it relates to the project. All comments were considered and relevant changes have been made to the analysis as a result. All new information, added to the analysis as a result of the public comments, has been shaded gray shaded to make it easy to identify changes that have been made.

**Internal Scoping:** Relevant issues pertaining to the proposed action were identified by technical staff review and site inspections of the project area.

**Greater Sage-grouse:** The northern reaches of proposed WBI mining disturbances are within approximately two miles of an active Sage-grouse lek (Bear Canyon) located to the northeast. Three additional leks are located east of the proposed activity within a four mile radius and several additional historic lek locations are within a six mile distance to the west and north.

**Cultural Resources:** A Class III Cultural Resource Inventory of the project area located a single site (24CB2273) determined to be eligible for listing on the National Register of Historic Places. However precontact site 24CB2270 remains unevaluated and eleven other sites were determined to be not eligible. WBI has agreed to avoid sites 24CB2273 and 24CB2270 including 50 foot no-disturbance buffers.

**Energy Corridors:** Section 368 of the Energy Policy Act of 2005, Public Law 109-58 (H.R. 6), enacted August 8, 2005, directs the Secretaries of Agriculture, Commerce, Defense, Energy and the Interior (the Agencies) to designate under their respective authorities corridors on federal land in 11 Western States (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming) for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities

(energy corridors).

Section 368 requires the Agencies to conduct any "environmental reviews" necessary to complete the designation of Section 368 energy corridors. The proposed designation of Section 368 energy corridors would not result in any direct impacts on the ground that may significantly affect the quality of the human environment.

Nevertheless, the Agencies prepared a Programmatic Environmental Impact Statement (PEIS) to conduct a detailed environmental analysis at the programmatic level and to integrate NEPA at the earliest possible time. The proposed designation of more than 6,000 miles of Section 368 energy corridors among the various Agency land use plans is a forward-looking response, mandated by statute, to address a national concern.

The evaluation of future project-related environmental impacts must await site-specific proposals and the required site-specific environmental review. A quantifiable and accurate evaluation of impacts at the local project level can be made only in response to an actual proposed energy project, when a proposal for an action with specific environmental consequences exists.

WBI's proposed 1M Amendment 2 project lies within Energy Corridors Zone #79-216, which is a 3,500 feet wide right-of-way.

## **Chapter 2 Proposed Action and Alternatives**

### **2.1 Introduction**

This chapter discusses the No Action, Proposed Action and Alternatives considered to mitigate potential impacts of the proposed action. Descriptions of current environmental resources associated with the WBI 1M Amendment 2 bentonite mine, and the potential impacts on these resources anticipated from implementing the Proposed Action and other Alternatives are presented in Chapters 3 and 4. Mitigation measures are identified as a result of the impact analysis and are presented with each Alternative.

### **2.2 Development of Alternatives**

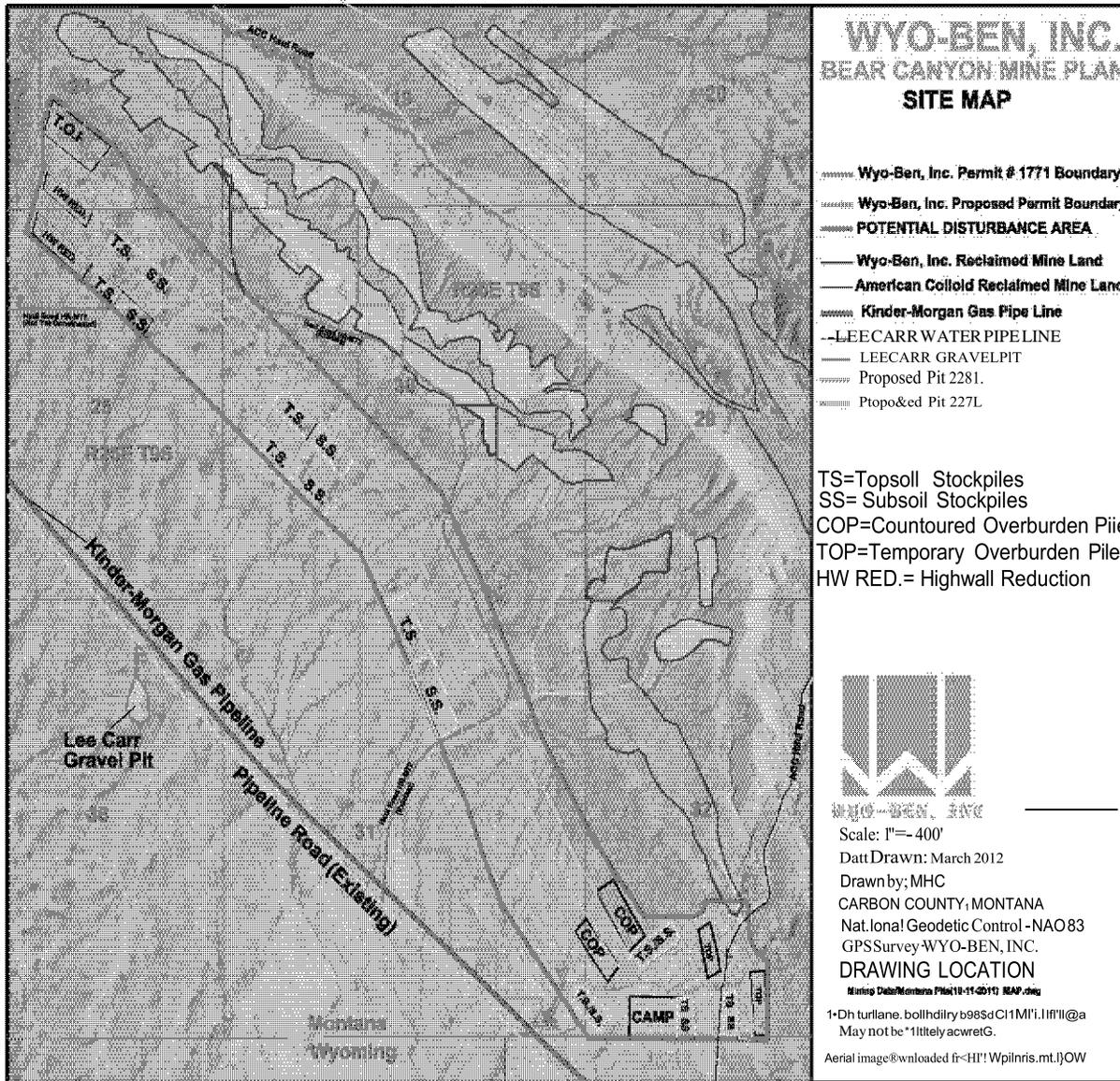
Alternatives present different management options in response to the purpose and need for the proposed action and address the relevant major issues related to the proposed action. Alternatives offer different management options which address impacts to resources or perceived avoidable anticipated impacts.

### **2.3 Proposed Action**

The proposed action would remove bentonite from lands described in this section through conventional surface mining methods. This would enable WBI to supply bentonite to its Lovell plant, which has been in existence for over 40 years and employs over 35 company and contract employees in north Big Horn County, WY. Mining would occur within WBI bentonite claims in Carbon County, MT. The currently permitted area of this mine includes 246.2 acres with a disturbance footprint of 84.7 acres. WBI's proposed Amendment 2 would increase these to 1,186.2 total acres and 639.4 disturbed acres. Table 2 summarizes BLM mining claims, legal descriptions and affected acreages associated with this proposal. The projected life-of-mine would be approximately ten (10) years.

General location Figure 1 (Chapter 1) illustrates the project's geographic setting and Figure 2 illustrates WBI's 1M Amendment 2 boundary and proposed mine plan footprint. Existing haul roads would access the southern portion of the mine (ACC haul road and WBI haul road HR-MT2). The latter of the two would be extended northwesterly, sequentially within the mining disturbance footprint to provide access concurrent with mining progress. Road HR-MT1 was approved with WBI's initial POO (MTM 105421) to provide additional access to the northern mining reaches. However this road has not yet been needed or constructed. It is included with this modification to provide a hauling/access road option, if required later in the mining stages.

Figure 2: Proposed Mine Plan and Plan of Operation Boundary for IM Amendment 2; provided by WBI



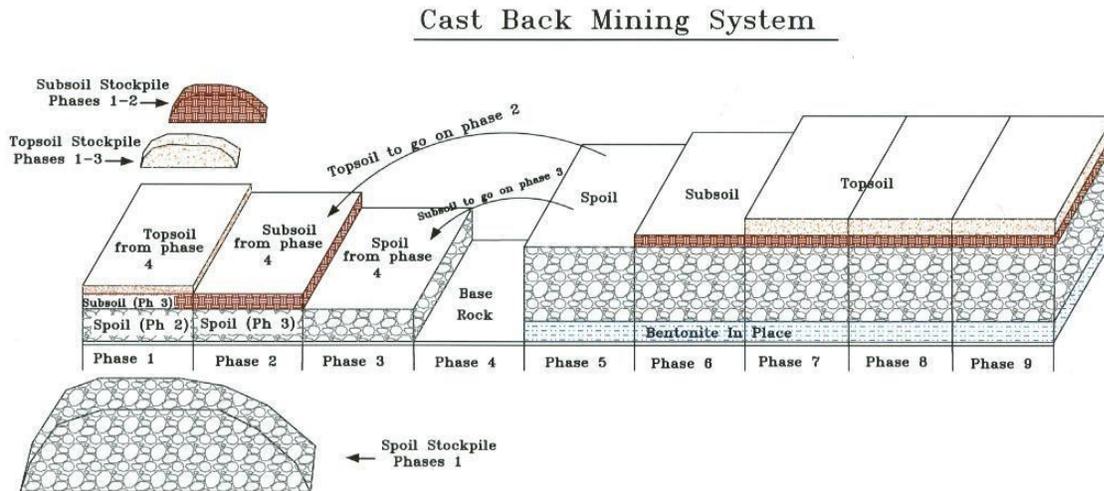
**Table 2: Claim Name and legal land location for WBI 1M Amendment 2 Mine, Carbon County, Montana**

Unpatented Claim Names & BLM MMC Serial#		Division (1/4 1/4, lot or tract)	Section	Township/Range	Legal Description Acres	Disturbance Acres
Montana 1	93867	Lot 6, 11, 12	32	T9S R26E	75.4	71.6
Montana 2	93868	Lot 3, Northern most 20 acres, and SE4 lot 10 S2 and NW4 Lot 4, Lot 5	31 32	T9S R26E	140.00	107.8
Montana 3	93869	SE4NE4, N2SW4NE4, NW4NE4 W2NE4NE4, SE4SW4NE4, NE4NW4SE4	31	T9S R26E	140.00	94.9
Montana 4	93870	SW4SE4, N2SE4SW4, SE4SE4SW4 NE4NE4NW4	30 31	T9S R26E	80.0	53.0
Montana 5	93871	S2SE4NW4, NW4SE4NW4, S2NW4SE4, NW4NW4SE4, NE4SW4, Eastern most 20 acres Lot 3	30	T9S R26E	120.00	61.2
Montana 6	93872	NE4NE4, N2SE4NE4, SE4SE4NE4 SW4 Lot 1, Lot 2, NW4 Lot 5	25 30	T9S R25E T9S R26E	129.7	101.2
Montana 7	93873	SE4SW4NE4, E2NW4SE4, SW4SE4, SW4SE4SE4 N2NW4NE4, SE4NW4NE4	24 25	T9S R25E T9S R25E	110.00	62.4
Disturbance Outside Claim Boundary						2.6
<b>TOTAL</b>	-	-				<b>554.7 Acres</b>

### 2.3.1 Mining Methods

WBI proposes to operate a surface mine with castback mining techniques and procedures, which removes overburden and product from a series of adjacent pits. Castback mining is a method that is beneficial both environmentally and economically. Figure 3 illustrates a stylized castback model. Figure 4 is a site-specific WBI schematic showing anticipated material flows for this proposed mining operation.

**Figure 3: Model schematic of a castback bentonite mining sequence (this schematic generally assumes horizontal bedding and fairly uniform overburden thickness); provided Figure MP-2**

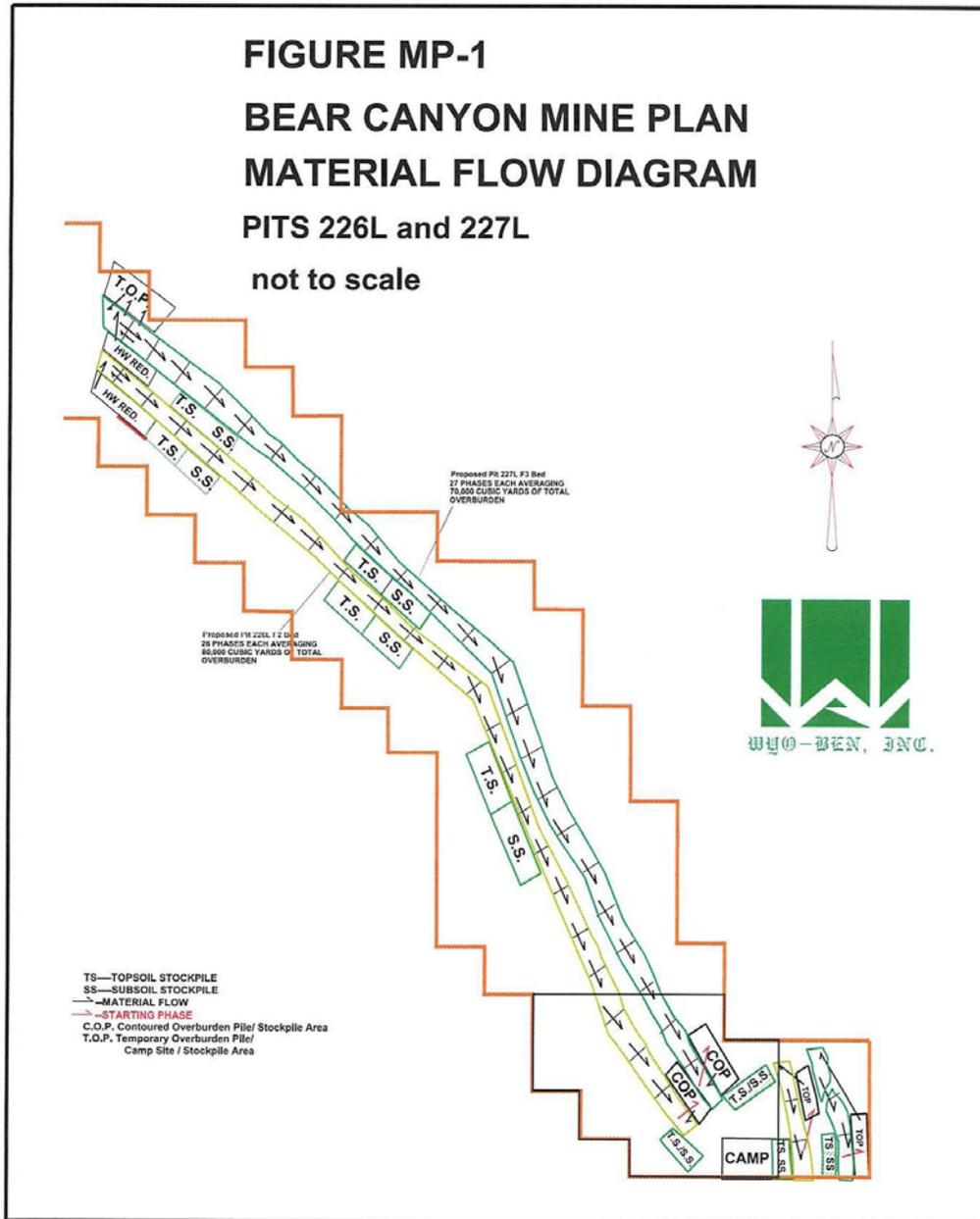


Topsoil would be removed from the surface affected by the initial pit-cut. This material would be stockpiled adjacent to the pit, followed by subsoil and overburden, each stockpiled separately. Bentonite would be removed and either stockpiled separately or hauled for processing. Topsoil would be removed from all overburden and bentonite stockpiling areas. Topsoil and subsoil stockpiles would be seeded with a native grass seed mixture to reduce erosion and establishment of noxious, invasive weed species.

Following completion of the initial pit, topsoil and subsoil would be stripped from adjacent pit two and placed with existing stockpiles. Overburden from pit two would be placed into pit one exposing bentonite for removal. Topsoil and subsoil from pit three would be removed and placed on existing stockpiles. Pit three overburden would be removed and cast into pit two for backfill and contouring. As a general rule, it takes approximately three initial mine phases to provide space for proper reclamation contouring and drainage design to allow for a continuous castback placement of “direct-haul” topsoil and subsoil from subsequent pit phases. This mining sequence of temporary topsoil and subsoil storage combined with “live” soil castback would continue throughout the life-of-mine, encouraging replacement of overburden, subsoil and topsoil in their pre-mine configurations.

Castback mining systems require final pit backfill to be achieved by extending the highwall disturbance and utilizing overburden material in the upper 40 percent of the extended wall to restore adequate backfill and drainage patterns. “Highwall reductions” are accomplished by removing topsoil and subsoil adjacent to the last phase, and bulldozing the underlying highwall material into the open hole. Highwall reductions would be used to backfill the last phases of both the F2 and F3 bentonite beds of the Frontier formation (Figure 4). Both highwall reductions would be gentle slope reductions. Delineated areas would be considered as the limit of necessary disturbance required to accomplish reclamation of each last phase. Stockpiled subsoil and topsoil would be replaced following final phase contouring.

Figure 4: (MP-1). Proposed Material Flow Diagram; provided by WBI.



### 2.3.2 Mining Schedule

The level of mining activity would vary throughout the year, at times, be limited to only loading trucks and hauling. Periods with very little activity may also occur depending on markets, wildlife considerations, weather, road conditions and processing schedules. With few exceptions, WBI would be mining throughout the year from approximately 7 am to 5 pm, Monday through Friday.

Mining sequences proposed with this modification would generally follow those shown on Figure 4, initiating in the southeast and moving to the northwest. Both bentonite beds would be mined concurrently, with new pits in each series opening approximately every six months. Projected annual disturbances would be 55.5 acres. Projected life-of-mine would be ten years, from 2014 to 2024 (Table 3).

**Table 3: WBI’s 1M Amendment 2, Projected disturbance acreage and approximate initial mining dates**

Pit Bed	Projected Opening Date	Projected Closing Date	Approximate Disturbance Per Year (AC)	Ave. Overburden Per Pit (Yds <sup>3</sup> )	Proposed Disturbance (AC)
226L (FRONTIER 2 BED)	February 2014	2024	10.2	70,000	102
227L (FRONTIER 3 BED)	March 2014	2024	8.6	80,000	86.3
ASSOCIATED DISTURBANCE	February 2014	2024	36.3*	N/A	363.2*
HAUL ROADS	February 2014				3.2

\*This assumes maximum disturbance within Associated Disturbance limits as illustrated on Figure 2. WBI anticipates likely Associated Disturbances to be considerably smaller (108.6 acres or 10.9 acres/year).

Following discussions with FWP and BLM wildlife biology personnel during a March 2012 site visit, WBI agreed they would delay mining in the northwestern portions of the proposal area until the later mining years to allow time to determine use by nesting, brood-rearing and wintering Sage-grouse. This portion of the proposed mine plan has the best potential Sage-grouse habitat. WBI and FWP personnel would conduct spring Sage-grouse dropping searches in this area to investigate quantitative density use to supplement data from the on-going radio-collared monitoring study being conducted cooperatively by ACC, WBI, MT FWP and the BLM.

In order to avoid nesting and brood-rearing areas utilized by Greater Sage-grouse and other ground nesting birds, spring nest surveys would be conducted by trained WBI personnel ahead of planned ground disturbing activities that occur between April 1 and July 15. If no nests are encountered, Wyo-Ben would have a three day window in which to begin surface disturbing activities. If mining activity has not occurred within that time frame, another survey would be conducted before beginning ground disturbance activities. If nests are found, ground disturbing activity would cease until young have fledged, and can survive independent of the nest, or FWP/BLM suggested mitigation measures are implemented.

### 2.3.3 Environmental benefits of castback mining and highwall reduction

Castback mining with a highwall reduction is a preferred method of mining due to the following:

- reduces material handling (topsoil, subsoil, and overburden)
- increases opportunities for direct hauling and live placement of topsoil and subsoil
- reduces degradation of soil structure and helps maintain biological integrity
- encourages conservation of soil nutrients and retention of seed and plant viability
- provides additional economic benefits such as lower fuel and maintenance costs

Stockpiling soil results in soil structure degradation from compaction and physical handling. Storing soil in stockpiles also reduces viability of functional soil micro- and macro- fauna communities. These conditions degrade a soil’s ability to support desirable vegetation on

reclaimed sites. WBI prefers concurrent reclamation utilizing the spreading of “live” soil to reestablish vegetation, resist erosion, and develop stable and productive habitats following disturbance. Castback sequencing also allows completion of larger, contiguous reclamation blocks by reducing the need to maintain access corridors for large equipment. Finally, using castback mining procedures greatly reduces disturbance acreages.

Field drying of exposed bentonite in-pit, often occurs adjacent to the pit or on previously mined un-reclaimed overburden. Bentonite is field dried by exposing it to the air, and turning it with large disk plows. Depending on weather conditions, field drying may take up to several months to complete. Field drying begins bentonite processing by reducing moisture content, thereby reducing material weight and volume for hauling to the plant and reducing energy needs for oven-drying at processing plants.

#### **2.3.4 Water management and erosion prevention**

Temporary water diversions would be installed around open pits to prevent storm-water entry. Bentonite stockpiles and other stockpiles would be bermed to prevent off-site sedimentation. All associated waterbodies with potential to receive sediment would be protected with appropriate BMP measures. All soil stockpiles would be seeded to prevent erosion and loss of soil.

#### **2.3.5 Temporary pit closures**

In the event of temporary pit closure, interim management procedures would include placing safety berms around highwalls of open pit phases and berms at the top of access ramps into open pits to prevent entrance, checking the highwalls periodically for failure and nesting birds. Temporary pit closures are not anticipated but would result from delays associated with unfavorable economic conditions.

#### **2.3.6 Reclamation**

Reclamation and revegetation efforts would be designed to restore post mine reclamation land uses of wildlife habitat and livestock grazing. Additional reclamation goals would include soil and drainage stabilization, erosion control and visual aesthetics.

Reclamation backfill would follow the castback mining sequences presented in the Mining Methods section. Recontoured landscapes would approximate premine drainage patterns, watersheds and hillslopes. Reclaimed slopes and surface contours would approximate native gradients and would blend with adjacent topography. Channel design for both temporary diversions and permanent channels would match premine channel morphology and cross-section geometry. Temporary diversions would allow passage of peak runoff from a two year, six hour precipitation event without excessive erosion. Permanent reconstructed channels and adjacent topography would be constructed to be stable during the passage of peak runoff from a 100 year, six hour precipitation event.

Following backfilling and contouring, all compacted surfaces would be ripped to improve water infiltration and retention. Final reclamation of these areas would include spreading of topsoil/subsoil and seeding.

Haul road reclamation would be accomplished by contouring to blend with surrounding topography and restore watershed and drainage patterns. All culverts would be removed. These areas would then be deep-ripped, subsoiled/topsoiled and seeded.

WBI would begin reclamation no longer than two years after lands are initially affected and complete reclamation of those specific lands prior to four years after initial disturbance. This commitment would be extended to three years and five years, respectively, if field-drying is included in the mining procedures. This timing will impact the amount of land available for concurrent reclamation in the cast back mining sequence.

Seedbed preparations may include deep-ripping after soil replacement to break up compacted areas and loosen the soil. Additional surface manipulations such as deep parallel furrows or pitting may be used to enhance moisture harvesting capacities of the areas receiving seed. Seed mixtures would be broadcast seeded. In general, seeding would be conducted in the fall and early winter (prior to freeze-up) to take full advantage of fall, winter and spring moisture. From time to time, WBI may exercise discretion to attempt spring seeding on areas where “live” topsoil has been directly placed during winter months to reduce destruction of native species germination during the first growing season and prior to what would be the fall seeding period. Although no negative grazing impacts are anticipated on newly seeded areas, attempts would be made to coordinate timing of use with the grazing permittee if problems develop.

Composition of the proposed seed mixture is detailed in Table 4. Use of all species depends on seed availability in the year of seeding.

**Table 4: WBI 1M Amendment 2 Proposed Reclamation Seed Mixture**

<u>Seed Species</u>	<u>Rate-lb PLS/acre</u>
Gardner saltbush ( <i>Atriplex gardneri</i> )	5.0
Fourwing saltbush ( <i>Atriplex canescens</i> )	3.0
Yellow Rabbitbrush ( <i>Chrysothamnus viscidiflorus</i> )	2.0
Western Wheatgrass ( <i>Elymus smithii</i> )	1.5
Bluebunch wheatgrass ( <i>Elymus spicatus</i> )	1.5
Indian ricegrass ( <i>Achnatherum hymenoides</i> )	1.5
Bottlebrush squirreltail ( <i>Elymus elymoides</i> )	0.5
Sandberg bluegrass ( <i>Poa sandbergii</i> )	0.5
Western yarrow ( <i>Achillea millifolia</i> )	0.5
Annual sunflower ( <i>Helianthus annuus</i> )	1.0
<u>Biscuitroot (<i>Lomatium ambiguum</i>)</u>	<u>1.0</u>
	18.0

Additionally, to reduce potential mining impacts to sagebrush obligate species, WBI would use site specific seeding of other native grasses, forbs or shrubs in locally adapted reclaimed areas. Wyoming big sagebrush seed would be targeted to drainages and areas of adapted soils at a rate of two PLS pounds per acre. Other species would be seeded separately based on soil quality and topographic features. These include basin wildrye (*Leymus cinereus*) broadcasted into reconstructed drainages and other low-lying areas at a rate of one half to two PLS pounds per acre, and fringed sagewort (*Artemisia frigida*) at a rate of one half to one PLS pound per acre. Monitoring of past reclamation successes and failures may influence seed mixture composition and surface preparation techniques.

WBI may consider alternative innovative reclamation techniques to enhance the chance to achieve reclamation success (e.g. using a pitter, hydro-seeding, applying Montana Certified weed-free straw or native hay mulch, applying gypsum, applying wood chips, using Montana Certified weed-free manure or compost, etc.). Other techniques such as using transplanted bare-root sagebrush seedlings, installing protective fencing, controlling invasive species or site specific supplemental irrigation would also be considered. Alternative seed mixtures would also be considered if future research or reclamation monitoring indicate improved reclamation success. Substitutions would only be used after obtaining BLM and Montana DEQ approval.

### **Noxious Weed Management**

WBI will be responsible for the monitoring and detection of noxious and invasive weeds associated with the project area including haul roads. WBI will be responsible for the chemical or mechanical treatment with the intent of eradication of those weeds when infestations are the result of mining or other associated activities. Monitoring and detection will be the responsibility of WBI personnel including environmental and other regular field personnel who have been trained to recognize noxious and invasive weeds. Dedicated monitoring will be done twice per year by the WBI environmental staff in the late spring and early fall of the year. Inadvertent monitoring will be done anytime trained personnel are in the project area. Chemical treatment of noxious or invasive weeds will be done by a licensed contractor who is knowledgeable about appropriate chemicals used for specific species and seasons of use. Mechanical treatment will be done by WBI personnel or a licensed contractor.

If an infestation of noxious weeds is detected on any haul road in the project area, it will be marked with flagged lath for avoidance by vehicle traffic and treated with the intent of eradication at the earliest appropriate time. All drivers of vehicles associated with mine activities (Contracted haul truck drivers and other contracted field personnel and WBI employees) will be instructed to avoid driving through such marked areas to prevent the spread of those weeds. Infestations of noxious or invasive weeds on reclaimed lands will be chemically or mechanically treated at the earliest appropriate time of the year when they are detected.

### **2.3.7 Post Closure Management**

WBI monitors all its bonded reclaimed lands post-closure for off-site sedimentation, erosion and seeding failures. Off-site sedimentation is controlled by installation of straw bale or fabric check dams into affected drainages. If unacceptable erosion is detected, it would be repaired at the first available opportunity. Repair in the past has mostly been accomplished by reconstructing the drainage and lining it with erosion control fabric, rock, or installation of rock gabions. Finally, seeding success is monitored on a regular basis. If, after two to four growing seasons vegetation establishment is not adequate, WBI would determine potential reasons for failure and propose mitigations to the BLM and MT-DEQ.

### **2.4 No Action (Alternative 2)**

Under this alternative no mining would occur on the proposed area described in the proposed action. There would be no surface disturbance and no additional roads in the area.

### **2.5 Wildlife Mitigations (Alternative 3)**

Lands included in the northern quarter of the proposed action have been mapped as sagebrush habitat during WBI pre-mine studies to develop the mine plan. These areas (138.7 acres) would

be removed from the mine plan to preserve sagebrush habitats and avoid conflicts or impacts to sagebrush obligate animal species that depend on these habitats. Other isolated sagebrush island habitats south of the larger contiguous habitat area would be mined as part of the pit series described in the proposed action. However, to avoid conflicts with Greater Sage-grouse and other nesting migratory birds, WBI would cease all mining and hauling associated activity from March 15 through July 15 throughout the project area. This would eliminate nesting and brood-rearing conflicts with Greater Sage-grouse and all migratory nesting birds in the area. Therefore, no surveys for nesting migratory birds or other mitigation measures would be required. In addition, impacts from mining and hauling on mule deer and antelope birthing and parturition would be eliminated.

The road labeled HR-MT1 was included with WBI's original POO #MTM-105421 to provide access to the northern reaches of the mine from haul road HR-MT2 and the existing Kinder-Morgan pipeline road. However it has not yet been constructed. This alternative allows for the elimination of this access road from the mine plan and restricts all vehicle access to the project area to haul road HR-MT2 as extended during the life of this mine. This would reduce the overall impact of mining related activity to wildlife and other natural resources on the north end of the project area and concentrates activities into a single travel corridor. Otherwise all other aspects to the mine and all commitments provided in the Proposed Action would be followed.

## Chapter 3 Affected Environment

### 3.1 Introduction

Several baseline investigations have been completed in WBI's 1M Amendment 2 area to characterize environmental resources. This chapter provides brief summaries of those investigations, brief summaries of other relevant aspects of the affected environment and a brief history of mine activities in the project area. "Project area" refers to the general area surrounding the proposed project components. (Figure 1; Chapter 1). Study area boundaries for each discipline are based on the anticipated extent of likely potential direct and indirect impacts.

NEPA, CEQ regulations, BLM policy and DEQ regulations instruct that potential impacts be addressed for Critical Elements and Other Resources or Concerns summarized in Table 5. Under NEPA regulations (40 CFR 1508.8), "Effects" are defined as: (a) Direct effects/impacts - are caused by the action and occur at the same time and place. (b) Indirect effects/impacts - are caused by the action but are delayed or removed in distance, although still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water and other natural systems, including ecosystems.

Of the fifteen critical elements listed, areas of critical environmental concern, prime and unique farmlands, floodplains, wastes (hazardous or solid), wetlands / riparian zones, wild and scenic rivers and wilderness areas do not occur within the proposed project area and are not discussed further. The proposed project would also: (1) Not impact water quality or water quality sources for drinking or groundwater, (2) Have no disproportionately high or adverse human health or environmental effects on minority and/or low-income populations (Environmental Justice), (3) Not impact Native American Religious Concerns as none are known in the area nor have any been noted by Tribal authorities. Should inventories or future consultations with Tribal authorities reveal the existence of such sensitive properties, appropriate mitigation and/or protection measures may be undertaken. Otherwise these three items are not further addressed within this EA.

Of the fifteen additional elements categorized as "Other Resources / Concerns"; Wild horses and Burros, Wilderness Characteristics and Woodland / Forestry do not occur within the proposed project area and are not discussed further.

**Table 5: Critical Elements and Other Resources or Concerns Associated with WBI's 1M Amendment 2**

Critical Elements	May Affect	Won't Affect
Air Quality	X	
Areas of Critical Environmental Concern		X
Cultural Resources	X	
Environmental Justice		X
Farmlands (Prime & Unique)		X
Floodplains		X
Invasive, Non-native weed species	X	
Native American Religious Concerns		X
Threatened, Endangered, or Candidate Plant Species	X	
Threatened, Endangered, or Candidate Animal Species	X	
Wastes (hazardous or solid)		X
Water Quality (drinking/ground)		X
Wetlands / Riparian Zones		X
Wild and Scenic Rivers		X
Wilderness		X
Other Resources or Concerns	May Affect	Won't Affect
Fuels / Fire Management	X	
Fish and Wildlife including special status species other than FWS candidate or listed species e.g. migratory birds ( <i>E.O. 13186</i> )	X	
Geology / Mineral Resources/ Energy Production	X	
Lands / Access	X	
Livestock Grazing; ( <i>Taylor Grazing Act of 1934, National Environmental Policy Act of 1969, Endangered Species Act of 1973, Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978</i> )	X	
Paleontology; ( <i>Paleontological Resources Protection Act P.L. 111-011, HR 146</i> )	X	
Rangeland Health Standards and Guidelines; ( <i>43 CFR 4180</i> )	X	
Recreation	X	
Socioeconomics	X	
Soils	X	
Vegetation including Special Status Plant Species other than FWS candidate or listed species	X	
Visual Resource Management; ( <i>FLPMA 1976, NEPA 1969</i> )	X	
Wild Horses and Burros ( <i>Wild and Free Roaming Horses and Burros Act of 1971, as amended</i> )		X
Wilderness Characteristics		X
Woodland / Forestry		X

### 3.2 Mine History

WBI has been mining bentonite by surface mining methods in the Warren, MT area since June, 2000 and currently has 246.2 acres under permit (Mined Land Reclamation Permit No. 1771) with the State of Montana. Of these, 84.7 acres have been disturbed by mining and all 84.7 acres have been reclaimed through seeding. WBI has submitted a bond release request to the MT DEQ for 45.0 of the reclaimed acres associated with Permit No. 1771. Although bond release approval

for these acres is pending MT DEQ review, no acreage is currently released from bonding obligations or removed from the permit. All lands in this permit are federally owned and administered by BLM (Table 1; Chapter 1).

### **3.3 Location and Topography**

The project would be located in Carbon County in south-central MT. The northern portion of WBI's 1M Amendment 2 is about two miles southeast of Warren, MT, and extends southward to the WY-MT State line. The entire project area roughly parallels U.S. Highway 310, at a distance ranging from one to one and a half miles to the east.

Mining would occur along linear exposures of the Frontier 2 and 3 bentonite beds; crossing portions of sections 24 and 25 Township 9 South, Range 25 East and portions of sections 30, 31 and 32 Township 9 South, Range 26 East. This landscape lies within the Frontier geologic formation and is dominated by moderately steep sandstone outcrop features, paralleled on the west by gently sloping plains bisected by ephemeral draws draining the sandstone outcrops. Plant communities are dominated by dryland shrub and sub-shrub species with Gardner saltbush (*Atriplex gardneri*) dominating the southern three quarters of the project area and Wyoming big sagebrush (*Artemisia tridentata*) increasing in dominance in the northern quarter.

Mean annual precipitation is between five and nine inches; elevations range from 4,400 feet on the F2 and F3 bentonite beds of the Frontier formation to 4,500 feet at the top of the Peay Sandstone.

The project area lies within the Sage Creek watershed. Bear Canyon Creek, a small ephemeral tributary of Sage Creek borders the proposed northwestern mining extent; Sage Creek is approximately two miles to the west.

### **3.4 Climate**

Climate summaries for this project area were obtained from the Deaver, WY reporting station (482415), Western Regional Climate Center (WRCC). Average annual precipitation is 5.4 inches; and the average annual temperature is 45 degrees Fahrenheit (**Table 6**). This climate is typical of cold desert regions in the inter-mountain west. Over fifty percent of yearly precipitation occurs from April through July. Annual average snowfall is 12.3 inches with an average of 124 frost-free days per year (<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?wy2415>). Although no wind speed or direction information is available for this specific area, average wind speed at the Greybull Airport ASOS (KGEY), 34 miles south of Lovell, WY was 6.9 mph from 1998 – 2006 (<http://www.wrcc.dri.edu/htmlfiles/westwind.final.html>).

**Table 6: Average Monthly Precipitation and Temperature Averages 1981-2010 Deaver, WY**

Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Temperature (°F)	Average Total Precipitation (inches)
January	31.8	5.1	18.5	0.09
February	39.5	11.2	25.4	0.09
March	51.0	20.9	36.0	0.21
April	60.7	29.6	45.2	0.36
May	70.2	39.7	55.0	1.05
June	79.3	47.9	63.6	1.15
July	88.1	53.8	71.0	0.68
August	86.9	51.6	69.3	0.46
September	75.5	41.2	58.4	0.58
October	60.9	29.5	45.2	0.42
November	43.8	16.9	30.4	0.15
December	32.7	6.8	19.8	0.14
Annual Ave.	60.2	29.6	44.9	5.38

### 3.5 Air Quality

Under the Clean Air Act of 1970 (as amended), EPA developed primary and secondary National Ambient Air Quality Standards (NAAQS) for each of the seven criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, fine particulate matter and sulfur dioxide. These standards establish pollution levels in the United States that cannot legally be exceeded during a specified time period.

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

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

NAAQS and MAAQS establish upper limits for concentrations of specific air pollutants. Incremental increases in the ambient concentration of criteria pollutants are regulated under the Prevention of Significant Deterioration (PSD) program. The program is designed to limit the incremental increase of specific air pollutants above a legally defined baseline level, depending on the classification of a location. Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict. By definition, PSD Class II areas "can accommodate normal, well-managed industrial growth". WBI's 1Montana Amendment 2 and surrounding areas are classified as PSD Class II.

Montana has also adopted state Ambient Air Quality Standards (MAAQS) (Montana Air Quality Monitoring Network Plan, 2013; Appendix B). These standards establish statewide targets for acceptable amounts of ambient air pollutants to protect human health.

No site-specific air quality data are available from the WBI's 1M Amendment 2 area. However, air quality in the area is considered to be generally good, and is in compliance with state and national ambient air quality standards. Total suspended particulate matter (TSP) data are available from Lovell, WY (approximately 15 miles south of WBI's 1M Amendment 2). The long-term mean for TSP at Lovell is 32 micrograms per cubic meter (USDI-BLM, 2013c). Particulate matter includes dust, soot and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources: burning of gasoline and diesel fuels, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining operations, oil and gas fields, agricultural and forest burning, and operation of fireplaces and woodstoves. Other air quality contaminants that may be present from mining related fuel combustion include: hydrogen sulfide (H<sub>2</sub>S), sulfur dioxide, nitrogen oxide, carbon dioxide, and vaporous hydrocarbons. Visibility in the region is typically very good (greater than 70 miles) and fine particulates are generally considered to be the main source of visibility degradation.

### **3.6 Hydrology**

#### **3.6.1 Groundwater**

Based on exploratory drilling by WBI in the project area, no groundwater is known to exist above the deepest projected depth of mining (40 feet on the F2 bed; 35 feet on the F3 bed). All mining would take place in the vadose (unsaturated zone) above the local and regional water table. Although natural saline seeps may occur near surface outcrops of bentonitic shale and clay from pockets of shallow perched water tables, none have been mapped within the project area. Seeps, if present, would be particularly evident in years of higher precipitation as water migrates over impermeable layers, surfacing where ground surface elevations intersect water flow elevations, such as draw side-slopes.

WBI obtained information from the Montana Department of Natural Resources and Conservation, Water Rights Bureau website ([http://www.dnrc.mt.gov/wrd/water\\_rts/default.asp](http://www.dnrc.mt.gov/wrd/water_rts/default.asp)), and the Wyoming State Engineer's website ([http://seo.state.wy.us/wrdb/PS\\_TnsRngSec.aspx](http://seo.state.wy.us/wrdb/PS_TnsRngSec.aspx)) regarding adjudicated groundwater rights within one mile of the project area. No ground water rights were recorded within 1000 feet of the proposed mine disturbance (Figure 1; Chapter 1).

An adjudicated artesian water-well identified in the NWSE of section 29 T9S R26E. A pipeline has been installed from that well to a dwelling just south of the MT border in WY. WBI would not disturb the pipeline during mining operations and would maintain a no-activity buffer of 25 feet on both sides of the pipeline for those portions that cross the proposed POO modification area. No impacts to this pipeline are anticipated.

#### **3.6.2 Surface Water**

Surface water hydrology within 1M Amendment 2 is characterized by several unnamed ephemeral streams and one stockpond. No perennial drainages are located within the project

area. Ephemeral channels that would be affected by this project represent a total of 69,913 lineal feet of total water-course length across 14 sub-watersheds. Only smaller sections of each of these water-courses would be directly impacted by activity associated with this project. These channels feature low gradients and are only a few feet wide. Channel morphologies are determined by factors such as: discharges, soil type, climate, and vegetation. Run-off from the area is comparatively high due to low infiltration potential of heavy clay and surface exposures of sandstone rock outcrops. These channels usually convey water as a result of snow melt or precipitation events.

The project area contains 940.0 acres within the Sage Creek watershed, a tributary of the Shoshone River. Proposed mining within the 1M Amendment 2 area would affect 554.7 acres within this watershed, 1.5 to 2.5 miles from Sage Creek.

WBI obtained information from the Montana Department of Natural Resources and Conservation, Water Rights Bureau website ([http://www.dnrc.mt.gov/wrd/water\\_rts/default.asp](http://www.dnrc.mt.gov/wrd/water_rts/default.asp)) (verified July 18, 2013), and the Wyoming State Engineer's Office website ([http://seo.state.wy.us/wrdb/PS\\_TnsRngSec.aspx](http://seo.state.wy.us/wrdb/PS_TnsRngSec.aspx)) (verified July 18, 2013) regarding adjudicated surface water rights within one mile of the 1M Amendment 2 project area. No surface water rights were recorded within 1000 feet of proposed mine disturbance. However, a single, non-recorded stock-watering pond is located immediately adjacent to the extreme southwest corner of the proposed disturbance area. Although this pond would not be affected, ephemeral inlet drainages to the pond would be crossed by the proposed activity.

No streams within WBI's 1M Amendment 2 are included on the 2012 Montana DEQ Impaired Stream List (303d list).

Low water crossings are planned for all drainage crossings, as discharges from these channels are infrequent and low.

### **3.7 Wildlife**

#### **3.7.1 Historical Surveys**

The area associated with this project was evaluated for wildlife habitat and wildlife species occurrence during site visits by WBI environmental personnel in the spring and summer of 2011. WBI drillers, surveyors, and contractors have also logged occasional wildlife observations. Those surveys, along with information provided by BLM wildlife personnel and other information found on U.S. FWS and MT FWP websites were used to determine potential occurrence and mitigation of impacts to wildlife associated with this project.

#### **3.7.2 Big Game**

##### **3.7.2.1 Mule and Whitetail Deer**

MT FWP indicates the project area is designated as Class 2 (high potential) winter habitat for Mule Deer (*Odocoileus hemionus*) and White-tail Deer (*Odocoileus virginianus*) based on suitable habitat and winter use (<http://fwp.mt.gov/gis/maps/caps/>). These two species are also the only big game species recorded in the area during WBI surveys.

The project area is also designated as Class 4 (low potential) habitat for all other big game species including Pronghorn (*Antilocapra americana*) and Rocky Mountain Elk (*Cervus canadensis*). No impacts are anticipated on these other big game species from this proposed action.

### **3.7.3 Other Mammals**

Other mammals reported in WBI baseline surveys include: chipmunk (species not indicated), jackrabbits and Cottontail Rabbits (*Sylvilagus audubonii*). WBI indicates potential habitat also exists for Pallid Bat (*Antrozous pallidus*), White-tailed Prairie Dog (*Cynomys leucurus*), Merriam's Shrew (*Sorex merriami*), and Western Spotted Skunk (*Spilogale gracilis*). Suitable habitat for Coyote (*Canis latrans*), Badger (*Taxidea taxus*), and Red Fox (*Vulpes vulpes*) is also present. No prairie dog colonies were reported to occur within the 1M Amendment 2 project area by WBI personnel. If present, prairie dog colonies provide suitable potential habitat for the Endangered Black-footed Ferret (*Mustela nigripes*).

### **3.7.4 Game Birds and Greater Sage-Grouse**

Game birds in the area include mourning dove (*Zenaida macroura*), chukar partridge (*Alectoris chukar*), and Greater Sage-grouse (*Centrocercus urophasianus*). WBI's 1M Amendment 2 area contains suitable habitat for all three species. In fact, it lies entirely within lands designated by the BLM as "Priority Protection Habitat" for Greater Sage-grouse, a Candidate species. WBI personnel reported two sage-grouse hens in the project area in summer, 2011. Greater Sage-grouse are further discussed below as a "Candidate, Endangered and Threatened" wildlife species.

### **3.7.5 Non-Game Birds**

Non-game birds common to the shrub/grassland habitat include those observed during WBI surveys: Horned Lark (*Eremophila alpestris*), Brewer's Sparrow (*Spizella breweri*), Sage Thrasher (*Oreoscoptes montanus*), and Lark Bunting (*Calamospiza melanocorys*). Brewer's Sparrows, Sage Thrashers, and Lark Buntings are all classified as BLM "sensitive" species. The project area also includes suitable habitat for the Sage Sparrow (*Artemisiospiza belli*), a BLM sensitive species.

The MT FWP has ranked habitat within the project area as suitable for Mountain Plover (*Charadrius montanus*), a species with a S2 ranking indicating it is at risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.

No waterfowl were observed within the project area and no habitat exists to support them. No impacts on waterfowl are anticipated but seasonal use of the area by non-game migratory birds is expected.

### **3.7.6 Raptors and Owls**

Raptor species typically found in open sagebrush/grassland habitat that characterizes the project area include: Rough-legged Hawks (*Buteo lagopus*), Prairie Falcons (*Falco mexicanus*), Northern Harriers (*Circus cyaneus*), American Kestrels (*Falco sparverius*), Golden Eagles (*Aquila chrysaetos*), and Red-tailed Hawks (*Buteo jamaicensis*). Project area habitat also supports a prey base of cottontail rabbits and other small mammals. However, no raptors were

included in WBI survey results and no nests were located. No impacts on raptors are anticipated by this activity.

The area does not contain suitable nesting, roosting or feeding habitat for Bald Eagles (*Haliaeetus leucocephalus*). In addition, Ferruginous Hawks (*Buteo regalis*) have not been known to occupy this area. No impacts are anticipated for either of these species from this proposed activity.

Although Golden Eagles are observed flying over and hunting within the project area, no nests have been located during searches by WBI personnel and appropriate nesting habitat does not occur in this immediate area. No impacts are anticipated on this species from this proposed activity.

As previously indicated, no prairie dog colonies were reported to occur within the project area by WBI personnel. If present, prairie dog colonies provide suitable potential habitat for the Burrowing Owl (*Athene cunicularia*), a BLM sensitive species.

### **3.7.7 BLM Sensitive Wildlife Species/MT Species of Concern & Migratory Birds**

WBI's 1M Amendment 2 area contains habitat suitable to support several designated BLM sensitive species, MT FWP species of concern and/or migratory birds, and other species given special protections through the Migratory Bird Treaty Act and Executive Order 13186.

BLM sensitive species are defined as species that:

- Could become endangered in or extirpated from a state, or within a significant portion of its distribution
- Are under status review by the USFS and/or the national marine fisheries service (NMFS)
- Are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution
- Are undergoing significant current or predicted downward trends in population or density such that federally listed, proposed, candidate, or state-listed status may become necessary
- Typically have small and widely dispersed populations
- Inhabit ecological refugia or other specialized or unique habitats, or
- Are State listed, but which may be better conserved through application of BLM sensitive species status.

Montana Species of Concern are native animals breeding in the state that are considered to be "at risk" due to declining population trends, threats to their habitats, and/or restricted distribution.

In addition, migratory birds have special protections through the Migratory Bird Treaty Act and Executive Order 13186.

BLM and MT "species of concern" with potential to occur in WBI's project area based on occurrence of suitable habitat are listed in Table 7.

This project also lies within Region 10 of the FWS list of Birds of Conservation Concern/Bird Conservation Area (BCR) and contains, or has habitat to support, species on the MT FWP's list of species of concern, including mountain plover and sage sparrow.

**Table 7: BLM and Montana Species of Concern with potential to occur in WBI's 1M Amendment 2 based on presence of suitable habitat.**

<b>BLM Sensitive Species</b>			
<b>Common Name</b>	<b>Scientific Name</b>	<b>BLM Status</b>	<b>State Status</b>
<b>Mammals</b>			
Black-Footed Ferret	<i>Mustela nigripes</i>	Special status	S1
Pallid Bat	<i>Antrozous pallidus</i>	Sensitive	S2
White-tailed Prairie Dog	<i>Cynomys leucurus</i>	Sensitive	S1
<b>Birds</b>			
Sage Sparrow	<i>Amphispiza belli</i>	Sensitive	S3B
Golden Eagle	<i>Aquila chrysaetos</i>	Special status	S3
Burrowing Owl	<i>Athene cunicularia</i>	Sensitive	S3B
Swainson's Hawk	<i>Buteo swainsoni</i>	Sensitive	-
McCown's Longspur	<i>Calcarius mccownii</i>	Sensitive	-
Chestnut-Collared Longspur	<i>Calcarius ornatus</i>	Sensitive	S2B
Greater Sage-grouse	<i>Centrocercus urophasianus</i>	Candidate	S2
Mountain Plover	<i>Charadrius montanus</i>	Sensitive	S2B
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Sensitive	S3B
Long-Billed Curlew	<i>Numenius americanus</i>	Sensitive	S3B
Sage Thrasher	<i>Oreoscoptes montanus</i>	Sensitive	
Brewer's Sparrow	<i>Spizella breweri</i>	Sensitive	S3B
<b>Reptiles</b>			
Milksnake	<i>Lampropeltis triangulum</i>	Sensitive	S2
Greater Short-Horned Lizard	<i>Phrynosoma hernandesi</i>	Sensitive	S3
Common Sagebrush Lizard	<i>Sceloporus graciosus</i>	-	S3

### 3.7.8 Aquatic Life

Sage Creek, a perennial stream, is approximately two miles west of the project area and would not be directly impacted by this proposal. Bear Canyon Creek, an intermittent stream, in addition to several unnamed ephemeral draws would each have small portions of their watersheds directly

impacted by this activity, but they contain no suitable habitat for aquatic life. Therefore, within the WBI 1M Amendment 2 area, no impacts on aquatic life are anticipated.

The MT FWP web site (<http://fwp.mt.gov/gis/maps/caps/>) lists three fish species in this reach of Sage Creek: Longnose Dace (*Rhinichthys cataractae*), Lake Chub (*Couesius plumbeus*), and White Sucker (*Castostomus commersoni*). None of these species are sensitive or a MT species of special concern. They are all categorized as tier III species (Lower conservation need; defined as: Although important to MT's wildlife diversity, these species, communities, and focus areas are either abundant and widespread or are believed to have adequate conservation already in place.)

### **3.7.9 Threatened and Endangered Species**

BLM Montana State Office entered into a Memorandum of Understanding (MOU) with the US FWS, Montana Field Office, to improve the efficiency and effectiveness of plan level Section 7 consultation processes under the ESA. The MOU states that during planning BLM agrees to promote conservation of candidate, proposed, and listed species and to consult on RMP effects for listed species, confer on RMP effects for proposed species, and develop conservation strategies for candidate species (BLM-MOU-MT923-0402, June, 2004). The BLM maintains specific goals of contributing to the recovery of species currently listed under the Endangered Species Act (ESA) and to promoting the recovery and conservation of all special status animal and plant species in the planning area.

Endangered and Threatened. For federally listed species that do not have critical habitat designated, BLM cooperates with the US FWS to determine and manage habitats of importance. The US FWS provides regulatory oversight for all fish, plant, and wildlife species listed as threatened or endangered, proposed for listing, or that are candidates for listing under the ESA. Management of federally listed species and the designation of critical habitats are overseen by the US FWS in accordance with the ESA.

There are no known Threatened or Endangered wildlife species in WBI's 1M Amendment 2 area. No impacts on threatened or endangered species are anticipated from this proposed activity.

Candidate species. Candidate species within the project area include Greater Sage-grouse which depend upon sagebrush habitat for mating, nesting, and wintering activities; and a combination of habitat types for summer brood-rearing.

Up to four historic Greater Sage-grouse lek locations are known from within four miles east of the proposed project boundary. One of these is approximately two miles northeast of the northern reaches of proposed WBI mining disturbance. An additional six documented Greater Sage-grouse leks are located from four to six miles west and north of the proposed project area. All of these are also west of U.S. Highway 310 and north of the WY border. All four of the leks located east of the project have been documented to be active in at least one year since 2002, although only two have documented birds in attendance since 2008. (Shawn Stewart, MT FWP) These leks have not been consistently surveyed three times a year during this time period, so it is possible that birds were in attendance and not observed. Overall, the project area would be expected to provide genetic and habitat connectivity from the south-central MT Sage-grouse populations in this portion of Carbon County with populations in north-central WY. All of the

lek sites and proposed bentonite development associated with this proposal are within BLM designated "Priority Protection Habitat" for Greater Sage-grouse.

Gardner saltbush/grasslands with intermittent Wyoming big sagebrush communities dominate the southern three quarters of the project area. WBI assessments indicate the ratio of Gardner saltbush to big sagebrush communities is roughly 4:1, with better quality Sage-grouse habitat (more sagebrush) occurring both on the north end of the proposed mining in sections 24 and 25, and along the eastern fringes in sections 30, 31 and 32 Township 9 South, Range 26 East.

Little is known about potential seasonal use of the project area by Greater Sage-grouse, although WBI personnel observed two hens using the project area in summer, 2011. It is likely that female Sage-grouse use the area for nesting, brood-rearing and winter habitat. Following a March 2012 site visit with FWP and BLM wildlife personnel, WBI agreed to delay mining in the northwest portion of the project area until the final mining stages to allow time to study Sage-grouse seasonal use patterns and develop suitable mitigations.

### 3.8 Cultural and Paleontological Resources

In advance of the bentonite mining project, a Class III Cultural Resource Inventory was conducted in 2012. During the course of the inventory, 13 previously unrecorded sites were encountered and recorded (Table 8). Nine isolated finds (IF) were also recorded. All IFs are considered not eligible for the National Register of Historic Places (NRHP) and are not discussed further in this document. Of the newly recorded sites, five are precontact, five contain both precontact and historic components and three are historic. All but two of the newly recorded cultural resources have been determined not eligible for the NRHP.

**Table 8: Sites Types and Site Eligibility in Project Area**

SITS Number	Site Type	Eligibility
24CB2267	Dual Component	Not Eligible
24CB2268	Dual Component	Not Eligible
22CB2269	Historic	Not Eligible
24CB2270	Precontact	Unevaluated
24CB2271	Precontact	Not Eligible
24CB2272	Precontact	Not Eligible
24CB2273	Dual Component	Eligible
24CB2274	Dual Component	Not Eligible
24CB2275	Historic	Not Eligible
24CB2276	Precontact	Not Eligible
24CB2277	Historic	Not Eligible
24CB2278	Precontact	Not Eligible
24CB2279	Dual Component	Not Eligible

Eligible site 24CB2273 is a multicomponent site, consisting of both precontact and historic cultural material scatter (CMS). Artifact Concentration (AC) 1 is found in the north end of the site. The precontact component of AC1 includes one biface, one retouched flake and 19 flakes. Lithic materials include gray, tan and brownish red orthoquartzite, purple and oolitic chert, black basalt and clear chalcedony. None of the precontact artifacts observed at the site are diagnostic. The historic component of AC1 includes two sanitary cans, a tobacco tin, a .22 caliber casing and a brass 12 gauge shotgun head, with markings dating it prior to 1912. AC2 is only historic,

containing cans and glass. Site 24CB2273 is recommended eligible for the NRHP under Criterion D, with avoidance recommended.

Site 24CB2270 is a precontact site with one feature and a cultural material scatter (CMS). Feature 1 is a well-defined, deeply sodded, circular hearth. The hearth contains 11 sandstone cobbles, with one quartz cobble; all exhibit lichen growth. The CMS consists of one Avonlea projectile point and seven flakes. The point is made of white chalcedony. Other lithic materials include tan quartzite, orange chert, gray orthoquartzite and purple orthoquartzite. Site 24CB2270 remains unevaluated because of the hearth and possible radio carbon dating; the presence of a diagnostic tool dates the site to the Late Prehistoric period.

Sites recommended not eligible for the NRHP include 24CB2267, 24CB2268, 24CB2274, and 24CB2279, all multicomponent sites. Not eligible historic sites are 24CB2269 and 24CB2277, both historic material scatters, and 24CB2275, composed of two historic features. Prehistoric sites 24CB2271, 24CB2272, 24CB2276, and 24CB2278 are lithic material scatters with no diagnostic materials and no subsurface deposits present. All four sites have been determined not eligible for the NRHP. Sites that have been determined not eligible for the NRHP are not actively managed by the BLM.

No paleontological sites have been reported for the location of the proposed project. The Potential Fossil Yield Classification (PFYC) for the project area suggests a low potential for paleontological resources based on the underlying geology of the area (Table 9). The stipulations preclude any severe damage to previously unrecognized paleontological resources.

**Table 9: PFYC Numbers for Wyo-Ben Inc. Project Location**

<b>Project</b>	<b>PFYC Class</b>	<b>BLM Acres</b>	<b>% BLM</b>
Wyo Ben	2	15,228	90
	3a	1,756	10
Totals		16,984	100

No impacts are anticipated to eligible or unevaluated cultural resources from the proposed activity. A possibility of discovery of unrecorded cultural or paleontological resources exists. The operators' responsibilities in dealing with the discovery of unrecorded cultural and paleontological resources are clearly defined in the stipulations including who to notify in case of discovery of previously unrecognized sites on public lands. Such sites would be avoided until evaluated by the Field Office Staff.

### **3.9 Soils**

Soil resources for the WBI project area were surveyed and described by WBI personnel (Matthew Call, Joe Sylvester, and Jared Welsh) in spring and summer of 2011. WBI personnel characterized proposed mining affected area soils at an Order II survey level, and the remaining project area with a general Order III survey. Total area inventoried consisted of approximately 1,200 acres. Soil map units and recommended soil salvage depths were delineated on 1": 400' satellite imagery. Topsoil suitability assessments and recommended salvage depths are based on field descriptions and laboratory analysis from 32 soil pedons. Soil samples were submitted for analysis to Inter-Mountain Laboratories, Inc. in Sheridan, WY. Analytical parameters and methods

followed those of the American Society of Agronomy (ASA) and USDA. Topsoil suitability was based on criteria established by the WY DEQ (WY DEQ, 1984).

The WBI soil inventory is a refinement of ongoing, preliminary mapping by the Natural Resource Conservation Service (NRCS). Common NRCS soil series mapped in the area include Stutzman silty clay, Nihill very gravelly loam, and Sandstone outcrop/Travessilla complex. Additional map units encountered in the soil survey were sodic Haplocambids, and Typic Torripsamments. Project area soils formed in residuum and slope wash of shale and sandstone; and from alluvium in drainages and fans. They are generally well to moderately well drained. Sodium and calcium salts of sulfates, carbonates, and chlorides are common. Some soils encountered in 1M Amendment 2 also have high concentrations of exchangeable sodium and are classified as saline-sodic soils.

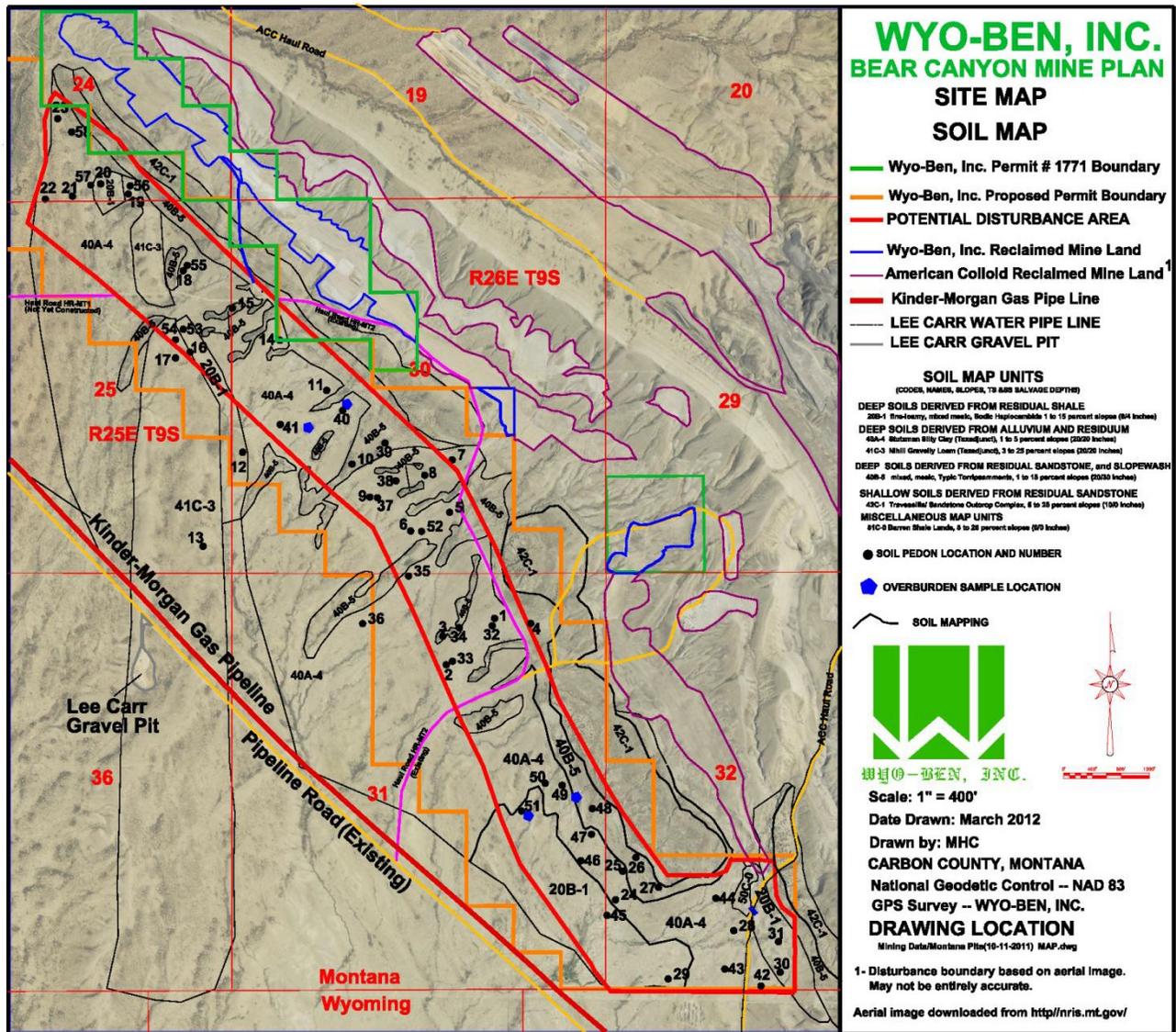
Alluvial soils are generally deep (greater than 40 inches) and have coarse to loamy textures. Soils derived from sedimentary rocks have clay texture and are generally very shallow (less than 10 inches) and shallow (less than 20 inches). Throughout the project area, occasional shale and bentonite outcrops occur that support very sparse vegetation. These areas would not be salvaged for topsoil.

Surface textures are commonly sandy loam, clay loam and loam. Subsurface soil textures are commonly sandy clay loam, sandy clay and clay loam. Recommended salvage depths range up to 20 inches for topsoil, with subsoil thickness ranging up to an additional 30 inches. Average soil replacement depths are projected to be six inches for topsoil and 26-28 inches for subsoil. Figure 5 illustrates soil map units across the project area and Table 10 presents recommended soil salvage depths.

**Table 10: WBI’s 1M Amendment 2; Soil Map Unit Summaries and Recommended Salvage Depths.**

Map Unit	Composition of Map Unit (%)	Depth of Topsoil (inches)	Salvage Depth of Topsoil/ Subsoil (inches)	Limitations
20B-1- Sodic Haplocambids	100	50	6/4	SAR > 15 often below 10", EC is generally not high at all depths. pH is above suitable levels below 15 inches.
40A-4 – Stutzman taxadjunct	100	50	20/20	None to 40 inches
40A-5—Typic Torripsamments	100	50	20/30	None to 50 inches
41C-3—Nihill Gravelly Loam taxadjunct	100	50	20/20	Coarse fragments high (>35%) from 3 to 30 inches. Would use due to limited soils of the area, and soil supports good vegetation, especially shrubs
42C-1-SSOC/Travessilla complex	40/60	0/10	0/10	None to 10 inches. Rock parent material below this
51D-0 Miscellaneous	100	0	0/0	Does not support vegetation; high SAR and EC

Figure 5: Soil Map Units, WBI's 1M Amendment 2; provided by WBI



### 3.10 Vegetation

Employees of WBI performed vegetation community mapping and sampling for this project area in the summer of 2011. Proposed disturbances would affect Frontier 2 (F2) and Frontier 3 (F3) bentonite beds, located between 3 to 4 miles northeast of Frannie, Wyoming in Carbon County, Montana. Topography is characterized by gentle slopes cut by ephemeral drainages, bounded by somewhat steeper-sloped sandstone outcrops to the northeast and a gravelly bench to the southwest.

Vegetation map units mapped and described within the project area include: Gardner saltbush (*Atriplex gardneri*)/grasslands, big sagebrush (*Artemisia tridentata*), Gardner saltbush/big sagebrush complex and barren outcrops. These were marked in the field on scaled aerial photographs and later transferred into electronic format at a 1":400' scale (Figure 6). The first three listed map units were described, sampled, photographed and species lists compiled. Barren

outcrops were not sampled. Numerical cover data were estimated using a line transect sample method outlined in WYDEQ/LQD Guideline 2, Vegetation. Separate cover values were calculated for vegetation, rock, litter, and bare ground for each transect. Shrub density belt transects (one meter by 50 meter) were also conducted, counting rooted shrubs and sub-shrubs on the right side of each transect. Each map unit was sampled using an extended reference area concept as described in WY Guideline 2. Results of this survey are reported in WBI's 1M Amendment 2 application. Vegetation map units are variously dominated and/or codominated by Gardner saltbush, Wyoming big sagebrush, pricklypear cactus (*Opuntia polyacantha*), basindaisy (*Platyschkuhria integrifolia*), Sandberg bluegrass (*Poa sandbergii*) Indian ricegrass (*Acnatherum hymenoides*) and bottlebrush squirreltail (*Elymus elymoides*).

Approximately forty percent of the project area was mapped as sagebrush or sagebrush complex plant communities, fifty-nine percent was mapped as a Gardner saltbush plant community and the remainder was mapped as barren outcrop. Proposed disturbance acreage totals for vegetation map units are given in Table 11.

**Table 11: WBI's 1M Amendment 2; Vegetation Map Units; Proposed Affected Acreages**

MAP UNIT	TOTAL DISTURBANCE ACRES
Gardner saltbush	175.4
Big sagebrush	45.3
Big sagebrush / Gardner saltbush complex	73.2
Barren outcrop	3.0
<b>Totals</b>	<b>296.9</b>

Average aerial cover by vegetation map unit, life-form and cover groups are given in Table 12. Average total vegetation cover ranged from 54.1 percent to 69.7 percent across the three map units.

**Table 12: Average Aerial Cover by Vegetation Map Unit, life-form and Cover Group**

<b>Gardner Saltbush/Grassland</b>		
<b>LIFE-FORM</b>	<b>Percent Cover Relative</b>	<b>Percent Cover Absolute</b>
PERENNIAL GRASSES	19.66	10.64
PERENNIAL FORBS	17.31	9.36
ANNUAL GRASSES	0.00	0.00
ANNUAL FORBS	20.67	11.18
SUCCULENTS	5.71	3.09
SUBSHRUBS	35.13	19.00
SHRUBS (ARTR)	1.51 (0.67)	0.82 (0.36)
TOTAL VEGETATION	100	54.1
LITTER		10.5
ROCK		9.9
TOTAL GROUND COVER		74.5
BARE GROUND		25.5

<b>Big Sagebrush</b>		
<b>LIFE-FORM</b>	<b>Percent Cover Relative</b>	<b>Percent Cover Absolute</b>
PERENNIAL GRASSES	21.66	15.10
PERENNIAL FORBS	2.15	1.50
ANNUAL GRASSES	5.88	4.10
ANNUAL FORBS	13.34	9.3
SUCCULENTS	0.14	0.10
SUBSHRUBS	1.58	1.10
SHRUBS (ARTR)	55.24 (52.51)	38.5 (36.60)
TOTAL VEGETATION	100	69.7
LITTER		12.4
ROCK		0.9
TOTAL GROUND COVER		83.0
BARE GROUND		17.0

<b>Big Sagebrush/Gardner Saltbush Complex</b>		
<b>LIFE-FORM</b>	<b>Percent Cover Relative</b>	<b>Percent Cover Absolute</b>
PERENNIAL GRASSES	31.55	17.70
PERENNIAL FORBS	10.87	6.10
ANNUAL GRASSES	0.53	0.30
ANNUAL FORBS	19.07	10.70
SUCCULENTS	0.00	0.00
SUBSHRUBS	19.07	10.70
SHRUBS (ARTR)	18.54 (12.48)	10.40 (7.00)
TOTAL VEGETATION	100	56.10
LITTER		10.6
ROCK		8.2
TOTAL GROUND COVER		74.9
BARE GROUND		25.1

### 3.10.1 Invasive, Non-Native Plant Species

WBI's baseline pre-mine vegetation surveys indicated that native plant species are dominant in the proposed project area. However, inspections of the project area in June 2012 by Carbon County Weed and Pest personnel located four noxious weed species populations: White top (*Cardaria draba*), Spotted Knapweed (*Centaurea stoebe*), Russian Knapweed (*Acroptilon repens*) and Scotch Thistle (*Onopordum acanthium*). Initially, WBI and Carbon County Weed and Pest entered into a contract to chemically treat 10 to 20 acres of these populations on an annual basis through 2014 (Appendix A). Rather than commit to a fixed number of acres to treat yearly, WBI will monitor

likely areas of noxious or invasive weed infestations on a yearly basis, including reclaimed areas and haul roads and conduct spraying as needed through the life of the mine using a licensed applicator that is knowledgeable of appropriate chemicals and seasons of use for maximum efficacy of control. Weed invasions are dynamic over time and new populations of invasive or noxious weeds could become established given opportunities by land disturbance, loss of native vegetation, overgrazing or improper mine reclamation. Other invasive species that commonly become established in areas disturbed by mining and related activities are Cheatgrass (*Bromus tectorum*), Halogeton (*Halogeton glomeratus*), Kochia (*Kochia scoparia*), and Russian Thistle (*Salsola kali*).

### **3.10.2 Special Status Plants**

Special status species are those listed as Threatened or Endangered (T&E) under the ESA, those proposed or Candidates for listing and those designated as sensitive by BLM or State listed species. These species require particular management attention due to population or habitat concerns.

#### **3.10.2.1 Threatened & Endangered Plant Species**

No T&E plant species, as described by the US FWS, were or have been observed during surveys conducted within the WBI project area.

#### **3.10.2.2 BLM Designated Sensitive Species; MT Natural Heritage Sensitive Species.**

This WBI project area contains suitable habitat for up to twelve of the twenty-one BLM designated sensitive plant species recorded from the Pryor Mountain Area (USDI-BLM, 2013b) (Table 13). Two of these species, Desert Dandelion (*Malacothrix torreyi*) and Spiny Hopsage (*Grayia spinosa*) were located in the project area during pre-mine vegetation surveys, although neither species were present in premine quantitative vegetation data collected by WBI. Table 13 summarizes the listed status for all twelve BLM sensitive plant species occurring or potentially occurring in the WBI project area and their known range and habitat associations in Pryor Mountain area.

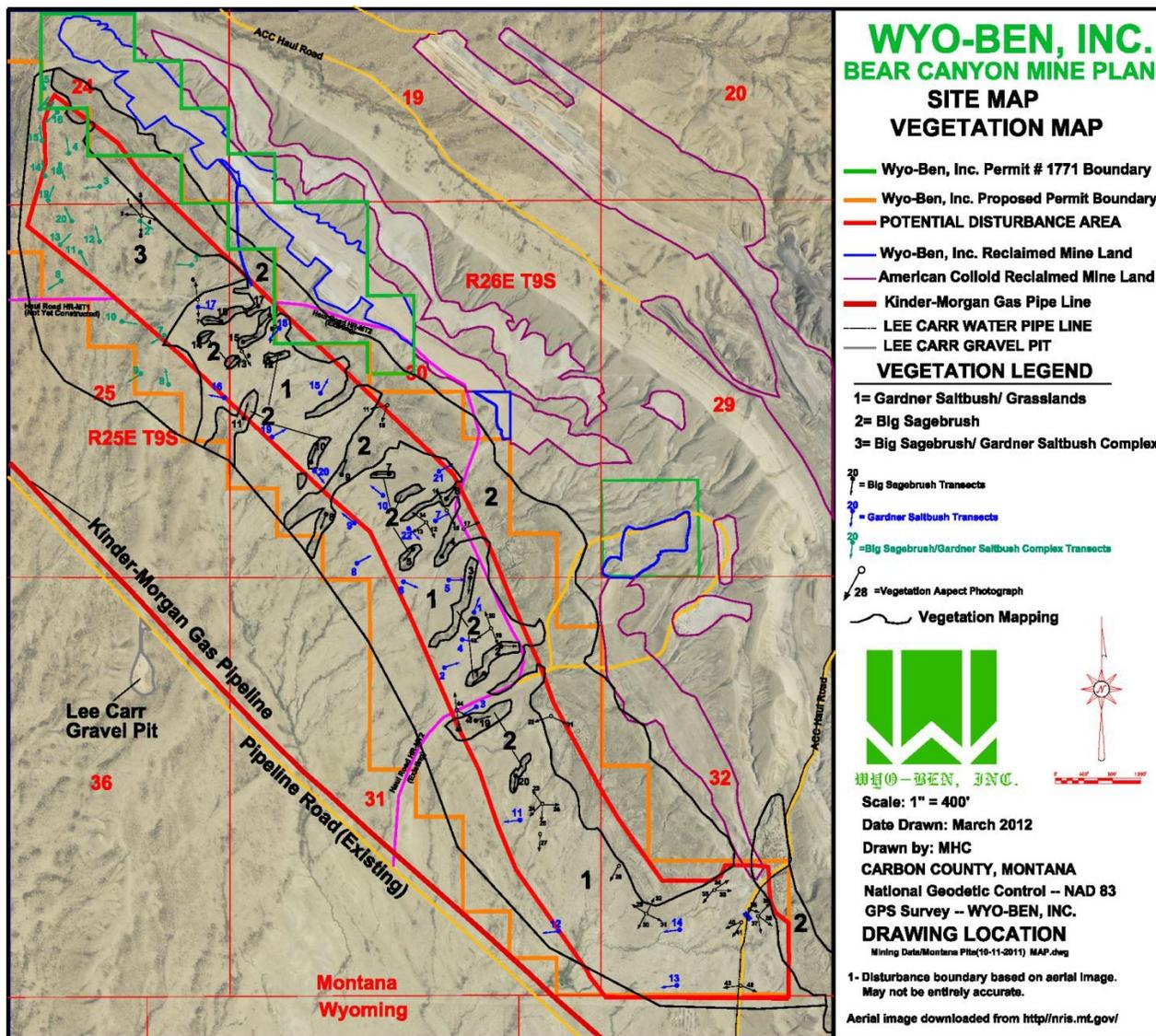
The MT Natural Heritage program also ranks species. Within this project area, three plant species are ranked as class 2 or higher; Desert Dandelion, Spiny Hopsage and Miner's Candle (*Cryptantha scoparia*). The first two species overlap with the BLM sensitive species list provided in Table 13.

**Table 13: BLM Special Status Plant Species with Potential to Occur in the WBI Project Area.**

<b>BLM Special Status Plant Species with Potential to Occur in the WBI Project Area. These are all listed as BLM “sensitive” species.</b>		
<b>Common Name<sup>e</sup></b>	<b>Scientific Name<sup>1</sup></b>	<b>Known Range and Habitat Associations</b>
Geyer’s Milkvetch	<i>Astragalus geyeri</i>	Occupies loose sandy soil habitats with little or no organic matter in alluvial plains and terraces. This species is known to occur in the Pryor Mountain foothills at four sites.
Gray’s Milkvetch	<i>Astragalus grayi</i>	Occupies open soil, valley habitats in sagebrush steppe communities. Species is known from three occurrences in the Pryor Mountain foothills.
Lewis River Suncup	<i>Camissonia parvula</i> ( <i>Oenothera parvula</i> )	Occupies sandy soil habitats weathered from calcareous sandstone between juniper woodland and sagebrush steppe zones. Species is known from two occurrences in the decision area on the southern edge of the Pryor Mountains.
Yellow Spiderflower	<i>Cleome lutea</i>	Occupies open, often sandy soil of sagebrush steppe valley communities. Species is known from four occurrences in the decision area, restricted to the Pryor Mountain foothills.
Spiny Hopsage	<i>Grayia spinosa</i>	Occupies dry shrublands in the valleys and foothills usually on sandy textured alkaline soils below 5,000 feet amsl. Species is known from 10 occurrences in the decision area and is restricted to the Pryor Mountain foothills.
Torrey’s Desert Dandelion	<i>Malacothrix torreyi</i> (M. <i>sonchoides</i> v. <i>torreyi</i> )	Occupies sandy alluvium, five occurrences are known from the south side of the Pryor Mountains.
Dwarf Mentzelia	<i>Mentzelia pumila</i>	Occupies open habitats, usually characterized by sandy soil in desert shrubland and woodland valley and foothill zones. Species is known from 16 occurrences in the Pryor Mountain foothills.
Leafy Nama	<i>Nama densum</i>	Occupies sandy soil habitats weathered from outcrops of calcareous sandstone and is known from one site in the Pryor Mountain foothills.
Platte River Cinquefoil	<i>Potentilla plattensis</i>	Occupies grassland and sagebrush steppe habitats in the valley and montane zones. Species is known from one site in the decision area in the Pryor Mountains.
Largeflower Goldenweed	<i>Pyrrocoma carthamoides</i> var. <i>subsquarrosa</i> ( <i>Haplopappus carthamoides</i> var. <i>subsquarrosus</i> )	Occupies grassland and sagebrush habitats dominated by bunchgrasses or bunchgrass with sagebrush, frequently found on cooler, moderate to steep slopes. Species is known from eight occurrences in the decision area and is a regional endemic restricted in Montana to the eastern front of the Beartooth and Pryor mountain foothills.
Persistent Sepal Yellowcress	<i>Rorippa calycina</i>	Occupies sparsely vegetated, moist sandy to muddy banks of streams, stock ponds, and manmade reservoirs near the high water line. Species is only known from one historic site in the decision area.
Salty Buckwheat	<i>Stenogonum salsuginosum</i> ( <i>Eriogonum salsuginosum</i> )	Occupies bentonite soils in dry, open slopes of breaklands at approximately 4,700 feet. Species is known from two small populations documented on the south side of the Pryor Mountains.

**Figure 6: Vegetation Map Units within WBI's Proposed 1M Amendment 2: provided by WBI.**

Site map of



### 3.11 Grazing Resources

Livestock grazing is stated as an existing land use within the project area. These lands include BLM Allotment number 01005, "GRAVEL CROSSING", operated by Rodney L. Crosby. This cattle allotment totals 17,207 acres; crossing the state line into WY. Allotment lands occur as an 86 percent to 14 percent split within MT and WY, respectively (USDI-BLM, 2013b; Allotment Master Report). Personal communication with Cody WY BLM Field Office personnel (Jack Mononi, April 8, 2013) indicated pre-mine range conditions of this allotment are 45 percent - Good; 50 percent-Fair and five percent-Poor over the 17,207 allotment acres. The allotment has a permitted use of 762 AUM with 307 AUM suspended and 455 AUM active for cattle use on a Spring/Fall/Rest Rotation.

### 3.12 Lands and Realty

#### 3.12.1 Ownership and Land Use Authorizations

WBI's 1M Amendment modification includes 940 acres of Federal (BLM) surface and Federal minerals that are claimed under authority of the 1872 Mining Law. An additional, unclaimed 2.6 acres of Federal surface may be affected to accommodate stockpiles and other mine associated disturbances. However, no bentonite would be mined on those 2.6 acres. Table 14 summarizes proposed disturbance acreages by unpatented mining claim and legal description.

**Table 14: Proposed disturbance acreage by mining claim and legal description**

Claim Name	BLM MMC Serial#	Division (1/4 1/4, lot or tract)	Section	Township/ Range	# Acres by Legal Description	Proposed Disturbance Acres
Montana 1	93867	Lot 6, 11, 12	32	T9S R26E	75.4	71.6
Montana 2	93868	Lot 3, Northern most 20 acres, and SE4 lot 10; S2 and NW4 Lot 4, Lot 5	31 & 32	T9S R26E	140.00	107.8
Montana 3	93869	SE4NE4, N2SW4NE4, NW4NE4, W2NE4NE4, SE4SW4NE4, NE4NW4SE4	31	T9S R26E	140.00	94.9
Montana 4	93870	SW4SE4, N2SE4SW4, SE4SE4SW4; NE4NE4NW4	30 & 31	T9S R26E	80.0	53.0
Montana 5	93871	S2SE4NW4, NW4SE4NW4, S2NW4SE4, NW4NW4SE4, NESW, Eastern most 20 acres Lot 3	30	T9S R26E	120.00	61.2
Montana 6	93872	NE4NE4, N2SE4NE4, SE4SE4NE4; SW4 Lot 1, Lot 2, NW4 Lot 5	25 & 30	T9S R25E T9S R26E	129.7	101.2
Disturbance Outside Claims						2.6
TOTAL						554.7 Acres

#### 3.12.2 Right-of-Way Authorizations

##### Haul Road ROW

WBI is proposing to utilize existing roadways that currently service WBI and ACC bentonite mining operations extending through the eastern half of section 24; Township 9 South Range 25 East and portions of sections 19, 29, 30, 31 & 32 Township 9 South Range 26 East. No new authorizations would be required to utilize these roadways.

Previously approved POO MTM-105421 included authority for WBI to construct and utilize two haul roads, HR-MT1 and HR-MT2. To date, only one of these roads (HR-MT2) has been upgraded, while the other remains an unimproved two-track trail. It is possible the later roadway would not be developed into standard haul road dimensions, but is included to provide a future hauling option if required. Haul road HR-MT2 would extend westward across the north half of section 25 Township 9 South Range 25 East to connect the existing Bear Canyon Access Road with the 1M Amendment 2 boundary. It would be constructed under authority of approved POO MTM-105421. The existing Bear Canyon road would not be upgraded.

##### Other ROW

A BLM authorized ROW for a buried eight inch diameter water pipeline, serialized as MTM-85689 is located on the south end of the project area in T. 9 S., R. 26 E., sec. 32, lots 6 and 11. This pipeline is located within the proposed disturbance area outlined on Mine Plan Map (Figure

2); Chapter 2 and is in close proximity to the ACC haul road that would be utilized as part of WBI's plan of operations. WBI would avoid this pipeline in their mining operations and maintain a protected 25 foot wide undisturbed buffer on each side of its center line.

### **3.12.3 Other Resources-Energy Corridors**

WBI's proposed 1M Amendment 2 project lies within designated Energy Corridor Zone #79-216 which was established under section 368 of the 2005 Energy Policy Act. That act directed the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior (the Agencies) to designate, under their respective authorities, corridors on federal land in 11 western states for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities. Evaluations of project-related environmental impacts are addressed with site-specific environmental reviews.

Although there are multiple existing oil and gas transmission pipelines within the corridor, there are no other known proposals that would conflict with WBI's proposed action. In the event of future proposal within the corridor, there is ample room to accommodate this potential need. The corridor is a total width of 3,500 feet, being 1,750 feet on either side of the existing Express Pipeline (currently held by Spectra Energy) centerline.

### **3.13 Recreation**

The June 2003 ROD for the OHV EIS, amended the 1984 BiFO RMP and limited motorized travel to existing roads and trails on BLM managed lands in MT. That ROD is the current standard for establishing management directions related to OHV use on BLM administered lands in the project area. Although lands included within the project area are within a BLM designated Recreation Management area, recreation use of the area is limited to big game and bird hunting and occasional weekend explorers.

### **3.14 Visual Resources**

The management system for visual resources begins with a process which evaluates landscapes according to three factors: scenic quality/visual appeal, sensitivity/public concern for scenic quality, and distance from the observer. The BLM has developed the Visual Resource Management System (VRM) to classify visual resources based on scenic quality, visual sensitivity, and visual distance zones. Air Quality Related Values (AQRV) include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified for a particular area. Air pollution can impact AQRVs through ambient exposure to elevated atmospheric concentrations, such as ozone effects to vegetation, through impairment of scenic views by pollution particles in the atmosphere, and through deposition of air pollutants, such as sulfur and nitrogen. It is important to note that VRM is based on human perceptions and expectations in the context of the existing landscape.

VRM classes include:

- Class I areas-The objective of this class is to preserve the existing character of the landscape. These are lands that are afforded specific AQRV protection under the Clean Air Act.
- Class II areas- The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. These lands, under NEPA, may be analyzed to assess AQRV impacts if they are identified as sensitive Class II areas.
- Class III areas-The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
- Class IV areas-The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high.

All lands within the WBI 1M Amendment 2 project area are classified as VRM Class III. This landscape is dominated by sagebrush and saltbush grasslands, similar to adjacent lands throughout south-central Montana and Wyoming's Big Horn Basin. As a Class III area, management activities may attract attention but should not dominate the view of occasional motorists on the Bear Canyon Road or U.S. Highway 310. Mine activities have modified the landscape by creating changes in form, line, color and texture of the landforms. New temporary landforms are created including overburden stockpiles, mine pits, soil stockpiles and roads.

### **3.15 Noise**

Noise in the general area of WBI 1M Amendment 2 results from bentonite mining activities (scrapers, dozers, haul trucks, and water wagons) and very occasional traffic along the Kinder-Morgan/Spectra Energy Pipeline access road.

Noise, as perceived by humans, is affected by intensity, pitch, and duration. Loudness is measured in decibels (dB), whereas the A-weighted sound scale (dBA) represents environmental noise. Mining activities are typically subject to noise regulations imposed by the Mine Safety and Health Administration (MSHA). Noise generated by trucks, dozers and other mine equipment typically ranges from 90 to 100 dBA at the source. For comparison, a gas lawnmower at three feet would register about 95 dBA, and a jet flying over at 1,000 feet would register about 105 dBA.

### **3.16 Transportation**

WBI is proposing to utilize existing roadways that currently service WBI and ACC bentonite mining operations extending through the eastern half of section 24; Township 9 South Range 25 East and portions of sections 19, 29, 30, 31 & 32 Township 9 South Range 26 East.

Bentonite is hauled by contract haul trucks. Haul patterns are characterized by intermittent periods of relatively high truck volume, when WBI's Lovell Plant production requires raw materials from this mine area to be targeted for hauling, coupled with long periods of up to several months with no hauling activity. Hauling would also commonly shut down during inclement weather. During active hauling operations, up to 25 or more loads per day would be hauled from WBI's 1M Amendment 2 mine site to the Lovell processing plant. No new authorizations would be required to utilize these roadways.

There are no existing BLM-issued transportation related right-of-ways within the project area.

### **3.17 Social and Economic Conditions**

#### Carbon County, MT

Carbon County extends from the base of the Beartooth Mountains to the base of the Pryor Mountains and is a popular tourist and recreationist destination that includes the Beartooth All-American Road and Scenic Highway, Red Lodge ski resort, most of the Bighorn Canyon National Recreation Area and part of the Pryor Mountain Wild Horse Range. In 2012, the U.S. Census Bureau estimated the population of Carbon County, Montana to be 10,127 residents with a population density of 4.9 persons per square mile, compared to 6.8 persons per square mile for the state. Slightly over 19 percent of the county population is 65 years or over, compared to 15 percent for the state. Carbon County population density data is influenced by the location its County seat, Red Lodge, which is also a regional recreational hub located about 55 road miles west of the WBI project area. It had a population of 2,125 in 2010. Other smaller communities in the County include Belfry, Bridger, Fromberg, and Joliet. In 2007, Carbon County had 715 farms and ranches with 335 (47 percent) of the principal operators identifying farming and ranching as their primary occupation. The number of farms and ranches increased two percent between 2002 and 2007 while the amount of land in farms increased by five percent and the average size of the farm increased by four percent to 1,110 acres. There are 220,384 acres of BLM administered surface land and 356,418 acres of BLM administered mineral estate in Carbon County. Activities on BLM administered lands include oil & gas leasing and production, bentonite production, recreation use, livestock grazing and rights-of-way (USDI-BLM, 2013b; Chap. 3 pg 230).

#### Big Horn County, WY

Big Horn County is located south of the MT-WY border, directly south of Carbon and Big Horn Counties, MT. It is home to part of the Pryor Mountain Wild Horse Range (PMWHR), the Pryor Mountain Wild Mustang Center (PMWMC) and part of the Bighorn Canyon National Recreation Area. The 2012 U.S. Census Bureau population estimate for Big Horn County was 11,794, with a density of 3.7 persons per square mile. Basin, the county seat, had a population of 1,269 in 2010. Lovell, with a 2010 population of 2,604, is the largest community in Big Horn County and the location of the PMWMC. Other small communities (less than 1,000 people) in Northern Big Horn County include Frannie, Deaver, Byron, and Cowley. There are 4,303 acres of BLM administered surface land and mineral estate in Big Horn County. Activities on BLM administered lands include livestock grazing and recreation on the PMWHR. In addition, some communities in this county are affected by mineral development on BLM administered land in the adjacent Montana counties.

#### WBI 1M Amendment 2 Project Area

Bentonite mining has been a major industry in the south-central Carbon County, MT and the Lovell, WY area for many years. WBI and ACC have been active in the area since the 1960s and both have processing facilities near Lovell, WY that receive bentonite from their Carbon County, MT mining operations.

Social-economic conditions of the project area in MT reflect a rural, sparsely populated setting, particularly in the region near Warren (unincorporated community). Most of the workforce for

WBI's 1M Amendment 2 operation would be based in WY, specifically, Lovell and the four other small communities noted above.

When fully operating, WBI has from 20-25 full-time employees working at its Sage Creek Plant in Lovell, with an additional 12-15 contract employees working for mining/hauling operation to feed that plant. WBI also employs 8-10 additional supervisory support staff at its Greybull, WY headquarters office with exploration, design and operational responsibilities for mining, engineering and environmental permitting. These employees are all dependent on the local bentonite production for their livelihood.

### Economic Conditions

Collectively, the Warren, MT and Lovell, WY regional economy is dependent on agriculture (farming and ranching), sugar beet processing, limestone mining/processing, oil and gas extraction and bentonite mine-related activities. Most of WBI's Lovell region field operations employees live in the small communities listed above in Big Horn County, WY.

The U.S. Census Bureau reports the per capita money income for Big Horn County, WY from 2007 to 2011 was \$25,452, with a median household income of \$52,597. For Carbon County, MT, those figures were \$25,943 and \$46,194, respectively.

WBI starting wage is approximately \$17.00/hour (\$35,360 annually) with numerous additional benefits including paid holidays, vacations and medical insurance. This exceeds the average annual per capita incomes reported above for Big Horn and Carbon Counties by approximately \$10,000.

WBI reports (Dale Nuttall, personal communication) the average annual production at its Sage Creek Plant is approximately 170,000 tons. The WBI Sage Creek operation is also supported by additional active mining claims on nearby federal and WY State lands. The Federal Government receives a \$140 maintenance fee for each claim; WY receives lease payments and royalties on bentonite developed from State properties to help fund its schools.

### **3.18 Mineral Resources and Geology**

Bentonite is a fine-grained mineral composed mainly of montmorillonite clay that forms as a result of in-situ alteration of rhyolitic volcanic ash. Pyroclastic material was ejected into the atmosphere by volcanic activity during Cretaceous time, and deposited in a marine environment. Bentonite is the only known locatable mineral resource in the area of the Proposed Action. Although it occurs in economical quantities in three Cretaceous age formations – the Frontier Formation, Mowry Shale, and Thermopolis Shale, only the F2 and F3 bentonite beds of the Frontier Formation are targeted for new mining under the WBI 1M Amendment 2 Plan modification. The Frontier formation is not considered to be geologically unique. These bentonite-bearing strata are generally composed of sodium bentonite beds of varying thicknesses up to 5-10 feet thick, inter-bedded with gray, marine shales and claystones which were deposited in the Cretaceous Interior Seaway approximately 99-106 million years ago (Slaughter and Early, 1965).

### Regional geology & local topography

The Big Horn Basin is bounded by Laramide mountain building to the northwest, north, and east, along with Absoraka volcanics to the west. The center of the basin is filled with flat-lying Eocene sediments, with progressively more complex folding and faulting in Mesozoic and Paleozoic strata as the flanks of the mountains are approached. A “stylized” geologic column of the major Big Horn Basin (and south-central MT) bentonite formations with highlights on bentonite beds targeted with this modification has been included as Figure 7.

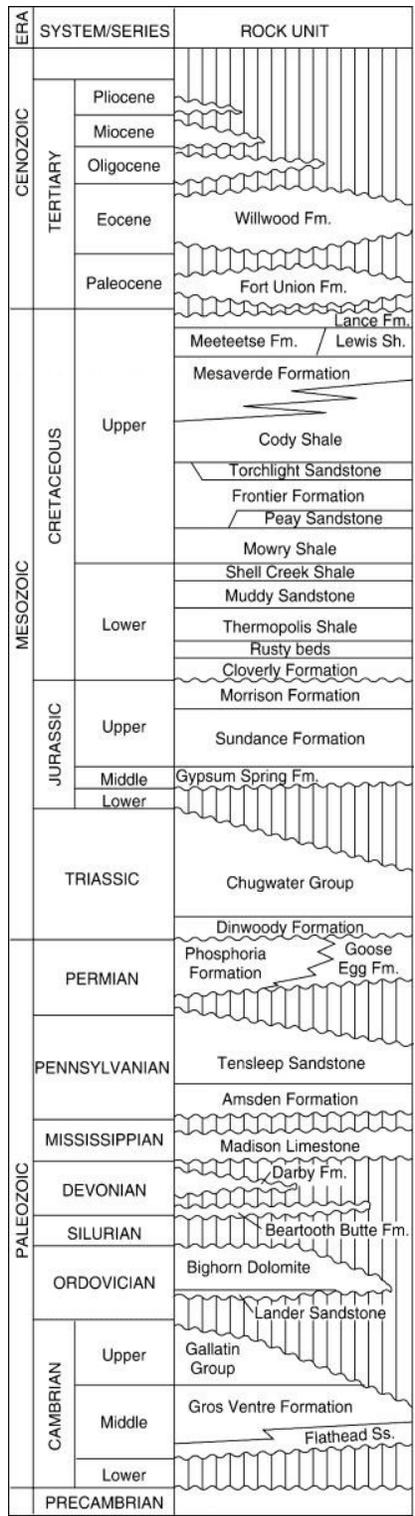
Topography within WBI’s 1M Amendment 2 is typical of bentonite geology in the area. A steeply dipping Mowry Formation is bounded by more gentle topography laterally on the east (Thermopolis Shale formation) and west (Frontier formation).

### Overburden quality

Overburden sampling characterizes soils and rock units below the surface to determine if exposure to the atmosphere or to potential groundwater/surface water would adversely affect the environment and whether the overburden may be suitable plant growth medium. Overburden considered adverse to groundwater/surface water and plants is generally managed to minimize its impact to the environment and potential rooting zones. This would include entombing unsuitable material above groundwater zones and well below the surface to prevent any wicking or capillary draw. Drill hole samples determined that groundwater was not present to the depth of mining, therefore it is not a major concern. Four separate drill holes (two on the F2 bed and two on the F3 bed), yielding 15 overburden samples from the F2 and 13 overburden samples from the F3 bed were tested for several parameters including pH, percent saturation, conductivity, calcium, magnesium, sodium, Sodium Absorption Ratio (SAR), and acid-base potential (ABP). Suitability of F3 bed overburden for use in reclamation was found to be acceptable throughout the profile. Suitability of F2 bed overburden has areas with acid, total sulfur ABP and sodicity concerns.

### Mineral resources

No commercially valuable minerals such as sand and gravel, or flagstone, are located in the proposed project area. In addition, no oil and gas leases are known to be located within this area, nor do any solid leasable minerals such as coal or trona occur in the area.



**Figure 7: General Stratigraphic Column of the Bighorn Basin; Emphasis on the Cretaceous Frontier Formation (1M Amendment 2 Plan Modification Area) Source: Wyoming Geological Association (1989)**

## **Chapter 4 Environmental Consequences**

### **4.1 Introduction**

Anticipated direct and indirect impacts of the Proposed Action and Alternatives are discussed in this chapter. Cumulative effects and potential mitigation measures are also described for those resources for which direct or indirect impacts have been identified. As stated in 40 CFR 1508.7 “. . . cumulative effects are impacts on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes such action. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time”.

Potential mitigation measures are identified, where necessary, in response to anticipated impacts of the Proposed Action. Mitigation measures can be required by BLM as a condition of approval (Decision Record) and are implemented by incorporating them into the POO.

### **4.2 Assumptions and Analysis Guidelines**

In order to evaluate potential environmental impacts resulting from the Proposed Action and any other long range future actions, agencies evaluate potential mining development using existing levels of development, mine plans developed for this proposal and a Reasonably Foreseeable Development (RFD) scenario for long term (10 to 20 years) future development within the Cumulative Effects analysis area by WBI and ACC. Mine plans have been developed for all the lands WBI wishes to add through 1M Amendment 2 to MT Mined Land Reclamation Permit No. 1771 (Figure 2; Chapter 2).

The RFD area is regarded by BLM as lands possessing future mining potential that could be permitted within the next 10 years by WBI or ACC. These lands are largely unexplored with no presently submitted mine plans. The RFD represents a best guess scenario for additional lands that could be permitted and mined in the ten year timeframe. The RFD would be used solely to allow BLM to analyze the cumulative (future) effects in the area delineated on Figure 9 and Figure 10. This RFD impact analysis is based on previous events, experience of personnel and their knowledge of resources in the area.

#### **4.2.1 Assumptions Common to All Alternatives and Resources**

##### **4.2.1.1 Past and Present Developments (Existing)**

This WBI project area lies within the larger Warren, MT bentonite mining region where both WBI and ACC currently operate. WBI's mine-related disturbances in this area currently extend southerly from Bear Canyon Creek in the SE $\frac{1}{4}$  Section 24, Township 9 South Range 25 East towards the SWSW $\frac{1}{4}$  Section 29 Township 9 South Range 26 East which is about one mile north of the MT-WY State line (Figure 2; Chapter 2). Development proposed with this application parallels existing WBI mining with an off-set of about a quarter mile to the southwest. The proposed disturbance would begin at the MT-WY State line in the SW $\frac{1}{4}$  Section 32, Township 9 South Range 25 East and proceed northwesterly to the SW $\frac{1}{4}$  Section 24, Township 9 South Range 25 East (Figure 2; Chapter 2). The Warren mining area lies entirely within the Sage Creek watershed. Direct and indirect impacts from the proposed action would be confined to the Warren Mine area, with hauling activity extending along existing haul road networks to WBI's Lovell, WY processing plant. Cumulative Effects analysis considers area adjacent to this project

that includes relevant biologic, geologic, geographic, sociologic or cultural connections. The Cumulative Effects analysis area selected for this WBI project includes significant mining activity by ACC (Figure 9 and Figure 10).

Dominant land uses for the proposed mine area are domestic grazing, wildlife habitat, bentonite mining and uses associated with being designated an energy corridor.

#### **4.2.1.2 Wyo-Ben, Inc.**

WBI, with offices in Billings, MT; Greybull, WY and Lovell, WY has been mining bentonite in the Warren mining region under MT Mine Land Reclamation Permit No. 1771 since June, 2000. This proposal would be the second amendment to the initial permit that contains 246.2 total acres; with 84.7 acres currently disturbed by mining, an additional 6.2 acres affected by roads, 84.7 acres reclaimed and 45.0 acres pending MT DEQ approval for bond release. All 246.2 acres in the permit are federally owned and administered by the BLM (Figure 1; Chapter 1). This modification to WBI's existing POO, if approved as submitted, would increase the permit by 940.0 acres, all of which are federal (BLM) lands. The proposed disturbed area associated with 1M Amendment 2 would be 554.7 acres. This activity is the only bentonite mine permit WBI has in MT.

#### **4.2.1.3 American Colloid Company**

ACC has 7,493.38 acres of mixed federal and private lands permitted under MT Opencut Mine Permit 8 in Carbon County. This permit extends about fourteen miles in a northwesterly direction from the northern border of WBI 1M Amendment 2 near Bear Canyon Road in section 24, Township 9 South, Range 25 East and five miles southeasterly from that point to the WY border. The 2012 Annual Progress Report for MT Permit 8 indicates ACC had disturbed about 991.3 of combined private and federal acres including about 108.02 acres of BLM lands. An additional 52.9 acres are affected by ACC haul roads, 16.5 acres of which are BLM surface. About 744.2 acres of the combined federal and private lands have been reclaimed. There are no lands in Permit 8 that have been fully released from reclamation bonding obligations. ACC intends to continue mining in the Bear Canyon Creek vicinity into the foreseeable future.

#### **4.2.1.4 Summary of Warren Mining Region**

The combined WBI/ACC permitted acreage in the Carbon County, MT mining region is 7739.58 acres of which about 1135.1 acres (including roads) have been disturbed by mining (**Table 15**). About 828.9 acres of mine-related disturbances have been reclaimed and 6,910.68 acres were never disturbed. None of the previously affected lands have been fully released from bonding liability.

**Table 15: Land Status Summary for WBI and ACC MT Mine Permits in Carbon County**

	<b>WBI</b>	<b>ACC</b>	<b>Totals</b>
<b>Acres Presently Permitted</b>	246.2	7493.38	7739.58
<b>Acres Undisturbed</b>	161.5	6449.18	6610.68
<b>Acres Reseeded</b>	84.7	744.2	828.90
<b>Acres in Active Mining</b>	0.0	247.1	247.10
<b>Acres Haul Roads</b>	6.2	52.9	59.10
<b>Total Acres Mine Related Disturbance</b>	90.9	1044.2	1135.10
<b>Acres Fully Released From Bond</b>	0	0	0

**4.2.2 Proposed Action, Cumulative Effects Analysis and Reasonable Foreseeable Development Areas**

WBI’s 1M Amendment 2 modification would increase Permit No.1771 by 940.0 acres, all of which would be federal (BLM) lands. WBI’s 1M Amendment 2 area, including all mine-related impacts such as pits, haul roads and stockpiles, would total approximately 554.7 acres. The Cumulative Effects Analysis (CEA) area considers a total of 59,202 acres of mixed federal, private and state lands adjacent to this project boundary. Bentonite mining and reclamation could also occur on an additional 1,418.5 acres of the Reasonable Foreseeable Development (RFD) lands within the CEA area (lands currently permitted and lands projected for inclusion in future permitting efforts) using development strategies and methods consistent with those discussed for 1M Amendment 2. These acreages are a “best guess” scenario based on limited exploration drilling. As bentonite reserves are identified and mine plans are developed, acreages would change.

Approximately 4,899 acres in the CEA area have been previously affected by past development. These are summarized in Table 16. A summary of the activities occurring in the Cumulative Analysis area can be found in Section 4.21.

**Table 16: Summary of Previously Affected Lands within the CEA and RFD Areas.**

<b>Disturbance Type</b>	<b>Previously Affected Lands (acres) in CEA</b>	<b>Previously Affected Lands (acres) in RFD</b>
Paved Roads	97	0
Unpaved Roads	321	11
Pipelines	295	14
Mining	1,493 (146 bond rel. in WY)	150
Towns and Farms	15	0
Agriculture Fields	2,278	0
Railroads	180	0
Oil and Gas	25	0
Other (industrial sites, cell towers, powerline substations, pipeline pump stations, sand/gravel)	20	0
<b>Totals</b>	<b>4,724</b>	<b>175</b>

## **4.3 Topography**

### **4.3.1 Proposed Action, Direct Impacts, Indirect Impacts and Cumulative Impacts**

The proposed action would add 554.7 acres to the total 84.7 acres of currently disturbed land in WBI's Warren mining region. This impact would be a permanent effect to the landscape. The proposed action would alter existing landscapes during mining. Reclamation activities would contour affected lands to blend with surrounding topography and restore slopes no steeper than 5:1 to protect from wind and water erosion. Preexisting channels would be restored to convey water discharge, and those with a high probability for erosion would be armored to resist accelerated erosion and degradation of the channel.

Bentonite on the proposed mine sites lies in deposits ranging from 2.5 to 3.5 feet thick. Ore removal, however, would generally not result in topographic reductions of comparable thickness because of overburden swelling characteristics. On relatively level sites, post mine contours would approximate original premine contours, although restored land surfaces would have reduced topographic diversity. Reduction of topographic diversity can diminish vegetation and habitat diversity resulting in a reduction of wildlife carrying capacity in restored areas for some species.

### **4.3.2 Alternative 2 (No Action), Direct and Indirect Impacts**

The additional impacts to the topography as described in the proposed action would not occur, but permitted mining areas would continue to be impacted until currently permitted reserves are exhausted.

#### **4.3.2.1 Alternative 2 (No Action) Cumulative Impacts**

The cumulative impacts to topography would be limited to those described for mining currently existing permitted reserves but would not include impacts for the proposed action on federal lands because it would be denied under this alternative. It would include those impacts that might occur in the future within the RFD areas (roughly estimated at 1,418.5 affected acres).

### **4.3.3 Alternative 3 (Wildlife Mitigations), Direct and Indirect Impacts**

Topographic impacts would be as described in the Proposed Action, except that no topographic impacts would occur on the northern 138.7 acres of the mine plan.

#### **4.3.3.1 Alternative 3 (Wildlife Mitigations) Cumulative Impacts**

Under this alternative, 416.0 affected acres would be added to the total 84.7 acres of currently disturbed land in WBI's Warren mining region. Otherwise impacts are the same as those described under the Proposed Action. This impact would be a permanent effect to the landscape.

### **4.3.4 Mitigation**

Additional mitigation for topographic impacts would not be necessary.

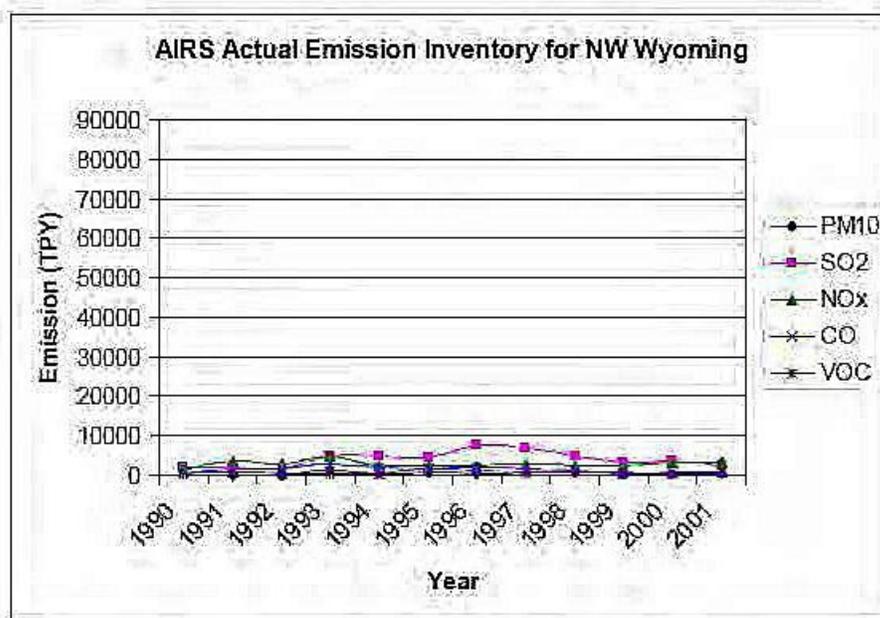
## **4.4 Air Quality**

### **4.4.1 Proposed Action, Direct and Indirect Impacts**

No site-specific air quality data are available from the WBI 1M Amendment 2 area. However, air quality in the area is considered to be generally good, and is in compliance with state and

National ambient air quality standards (MT Air Quality Monitoring Network Plan, May 2013; Appendix B). Total suspended particulate matter (TSP) data are available from Lovell, WY (approximately 15 miles south of WBI 1M Amendment 2). The long-term mean for TSP at Lovell is 32 micrograms per cubic meter (USDI-BLM, 2013c). Figure 8 below (1990-2001) is taken from an Emissions Data Assessment of the WDEQ Air Quality Division entitled “2003 Review Report on Wyoming Long Term Strategy for Visibility Protection in Class I Areas”. This report provides some general baseline data on air quality in northwest WY. Emissions shown on the Figure 8 are particulate matter 10 (PM10), sulfur dioxide, carbon dioxide, nitrogen oxides, and volatile organic compounds. PM10 is particulate matter with an aerodynamic diameter of up to 10 micrometers (about 1/7 the diameter of a single human hair). Particulate matter includes dust, soot and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources, including burning of diesel fuels by trucks and buses, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining operations, agricultural and forest burning, and operation of fireplaces and woodstoves. Emission levels in northwest WY are much lower than levels in highly developed and industrialized areas (USDI-BLM. 2013d).

**Figure 8: AIRS Actual Emission Inventory for NW Wyoming 1990-2011**



The air-shed associated with the Project Area is classified as Class II, which generally allows concentrations of some air pollutants to increase to accommodate regional economic development. Bentonite mining and hauling activities are a source of particulate and gaseous emissions. Fugitive dust emissions are generated by mining, hauling and stockpiling operations. Gaseous air pollutants include sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC). The source for these emissions would be diesel-fired engines used to power mining equipment and haul trucks. All emissions from mining bentonite are fugitive emissions emitted at ambient temperature with no momentum. These emissions are not expected to impact visibility or air quality to a measurable degree.

EPA has adopted emission standards for all types of non-road engines, equipment, and vehicles. WBI's contractor, GK Construction, maintains a haul truck and mining equipment fleet (over the road haul-trucks; off-road excavators, wheel-loaders, motor graders, motor scrapers, and dozers) that is 80% Tier 4 and 20% Tier 3 compliant (Richard Grandalen, President, GK Construction, Personal Communication). The U.S. EPA Tier standards for non-road diesel engines were adopted in 1994. Table 17 provides a summary of EPA Non-road Compression-Ignition Engines—Exhaust Emission Standards. Table 18 provides a summary of the CO, NO<sub>x</sub> and PM pollutants that would be anticipated under this option.

Fugitive dust generated by wind erosion on the moderate to severely susceptible soils would elevate TSP from average background concentrations. This would continue on a long-term basis. Mining and hauling would increase surface exposure and raise fugitive dust concentrations over the short term, until vegetation would become well established. Increased vegetative production over time on successfully reclaimed lands would have a positive effect on reducing fugitive dust generation from wind erosion. Chemical control of noxious weeds could produce localized, short term, minute impacts to air quality by drifting in and around the treatment areas.

**Table 17: EPA Non-road Compression-Ignition Engines—Exhaust Emission Standards**  
<http://www.epa.gov/otaq/standards/nonroad/nonroadci.htm>

Rated Power (kW)	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NO <sub>x</sub> (g/kW-hr)	NO <sub>x</sub> (g/kW-hr)	PM (g/kW-hr)	CO (g/kW-hr)
225≤kW<450	3	2006-2010		4.0		0.20	3.5
	4	2011-2013		4.0		0.02	3.5
	4	2014 <sup>+</sup>	0.19		0.40	0.02	3.5
450≤kW<560	3	2006-2010		4.0		0.20	3.5
	4	2011-2013		4.0		0.02	3.5
	4	2014 <sup>+</sup>	0.19		0.40	0.02	3.5

**Table 18: WBI Projected Annual Exhaust Emissions**

Range of Rated Power (kW)	G.K. Inc., LLC equipment type	Estimated mining hours/year <sup>a</sup>	Tier <sup>b</sup>	Model year	% of G.K. fleet <sup>c</sup>	Federal EPA Exhaust Emission Standards for Nonroad Compression-Ignition Engines <sup>d</sup>			Projected Annual Emissions at estimated hours of operation if operate at Federal Standard Level					
						NMHC + NO <sub>x</sub>	PM	CO	NMHC + NO <sub>x</sub>		PM		CO	
						(g/kW-hr)	(g/kW-hr)	(g/kW-hr)	grams/kW-hr	Tons/Yr <sup>e</sup>	grams/kW-hr	Tons/Yr	grams/kW-hr	Tons/Yr
225≤kW<450	scrapers	300	3	2006-2010	50%	4	0.2	3.5	1200.00	0.50	60.00	0.02	1050.00	0.43
		1200	4	2011-2013	50%	4	0.02	3.5	4800.00	1.98	24.00	0.01	4200.00	1.74
	dozers	200	3	2006-2010	20%	4	0.2	3.5	800.00	0.33	40.00	0.02	700.00	0.29
		800	4	2011-2013	80%	4	0.02	3.5	3200.00	1.32	16.00	0.01	2800.00	1.16
	trackhoe	1000	4	2011-2013	100%	4	0.2	3.5	4000.00	1.65	200.00	0.08	3500.00	1.45
	Wheel-loaders	400	4	2011-2013	100%	4	0.2	3.5	1600.00	0.66	80.00	0.03	1400.00	0.58
	Motor-graders	400	4	2011-2013	100%	4	0.2	3.5	1600.00	0.66	80.00	0.03	1400.00	0.58
	Haul Trucks	800	4	2011-2013	100%	4	0.2	3.5	3200.00	1.32	160.00	0.07	2800.00	1.16
<b>TOTAL ANNUAL ANTICIPATED EXHAUST EMISSIONS</b>								<b>20400.00</b>	<b>8.43</b>	<b>660.00</b>	<b>0.27</b>	<b>17850.00</b>	<b>7.38</b>	

NMHC=Non-MethaneHydrocarbons

<sup>a</sup>Provided by Dale Nuttall, WBI

<sup>b</sup>Refers to EPA Standards Adopted in 2004

<sup>c</sup>Provided by Richard Grandalen, G.K. Inc., LLC

<sup>d</sup><http://www.epa.gov/otaq/standards/nonroad/nonroadci.htm>

<sup>e</sup>Assumes Rated Power Average of 375kW

#### **4.4.1.1 Proposed Action, Cumulative Impacts**

True cumulative impacts to air quality are extremely difficult to quantify and are probably negligible. As mining activity shifts into the WBI IM Amendment 2 area, mining in adjacent areas south of the Wyoming border would decrease and reclamation activities increase as previously permitted pit sequences are completed. Reclamation within the new sequence would be conducted concurrently with mining after completion of the initial phases, so as new mine areas open, previously mined areas are recontoured and revegetated. Thus, impacts from blowing dust particles and emissions would be anticipated to be of short duration. There would be some small amount of cumulative impact from mine area to mine area but only over the short term until the mining and reclamation cycles are complete. Similar impacts would result from mining the RFD area sometime in the future.

It is not anticipated that direct air quality impacts from the proposed action would violate any local, state, tribal, or federal air quality standards.

#### **4.4.2 Alternative 2 (No Action), Direct and Indirect Impacts**

This alternative would not have additional impacts to air quality beyond those already expected in currently permitted mining operations in the Warren mining region.

##### **4.4.2.1 Alternative 2 (No Action) Cumulative Impacts**

There would be no cumulative impacts beyond currently mined and permitted acreage limits because no new mining would take place.

#### **4.4.3 Alternative 3 (Wildlife Mitigations), Direct and Indirect Impacts**

Air quality impacts would be as described in the Proposed Action, except reduced by approximately 25 percent.

##### **4.4.3.1 Alternative 3 (Wildlife Mitigations) Cumulative Impacts**

Air quality impacts would be as described in the Proposed Action, except reduced by approximately 25 percent.

#### **4.4.4 Mitigation, Alternatives 1, 2 and 3**

Dust emissions would be partly mitigated by intermittent dust suppression (watering) of the haul roads and concurrent reclamation (reduction of emission source). Main haul roads would be watered to suppress dust from bentonite hauling when needed. The quality of the source water for dust suppression would be tested for suitability prior to its use on public lands.

### **4.5 Hydrology**

#### **4.5.1 Groundwater, Proposed Action, Direct and Indirect Impacts**

Limitations in equipment capabilities and mining procedures result in less than 100% removal of bentonite from open pits. However these residual bentonite amounts function to variously impede downward migration of infiltrating surface waters and shallow groundwater into deeper aquifers. In addition, native overburden materials are mixed during removal and backfill, changing profile arrangements and altering chemistry equilibriums and cycling in the near surface and sub-surface environments. Small amounts of residual bentonite could also potentially create new perched groundwater tables and saline seeps in the backfilled environment.

Data indicate no useable groundwater exists above the deepest projected depth of mining. It is therefore anticipated that no aquifers would be impacted. However, changes in surface water drainage, infiltration rates and concentrations of soluble salts due to replacement and mixing of spoils would impact water qualities of other shallow subsurface waters. Sediments escaping from disturbed areas by wind erosion, water transport or mining related activities could introduce trace amounts of bentonite or other contaminants into surface waters with connectivity to groundwater.

#### **4.5.1.1 Groundwater, Proposed Action, Cumulative Impacts**

Proposed (554.7 acres) and RFD (2,555.5 acres) mining in the CEA area would increase mining-related disturbance acreage in the CEA by approximately 170 percent. Direct and indirect effects of bentonite mining on groundwater would be minimal because of the lack of aquifers in the area. Even minimal impacts would be localized. Past, present, and future mining in MT and WY would influence potential impacts along with other land uses such as grazing, pipeline or powerline construction, or oil and gas development if they were to occur.

#### **4.5.2 Groundwater, Alternative 2 (No Action), Direct and Indirect Impacts**

Under the no action alternative, the impacts described in the Proposed Action would not occur. There would be continued minimal impacts from past and current mining, grazing, and other land uses within the impacted ephemeral watersheds.

#### **4.5.2.1 Groundwater, Alternative 2 (No Action), Cumulative Impacts**

The cumulative impacts under this alternative would be very similar to the cumulative impacts described for the Proposed Action except 557.4 fewer acres would be impacted.

#### **4.5.3 Groundwater, Alternative 3 (Wildlife Mitigations), Direct and Indirect Impacts**

Ground water impacts under this alternative would be the same as those described for the Proposed Action except that the disturbed area involved would be reduced by approximately 25 percent.

#### **4.5.3.1 Groundwater, Alternative 3 (Wildlife Mitigations) Cumulative Impacts**

Ground water impacts under this alternative would be the same as those described for the Proposed Action except that the disturbed area involved would be reduced by approximately 25 percent.

#### **4.5.4 Surface Water, Proposed Action, Direct and Indirect Impacts**

Bentonite mining activities (e.g., surface disturbance, construction of roads, removal and replacement of overburden, and rerouting of stream systems) would impact surface water resources by disrupting natural surface water flow, altering drainage patterns, changing dissolved and suspended constituents in flowing water, changing infiltration rates and altering overland flows; thereby impacting erosion and sedimentation rates. Soil compaction would increase overland flow and erosion and sedimentation. Increases in erosion and sedimentation would occur during mining activities until reestablishment of sufficient vegetation. Sediment escape from the site caused by wind, water, or mining related activities could introduce trace amounts of bentonite into surface water.

During active mining operations and lasting until establishment of sufficient vegetation, slight increases in total dissolved solids (TDS) and total suspended solids (TSS, turbidity) would be expected. Run-off related sediment loads from disturbed surfaces would increase relative to native, vegetated prairie. Some ephemeral drainage channels would be directly impacted by mining activity through diversion, removal, and reestablishment. Alteration of ephemeral drainage flow patterns would occur during mining as flow is directed around active mine sites. Ephemeral drainages would be reestablished during the reclamation process, but not necessarily to the same location or pattern.

Reclaimed channel slopes and beds would have gradients approximating original contours with comparable overland flow velocity and infiltration rates.

No culvert installations are planned with this application.

#### **4.5.4.1 Surface water, Proposed Action, Cumulative Impacts**

Water is affected by past and present land use, dams, natural events, and changes in local and global climatic patterns. Water resources are connected throughout a watershed which compounds the effects of land use throughout an entire watershed. The cumulative effects of surface-disturbing activities within uplands, riparian areas, and stream channels by grazing, mining, road building and agricultural practices have contributed to accelerated erosion and increased sedimentation. Sedimentation from activities in upper watersheds are compounded as drainages combine and flow into larger streams and rivers.

In addition to the 554.7 acres of new disturbance proposed by this action, in WBI's existing MT Land Reclamation Permit No. 1771, has had 84.7 acres disturbed and reclaimed through seeding. These disturbed acres, along with haul roads, would continue to cause slightly elevated levels of total suspended and dissolved solids in overland flows until successfully revegetated for bond release.

Proposed (554.7 acres) and RFD (2,555.5 acres) mining in the CEA area would increase mining-related disturbances by approximately 170 percent. All of this would occur in the Sage Creek watershed with Sage Creek, a tributary of the Shoshone River in WY, being the receiving waters. Sage Creek, which accepts water from the mining area, is an impaired waterway listed on the EPA 303(d) list because of biological contaminants. WBI activity would likely increase sediment discharges to Sage Creek. After reclaiming and stabilizing an area, WBI would remove any temporary sediment barriers, and reestablish drainages. Mitigation measures put into place during and after mining would reduce effects on local surface water resources, or on downstream resources that might otherwise be affected by sediment or other pollutants

Total Maximum Daily Load (TMDL) implementation recommendations developed by the WY DEQ/Water Quality Division would be implemented to reduce cumulative impacts. This relative increase in direct and indirect impacts on surface water would also be increased by future mining in MT and WY. Other land uses such as grazing, pipeline or powerline construction, and oil or gas development would further compound impacts.

#### **4.5.5 Surface Water, Alternative 2 (No Action), Direct and Indirect Impacts**

Under the no action alternative, the impacts described in the Proposed Action would not occur. There would be continued erosion and sedimentation from past and current mining, grazing, and other land uses within the Bear Canyon Creek and Sage Creek watersheds.

##### **4.5.5.1 Surface Water, Alternative 2 (No Action), Cumulative Impacts**

The cumulative impacts under this alternative would be very similar to the cumulative impacts described for the Proposed Action except they would occur on 554.7 less acres because 1M Amendment 2 would not be mined.

#### **4.5.6 Surface Water, Alternative 3 (Wildlife Mitigations), Direct and Indirect Impacts**

Surface water impacts under this alternative would be the same as those described for the Proposed Action except the disturbed area involved would be reduced by approximately 25 percent.

##### **4.5.6.1 Surface Water Alternative 3 (Wildlife Mitigations) Cumulative Impacts**

Surface water impacts under this alternative would be the same as those described for the Proposed Action except the disturbed area involved would be reduced by approximately 25 percent.

#### **4.5.7 Surface Water, Mitigation, Alternatives 1, 2 and 3**

WBI holds a stormwater permit (MTR000505) from MT that requires use of BMPs to control the amount of sediment leaving the site. According to WBI's mine plan, disturbed areas would be isolated from overland flow with berms and v-ditches. Controlling run-on would reduce disturbed area run-off volumes, thereby decreasing erosion, sedimentation and changes in water quality. Reseeding, straw bales, sediment fences, check dams, and/or water bars would be utilized as necessary to minimize erosion and sedimentation. All sediment control measures taken by WBI would follow recommended BMPs such as use of erosion-control structures (i.e. sediment fences, straw bales or check dams, etc.) designed to minimize the water quality impacts. BMPs would be employed before, during, and after mining activities. Total Maximum Daily Load (TMDL) recommendations developed by the WY Department of Environmental Quality/Water Quality Division would be implemented to reduce cumulative impacts

As described in the referenced stormwater permit, water originating from disturbed lands where topsoil has been removed would be directed into open pit areas to allow heavier sediments to settle and the captured water to evaporate. These waters would not enter groundwater aquifers.

Surface flow diversions would be channeled within original watersheds and would occur around open pits and other affected areas during active mining stages to prevent erosion and sedimentation. No drainage would be blocked by material stockpile, stockpiling of overburden or soils. Channel design for both temporary and permanent diversions would match pre-mine channel gradients, sinuosity, and cross-sectional shapes. If necessary, sediment control would be installed and/or adequate vegetated buffer strips would be maintained at discharge points into natural channels. Erosion and sediment control structures would be maintained and installed as mining progresses.

Reclamation operations would include removal of all temporary diversions and reestablishment of through drainage. Reconstructed channels would approximate the existing slope for the purpose of minimizing water velocity and channels would be designed according to watershed size, peak flow, and velocity calculations. In all reconstructed channels, seeding would be done perpendicular to water flow to reduce erosion.

No mitigation additions would be required for enacting either Alternative 2 or 3.

## **4.6 Riparian and Wetland Areas**

### **4.6.1 Alternative 1 (Proposed Action), Alternative 2 (No Action) and Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts**

No Riparian or wetland areas exist within the project area and no impacts were assessed.

### **4.6.2 Mitigation**

No mitigation measures are necessary because no riparian or wetland areas exist in the project area.

## **4.7 Wildlife**

### **4.7.1a Alternative 1 (Proposed Action), Direct Impacts**

Direct impacts to wildlife resources include loss of habitat through construction activities, location of infrastructure (haul roads, mine pits, stockpile areas), and potential mortalities resulting from collisions with vehicles. A number of small animals (e.g. small mammals and reptiles) lacking mobility to escape heavy equipment activity may be destroyed by the mining operations. In addition, if construction and habitat removal occurs during nesting or brood-rearing seasons, upland game bird and songbird nests would be destroyed.

The proposed action would add 940.0 total acres and 554.7 disturbance acres to WBI's existing POO. This is a direct loss of 554.7 acres of wildlife habitat (both forage and cover). Although reclamation activities would be started within two years of initiating mining operations, the proportion of reclaimed land to affected land would vary as mining, stockpiling and field-drying progresses through the life-of-mine. Because the removal rate of stockpiled and field-dried bentonite from the project area would be dependent on the processing needs of the Lovell plant, the amount of affected land available for reclamation and the ratio of reclaimed to affected lands would range from approximately 20 percent in the early and mid-mining stages to 100 percent in the final stage. Temporary habitat loss would average approximately 80 percent of the affected lands during the ten year life-of-mine. Successful reclamation would stabilize disturbed sites and restore pre-mine land uses. Reclamation would not always recreate pre-disturbance values. Changing shrub-grasslands with intermingled forbs to environments characterized by perennial grass dominance would affect wildlife species that are sagebrush obligates by reducing vital habitat and forage. Approximately 40 percent of the proposed disturbance would be on lands dominated or co-dominated by Big Sagebrush. Within the project area, some species of passerine birds, small mammals, reptiles, Sage-grouse and Mule Deer would be affected by this change.

Shrubs, particularly big sagebrush, are important as winter dietary components and winter cover for both big game and Greater Sage-grouse. Big sagebrush also provides important nesting cover

for Greater Sage-grouse. Removal of shrubs during mining would decrease forage availability, reduce winter carrying capacities of sagebrush areas and reduce available nesting cover. Reclamation activities would provide forage vegetation (primarily grasses) in a relatively short period of time (less than three years). Native forbs are generally slower to reestablish than grasses and are typically only available as a food source during summer months. Vegetation that is suitable for wildlife cover (shrubs) would require a longer time to establish and mature. As shrubs begin to grow in reclaimed areas, they are primarily available in the summer months as forage. As they mature, gaining height and stature, shrubs provide hiding and thermal cover.

#### **4.7.1.1 Greater Sage-Grouse**

Greater Sage-grouse occupied habitat within and adjacent to the area of WBI's proposed 1M Amendment 2 would potentially be impacted by implementation of the Proposed Action.

As mentioned in Chapter 3, up to four historic Greater Sage-grouse lek locations are known within four miles of the eastern proposed project boundary. One of these is approximately two miles northeast of the northern reaches of proposed WBI mining disturbance. An additional six documented Greater Sage-grouse leks are located from four to six miles west of the proposed project area. All of these are also west of U.S. Highway 212 and north of the WY border. All four of the leks located east of the project have been documented to be active in at least one year since 2002, although only two have documented birds in attendance since 2008. These leks have not been consistently surveyed three times a year during this time period, so it is possible that birds were in attendance and not observed. Overall, the project area would be expected to provide genetic and habitat connectivity from the south-central MT Sage-grouse populations in this portion of Carbon County with populations in north-central WY. All of the lek sites and proposed bentonite development associated with this proposal are within BLM designated "Priority Protection Habitat" for Greater Sage-grouse. Under this alternative, mobile Sage-grouse would also be at risk from haul truck activity. The haul road servicing this proposed activity may support up to 25 round trips per day during intermittent seven to ten day hauling episodes, with fewer trips during other periods as needed.

In a study that looked at the influence of disturbance factors on Sage-grouse lek persistence in WY's Big Horn Basin, approximately 35-40 miles southeast of the proposed action, Hess and Beck (2012) found, "support for the synergistic influence of multiple disturbance factors influencing Sage-grouse lek persistence". They predicted that increasing roads, energy development, and wildfire would result in loss of Sage-grouse leks. While their study did not look at impacts from bentonite mining per se, their conclusion that multiple disturbance factors impact lek persistence is relevant. They recommend that conservation efforts should focus on minimizing well development and implementing wildfire suppression tactics within 1.6-km of active Sage-grouse leks. Other studies looking at coal mining activity in North Park, Colorado, found a substantial decrease in Sage-grouse lek attendance on two leks within 1.2 miles (2 km) of development activities relative to leks located more than 1.2 miles (2 km) from these activities (Remington and Braun, 1991). Male attendance decreased from 144 to zero and 44 to five on these two leks, and far exceeded fluctuations at other leks. Braun (1986) attributed declines to decreased recruitment of juvenile males (i.e., first-year breeders). Failure to recruit juvenile males could have resulted from juvenile male dispersal to different lek sites, poor nesting success or decreased survival of young resulting in fewer available replacement juveniles, or acoustical or physical factors that deterred juveniles from becoming established. Although Remington and

Braun (1991) indicated that leks closely associated with mining activity declined relative to control leks, overall greater-sage grouse population trends in their study area did not change, suggesting that the distribution rather than the number of breeding grouse was altered. However, it appeared the study area consisted of substantially more active leks (up to 35), with higher population totals compared to the general area adjacent to WBI's 1M Amendment 2. In the North Park study area, numbers of males counted that were considered to be located within the "mining area of influence" approached almost 400 in one year, and 1,100 in control areas outside of the mining area in the same year. Higher population levels would be expected to be more resilient to forces of impacting disturbances or environmental changes.

The four leks within four miles of the proposed action had 26 males in 2013, and these were divided between only two of the leks (Bear Canyon and Gravel Pit). The other two leks (Prospects and Gyp) were not occupied in 2013, Gyp has not had birds since 2004. The long-term average male attendance at these four leks is 17, 18, 6 and 2, respectively (lek attendance data provided by Shawn Stewart, MT FWP). In this comparison, if impacts occurred to Sage-grouse with this proposal, they would possibly affect a higher percentage of the area's Sage-grouse population. When impacts occur that result in a decrease in numbers in an already small population, a rebound to stable numbers is less likely to occur or would be expected to take much longer barring other detrimental factors.

It is not known if Sage-grouse currently utilizing leks closest to bentonite mining activities would be displaced to other adjacent lek sites. A slight possibility also exists that a new lek site may form at some distance from activities that is more tolerable to Sage-grouse, if suitable habitat exists.

Research on oil and gas impacts to Sage-grouse has been conducted in the last few years. In some instances, anthropogenic aspects of this research such as truck hauling, other traffic, and noise would be considered similar in impacts to aspects of this WBI proposal. Research in the Pinedale Anticline in WY found that main haul roads within three km of leks, and a length of greater than five km of main haul road within three km of leks negatively influenced Greater Sage-grouse male lek attendance. Rates of male lek attendance were negatively associated with increased traffic volumes. Additionally, vehicle activity on roads during the daily strutting period (i.e., early morning) had a greater influence on male lek attendance compared to those roads with no vehicle activity during the daily strutting period. Although portions of two leks used for traffic analyses were located on main haul roads, direct mortalities resulting from vehicle collisions were rarely observed. Further, because declines were associated with traffic volumes, they appeared to be related to male avoidance of traffic activity (Holloran, 2005). Remington and Braun (1991) reported that the upgrade of haul roads associated with surface coal mining activity in Colorado was correlated with declines in the number of displaying males on leks situated relatively near the road.

The closest leks associated with this Proposed Action all lie greater than two miles (3.2 km) east of the haul road servicing existing bentonite mines and that would also service proposed mining in the 1M Amendment 2 area. They are also separated from the proposed mining activity by a large ridge developed in the Mowry geologic formation which functions as a visual, topographic barrier. This haul road is expected to receive occasional light vehicle traffic and some bentonite hauling activity from previously approved mines, regardless of this action. Reducing overall

traffic volumes and isolating traffic disturbance with timing restrictions could reduce road effects on Sage-grouse. Considering the previous discussion, direct impacts on Sage Grouse are expected to occur in the form of habitat avoidance and mortality resulting from direct (albeit rare) strikes with equipment. The degree to which these impacts occur is indeterminate due to the presence of the Mowry Ridge and the distance (2 miles) to the nearest lek.

#### **4.7.1.2 Big Game**

MT FWP indicates the area within WBI's 1M Amendment 2 is Class 2 (high potential) winter habitat for mule deer and white-tail deer. Removal of native shrub species used for winter browse and shelter would reduce resources available to these species for winter survival. Increased mining and hauling activity associated with this proposed action would alter and increase winter movements for these species and result in increased energy demands that may be significant in harsh winters. These impacts would be mitigated by the relatively small amount of sagebrush habitat (118.5 acres) involved, relative to the total available sagebrush habitat in the CEA Area (36,277 acres); and by WBI's concurrent reclamation practices which would minimize non-vegetated habitat at any given point in time. The project area is also rated as Class 4 (poor) habitat for all other big game species including Pronghorn (*Antilocapra americana*) and Rocky Mountain elk (*Cervus canadensis*).

#### **4.7.1.3 Migratory Birds**

Several bird species were identified as inhabitants within the project area. Removal of native plant communities would reduce habitat for many migratory bird species. Impacts to sagebrush obligate species (e.g. Brewer's sparrow, Sage Sparrow, Sage Thrasher etc.) would be expected. Research in Sublette County, WY on the effects of natural gas development on sagebrush steppe passerines documented negative impacts to sagebrush obligates such as Brewer's Sparrows, Sage Sparrows, and Sage Thrashers (Ingelfinger, 2001). Impacts were reported greatest along roads where traffic volumes are high and within 100 meters of these roads. Sagebrush obligates were reduced within these areas by as much as 60 percent. Sagebrush obligate density was reduced by 50 percent within 100 meters of a road even when traffic volumes were less than 12 vehicles /day. Similar impacts to sagebrush obligate species utilizing this area would be expected from mining activity.

Increased mining and hauling activity would also create less tolerable habitat for Mountain Plover, considered an at-risk species because of declining population numbers throughout its habitat.

#### **4.7.1.4 Raptors and Owls**

Removal of native vegetation during the mining process would reduce feeding and roosting habitat for some raptor species. However there is no suitable nesting habitat for Bald or Golden Eagles or for any cliff or tree nesting raptors within the project area. Therefore, no significant direct impacts would be anticipated on these species from this proposal.

#### **4.7.1.5 Aquatic life**

There are no known Threatened or Endangered aquatic life species (or their habitats) that would be affected by WBI's proposed operations. No aquatic habitat is present in the project area and

no impacts to fish species, aquatic invertebrates or amphibians in, or downstream from the project area would be anticipated.

#### **4.7.1b Alternative 1 (Proposed Action), Indirect Impacts**

Indirect impacts from development actions occur to wildlife species that are sensitive to human activities, require large blocks of uniform cover, or are displaced by other species or individuals of their own species. In addition to the 554.7 acres that would be directly disturbed, the additional 385.3 acres within WBI's 1M Amendment 2 POO would become less suitable because of disturbances related to mining and associated human activities.

Similar habitat is available in immediately adjacent areas, and would be used by those animals mobile enough to leave when mining operations begin. Some redistribution of Pronghorn, Mule Deer, upland game birds such as Sage-grouse, non-game birds, and small mammals would occur during mining as they are displaced to adjacent lands. As long as appropriate and suitable quantities of habitat exist within these areas, impacts are expected to be minimal for most species. This may not be the case for Sage-grouse which are discussed separately. Some additional competition would occur between displaced wildlife and species already inhabiting non-project habitats, but that level is difficult to measure.

Indirect effects of the mining activity would include changes to traditional use and movement patterns, disruption to normal foraging and reproductive habits, and increased energy expenditure by most wildlife species in the project area. Species most impacted by habitat fragmentation include those with larger home ranges, such as big game, upland birds and raptors.

Passerine and other neotropical migratory birds are impacted by interruptions to preferred nesting habitat, improved habitat for undesirable competitors and increased potential for predation. The pre-mine sagebrush and grassland habitats are important to a specific group of associated species, and numerous birds, several considered as BLM sensitive species that would be expected to occupy this area.

Impacts to prairie dogs and species associated with prairie dog towns would be minimal, because no prairie dog towns are within the project area.

As with any disturbance, some wildlife species and individuals, including big game, can and would acclimate to sustained and regular human contact providing that contact is not perceived as threatening. Many of the small mammal species are disturbance tolerant and would be expected to reestablish their populations on reclaimed land.

##### **4.7.1.1 Alternative 1 (Proposed Action), Cumulative Impacts**

The CEA area (59,201.9 acres) is comprised of Wyoming big sagebrush dominated plant communities, Gardner saltbush dominated plant communities, juniper dominated sandstone outcrops, barren and nearly barren clay/shale outcrops, a relatively narrow corridor of riparian habitat associated with Sage Creek, irrigated crop lands and previously affected lands occupied by roadways, pipelines, railways, mined land and other man-made structures. Approximately 36,277 acres of these lands would be considered suitable big sagebrush dominated Sage-grouse habitat. Other lands within the CEA area would have been affected by past disturbances as summarized in Table 16. Past disturbances within RFD areas are also summarized.

Cumulative Effects would include wildlife injuries and mortalities and the loss of additional habitat. Habitat loss, direct and indirect, over the life of the project (ten years) could approach or exceed the 554.7 acres included in WBI's proposed mine plan for 1M Amendment 2. Reclamation would not always recreate pre-disturbed conditions or values. Some wildlife populations, especially those dependent on sagebrush, would not recover to pre-disturbance levels (e.g. Greater Sage-grouse and sagebrush obligate passerines). However, pre-disturbance surveys and monitoring over the past 3-5 years have indicated that wildlife species also occupy adjacent habitat outside proposed project areas. Therefore, cumulative impacts to most wildlife would be at least partially mitigated by aggressive implementation of concurrent reclamation. Indirect cumulative impacts would include disturbance to, or displacement of, certain wildlife species from human activities, habitat loss, and potential changes in animal behavior and movement patterns.

Although cumulative impacts to Greater Sage-grouse may be expected within the project area from this proposal, the extent is not apparent. It is unknown if mitigation measures proposed are conservative enough to maintain Sage-grouse use in affected areas or overall impacts to local Sage-grouse populations. On-going cooperative monitoring efforts by WBI, ACC, BLM and MT FWP should, over-time, provide vital information on Sage-grouse use in and around the project area. Preliminary data from this study collected during the 2013 field season (Dillon, Matt. ACC. September 2013 verbal communication) indicate:

- Females from all monitored leks co-mingle. Their use of habitat is very dynamic and they exhibit no lek loyalty.
- Collared female Sage-grouse seem to concentrate in three main late summer staging areas; Bowler (irrigated agricultural lands), Loyning/Sage Creek (irrigated agricultural lands) and high elevation Pryor mountains (alpine habitat). None of these are within the WBI project area, although Loyning/Sage Creek is located within the CEA area.
- One successful Sage-grouse nest was recorded within yards of an active limestone quarry haul road.
- These Sage-grouse avoid juniper habitat even when moving between areas
- Nesting and brood-rearing were documented within and adjacent to the north end of the WBI project area in sagebrush habitat. Nesting efforts were limited to one unsuccessful attempt in 2013.

Additional data from this on-going study will be assessed as it becomes available to evaluate impacts and the effectiveness of proposed mitigations. Operating protocols and management strategies will be adjusted as necessary to minimize potential negative impacts to Sage-grouse populations from the proposed activity.

#### **4.7.2 Alternative 2 (No Action), Direct and Indirect Impacts**

There would be no impacts to wildlife in addition to those analyzed for previous WBI expansions and plans of operation. No additional areas would be mined, so no direct or indirect impacts, beyond those already permitted, would occur.

#### **4.7.2.1 Alternative 2 (No Action), Cumulative Impacts**

Under this alternative, no additional cumulative impacts would occur, beyond those identified and permitted for previous POOs.

#### **4.7.3 Alternative 3 (Wildlife Mitigations), Direct and Indirect Impacts**

Under this alternative impacts to sagebrush obligate wildlife species would be greatly reduced compared to those anticipated in the proposed alternative. This alternative preserves 138.7 acres of the big sagebrush/Gardner saltbush vegetation map unit on the project's north end that is native habitat suitable for use by nesting migratory birds; nesting, brood-rearing and wintering Greater Sage-grouse and winter browse/cover for mule deer. It would also eliminate direct impacts to wildlife use of the project area from March 15 through July 15 by not allowing mining or hauling activity throughout the project area during that time frame. Both direct and indirect wildlife impacts would also be reduced by not constructing proposed access road MT-HR1, which would reduce traffic and activity on the north portion of the project area. Other direct and indirect impacts would be similar to those discussed above in Proposed Action.

It is unknown if these mitigations would be effective in maintaining current populations of Sage-grouse within the project area. Mitigations associated with this alternative are intended to reduce impacts during nesting, brood-rearing and winter use. Although Greater Sage-grouse use is known to occur in the project area for these purposes, it is not known to what extent alternative sites would be utilized by Greater Sage-grouse if habitat in the project area is made unavailable. The current monitoring study being conducted by ACC, WBI, MT FWP and the BLM is intended to provide data to assess the current extent of Greater Sage-grouse use in the project area and allow for future mitigations that may more accurately address project impacts on this Sage-grouse population. Mitigation measures proposed with this alternative are intended to minimize mining impacts on a small, but important, portion of habitat utilized by Sage-grouse. Impacts to Greater Sage-grouse outside of these timeframes and in suitable habitat within the Cumulative Impact area are also expected.

The road labeled HR-MT1 was included with WBI's original POO MTM-105421 to provide access to northern reaches of the project from haul road HR-MT2 and the Bear Canyon access road. However it has not yet been constructed. This alternative eliminates this haul road from the mine plan, and assumes all bentonite would be hauled on road HR-MT2 during the life-of-mine. This would reduce the overall impact of material hauling on wildlife and other natural resources by concentrating these activities into a single travel corridor.

#### **4.7.3.1 Alternative 3 (Wildlife Mitigations), Cumulative Impacts**

Cumulative impacts under this alternative would be the similar to those discussed in the Proposed Action (Alternative 1), except habitat loss would be reduced by 138.7 acres to 416.0 acres. Wildlife injuries and mortalities would be reduced proportionately.

#### **4.7.4 Mitigation (Alternatives 1, 2 and 3)**

##### **4.7.4.1 Proposed Action (Alternative 1)**

Although a single lek is located approximately two miles from the proposed project boundary, it has a large topographic barrier (Mowry Ridge) between it and planned mining on the north end

of 1M Amendment 2. All other known leks are more than two miles from the proposed project. Therefore no lek-associated protection measures are proposed with this submission.

Data from radio-collared female Sage-grouse obtained by ACC and WBI during the 2013 field season, documented limited nesting and brood-rearing use by Sage-grouse within and adjacent to the north end of WBI project area in big sagebrush habitat. In order to protect possible nesting or brood-rearing Greater Sage-grouse from harm, spring nest searches would be conducted ahead of planned mine phase disturbances during the time frame from April 1 to July 15. If Greater Sage-grouse nests are found, mining activity would cease until chicks have fledged, and can survive independent of the nest. Additionally, to reduce impacts to Sage-grouse in general, WBI would maintain concurrent reclamation of available mined areas and use diverse seed mixtures with native grasses, forbs and shrubs. Big sagebrush seed would be included in appropriate environments. Also, in order to reduce impacts to nesting or brood-rearing Sage-grouse, WBI would forego development on the northern portions of this proposed action (approximately 138.7 acres) until the last stages (years 7 through 10) in the life-of-mine. This area supports a big sagebrush-Gardner saltbush vegetation community that is suitable habitat for nesting or brood-rearing Sage-grouse.

WBI would mitigate impacts to all migratory bird species by conducting bird-call and ocular surveys when proposed activity would directly remove native vegetation during the spring breeding period (April 1 to July 15). Surveys would be conducted three days or less prior to initial surface disturbances associated with any mining or road building activity. If no nests are encountered, WBI would have a three day window in which to begin surface disturbing activities or conduct a new survey to maintain the three day time-frame. If migratory bird nesting activity is noted, mining activity would cease until MT FWS or BLM personnel are consulted for suggested mitigation measures. Only a small percentage of mining activities within 1M Amendment 2 would be expected during the nesting season. In addition, proposed reclamation standards and concurrent reclamation would be expected to minimize impacts to migratory birds over the long term as reclamation goals are achieved.

Anticipated impacts to other wildlife species, including big game, would be mitigated by relatively small acreages involved compared to total available habitat in the Cumulative Impact area. Affected big sagebrush communities would total 118.5 acres of the 36,272 acres of big sagebrush community within the Cumulative Impact area and affected Gardner saltbush habitat would be 175.4 acres of the 17,934 acres it occupies in the Cumulative Impact area. WBI would also emphasize concurrent reclamation practices to reduce the amount of non-vegetated habitat at any given point in time. Mitigations to restore Greater Sage-grouse and sagebrush habitats are also proposed. Reclamation efforts within Sage-grouse habitat would focus on establishing a diverse community with native forbs, grasses, and shrub species; and a commitment to increase the abundance of big sagebrush in reclaimed areas for the benefit of Greater Sage-grouse and other sagebrush associated species.

Financial guarantees for reclamation ensure that reclamation would occur.

#### **4.7.4.2 No Action (Alternative 2)**

No additional disturbances or wildlife impacts would occur under this alternative other than those associated with currently permitted operations. No additional mitigations would be necessary.

#### **4.7.4.3 Wildlife Mitigations (Alternative 3)**

Although cumulative impacts may be expected to Greater Sage-grouse within the project area from this proposal, their extent is not apparent. It is unknown if mitigation measures proposed are conservative enough to maintain Greater Sage-grouse use in affected areas or overall impacts to local Sage-grouse populations. On-going cooperative monitoring efforts of these Sage-grouse populations by WBI, ACC, MT FWP and BLM should provide important information on Sage-grouse use in and around the project area. Until results from those studies are available, all potential impacts should be anticipated and mitigated.

Financial guarantees for reclamation ensure that reclamation would occur on mine affected lands.

### **4.8 Cultural and Paleontological Resources**

Because a cultural resource inventory was conducted before initiating the proposed project, any NHRP eligible sites in the project area can be avoided by project design. Because unevaluated cultural resources are afforded the same considerations as eligible sites, all unevaluated sites would be avoided. The possibility of previously unrecorded cultural or paleontological resources becoming apparent during the course of the project is addressed under the stipulations. Should this occur, contractors should cease work in the area and report this finding to the BLM Billings Field Office as soon as possible. The operators' responsibilities in dealing with the discovery of unrecorded cultural and paleontological resources are clearly defined in the stipulations including who to notify in case of discovery of previously unrecognized sites on public lands. Such sites should be avoided until evaluated by Field Office Staff.

The Montana State Historic Preservation Officer (SHPO) was sent the cultural resource inventory report and site recommendations in June 2013. The SHPO concurred with the BLM's determinations regarding the newly recorded sites, including that 11 of these sites are not eligible for the NRHP. Because not eligible cultural resources are not actively managed by the BLM, the non-eligible sites may be impacted by the proposed project.

#### **4.8.1 Alternative 1 (Proposed Action) Direct and Indirect Impacts**

The Proposed Action is the utilization of the project area for bentonite mining. Direct and indirect impacts to cultural and paleontological sites are enhanced by ongoing mining activities. This consideration includes the possibility of previously unrecorded cultural resources becoming apparent. Should this occur, the operator shall follow procedure as outlined in the stipulations.

##### **Direct impacts**

Direct impacts to archaeological resources located in the project area are the same across site types. The impacts to archaeological and paleontological sites include the total or partial removal of these resources by mechanical means. Because mining is conducted through conventional methods, including removal of topsoil from designated areas; surface materials would be removed from their original locations. Direct impacts of mining are not anticipated to known

eligible and unevaluated cultural resources provided these sites are avoided during the project. WBI has agreed to avoid any eligible or unevaluated cultural resources, of which there are two, 24CB2270 and 24CB2273. WBI would be provided with coordinates of the sites to facilitate site avoidance.

### **Indirect impacts**

Indirect impacts to the project area could include soil erosion, gulying, and increased potential for unlawful collection and vandalism, and the exposure of previously unrecorded cultural or paleontological resources. The retrieval of bentonite from pits also may result in the discovery of previously buried cultural or paleontological materials not visible on the surface. During mining activities, the inadvertent discovery of previously unrecorded cultural or paleontological resources shall halt construction until the Field Office is notified. The contractors' responsibilities in dealing with unrecorded cultural and paleontological sites are clearly defined in the stipulations, including who to notify in case of discovery of previously unrecognized sites on public lands and how such sites are treated until evaluated by the Field Office Staff.

#### **4.8.1.1 Alternative 1 (Proposed Action) Cumulative Impacts**

The cumulative impacts would not vary from Direct and Indirect impacts as eligible and unevaluated cultural resources would be avoided by the project by design.

#### **4.8.2 Alternative 2 (No Action) Direct and Indirect Impacts:**

Under the No Action alternative, mining would not occur in the project area and all cultural and paleontological resources would not be impacted. There would be no additional surface disturbance therefore there would not be any chance for a discovery situation, nor would there be any actions that would require Native American religious consultation.

##### **4.8.2.1 Alternative 2 (No Action) Cumulative Impacts**

There would be no cumulative impacts beyond currently mined and permitted acreage limits because no new mining would take place.

### **4.8.3 Mitigation**

The operator/holder of this authorization (WBI) shall immediately bring any objects or resources of cultural or paleontological value discovered as a result of operations under this authorization to the attention of the authorized officer. The operator/holder shall suspend all activities in the vicinity of such a discovery until notified to proceed by the authorized officer. If human remains are discovered or suspected the operator (WBI) shall suspend operations immediately, physically guard the area, and notify BLM immediately.

#### Cultural Resources Mining Stipulations (compatible with the current 43 CFR 3809 regulations)

The operator/holder (WBI) is responsible for informing all persons associated with this project that they may be subject to prosecution for knowingly disturbing, altering, injuring, excavating, removing or destroying any historical or archaeological site, structure, building, or object on Federal lands.

The operator/holder (WBI) shall immediately bring to the attention of the Authorized Officer any cultural or paleontological resources that might be altered or destroyed on Federal lands by his/her operations. If archaeological, historical, or paleontological resources are discovered, the

operator is to suspend all operations that further disturb such materials and immediately contact the Authorized Officer. Any such discovery shall be left intact until the operator is told to proceed by the Authorized Officer.

The Authorized Officer shall evaluate the discoveries brought to his/her attention, take action to protect or remove the resource, and allow operations to proceed within 10 working days after notification to the Authorized Officer of such discovery. The decision as to the appropriate measures to mitigate adverse effects to cultural or paleontological resources shall be made by the Authorized Officer after consulting with the operator/holder.

Before a POO is approved, the operator/holder is responsible for the cost of any investigations necessary, and any mitigation measures required by the Authorized Officer. The Authorized Officer would provide technical and procedural guidelines for the conduct of the required evaluation and mitigation. After the POO is approved, or where a POO is not involved, the Federal Government (BLM) shall have the responsibility and bear the cost of investigations and salvage of any cultural (and paleontological) values discovered by the operator.

## **4.9 Soils**

### **4.9.1 Alternative 1 (Proposed Action), Direct and Indirect Impacts**

Bentonite mineral exploration, extraction, and infrastructure development (e.g., roads, ancillary facilities) would cause soil mixing and compaction. Such surface disturbing acts reduce ground cover (e.g., biological soil crust, vegetation, litter and rock), exposing the soil resource to accelerated mass failure and erosion by wind and water; resulting in the irretrievable loss of topsoil and nutrients and potentially resulting in sedimentation and fugitive dust formation. Surface disturbances also change soil structure, heterogeneity (variable characteristics), temperature regimes, nutrient cycling, biotic richness and diversity. Along with this, soil salvage mixes soil and alters bulk density, porosity, infiltration, air-water relationships, salt content and pH (Perrow and Davy, 2003; Bainbridge 2007). Soil compaction results in increased bulk density, and reduced porosity, infiltration, moisture, air, nutrient cycling, productivity, and biotic activity (Logan 2001; Perrow and Davy, 2003; Bainbridge 2007). Altered parameters include organic matter content, calcium carbonate concentrations, clay translocation properties, texture class, rock fragment content, structure, and depth to bedrock.

Soil salvage during mining mixes soil horizons which are not restored to ambient qualities and quantities during reclamation. Altered soil parameters would take decades to hundreds of years to recover (Perrow and Davy, 2003). However, replaced soils would return to natural rates of erosion and support stable and productive vegetation capable of sustaining post-mining land uses, livestock grazing and wildlife habitat, although not earlier than five years following reclamation.

Surface-disturbing actions provide ideal conditions for weed establishment. Many weed species alter soil environments by allelopathy, reduced soil fertility or reduced soil moisture content. This results in accelerated erosion and altered biodiversity (DiTomaso, 2000; Radosovich et al., 2007). Vehicles are vectors for weedy species and cause removal of ground cover, compaction, rutting, increased surface runoff, accelerated erosion, sedimentation, and fugitive dust. The severity of the effects depends on soil type, soil moisture content, soil temperature, frequency of

activity, pressure of the vehicle on the soil, type of vehicle, tire tread and width, and vehicle concentration (Logan 2001). Disturbing areas prone to producing dust would reduce air quality and inhibit vegetative production. Wet soils would be especially susceptible to rutting, leading to braiding, channeling, accelerated erosion, and sedimentation.

Bentonite and shale outcrops support little or no vegetation and would not be salvaged as topsoil. In such areas, vegetation is often spotty due to the soil's chemical and physical characteristics. Reclamation would include replacing unsuitable topsoil with suitable topsoil; such sites would then be able to support vegetation. Post-mining soils would be replaced at uniform depths compared to pre-disturbance conditions. Soil replacement depths would be six inches for topsoil and 26 to 28 inches for subsoil. Vegetation productivity would be reduced in areas where topsoil is thinner than pre-disturbance conditions.

#### **4.9.1.1 Alternative 1 (Proposed Action), Cumulative Impacts, RFD Scenario**

Historic and on-going activities adjacent to, or within, the planning area include: minerals exploration and development, petroleum and natural gas pipeline rights-of-way, livestock grazing, vehicle use on and off-road, recreation, infrastructure, noxious weed infestation, pollution, and agriculture. RFD in the CEA area projects that proposed and future mining would increase mining-related disturbance acres by approximately 2,127 acres. Cumulative effects of such activity contribute to compaction, increased surface runoff and accelerated erosion by wind and water; resulting in sedimentation, fugitive dust formation, and the irretrievable loss of topsoil and nutrients. Long-term impacts include altered soil soluble salt regimes, pH, reduced soil stability, organic matter content, microbial mass, biotic richness and diversity, and phosphorus and nitrogen content (Perrow and Davy, 2003). Permanent impacts include altered calcium carbonate and clay translocation properties, texture class, rock fragment content, structure, and depth to bedrock.

Successfully reclaimed lands would have gentler slopes and reduced topographic diversity compared to pre-disturbance conditions, which would alter natural erosion and deposition rates by reducing surface run-off and increasing infiltration rates. Re-instating grazing following reclamation would have a collective effect on the soil resource, augmenting impacts to reclaimed soil systems. Surface-disturbing actions in areas of weed infestations would compound the degradation of the soil resource. Extraction and infrastructure development would cause soil system fragmentation, leading to altered soil heterogeneity (variable characteristics), microclimate, hydrology, nutrient cycling, biotic richness, and diversity (Perrow and Davy, 2003). From the edge of the fragmented patch, localized impacts would include microclimatic changes tens of meters into the patch; while altered biota and nutrient cycling would extend even further into the patch. On a landscape-scale, pre-existing disturbance regimes (e.g.; erosion and wind deposition) would be altered; changing natural rates of soil formation (Perrow and Davy, 2003).

#### **4.9.2 Alternative 2 (No Action), Direct and Indirect Impacts**

The no action alternative would not disturb soils of the area beyond existing permit levels and would have no direct or indirect impacts.

#### **4.9.2.1 Alternative 2 (No Action), Cumulative Impacts**

There would be no cumulative impacts to soils of the area as these soils would not be disturbed beyond existing permit levels.

#### **4.9.3 Alternative 3 (Wildlife Mitigations), Direct and Indirect Impacts**

Soil impacts would be as described in the Proposed Action, except that no soil impacts would occur on the northern 138.7 acres (25 percent) of the mine plan. This would eliminate any disturbance in the Nihill Gravelly Loam soil map unit.

##### **4.9.3.1 Alternative 3 (Wildlife Mitigations) Cumulative Impacts**

Cumulative soil impacts under this alternative would be the same as those described under the Proposed Action, except that no soil impacts would occur on the northern 138.7 acres (25 percent), eliminating disturbances in the Nihill-Gravelly Loam soil map unit.

#### **4.9.4 Soil Mitigation Measures**

Best management practices that minimize the total area of disturbance, control wind and water erosion, maintain topsoil viability, and reduce compaction, as well as rapid implementation of reclamation, would conserve soil resources. Suitable topsoil and subsoil would be salvaged prior to mining and either be temporarily stockpiled or direct-hauled and replaced on previously mined areas. Some reclamation would be conducted concurrently with mining, thus enabling direct-hauling of topsoil to previously backfilled areas. Direct-hauling of topsoil promotes vegetative establishment, reducing accelerated soil erosion by wind and water. Both stockpiled and direct-hauled soils would be seeded as soon as possible in accordance with the appropriate planting season. Topsoil stockpiles would be in a stable configuration. Erosion would be controlled on topsoil stockpiles using native species cover crops, or other suitable methods. Burial (minimum two meters deep) of unsuitable spoil and topsoil material and the addition of soil amendments (e.g. organic matter) would improve vegetation recovery (Dollhopf and Baumen 1981). Soils contaminated by bentonite field-drying or storage stockpiles would also require burial during reclamation backfill.

Considering soil resource constraints when maintaining and constructing infrastructure would encourage sustainable use of the soil resource. Designing infrastructure on stable locations, with proper drainage would avoid destabilizing erosive soils. Developing roads with gentle grades and along contours would reduce accelerated erosion from surface runoff. Road/infrastructure maintenance would include control of surface runoff, accelerated erosion, sedimentation, rutting, and fugitive dust. Avoiding vehicle use during conditions which lead to ruts greater than four inches deep would reduce water erosion, channeling, and braiding.

In addition, WBI's mining operations are bonded by BLM/MT DEQ. This bond would not be released until satisfactory reclamation is achieved.

No mitigation additions would be required for enacting either Alternative 2 or 3.

## 4.10 Vegetation

### 4.10.1 Alternative 1 (Proposed Action), Direct and Indirect Impacts

There would be a loss of vegetation during mining operations and potential for increased erosion until vegetation is reestablished. Reclamation activities would be conducted concurrently with mining on backfilled pits so that the entire mine site would not be stripped of vegetation at any one time. Seeding would be conducted each spring or fall on lands that have been prepared for seeding.

WBI's goal would be to match reclaimed acreage approximately with the same amount of new mine affected acreage. Reclaimed land would be seeded with a native shrub/grass/forb mixture without the use of fertilizer, nurse crop, mulch or irrigation. Seedbed preparations would include the option of deep-ripping after soil replacement to break up the surface and loosen the soil. Additional surface manipulations would include options such as pitting to enhance moisture harvesting capacities of reclaimed areas. Seed mixtures would be broadcast seeded in fall or early winter (prior to freeze-up) to take full advantage of seasonal moisture.

Various wildlife species would be impacted by removing native habitats and vegetation communities during active mining. Replacement of mature habitats with early seral stage vegetation communities on reclaimed lands would alter wildlife use until native shrubs, grasses and forbs become established. Reintroduction of these species may be quicker on areas where topsoil is direct-hauled ("live spread"). Seeded shrub/grasslands would provide valuable habitat to wildlife species adapted to multiple habitats and to those species benefiting from habitat "edge effects". Big game animals, in this case mostly mule deer, would favor mixed shrub-lands, while small mammals are suited to a variety of habitats. WBI's reclamation seed mix is described in Chapter 2 (Table 4).

There are no known Threatened or Endangered plant species within the study area; therefore, there should be no impacts to these species.

Numerous BLM designated sensitive plant species (Table 13) are known from the Pryor Mountain foothills area and would potentially be impacted by this proposed mining activity. Two of these species, Desert Dandelion (*Malacothrix torreyi*) and Spiny Hopsage (*Grayia spinosa*) were found in the project area during pre-mine vegetation surveys, although neither were encountered in WBI sampled transects. Some individual plants of both species may be removed as mining progresses.

Evidence of mining and reclamation would remain for the long term until vegetation and erosion return to equilibrium with surrounding environments. Reclamation would continue until BLM standards are achieved, and bond released.

#### 4.10.1.1 Alternative 1 (Proposed Action), Cumulative Impacts, RFD Scenario

Cumulative impacts on vegetation would include past, present and future disturbances. In WBI's Permit No. 1771 about 84.7 acres of vegetation have been disturbed to date, and an additional 554.7 acres would be disturbed under the Proposed Action for a total of 639.4 acres of disturbance. The RFD scenario in the CEA area also estimates an additional 1,418.5 acres of

potential future mining related disturbance by ACC, Bentonite Performance Minerals and WBI. Therefore, total potential long-term bentonite disturbance in the CEA area would be 2,126.9 acres.

Cumulative impacts on special status plant species would include the loss 554.7 acres of potential habitat for Desert Dandelion and Spiny Hopsage with the proposed action and an additional 2,555.5 acres of potential habitat for those two species with the RFD scenario. Desert dandelion is limited in MT to a few localized sites on the south side of the Pryor Mountains (MT Natural Heritage Program, <http://mtnhp.org/SpeciesOfConcern/?AorP=p>). Spiny Hopsage is limited in MT to the Pryor Mountain Desert with a couple additional records from southwest MT. In the Pryor Mountain area, it is known from less than a dozen locations and the total MT population of this species likely numbers less than 2,000 individuals. Increases in cheatgrass related to development may also pose a threat to sensitive species by reducing seedling establishment and increasing fire frequency (MT Natural Heritage Program, <http://mtnhp.org/SpeciesOfConcern/?AorP=p>). Within MT, Miner's Candle (*Cryptantha scoparia*) is documented from a single area in Carbon County that is widely disjunct from the nearest known occurrences in southwest WY and central Idaho. This population is located approximately ¼ mile west of the disturbance projected with the proposed action and would not be directly impacted. However, the potential for direct impact to this population increases in the RFD scenario.

Current reclamation would be emphasized and reclaimed areas seeded with native species. This would minimize the amount of non-vegetated area at any one time. Many different stages of vegetation establishment would occur throughout the mine area over time, ranging from fully revegetated to newly seeded areas. Mined lands would eventually restore stable plant communities dominated by native species.

#### **4.10.2 Alternative 2 (No Action), Direct and Indirect Impacts**

Under this alternative, no additional impacts beyond those already permitted would occur to the vegetation.

##### **4.10.2.1 Alternative 2 (No Action), Cumulative Impacts**

Under this alternative, there would be no cumulative impacts beyond those that would occur from lands which are already permitted for mining.

#### **4.10.3 Alternative 3 (Wildlife Mitigations), Direct and Indirect Impacts**

Vegetation impacts would be as described in the Proposed Action, except that no vegetation impacts would occur on the northern 138.7 acres (25 percent) of the mine plan. This would eliminate any disturbance in the big sagebrush/Gardner saltbush map unit.

##### **4.10.3.1 Alternative 3 (Wildlife Mitigations) Cumulative Impacts**

Cumulative vegetation impacts under this alternative would be the same as those described under the Proposed Action, except that no vegetation impacts would occur on the northern 138.7 acres (25 percent), eliminating disturbances in the big sagebrush/Gardner saltbush map unit.

## **4.11 Invasive, Non-Native Species**

### **4.11.1 Alternative 1 (Proposed Action), Direct, Indirect and Cumulative Impacts**

Noxious weeds are invasive species that may become established on open rangelands, particularly on disturbed sites. They are aggressive plants that compete with native species for space, sunlight, soil moisture, and nutrients. Once established, they may eventually exclude desirable native species. If a seed source is present, noxious weed seeds can be physically transported to new areas by livestock movements, vehicular travel, human foot travel and wildlife movement.

Carbon County Weed and Pest personnel located four noxious weed species populations along roadways accessing the Project area in June, 2012: 1) White-top (*Cardaria draba*), 2) Spotted Knapweed (*Centaurea stoebe*), 3) Russian Knapweed (*Acroptilon repens*), and 4) Scotch Thistle (*Onopordum acanthium*). Other weed species known from the CEA area are Cheatgrass (*Bromus tectorum*), Halogeton (*Halogeton glomeratus*), Kochia (*Kochia scoparia*), and Russian Thistle (*Salsola kali*). The proposed action would increase potential to spread populations of these species and increase potential to introduce other invasive, non-native species by increased vehicle traffic and potential contaminants in reclamation seed mixes.

### **4.11.2 Alternative 2 (No Action), Direct, Indirect and Cumulative Impacts**

The possibility of noxious weeds being introduced and/or spread through mining related ground disturbing activities and vehicular movement associated with mining and product hauling would no longer exist. However, disturbed areas associated with prior mining activity and other land uses may still be present. Therefore, the opportunity for noxious weeds to be introduced and/or spread by livestock grazing, vehicular travel, waterways, wildlife movements, and other human influences would still exist in and around the project area.

### **4.11.3 Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts**

Invasive species impacts would be as described in the Proposed Action, except that no vegetation impacts would occur on the northern 138.7 acres (25 percent).

### **4.11.4 Mitigation**

WBI has a comprehensive weed management plan included with their mine and reclamation plan (Appendix A) and a weed compliance contract with Carbon County Weed and Pest to inspect and monitor weed populations in the Project area through 2014 (Appendix A). The comprehensive weed management plan would be included in the reclamation bond cost estimate, thereby insuring control measures occur. The weed management plan and weed compliance contract provide for monitoring and control of noxious weeds in the project area and associated access/haul roads. WBI would monitor likely areas of noxious or invasive weed infestations and contract spraying with a state certified applicator, as needed. Both WBI and Carbon County are committed to extending this contract to monitor and control noxious weeds throughout the projected life-of-mine. In addition, erosion control and seeding plans described in this document would encourage successful vegetation reclamation to mitigate impacts and minimize locations available for weed establishment. Mitigation measures would include use of proper seed mixtures, seeding application rates and cultural seeding techniques. All seed used on public lands would be certified noxious weed-free by laboratory testing and would conform to BLM seed policy IM No. 2006-073; any hay or straw used for check-dam construction would be certified MT weed-free. If necessary, reclaimed areas would be fenced to exclude livestock grazing on newly

Reclamation goals would be to establish self-sustaining, healthy, diverse, native plant communities, with a density sufficient to control erosion and invasion by non-native plants and to reestablish wildlife habitat and forage production.

No additional mitigations would be required for enacting either Alternative 2 or 3.

## **4.12 Grazing Resources**

### **4.12.1 Alternative 1 (Proposed Action), Direct and Indirect Impacts**

Lands that would be affected by the proposed action would be non-vegetated during mining and early reclamation stages. As such, they would be non-productive for livestock grazing use, although the total proposed affected lands for the this action represents only 3.2 percent of the 17,207 acre “Gravel” allotment (# 01005) permitted for livestock use by the BLM. WBI use of concurrent reclamation practices would reduce the amount of non-vegetated area within the allotment to less than one percent of the total acreage at any given point in time. The BLM would monitor grazing activities and assess, through the grazing decision process specified within the Title 43 CFR 4160, potential suspensions of AUMs within the proposed action. No AUM reductions would be currently anticipated from this action. The BLM would utilize continued monitoring to determine on-going effectiveness of WBI management to prevent livestock damage to reclaimed lands. If unanticipated problems develop, the BLM would issue grazing decision(s) as described above to assess AUM adjustments. WBI’s reclamation plan is designed to stabilize affected lands and allow them to support livestock grazing after mining.

Any interior allotment fences being removed during mining activity would be replaced in the exact location with a four wire fence built to BLM standards (see BLM Manual Handbook H-1747-1). Any allotment boundary fences removed during mining activity would be replaced in the exact location with the same style of fenced removed.

#### **4.12.1.1 Alternative 1 (Proposed Action), Cumulative Impacts, RFD Scenario**

BLM lands made unavailable to grazing because of vegetation removal would continue to accrue as new areas are mined and reclaimed for at least two years following seeding. It is anticipated that the cumulative effects on this allotment as summarized above would be insufficient to require AUM adjustments. Ultimately, mining would cease and the grazing practices would return to normal.

Reasonable foreseeable development (RFD) by WBI would expand potential impacts to include an isolated parcel of the Limestone Allotment (#04132). Reasonable foreseeable development by ACC would expand potential impacts to include the Loyning Ranch, Bluewash Allotment (#04115).

#### **4.12.2 Alternative 2 (No Action), Direct, Indirect and Cumulative Impacts**

Under this alternative, existing impacts to grazing would continue up to currently permitted mining levels. Cumulative impacts under this alternative would accrue only up to the presently permitted mining levels as no new mining would occur. Livestock would continue to utilize the allotment as in previous years.

#### **4.12.3 Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts**

Under this alternative, impacts to grazing resources would be as described in the Proposed Action, except total disturbed surface would be reduced by 25 percent.

#### **4.12.4 Mitigation**

If interim monitoring indicates unanticipated grazing impacts on reclaimed lands, WBI would work with the grazing permittee to coordinate timing of use. Situational fencing would also be required if other mitigations are ineffective.

No mitigation additions would be required for enacting either Alternative 2 or 3.

### **4.13 Lands and Realty**

#### **4.13.1 Land Use Authorizations and Ownership; Alternative 1 (Proposed Action), Alternative 2 (No Action), and Alternative 3 (Wildlife Mitigations); Direct, Indirect, and Cumulative Impacts**

Alternative 1 (proposed action), Alternative 2 (No Action), and Alternative 3 (Wildlife Mitigation) would not have any direct, indirect, or Cumulative Impacts to the land use authorizations or land ownership.

### **4.14 Recreation**

#### **4.14.1 Alternative 1 (Proposed Action), Direct, Indirect and Cumulative Impacts**

The area is not a high-use recreation area. Recreation use is limited to big game hunting and small amounts of bird hunting. Mining operations would temporarily remove small acreages with very minor impacts on big game distribution. No impacts to public access along Bear Canyon Road would be anticipated and no other impacts on recreation activities would be anticipated from the Proposed Action.

#### **4.14.2 Alternative 2 (No Action), Direct, Indirect and Cumulative Impacts**

The impacts would be as described above for the Proposed Action since mining would occur on lands that are already permitted.

#### **4.14.3 Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts**

Impacts to recreational activities would be as described in the Proposed Action, except total disturbed surface would be reduced by 25 percent.

#### **4.14.4 Mitigation**

Mitigation is not required for recreational resources.

### **4.15 Visual Resources**

#### **4.15.1 Alternative 1 (Proposed Action), Direct and Indirect Impacts**

Two Key Observation Points (KOPs) were established for the purpose of evaluating potential impacts of the project on the landscape. The first KOP was located near the major traffic corridor. The second KOP was located adjacent to the project site. Factors for locating the KOPs

were the angle of observation, the potential number of viewers, the length of time the project would be in view, the relative project size, the season of use, and light conditions.

Generally, this is an open panoramic landscape, with muted colors and textures due to low growing and sparse vegetation types. Linear forms become more apparent in the middle and far distances and result primarily from low geological formations.

### Key Observation Points

#### **Point 1:**

The mine site lies east of U.S. Highway 310, at a distance of approximately two miles from the project site being in the near distance. From this point, the view is that terrain slopes gently easterly, with a more pronounced rise at the base of the low ridge line, which is where the proposed project is located. There is existing disturbance from prior mining activities and reclamation on the slope above the proposed project, which has resulted in an alteration of line, color and texture. Most noticeable are the contrasts of color and texture.

#### **Point 2:**

The KOP lies immediately adjacent to the project site in the foreground. From this point the view is of more pronounced slopes directly above the project site with existing alterations from previous mine activities being readily apparent. Linear impacts from previous reclamation efforts are readily apparent, as is the alterations of texture.

#### **Contrast Degrees:**

From KOP 1 the contrast is weak, with the impacts seen but not readily attracting attention. This contrast would be slightly higher if coming from the south on the highway since the angle of view and length of time in view is less than viewing the project site while coming from the north. From KOP 2 the contrast is moderate; the impacts would begin to attract attention and would also begin to dominate the characteristic landscape.

#### **4.15.1.1 Alternative 1 (Proposed Action), Cumulative Impacts**

Under the Proposed Action, cumulative impacts on the visual landscape would include past, present and future disturbances. As described above, permanent changes to the landscape would occur but over the long term, visual impacts from recent mining and mining under the proposed action would become negligible.

The RFD area could include another 2,555.5 acres of bentonite related disturbances that would also have negligible visual impact over the long term.

#### **4.15.2 Alternative 2 (No Action), Direct and Indirect Impacts**

Under this alternative, landscape impacts, as described above, would continue to occur up to the limits of the presently permitted operations.

#### **4.15.2.1 Alternative 2 (No Action) Cumulative Impacts**

Under this alternative, cumulative landscape impacts, as described above, would continue to occur up to the limits of the presently permitted operations.

#### **4.15.3 Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts**

Impacts to the visual landscape would be as described in the Proposed Action, except total disturbed surface would be reduced by 25 percent.

#### **4.15.4 Mitigation**

Current reclamation practices are sufficient to mitigate visual impacts to the landscape.

### **4.16 Noise**

#### **4.16.1 Proposed Action, Direct and Indirect Impacts**

Noise resulting from mining operations would be within acceptable ranges for workers. Mining operation noise level measurements are periodically monitored by MSHA (Mine Safety & Health Administration), and no citations have been issued to WBI for exceeding mining operation noise limits. Noise impacts would be minimal for the nearest residents, which are within a quarter mile of the nearest proposed mining in the southeast of proposed 1M Amendment 2.

Noise levels for Sage-grouse would not exceed 10 dBA above ambient noise levels (estimated at 20-24 dBA billings RMP) at lek perimeters in the hours extending from 6:00 p.m. to 8:00 a.m. during initiation of breeding (March 1 to May 15). Heavy equipment backup alarms have a typical volume of 97-112 decibels (dB) at the source (Holzman, 2011). This would diminish at a distance of 2 miles (closest lek) depending on specific machinery, weather and wind conditions.

#### **4.16.1.1 Proposed Action, Cumulative Impacts**

Under this alternative, there would be no cumulative impacts related to noise as no new additional mining equipment is proposed to be used and the proposal does not represent an increase in production rates.

#### **4.16.2 Alternative 2 (No Action), Direct, Indirect and Cumulative Impacts**

Under the no action alternative, current levels of noise would continue at the usual and customary times that they occur until existing permitted mine lands are mined out. There would be no cumulative noise impacts from this alternative.

#### **4.16.3 Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts** **Impacts to noise would be as described in the Proposed Action, except total disturbed surface and duration of the noise, would be reduced by 25 percent.**

#### **4.16.4 Mitigation**

Noise levels for Sage-grouse would be limited to not exceed 10 dBA above ambient noise levels (estimated at 20-24 dBA at lek perimeters in the hours extending from 6:00 p.m. to 8:00 a.m. during initiation of breeding (March 1 through May 15).

## **4.17 Transportation Facilities**

### **4.17.1 Proposed Action, Direct and Indirect Impacts**

WBI's proposed 1M Amendment 2 activity would extend the existing permitted roadway to haul material from new mine sites in the SE $\frac{1}{4}$  section 24 and NE $\frac{1}{4}$  section 25; Township 9 South Range 25 East and portions of sections 30, 31 & 32 Township 9 South Range 26 East. All new extensions would be located on lands to be affected by the mine sequence itself. An existing two-track trail may be upgraded to provide service access to mine sequences in the NE $\frac{1}{4}$  section 25 later in the life-of-mine. Even if upgraded, this later road (currently permitted haul road HR-MT1) would not be utilized for hauling.

WBI utilizes contract haul trucks to transport bentonite to its Lovell, WY processing plant. Haul patterns are variable according to processing demands with periods of relatively high truck volume alternating with periods of no or low activity. Hauling would also be commonly shut down during inclement weather. During active hauling operations, up to 25 or more loads per day would be hauled from WBI's 1M Amendment 2 mine site to the processing facility. This represents the status quo. Additional haul truck traffic from the Proposed Action is not anticipated.

#### **4.17.1.1 Proposed Action, Cumulative Impacts**

Extensions of existing haul road HR-MT2 into advancing mine sequences would create additional, temporary roadway subjected to increased wear and tear from accumulated heavy haul truck traffic. Past mining would not contribute to traffic impacts in a cumulative sense.

### **4.17.2 Alternative 2 (No Action), Direct and Indirect Impacts**

Under this alternative, there would be no shift in access points to the existing haul road, and current transportation impacts would continue until permitted reserves are exhausted.

#### **4.17.2.1 Alternative 2 (No Action) Cumulative Impacts**

Under this alternative, the impacts would be the same as those described under the cumulative impacts for the Proposed Action.

### **4.17.3 Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts**

Impacts to traffic under this alternative would be as described in the Proposed Action, except that access road HR-MT1 would not be built or used.

### **4.17.4 Mitigation**

Proper traffic control and safety signs would be installed at or near new access points and intersections. This would include signs advising motorists of trucks entering the roadway and stop signs for haul trucks at appropriate intersections.

## **4.18 Social and Economic Conditions**

### **4.18.1 Alternative 1 (Proposed Action), Direct and Indirect Impacts**

The Proposed Action would result in production averaging 30,000 tons of bentonite per year for the life-of-mine. This represents about fifteen percent of the annual production for WBI's Sage

Creek (Lovell) processing facility. This project would not result in new jobs, but it would continue status quo employment levels, wages, expenditures and taxes paid in WY. Once mining is initiated in Montana, Bentonite Production Taxes would be paid per ton of bentonite produced, and would average \$46,800 per year.

During this analysis, no alternative considered resulted in any identifiable effects or issues specific to any minority or low income population or community. The agency has considered all input from persons or groups regardless of age, race, income status, or other social or economic characteristics.

#### **4.18.1.1 Alternative 1 (Proposed Action), Cumulative Impacts**

Expansion of WBI's existing mining and hauling operations into adjacent lands included in proposed 1M Amendment 2 would extend economic impacts described above into the foreseeable future.

#### **4.18.2 Alternative 2 (No Action), Direct, Indirect and Cumulative Impacts**

The no action alternative would result in cessation of WBI's MT bentonite production as they would have no other remaining, permitted bentonite reserves in the state. Direct annual impacts would be 13,104 fewer man-hours worked, \$339,600 in lost wages and \$67,000 less MT taxes paid. Extended over the projected ten year life-of-mine, these would be: 130,104 fewer work hours, \$3,396,000 in lost wages and \$670,000 in lost MT tax revenue. Carbon County would also be impacted by corresponding reductions in property tax values.

#### **4.18.3 Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts**

Direct, indirect and cumulative impacts to social and economic conditions under this alternative would be decreased relative to those described in the Proposed Action. Elimination of 138.7 acres from the proposed mine plan would decrease bentonite volumes extracted by about 25 percent from that anticipated under Alternative 1. Potential wages, expenditures and taxes would decrease proportionately.

#### **4.18.4 Mitigation**

Mitigation would not be required.

### **4.19 Mineral Resources and Geology**

#### **4.19.1 Alternative 1 (Proposed Action), Direct and Indirect Impacts**

Bentonite reserves within 40 feet of the surface would be removed by WBI's activities on 1M Amendment 2 lands, representing an irretrievable commitment of the resource. Removal and processing of bentonite reserves result in those resources being lost to future users.

Certain grades of bentonite that are not considered currently marketable or economically retrievable may be mined in the future if favorable economic conditions develop. No other mineral resource would be affected.

#### **4.19.1.1 Alternative 1 (Proposed Action), Cumulative Impacts**

Past, present, and future mining of bentonite represents an irretrievable commitment of the resource. When reserves are depleted, WBI would have to discover more, re-mine bypassed ore or close the mine.

#### **4.19.2 Alternative 2 (No Action), Direct, Indirect and Cumulative Impacts**

Under this alternative, the bentonite reserves underlying proposed WBI 1M Amendment 2 would not be developed, remaining available for future users. Mining of currently permitted lands would continue until reserves are depleted

#### **4.19.3 Alternative 3 (Wildlife Mitigations), Direct, Indirect and Cumulative Impacts**

Impacts to mineral resources would be as described in the Proposed Action, except the volume of extracted bentonite and the area of mineral extraction (bentonite) would both be reduced by 25 percent.

#### **4.19.4 Mitigation**

No additional mitigations would be needed.

### **4.20 Other Resources – Energy Corridors**

#### **4.20.1 Alternative 1 (Proposed Action), Direct and Indirect Impacts**

WBI's proposed 1M Amendment 2 project lies within the 3,500 feet wide right-of-way designated for Energy Corridor Zone #79-216 which was established under section 368 of the 2005 Energy Policy Act. Other than existing oil and gas pipelines, there are no currently known additional projects proposed for this energy corridor and no known conflicts with WBI's proposed 1M Amendment 2 project. Lands within the Energy Corridor Zone that would be affected by this Proposed Action would not be available for new rights-of-way during active mining phases, but the remaining unused right-of-way width would still be available.

##### **4.20.1.1 Alternative 1 (Proposed Action); Cumulative Impacts**

Current and future mining to remove bentonite from permitted lands within this Energy Corridor diminishes potential for future conflicts if Energy projects are eventually proposed in this Zone. Therefore it would be advantageous to extract mineral prior to potential conflicts arising.

#### **4.20.2 Alternative 2 (No Action); Direct, Indirect and Cumulative Impacts**

Under this alternative, bentonite reserves underlying proposed WBI 1M Amendment 2 lands would not be developed. Therefore potential for conflicts with future Energy projects would remain.

#### **4.20.3 Alternative 3 (Wildlife Mitigations); Direct, Indirect and Cumulative Impacts**

Under this alternative direct, indirect and cumulative impacts to Energy – Corridor resources would be similar to those described in the Proposed Action, except 138.7 acres of the proposed mine plan would not be developed, thereby sustaining potential for conflicts with future Energy projects

#### **4.20.4 Mitigation**

No additional mitigations would be needed.

### **4.21 Reasonably Foreseeable Development**

Reasonably Foreseeable Development (RFD) actions within the general CEA area include bentonite mining, livestock grazing, pipeline construction, powerline installations, wind farm development and oil and gas drilling. RFD activities related to projected

bentonite mining are delineated on Figure 9 and Figure 10 within the CEA boundary. All of these activities are discussed as primary potential land uses under analysis. The area also sustains recreational activities such as hunting, off-highway vehicle use, and other activities, but these land uses are not considered among the primary surface-disturbing land uses, and therefore, are not discussed. This CEA encompasses 59,202 acres and was determined by assessing land use and habitat relationships of adjacent lands relative to those within the project area. Habitat for Greater Sage-grouse was an important determinant for establishing the extent of the area.

#### **4.21.1 Bentonite and Limestone Mining**

Bentonite is an economically important locatable mineral with a variety of industrial and cosmetic uses that includes kitty litter, drilling mud, binding agent for taconite iron pellets, medicines, food thickeners, landfill liners, cosmetics and many others. Because MT and WY sodium-bentonite deposits make up about 70 percent of the world's known supply, it is reasonably foreseeable that bentonite mining will continue steadily into the future in this region. Three bentonite mining companies, ACC, Bentonite Performance Minerals and WBI have patented and unpatented claims for bentonite located in the RFD area. It is currently economical to remove up to 100 feet of overburden to extract the bentonite. The BLM's BiFO estimates future impacts on 1,973.2 acres from bentonite mining related disturbances in the CEA area. This includes 554.7 acres of proposed mining that has not yet been approved (1M Amendment 2) and an estimated 1,418.5 acres of patented and unpatented mining claims within the RFD that are being explored for potential future development. Bentonite reserves on federal lands south of the WY border are managed by the BLM's Cody, WY Field Office.

#### **4.21.2 Livestock Grazing**

Types and numbers of livestock along with the number of grazing days and seasons-of-use would be expected to continue at current or somewhat reduced rates in the future.

#### **4.21.3 Pipeline Construction and Powerline Installations**

Because WBI's proposed 1M Amendment 2 project lies within the right-of-way designated for Energy Corridor Zone #79-216, RFD would include additional pipeline and powerline installations. However, there are no known plans for future projects at this time and it is likely none would occur until mining and reclamation considered with this WBI 1M Amendment 2 proposal has been completed.

#### **4.21.4 Wind Farm Development**

Information provided in the BiFO's draft Billings and Pompeys Pillar National Monument RMP/EIS revision indicates some interest in wind development within this RFD area. A single site testing and monitoring ROW grant authorizes site testing and monitoring on 6,097 acres of public lands approximately 10 air miles southeast of Bridger, immediately north of the RFD area. According to wind resource potential maps provided by the U.S DOE National Renewable Energy Laboratory (NREL), the wind resource level for this area is high or Class 5. The project area is intersected by two 230 kV transmission lines and a network of county roads.

An additional preliminary application and expression of interest was also received by the BiFO for a second site testing and monitoring ROW grant for a site located 6 miles

directly east of Warren, bounded approximately by the Custer NF on the north, and the Wyoming state line to the south. This proposal would cover approximately 13,000 acres of BLM public land, some of which may overlap the CEA area. According to the NREL wind resource potential map, this area has a low wind resource level.

#### **4.21.5 Oil and Gas Wells**

Information provided in the BiFO's draft Billings and Pompeys Pillar National Monument RMP/EIS revision indicates that portions of the Big Horn Basin Province extend north from WY into Carbon County, MT. The first fields in this Province were discovered in 1906 and 1907. Portions of this province border the western edge of the RFD area, near the town of Frannie. However, no new well applications are anticipated in WBI's 1M Amendment 2 CIA area, as of the date of this EA, based on current hydrocarbon exploration activity in the area.

#### **4.22 Cumulative Effects Summary**

This section provides a summary for those items where Cumulative Effects associated with the Proposed Action have been identified within the CEA (59,201.9 acres).

##### **4.22.1 Topography**

The Proposed Action would add 554.7 acres to the total 4,724 acres of currently disturbed land in the Cumulative Effects area and 75 currently disturbed acres of the RFD scenario. This impact would permanently alter existing landscapes but restore affected lands to approximate original premine contours during reclamation with some reductions in topographic diversity. No significant topographic impacts are anticipated by the Proposed Action.

##### **4.22.2 Air Quality**

The air-shed associated with the Project Area is classified as Class II, which generally allows concentrations of some air pollutants to increase to accommodate regional economic development. Fugitive dust and gaseous air pollutant emissions generated by bentonite mining and hauling activities are not expected to impact visibility or air quality to a measureable degree. However, fugitive dust generated by wind erosion on moderate to severely susceptible soils would elevate TSP from average background concentrations and mining or hauling would increase surface exposure and raise fugitive dust concentrations over the short term, until successfully reclaimed lands would support vegetation to mitigate these impacts over time. No violations of local, state, tribal, or federal air quality standards are anticipated to occur within the CEA or RFD lands from the Proposed Action.

##### **4.22.3 Hydrology**

Cumulative Effects of bentonite mining on groundwater would be minimal because of the lack of aquifers in the area. Even minimal impacts would be localized.

WBI holds stormwater permit (MTR000505) from MT that requires use of BMP's to control the amount of sediment leaving the site. These mitigations would reduce Cumulative Effects to surface waters during active mining and hauling activity. Reclamation operations would be designed to reconstruct channels to minimize erosion and sedimentation. Other mitigating factors include a lack of surface water within the project area and the 1.5 to 2.5 mile distance to Sage Creek, the closest receiving waters. Therefore, no significant Cumulative Effects to surface or ground waters are anticipated to occur within the CEA or RFD lands from the Proposed Action.

#### **4.22.4 Wildlife**

Cumulative Effects to wildlife resources include loss of habitat through construction activities, location of infrastructure (haul roads, mine pits, stockpile areas), and mortalities resulting from collisions with vehicles. The Proposed Action would add 554.7 disturbance acres to the 4,724 acres currently disturbed in the CEA, an increase of about 12%. This represents a direct loss of 554.7 acres of wildlife habitat (both forage and cover) or about 1% of the 59,201.9 total acres in the CEA. This also represents 39% of the 1,418.5 acres in the RFD lands. However, this loss would be incremental over-time and reclamation activities would mitigate the cumulative impact to habitat.

#### **Greater Sage-Grouse**

Sage-grouse occupied habitat within and adjacent to the CEA is designated as Core habitat. Big sagebrush dominated plant communities occupy 36,277 acres (61%) of the lands within the CEA. Plant communities dominated by Gardner saltbush occupy an additional 17,934 acres (30%) and are considered marginal sage-grouse habitat for breeding, nesting, brood-rearing or wintering because of inadequate vegetation cover. The remaining 10% of CEA lands are occupied by bare outcrops, riparian habitat, juniper shrub-lands or irrigated fields.

Known Leks within the CEA occur in big sagebrush plant communities. Distances to the Project Area from each Lek are given in Table 4.1. The initial 2013 monitoring efforts from the on-going study referenced in section 4.7.1 (page 58), identified ten nesting attempts within the CEA from local sage-grouse populations associated with these Leks. These were all located in big sagebrush plant communities. Only one of these nest attempts was located within the Project Area, and one was a little over one mile to the north. The remainder were well north, east and west of the Project Area.

Previous disturbances within the CEA have affected an estimated 1,890 acres of big sagebrush dominated lands, or about 5% of the total sagebrush plant community in the CEA. It is anticipated that an additional 118.5 acres of big sagebrush dominated lands will be disturbed by this Project, with the remaining 60% of the Project Area being located in less suitable, saltbush dominated habitat. This increase represents only 0.3% of the total big sagebrush community in the CEA. The large amount of unaffected big sagebrush dominated lands within the CEA would continue to provide suitable sage-grouse habitat for the duration of WBI's activities in the project area.

Cumulative Effects to Greater sage-grouse are expected to occur in the form of localized habitat avoidance and mortality resulting from direct (albeit rare) strikes with equipment. However, the overall low habitat quality and low sage-grouse use rate within the Project Area compared with better quality habitat and higher sage-grouse use rates in adjacent CEA help to reduce anticipated overall impacts within the CEA. In addition, WBI would mitigate direct impacts to localized nesting and brood-rearing sage-grouse by conducting spring nest surveys and ocular surveys when proposed activity would directly remove native vegetation from April 1 to July 15. When active nests or active brood-rearing locations are found, WBI will cease operations and avoid those areas until after July 15 unless subsequent surveys indicate the young have fledged. Therefore, no significant Cumulative Effects to Greater Sage-grouse are anticipated to occur within the CEA or RFD lands from the Proposed Action.

**Table 19. Distance to Known Leks from Project Area Boundary**

<b>LEK</b>	<b>DISTANCE (FEET)</b>
Bear Canyon	13,506
Prospect	15,019
Gravel Pit	22,647
Warren West 4	14,191
Warren West 3	27,702
Warren West 5	28,034
Warren West 1 and 2	21,170
Weatherman 2	28,892
Weatherman	36,006

Big Game

The Proposed Action would occur in high potential winter habitat for mule deer and white-tail deer. Cumulative Effects would include removal of native shrub species used for winter browse and shelter. Increased mining and hauling activity associated with this Proposed Action would alter big game winter movements and increase energy demands in harsh winters. These impacts would be mitigated by the small amount of sagebrush habitat involved, relative to the total available sagebrush habitat in the CEA Area (less than one percent of total) and by aggressive implementation of concurrent reclamation.

Migratory Birds, Raptors and Owls

Several bird species are inhabitants within the Project Area. Cumulative Effects would include short-term habitat reduction from removal of native plant communities. Impacts to sagebrush obligate and other migratory bird species would be mitigated by WBI's proposed pre-disturbance nesting surveys and nest avoidance. In addition as previously noted, only 40 percent of the proposed disturbance area occurs on lands dominated by big sagebrush. No significant Cumulative Effects to migratory bird species are anticipated by the Proposed Action.

There is no suitable nesting habitat for Bald or Golden Eagles or for any cliff or tree nesting raptors or owls within the Project Area. No Cumulative Effects to these species are anticipated by the Proposed Action.

**4.22.5 Cultural and Paleontological Resources**

Cultural and Paleontological Resources from the Proposed Action were mitigated by extensive pre-disturbance surveys conducted by qualified contractors to identify potentially significant sites. WBI has agreed to avoid all eligible sites identified in those surveys and to bring to the attention of the Authorized Officer any cultural or paleontological resources discovered on

Federal lands during mining activities that might be altered or destroyed by their operations. WBI would immediately suspend all operations that would further disturb such materials, immediately contact the Authorized Officer, and leave the discovery intact until told to proceed by the Authorized Officer. Therefore, no significant Cumulative Effects to Cultural and Paleontological Resources are anticipated to occur within the CEA or RFD lands from the Proposed Action because WBI is avoiding all known sites and immediately stopping in the event that previously unknown materials are encountered.

#### **4.22.6 Soils**

Proposed and future mining within both the CEA and RFD areas would increase Cumulative Effects of mining-related disturbances by increasing soil compaction, fugitive dust formation, rates of erosion and sedimentation, along with an irretrievable loss of topsoil and nutrients. Long-term impacts would include altered soil soluble salt regimes, pH, reduced soil stability, organic matter content, microbial mass, biotic richness and diversity, and phosphorus and nitrogen content. Permanent impacts to affected areas would include altered calcium carbonate and clay translocation properties, texture class, rock fragment content, structure, and depth to bedrock. Aggressive concurrent reclamation and revegetation practices would mitigate these effects. Therefore, no significant Cumulative Effects to soil resources are anticipated to occur within the CEA or RFD lands from the Proposed Action.

#### **4.22.7 Vegetation**

Cumulative Effects on vegetation would include past, present and future disturbances. Cumulative Effects on special status plant species would include the loss 554.7 acres of potential habitat for Desert Dandelion and Spiny Hopsage with the Proposed Action and an additional 1,418.5 acres of potential habitat for those two species with the RFD scenario. Concurrent reclamation would be emphasized and reclaimed areas seeded with native species to minimize exposures of temporarily non-vegetated areas to non-native invasive species. Mined lands would eventually restore stable plant communities dominated by native species. Therefore, no significant Cumulative Effects to vegetation resources are anticipated to occur within the CEA or RFD lands from the Proposed Action.

#### **4.22.8 Invasive, Non-Native Species**

The Proposed Action would expose additional lands to potential invasion by aggressive, non-native species through livestock movements, vehicular travel, human foot travel and wildlife movement. Carbon County Weed and Pest personnel located four noxious weed species populations along roadways accessing the Project Area in June, 2012. The Proposed Action would increase potential to spread populations of these species and increase potential to introduce other invasive, non-native species. WBI has a comprehensive weed management plan which requires continuous monitoring and treatment of existing and new weed populations throughout the life-of-mine. Furthermore, WBI would have a reclamation bond in place to ensure that these actions continue even in WBI's absence. This is included with the WBI mine and reclamation plan along with a weed compliance contract with Carbon County, MT. Weed and Pest to treat weed populations in the Project Area through 2014. It is WBI's intention to renew this contract throughout the life-of-mine. Therefore, no significant Cumulative Effects to invasive, non-native species are anticipated to occur within the CEA or RFD lands from the Proposed Action.

#### **4.22.9 Grazing Resources**

Cumulative Effects to lands disturbed by the Proposed Action would include temporary removal of native vegetation. As such, these lands would be temporarily non-productive for livestock grazing during active mining stages. However, these lands represent only 3.2 percent of the impacted “Gravel” grazing allotment (# 01005: 17,207 total acres) that is permitted for livestock use by the BLM. Grazing use of the remaining allotment acreages would not be affected. In addition, aggressive concurrent reclamation practices would reduce the amount of non-vegetated area within the allotment to less than one percent of the total acreage at any given point in time. No significant Cumulative Effects to grazing resources are anticipated to occur within the CEA or RFD lands from Proposed Action.

#### **4.22.10 Visual Resources**

Under the Proposed Action, Cumulative Effects to the visual landscape would include past, present and future disturbances. Permanent changes to the landscape would occur. But over the long-term, visual impacts from recent mining and mining under the Proposed Action would become negligible as reclaimed vegetation ages and slowly blends with existing undisturbed areas. No significant Cumulative Effects to visual resources are anticipated to occur within the CEA or RFD lands from the Proposed Action.

#### **4.22.11 Noise**

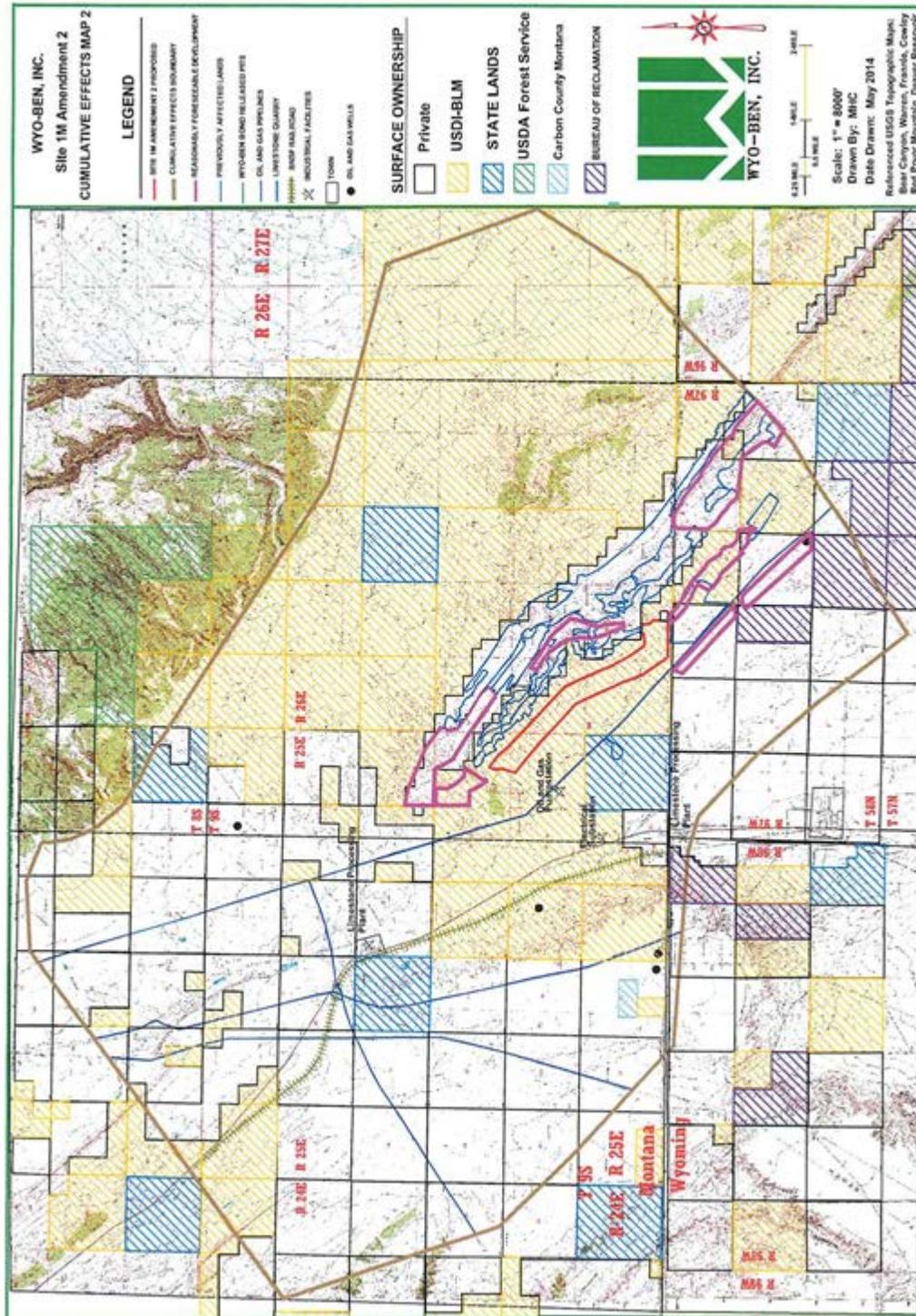
Under the Proposed Action, Cumulative Effects of noise resulting from mining operations would be within acceptable ranges for workers and would not exceed 10 dBA above ambient noise levels at sage-grouse lek perimeters in early morning hours. No significant Cumulative Effects to ambient or work area noise levels are anticipated within the CEA or RFD lands by the Proposed Action.

#### **4.22.12 Transportation Facilities**

Under the Proposed Action, an existing permitted roadway would be extended with new extensions located on lands to be otherwise affected by mining activity. Haul truck traffic from the Proposed Action is anticipated to be approximately 25 or more loads per day going to the WBI processing plant. Hauling would be intermittent with long periods of up to several months with no hauling activity. Hauling would also commonly shut down during inclement weather. Dust control would be achieved by an active WBI haul road watering and blading program. Proper traffic control and safety signs would be installed at appropriate access points and intersections. No significant Cumulative Effects to transportation facilities are anticipated within the CEA or RFD lands by the Proposed Action.



**Figure 10: Cumulative Effects and Reasonably Foreseeable Development Analysis Area**



## Chapter 5 List of Preparers

### 5.1 Preparers

Lyle King	Soil Scientist/Ecologist; Shell Valley Consulting Assoc. Inc.
Jeff Petty	Hydrologist; Shell Valley Consulting Associates, Inc.
Craig Drake	BLM - Team Leader, Acting NEPA Coordinator
Jennifer Macy	Archaeology, Paleontology
Jim Sparks	BLM - Field Manager
Jay Parks	Wildlife
Larry Padden	IWM Weeds
Tim Finger	Recreation, Special Designations, Visual Resources
Ernie McKenzie	Wildlife
Dusty Crowe	Range and Soil Resources
Tom Carroll	Lands and Realty

## Chapter 6 List of Agencies and Persons Consulted

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Program Phone: (406) 444-4970;

Montana Department of Environmental Quality  
Kari Smith, Water Protection Bureau  
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Montana Department of Environmental Quality; Waste & Underground Tank Management Bureau  
Permitting & Compliance Division, Solid Waste Section  
Ricknold Thompson, Supervisor  
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Montana, Fish Wildlife & Parks  
Shawn Stewart - Wildlife Biologist  
**FWP Region 5 Office**  
2300 Lake Elmo Drive  
Billings, MT 59105

Montana State Historic Preservation Office  
Kathryn Ore  
1410 Eighth Avenue  
Helena MT 59620

Wyoming Department of Environmental Quality  
Kevin Hyatt , TMDL Coordinator  
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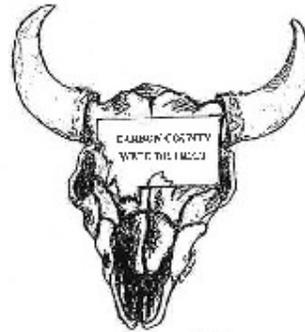
**APPENDIX A**

**Carbon County Weed District Weed Compliance Contract**

**and**

**Wyo-Ben, Inc.'s Noxious Weed Management Plan for Federal  
Lands**

**Carbon County Weed District  
Noxious Weed Control Plan  
Open-cut Mining Operations**



In accordance with 7-22-2123 (4) MCA, A person is considered in compliance if they submit and the Board accepts a proposal to undertake specified control measures is in compliance for so long as they perform according to the terms of the proposal.

Legal Description of Mine: Wyo-Ben Inc. Potential Bentonite Mine Area  
 Landowners name: Wyo-Ben Inc.  
 Noxious Weed Species found on site if any:  
White top Russian knapweed  
Spotted knapweed  
Scotch thistle  
 Method of weed control: Chemical  Biological  Cultural   
 Specific control measures: Weed control needs to be done before starting project.  
 Weed control to be completed by: Self  Commercial Firm  County   
 If a commercial firm is to be used, please give name, address and phone number when hired.

Dates weed control will be implemented:  
 Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_  
 This plan if implemented by said contractor, will be in effect for three years from the date above or the date of the Reclamation Bond Release. The responsibility for weed control will revert back to the landowner after this period.

I acknowledge and agree to the foregoing provisions. Signature: Matthew Call  
 Name & address: WYO-BEN INC. P.O. Box 1072 GREYBULL, WY 82426  
7. MATT CALL  
 Phone number: (307) 765-4446

Weed Management Approval:  (YES)  (NO) Date: \_\_\_\_\_  
 Inspection Fee Paid:  (YES)  (NO) Amount: 75.00 Date of Payment: 5/19/12 of 13004  
 Weed District Representative: Brian Ostwald  
 County Weed District Recommendations: Weed Company are presently the commercial applicators for the existing pit. I recommend continuing with them for the new area. Have the spray area before project starts.

attach additional information if needed

\*\*\*MINE SITE MAP MUST BE ATTACHED\*\*\*

I have a map  
attached

**Carbon County Weed District  
Noxious Weed Control Plan  
Opencut Mining Operations**



In accordance with 7-22-2123 (4) MCA, A person is considered in compliance if they submit and the Board accepts a proposal to undertake specified control measures is in compliance for so long as they perform according to the terms of the proposal.

Legal Description of Mine: R25E T9S Sec 24, R26E T9S Sec 19

Landowners name: Wyo - Ben

Noxious Weed Species found on site if any:  
Whitetop, Spotted Knopweed, Russian Knopweed  
Scotch Thistle

Method of weed control: Chemical  Biological  Cultural

Specific control measures: Target weeds controlled with  
chemical application. Do complete survey of project area for new infestations

Weed control to be completed by: Self  Commercial Firm  County

If a commercial firm is to be used, please give name, address and phone number when hired.

Dates weed control will be implemented: September 2012

Dated this 15<sup>th</sup> day of June, 2012

This plan if implemented by said contractor, will be in effect for three years from the date above or the date of the Reclamation Bond Release. The responsibility for weed control will revert back to the landowner after this period.

I acknowledge and agree to the foregoing provisions. Signature: \_\_\_\_\_

Name & address: \_\_\_\_\_

Phone number: \_\_\_\_\_

Weed Management Approval: (YES) (NO) Date: \_\_\_\_\_

Inspection Fee Paid: (YES) (NO) Amount: \_\_\_\_\_ Date of Payment: \_\_\_\_\_

Weed District Representative \_\_\_\_\_

County Weed District Recommendations: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*attach additional information if needed*

\*\*\*MINE SITE MAP MUST BE ATTACHED\*\*\*

Weed Management Plan

### WEED COMPLIANCE

In order that a proposed mining operation governed by the Open Pit Mining Act will be in compliance with local weed district regulations, permit applications must include this form.

WYO-BEN, INC. (operator) submitted a copy of its proposed Plan Of Operation for BEAR CANYON MINE PLAN site in the

NW 1/4 Sec. 24+25 T. 9 S. R. 25 E.  
1/4 Sec. 20+31+32 T. 9 N. R. 26 W.

Carbon County to the weed district. The landowner of this site is BUREAU OF LAND MANAGEMENT

operator is in compliance with weed district requirements for the proposed open pit operation.

#### COUNTY WEED COORDINATOR

Scian Ostwald  
Name (print or type)

[Signature]  
Signature

6/1/02  
Date

1-406-962-3867  
Phone Number

## CARBON COUNTY WEED DISTRICT GRAVEL PIT ORDINANCE PROPOSAL

**WHEREAS**, noxious weeds often flourish in gravel pits and other open-pit mining operations and are then scattered along roadways and to other construction zones and

**WHEREAS**, Section 7-22-2121 (4), M.C.A., of the County Noxious Weed Control Act, Title 7, Chapter 22, Sections 7-22-2101 through 7-22-2153, M.C.A., allows the county weed board to establish special management zones within the weed management district,

**NOW THEREFORE LET IT BE RESOLVED AS FOLLOWS:** All such operations containing gravel pits and or open pit mining operations are considered special management zones and the following management criteria are in effect:

The Carbon County Weed District is to be notified by property owner before any open pit mining permits are issued and before any equipment is moved on site.

Before any permit or permits are issued, all proposed sites would be inspected for the presence of noxious weeds by the weed district coordinator or weed board representative before any permit or permits are issued. Also, a \$75.00 fee will be paid to Carbon County Weed District for inspection of site.

All sites shall require that the owner of the pit file a weed management plan with the county weed district. The plan must take into consideration all areas to be used for stripping and mining, stock piling and for parking of vehicles and equipment. The plan must also address how the area will be monitored for the three years following the proposed project, including chemical, biological and cultural control methods used to control noxious weeds. The plan must be approved at a weed board's regular meeting or by a person who is designated to do so by the county weed board, before any activity on the project can proceed. Any person who refuses to obey an order or notice of the board is guilty of a misdemeanor and upon conviction thereof, they shall be fined. Fines shall not exceed \$100.00 for the first offense and not less than \$100.00 or more than \$200.00 for each subsequent offense (Section 7-22-2117, Violations).

All equipment that is used for development of the gravel pit must be pressure washed before entering the proposed gravel pit site. Also, all equipment that is used within the confines of the gravel pit must be pressure washed before entering such as the following: bulldozers, rock crushers, backhoes, front-end loaders, batch plant, etc. Special attention should be paid to undercarriages and other areas on which weed seeds may accumulate.

If the site contains Category II or Category III noxious weeds designated

Carbon County  
Open-pit Mining Three (3) Year Weed Management Plan

Each year planned will commit you to acres to control, how the control will be done, who control will be done by and what weeds will be controlled.

*Please list weeds on property and number of acres affected*

Kinds of weeds on property:	Acres infested
Whitetop Spotted/Knapweed Scotch Thistle	10 - 20 acres

Year one (1) plan: For year of 2012

Work will be done by Wright Company Phone 406-445-2271  
 Times(s) of year control will be implemented: Spring  Summer  Fall  Other   
 Please explain if other:

Control method that will be used:

Herbicide Control			
Herbicide Name	Weed	Rate per acre	Acres to be controlled
Tordon	Knapweed, Thistle	2-4 pt per ac	10-20
Cimaron Plus	Whitetop	1.25 oz per ac	10-20
2,4-D	All	1 pt per ac	10-20
Cultural / Mechanical Control			
Method of cultural/mechanical control	Weed	Acres to be controlled	

Cultural / Mechanical Control		

Year two (2) plan: For year of 2013

Work will be done by Wright Company Phone 406-445-2271  
 Time(s) of year control will be implemented: Spring  Summer  Fall  Other   
 Please explain if other:

Control method that will be used:

Herbicide Control			
Herbicide Name	Weed	Rate per acre	Acres to be controlled
Tordon	Knapweed, thistle	2-4 pt per ac	10-20
Cimmaron Plus	Whitetop	1.25 oz per ac	10-20
2,4-D	Acl	1 pt per ac	10-20

Cultural / Mechanical Control		
Method of cultural/mechanical control	Weed	Acres to be controlled

Year three (3) plan: For year of 2014

## **Wyo-Ben, Inc.'s Noxious Weed Management Plan for Federal Lands**

Wyo-Ben Inc. would implement the following management plan to address noxious weed control on all of its activities conducted on Federal lands:

- The list of Prohibited and Noxious Weeds compiled by the Carbon County Weed and Pest would be used to identify noxious weeds and other weeds that may reduce wildlife habitat. This list of noxious weeds would be monitored and addressed for treatment once they are identified.
- All Wyo-Ben, Inc. activity areas and access routes would be inventoried for infestations of noxious weeds of particular concern. Wyo-Ben Inc. personnel would conduct on-going monitoring of noxious weed presence at all of our activity sites and their access routes and take action, in cooperation with the Billings Office of BLM and the Carbon County Weed and Pest, to remove noxious weeds when located.
- All off-road access would be limited to only necessary routes to minimize impacted areas and reduce spread of weeds.
- Access would be controlled through infested areas until weed removal is accomplished.
- Wyo-Ben, Inc. would train mining personnel (including contractor representatives) to identify noxious weeds of particular concern to assist in the monitoring process. Weed identification materials would be made readily available to assist in field identification.
- Vegetation would be reestablished on all vegetated soil disturbed by construction, reconstruction or maintenance activities at the first available window of opportunity. This may mean waiting until the fall planting season to help ensure the success of vegetation establishment.
- All seed obtained from commercial sources would be laboratory tested for the presence of noxious weed seed. Native seed offered by local collectors would only be utilized after Wyo-Ben, Inc. personnel have consulted with the collectors to ensure they possess the skills necessary to recognize noxious weeds of concern and sign a statement certifying that they have not collected seed in areas with noxious weed infestations.
- All hay or straw used for check-dam construction or mulching would be Montana Certified weed-free.
- All herbicides used on the Bureau of Land Management (BLM)-administered public land would be approved by the BLM prior to its application.

**APPENDIX B**

**NATIONAL and MONTANA  
AMBIENT AIR QUALITY STANDARDS**

FEDERAL & STATE AIR QUALITY STANDARDS				
Pollutant	Averaging Period	Federal (NAAQS)	State (MAAQS)	NAAQS Standard Type
Carbon Monoxide (CO)	1-Hour	3S ppm <sup>a</sup>	23 ppm <sup>b</sup>	Primary
	8-Hour	9 ppm <sup>a</sup>	9 ppm <sup>b</sup>	Primary
Fluoride in Forage	Monthly	NA	50 µg/g <sup>c</sup>	NA
	Grazing Season	NA	3S µg/g <sup>c</sup>	NA
Hydrogen Sulfide (H <sub>2</sub> S)	1-Hour	NA	0.05 ppm <sup>b</sup>	NA
Lead (Pb)	Quarterly	1.5 µg/m <sup>3</sup> <sup>c,o</sup>	1.5 µg/m <sup>3</sup> <sup>c</sup>	NA
	Rolling 3-Month	0.5 µg/m <sup>3</sup> <sup>c</sup>	NA	Primary & Secondary
Nitrogen Dioxide (NO <sub>2</sub> )	1-Hour	100 ppb <sup>d</sup>	0.30 ppm <sup>b</sup>	Primary
	Annual	53 ppb <sup>e</sup>	0.05 ppm <sup>1</sup>	Primary & Secondary
Ozone (O <sub>3</sub> )	1-Hour	NA <sup>g</sup>	0.10 ppm <sup>b</sup>	Primary & Secondary
	8-Hour	0.075 ppm <sup>h</sup> (2008 std)	NA	Primary & Secondary
Particulate Matter :5 10 µm PM <sub>10</sub>	24-Hour	150 µg/m <sup>3</sup> <sup>i,l</sup>	150 µg/m <sup>3</sup> <sup>j</sup>	Primary & Secondary
	Annual	NA	50 µg/m <sup>3</sup> <sup>k</sup>	Primary & Secondary
Particulate Matter :5 2.5 µm (PM <sub>2.5</sub> )	24-Hour	35 µg/m <sup>3</sup> <sup>i</sup>	NA	Primary & Secondary
	Annual	12.0 µg/m <sup>3</sup> <sup>m</sup>	NA	Primary
	Annual	15.0 µg/m <sup>3</sup> <sup>m</sup>	NA	Secondary
Settleable PM	30-Day	NA	10g/m <sup>2</sup> <sup>c</sup>	NA
Sulfur Dioxide (SO <sub>2</sub> )	1-Hour	75 ppb <sup>n</sup>	0.50 ppm <sup>p</sup>	Primary
	3-Hour	0.5 ppm <sup>a</sup>	NA	Secondary
	24-Hour	0.14 ppm <sup>a,q</sup>	0.10 ppm <sup>b</sup>	Primary
	Annual	0.030 ppm <sup>e,q</sup>	0.02 ppm <sup>1</sup>	Primary
Visibility	Annual	NA	3 x 10 <sup>-5</sup> /m <sup>1</sup>	NA

- Federal violation when exceeded more than once per calendar year.
- <sup>b</sup> State violation when exceeded more than once over any 12-consecutive months.
- <sup>c</sup> Not to be exceeded (ever) for the averaging time period as described in either state or federal regulation. Pb is a 3-year assessment period for attainment.
- <sup>d</sup> Federal violation when 3-year average of the 98th percentile of the daily maximum 1hr average at each monitoring site exceeds the standard.
- Federal violation when the annual arithmetic mean concentration for a calendar year exceeds the standard.
- <sup>1</sup> State violation when the arithmetic average over any four consecutive quarters exceeds the standard.

- <sup>g</sup> Applies only to NA areas designated before the 8-hour standard was approved in July, 1997. MT has none.
- <sup>h</sup> Federal violation when 3-year average of the annual 4th-highest daily max. 8-hour concentration exceeds standard. (effective May 27, 2008)
- <sup>i</sup> To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard. EPA is in the process of reconsidering these standards (set in March 2008).
- <sup>j</sup> State and federal violation when more than one expected exceedance per calendar year, averaged over 3-years.
- <sup>k</sup> State violation when the 3-year average of the arithmetic means over a calendar year at each monitoring site exceed the standard.
- <sup>l</sup> Federal violation when 3-year average of the 98th percentile 24-hour concentrations at each monitoring site exceed the standard.
- <sup>m</sup> Federal violation when 3-year average of the annual mean at each monitoring site exceeds the standard.
- <sup>n</sup> Federal violation when 3-year average of the 99th percentile of the daily maximum 1-hr average at each monitoring site exceeds the standard. Promulgated June 2, 2010. Expected effective date mid-August, 2010.
- <sup>o</sup> The 1978 Pb NAAQS will remain effective until one year after designations are effective for the October 15, 2008, revised Pb NAAQS (0.15  $\mu\text{g}/\text{m}^3$ ), except in existing Pb nonattainment areas (East Helena, MT). In East Helena, EPA will retain the 1978 Pb NAAQS until EPA approves attainment and/or maintenance demonstrations for the revised Pb NAAQS.
- <sup>p</sup> State violation when exceeded more than eighteen times in any 12 consecutive months.
- <sup>q</sup> The 1971 SO<sub>2</sub> NAAQS will remain effective until one year after designations are effective for the June 2, 2010, revised SO<sub>2</sub> NAAQS (75 ppb), except in existing SO<sub>2</sub> nonattainment areas (Laurel and East Helena, MT). In Laurel and East Helena, EPA will retain the 1971 SO<sub>2</sub> NAAQS until EPA approves attainment and/or maintenance demonstrations for the revised SO<sub>2</sub> NAAQS.