

ENVIRONMENTAL ASSESSMENT

**Bentonite Mine Plan of Operation
Update to Wyoming Mining Permit 321C
Potato Ridge Block E; WYW-165211**

BLM

Worland Field Office, Wind River/Bighorn Basin District, Wyoming

January 2012



The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

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Project Title: Potato Ridge Block E
NEPA Number: DOI-BLM-WY-R010-2011-0034-EA
Project Type: Bentonite Mining Plan of Operations

Location:

T51N, R91W Sec. 3, 4, 10, 11, 13, 14, 15
T52N, R91W Sec. 19, 29, 32, 33
T52N, R92W Sec. 15,22,23,24

Name and Location of Preparing Office:

Worland Field Office
101 S. 23rd St.
Worland, WY 82401

Case File Number: WYW165211

Applicant/Address:

Wyo-Ben, Inc.
Greybull, WY

1.0 INTRODUCTION

1.1 Background Information

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of the POTATO RIDGE BLOCK E UPDATE TO WYOMING MINING PERMIT 321C as proposed by Wyo-Ben, Inc. The EA is a site-specific analysis of potential impacts that could result with the implementation of a proposed action or alternatives to the proposed action.

This plan of operation would allow the operator the ability to mine and remove the minerals the operator has claimed pursuant to Subpart 3809 -Surface Management to Title 43 of the CFR; which requires the submission of a plan of operation when mining of locatable minerals is proposed. The operator has submitted a proposal to mine in accordance with §43 CFR 3809.401.

The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any “significant” impacts could result from the analyzed actions. “Significance” is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of “Finding of No Significant Impact” (FONSI). If the decision maker determines that this project has “significant” impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record may be signed for the EA approving the selected alternative, whether the proposed action or another alternative. A Decision Record (DR), including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts (effects) beyond those already addressed in the Washakie Resource Management Plan, September, 1988.

1.2 Purpose and Need of the Proposed Action

BLM is considering approval of private exploration and production from federal minerals because the activity is an integral part of BLM’s minerals program under authority of the Mining Law of 1872, as amended. These regulations are issued under the authority of sections 302 and 603 of the Federal Land Policy and Management Act of 1976 (43

U.S.C. 1732, 1733, and 1782). Additionally, mineral exploration and development is recognized as an appropriate use of public lands in the Washakie Resource Management Plan that provides management direction for the area containing the mining claims. As per §43 CFR 3809.1 the purposes of this subpart are to (a) Prevent unnecessary or undue degradation of public lands by operations authorized by the mining laws. Anyone intending to develop mineral resources on the public lands must prevent unnecessary or undue degradation of the land and reclaim disturbed areas. This subpart establishes procedures and standards to ensure that operators and mining claimants meet this responsibility; and (b) Provide for maximum possible coordination with appropriate State agencies to avoid duplication and to ensure that operators prevent unnecessary or undue degradation of public lands.

Federal public domain lands included in this proposal are managed by the Bureau of Land Management (BLM). These lands are covered by placer mining claims which, under federal law of the General Mining Act of 1872 (as amended), give the applicant, Wyo-Ben, Inc., the right of access to extract the minerals claimed and to use the surface of the claim area in as careful and prudent manner as may be necessary to facilitate this extraction. The approval of this Plan of Operations (POO) through the signing of a Finding of No Significant Impact/Decision Record by the BLM, under the terms of §43 CFR 3809, and the Cooperative Agreement between the Bureau and the State of Wyoming, Department of Environmental Quality - Land Quality Division (DEQ-LQD), and the issuance of the Plan Approval letter from BLM, will constitute surface owner consent on those lands.

1.3 Decision to be Made:

The Authorized Officer (AO) must determine whether 1) to approve the plan of operation as received, 2) to approve the plan subject to changes or conditions to meet the performance standards of §43 CFR 3809.420 and to prevent unnecessary or undue degradation; or 3) disapprove the plan because the proposed operations would result in unnecessary and undue degradation of the national system of public lands (see §43 CFR 3809.411(d)).

If it is decided to issue the permit, the AO must decide what Conditions of Approval would apply to the mine plan. Conditions of Approval could include specification of operations, production and reclamation activities for the proposed project area.

Finally, the AO must determine whether or not the proposed action could result in significant impact to the human environment. If not, this determination would be documented in a Finding of No Significant Impact (FONSI.) If the impacts could be significant, an environmental impact statement would be necessary.

This environmental assessment was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) and other statutes relevant to the proposal. Authority for the proposed action and alternatives is contained in the Federal Land Policy and Management Act of 1976, as amended (FLPMA) and the regulations in 43 CFR 2200.

1.4 Relationship to Statutes, Regulations, or Other Plans

This environmental assessment was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) and other statutes relevant to the proposal. Authority for the proposed action and alternatives is contained in the Federal Land Policy and Management Act of 1976, as amended (FLPMA) and the regulations in 43 CFR 2200.

§43 CFR 3809. 2 applies to all operations authorized by the mining laws on public lands where the mineral interest is reserved to the United States, including Stock Raising Homestead lands as provided in §43 CFR 3809.31(d) and (e). When public lands are sold or exchanged under 43 U.S.C. 682(b) (Small Tracts Act), 43 U.S.C. 869 (Recreation and Public Purposes Act), 43 U.S.C. 1713 (sales) or 43 U.S.C. 1716 (exchanges), minerals reserved to the United States continue to be removed from the operation of the mining laws unless a subsequent land-use planning decision expressly restores the land to mineral

entry, and BLM publishes a notice to inform the public. This subpart does not apply to private land except as provided in paragraphs (a) and (c) of this section.

1.5 Scoping and Issues

1.5.1 Public Participation

The public was invited to comment on the proposed project during a Public Scoping process for 30 days prior to the writing of the EA; beginning March 24, 2011. No comment was received from the public during the 30 day scoping period. The EA was listed on the WFO NEPA Register webpage beginning on March 7, 2011.

Four Tribes were contacted regarding this project – Eastern Shoshone, Crow, Northern Arapaho, and Northern Cheyenne.

1.5.2 Summary of Public Participation

The Eastern Shoshone and Crow responded that they were interested in the project. A field trip was scheduled with the Eastern Shoshone but was cancelled due to weather. A meeting with them was held in May 2011. Tribes that expressed an interest in the project have been kept up to date through emails and letters.

1.5.3 Internal Scoping

Internal scoping was conducted in the BLM WFO beginning in March 2011, and concluding in October 2011.

No other mine plan revisions were requested during internal scoping. No other unusual environmental issues were identified relative to the proposed mine plan.

1.5.4 Issues Identified

Internal scoping resulted primarily in the following BLM specialist concerns:

- 1) What would be the affect to air quality by the dust and exhaust generated by the burning of fossil fuels associated with bentonite mining?
- 2) Would bentonite mining in this area increase sedimentation, bentonite and water run-off into surface and ground water as well as into wetlands, riparian areas, floodplains, and aquatic habitats?
- 3) Would drainages be affected by disturbance that would be caused by the proposed bentonite mining in the proposed mine area?
- 4) How difficult is revegetating areas disturbed by mining due to changes in post-mining soil characteristics, the areas dry climate, and the presence of invasive weeds?
- 5) Would the proposed mining process contribute to the spread of noxious and invasive weeds?
- 6) Are raptor nests present in the area and would nesting success be affected by the proposed mining disturbance?
- 7) What is the inventory of cultural sites and would sites be disturbed by Bentonite mining?

- 8) If new roads were required for bentonite mining, would these increase human disturbance to cultural and wildlife resources?
- 9) What would be the effects to Visual resources in the area?
- 10) What is the type and level of recreational use of the area, and what would be the effects?
- 11) Would the bentonite mine cause changes in livestock grazing? Would there be a measurable loss in available forage for livestock or wildlife?
- 12) How can we permit mining operations and avoid unnecessary and undue degradation of resources in the process?

2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

The proposed action involves the mining of bentonite in proposed surface mining pit location where Wyo-Ben Inc., the operator, had located placer claim locations within Big Horn County (see Figure 1) within the 6th Principle Meridian. Table 1 presents information about the proposed pit area. There are existing dirt roads that the operator would maintain to BLM standards or upgrade as needed, that would be used as transportation routes for the mined product that would be hauled to a processing plant in Greybull. The cast-back method of mining proposed is intended to promote the practice of concurrent reclamation and would minimize the size of disturbances at any particular time. This plan of operation has been assigned serial number WYW165211 which is on file with the Worland Field Office.

2.2 Alternative 1-- Proposed Action

Potato Ridge Block E proposes an open pit bentonite mine of no more than 594 acres of disturbance that would occur on haul roads and be excavated in multiple phases using standard castback mining techniques and procedures. A pit sequence can take between five to ten years to complete.

Table 1. Pit locations and total proposed disturbance

PROPOSED PITS (BENTONITE BEDS and STOCKPILE AREAS)	TOWNSHIP	RANGE	SECTION	PROPOSED DISTURBANCE AREA	CLAIMS
202G (BEAVER BED)	T51N	R91W	3,10,11,13,14	93.6	Charlie 1,2,5,6,9,14,18,19,20 Plains 13,15,16,17 PR 11,19
203G/204G (Mowry A & B BEDS)	T51N T52N	R91W	3,4,10,11,14 29,32,33	74.5	Charlie 2,3,5,6,9 Plains 13,17,18,19,20 PR 8,9,10,11,19
205G – 208G ¹ Canadian, D, Rusty, and 3 rd Beds of The Thermopolis Shale	T51N T52N	R91W	3,4,10,11,14 29,32,33	176.1	Charlie 2,3,6 Plains 17,18,19,20,21,22 PR 8,9,10,11,19
Haul Roads Outside Proposed Disturbance area	T51N T52N	R91W	3,4,10,11, 13,14,15 19,29,30,32,3 3	40.9	Charlie 1,2,3,4,5,6,9,10,14,18,1 9 Plains 12,13,15,16,17,18,19,2 0,21,22,23,24,25,26,27,

¹ * The Thermopolis Shale pits of this proposal (Pits 205G – 208G) are in very close proximity to each other. It is likely there will be no native lands left undisturbed between those pits in much of the proposed disturbance area. Therefore, one disturbance acreage was determined for those pits.

	T52N	R92W	15,22,23,24		28 PR 6,7,8,9,10,11,19
POTENTIAL DISTURBANCE AREA ^{1,2,3}	T51N	R91W	3,4,10,11,13,1 4	208.3	Charlie 1,2,3,5,6,9,10,14,18,19, 20
	T52N	R91W	29,32,33		Plains 13,15,16,17,18,19,20,2 1,22,27,28
					PR 8,9,10,11,19
TOTAL PROPOSED DISTURBANCE AREA				593.4	

1. Because the pits of this proposal are in very close proximity to each other, it is difficult to separate each pit disturbance area. A total proposed disturbance area is reported, which includes the mine plan as shown on submitted maps and the extended disturbance limit above and below the proposed pit disturbance area. Some of the pit disturbance areas may reach an adjacent pit's disturbance, thus resulting in continuous disturbance between pits. In other cases, there will be islands of native vegetation between pit sequences; however, it is included in the total proposed disturbance area.
2. The extended disturbance limit allows a little extra room for Wyo-Ben, Inc., to be able to expand their pits if the production of bentonite is discovered to be economically advantageous, or if additional stockpile area is needed. This will avoid the use of additional limited time to review paperwork by DEQ-LQD and BLM for post approval modifications.
3. C.O.P. = Contoured Overburden Pile – this area may include overburden stockpile area, temporary bentonite stockpiles, camp site, and will be reclaimed as a permanent contoured overburden area once mining is complete to reflect the surrounding topography.
4. T.O.P. = Temporary Overburden Pile – this area may include temporary overburden stockpile area, temporary bentonite stockpiles, camp site, and will be reclaimed similar to the original topography.

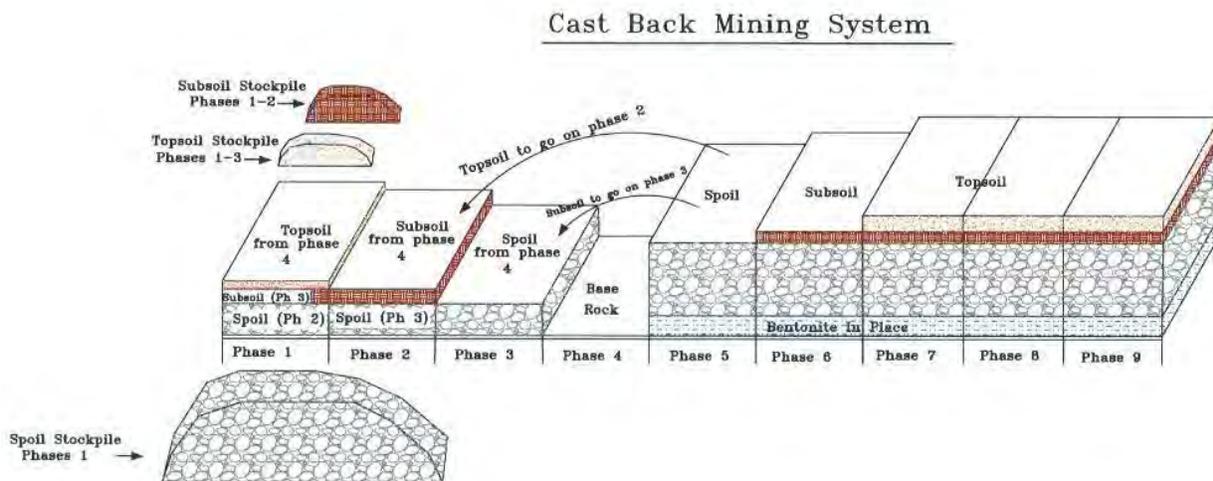
2.2.1 Castback Mining Technique

These will all be open pit bentonite mines excavated using standard castback mining techniques and procedures. Castback mining is a technique that is beneficial both environmentally and economically on many levels. Figure MP-1 shows a model of the castback system as described:

1. In this process, overburden from the first open pit (phase 1) of a pit sequence is usually piled and contoured adjacent to the first open hole (sometimes referred to as an out-of-pit overburden pile). Top and subsoil are also stockpiled separately in the same general area. At the earliest opportunity, the original overburden pile from Phase 1 is then contoured to match existing topography, after which at a later date, subsoil and topsoil is spread from existing soil piles in preparation for seeding. If soil stockpiles will be in place longer than one year, they will be seeded with a BLM approved perennial grass species.
2. Once the bentonite is removed from phase 1, topsoil and subsoil is stripped from phase 2 and placed on existing piles from Phase 1; and the remaining overburden from the next open pit of the sequence (Phase 2) is cast into the open hole of phase 1.

3. Once the bentonite is removed from Phase 2, topsoil from Phase 3 is removed and placed on the existing pile from Phase 1 and 2. The subsoil is then castback into Phase 1 and the remaining overburden is cast back into Phase 2.
4. After the removal of bentonite from Phase 3, topsoil from Phase 4 is then cast onto contoured and previously subsoiled Phase 1; the subsoil is then cast onto Phase 2; and the remaining overburden from phase 4 is cast into Phase 3.
5. This process repeats itself until the end of the pit sequence. At this time, since there is not overburden available from another phase of mining, material to fill the last hole is acquired by reducing the highwall's steep grade, also known as a highwall reduction. The castback/ highwall reduction process provides ecological and economic pragmatism by promoting live topsoil distribution, as well as eliminating the need for long-distance transport of the original overburden from phase 1. In many cases this distance can exceed a mile. The cost, energy, and equipment necessary for that effort are well above accepted norms.

Figure MP-1 Castback Mining illustration



Environmentally, castback mining with a highwall reduction is beneficial on many levels. First, a pit sequence can take between five to ten years to complete. In this time, micro fauna residing in a deep stockpile effectively die before soils are spread. Degradation can occur due to soil compaction. Both of these conditions degrade a soil's ability to support desirable vegetation on reclaimed sites. Wyo-Ben practices concurrent reclamation with the spreading of "live" soils to reestablish vegetation, resist erosion, and develop stable and productive habitats following disturbance. Complete blocks of reclamation started behind the final phases of mining would be impossible because of the need for access corridors to accommodate the hauling of material. Using the castback mining procedure greatly reduces the amount of disturbance created when compared to older mining techniques where overburden was piled on the highwall and outcrop sides of the pit until commencement of backfilling.

The mining proposed would have two highwall reduction sites, the first being at the last phases of the Thermopolis Shale pits which will be a gentle slope highwall reduction. The second highwall reduction is at the last phase of mining of the Beaver Bed. This would also be a gentle-sloped highwall reduction. Those areas included in the mine plan are considered to be the limit of necessary disturbance required to accomplish reclamation of the last phase in a pit sequence. In most cases, usually less area than that requested to disturb during mining would be needed to accomplish final fill and contour of the last phase.

A highwall reduction is accomplished by removing top and subsoil adjacent to the last phase, and dozing the underlying material adjacent to the highwall into the open hole of the last phase. Once contouring of the last phase is complete, the area is then soiled using both material from the highwall reduction area, and a partial amount of saved soil from two or three previous phases.

The area of disturbance in the highwall reduction is determined by three factors. One is the depth of the highwall of the last phase. The second factor is the size of the phase; and the last factor is swelling of overburden as it breaks up during mechanized removal from the previous phase. In general, a deep highwall will require more disturbances in the highwall reduction area. Similarly, larger pits will require a larger reduction disturbance. Finally, if the overburden in the next-to-last phase has a high swell factor, there will be more material to go into the last phase of mining. This opportunity, when present, minimizes the area of disturbance required for the highwall reduction. Wyo-Ben has the mining practice of intentionally reducing the size of its phases of mining as mining progresses through the pit sequence. When the last phase is reached, it is usually smaller than the first phases of mining, thus reducing the area needed for the highwall reduction.

Soil handling in castback mining is also more economically and environmentally sound than in older mine techniques. Stockpiling soil for long periods of time can be detrimental to the resource. Castback mining reduces or eliminates stockpiling time. After the first phase of overburden is contoured in-place, it can be soiled with stockpiled top and subsoils obtained from the first few phases of mining. Upon backfilling and contouring of the first and subsequent phases of mining, soils can be spread “live” as it is being removed from subsequent phases. This reduces the degradation of soil microbes, and increases vegetation establishment due to seed propagules contained in the soil. It reduces the cost of soil redistribution by decreasing the amount of material handling. Wyo-Ben will also salvage suitable material below subsoil that is chemically and physically beneficial or neutral to vegetation establishment. This practice allows placement of a buffer between the more detrimental spoil material and the top and subsoil, thus increasing the chance of establishing a diversity of desirable vegetation.

Pit delineation boundaries establish the limit of the resource that is economically viable to extract, based on market demands. Often, due to various economic or physical conditions, Wyo-Ben may not disturb to the limits shown or requested in the proposal. This routinely results in less acreage of disturbance than originally proposed. The width of disturbance illustrated in Figure 1 of the environmental analysis is based on the geologic dip of the bentonite bed of interest. Steeply dipping beds usually result in a narrower pit than flatter-lying beds. When practical, Wyo-Ben would leave mosaics of undisturbed lands within the proposed pit sequence or between adjacent pit sequences which enhance reclamation aesthetics, and serve as a seed source for reclaimed lands. Pit area locations, boundaries and stockpile sites would be staked prior to disturbance. The C.O.P. and T.O.P. areas may consist of the following items: topsoil stockpiles, subsoil stockpiles, temporary bentonite stockpiles, camp sites for mine equipment, and overburden material from initial or subsequent phases of mining.

TABLE 2. PROJECTED DISTURBANCE ACREAGE AND MINING DATES

PROPOSED PITS BEDS # OF PHASES	PROJECTED OPENING DATE	PROJECTED ENDING DATE	APPROXIMATE DISTURBANCE PER YEAR ACRES	AVERAGE OVERBURDEN PER PHASE CUBIC YARDS	PROPOSED DISTURBANCE ACREAGE
202G (BEAVER BED)	October, 2011	October, 2020	9.4	68,200	93.6
203G/204G	May, 2012	May, 2025	5.0	19,100	74.5

(MOWRY BEDS)					
205G-208G (THERMOPOLIS SHALE BEDS)	January, 2012	January, 2024	13.5	16,750	176.1
HAUL ROADS	October, 2011				75.8

2.2.2 Proposed Haul Roads

New Haul Road HR 61 (Primary haul road from existing HR 23. Routes around the northern end of existing PR Block D and proceeds along the Thermopolis Shale side to the furthest southern COP stockpile area)

44,590 lineal feet x 60 feet wide = 61.4 acres

New Haul Road HR 61.1 (Access across Potato Ridge from the farthest south Thermopolis Shale COP pile to the existing MI SWACO haul road)

5,204 lineal feet X 60 feet wide = 6.9 acres

New Haul Road HR 61.2 (Access from HR 61.1 to the COP area for the Beaver Bed)

3,050 lineal feet x 60 feet wide = 3.5 acres

New Haul Road HR 61.3 (Access road for the Beaver Bed from HR 23 and travels south to HR 61.1)

531 lineal feet x 60 feet wide = 0.7 acres

New Haul Road HR 61.4 (Haul road to access the Mowry beds from existing HR 23)

729 lineal feet x 60 feet wide = 0.7 acres

Haul Road HR 23.1 Extension (Provides access to the Mowry Beds from HR 23)

951 lineal feet x 60 feet wide = 1.3 acres

Summary of Proposed Disturbance

Total Proposed Pit and Stockpile Disturbance	344.2 Acres
Remaining Potential Disturbance Area	208.3 Acres
Haul Roads Outside of Potential Disturbance*	40.9 Acres
Total Proposed Disturbance Area	593.4 Acres

*There is a total of 74.8 acres of proposed haul roads in this Amendment/Plan of Operation (POO); however, only 40.9 acres lie outside of the Potential Disturbance Area. The remaining road acreage will lie either in pit areas or inside of the Potential Disturbance Area.

2.2.2.1 Haul Road Culverts

None of the proposed haul roads of this submission will require culverts in drainage crossings based on hydrology calculations, and the fact that most crossings are near the heads of drainages. Haul road 61 will cross some deeper drainages on the northwest area of the Thermopolis Shale side of the proposal. Drainage 9A-RD (illustrated in the Mine Plan) shows the hydrologic summary of those typical deeper drainages, which do not suggest the need for culverts. Wyo-Ben will assess each drainage in this area to determine the need for a culvert in those drainage crossings. If low water crossings can be constructed without the need for a large amount of disturbance immediately outside the drainage, low water crossings would be implemented; otherwise, 18-inch culverts will be placed in those drainages.

2.2.3 Reclamation Plan

The reclamation/revegetation process is designed to restore a mosaic vegetation scheme consisting of site specific dominance of various life forms (shrubs, grasses, and forbs) with a diverse species composition. Additional revegetation goals include site stabilization/erosion control and visual aesthetics. Land use restoration goals include wildlife habitat and livestock grazing.

Reclamation backfill would be achieved during the castback mining process using variously sized Caterpillar tractor-scrappers depending on availability. Wyo-Ben, Inc.'s mining contractors typically use Caterpillar 627 and 631 tractor-scrappers. These are supplemented with Caterpillar tractor-dozers ranging from D-8 to D-10 in size, used for backfilling and contouring. Most drainage construction will be done with a backhoe excavator.

Final reclamation contours would be consistent with those necessary to reestablish the projected postmining land use goals of domestic livestock grazing and wildlife habitat. Final slopes and surface contours will approximate native gradients and will blend with adjacent topography. Through drainage would be reestablished in all backfilled phases. Ephemeral channels to be impacted by this proposed mining activity would be temporarily directed around open pits during active mining stages. Channel design for both temporary and permanent diversions would match premine channel gradients and cross sectional shapes. Temporary diversions would allow passage of peak runoff from a 2 year, 6 hour precipitation event in an erosive manner. Permanent diversions (including reconstructed channels and adjacent topography) would be erosionally stable during the passage of the peak runoff from a 100 year, 6 hour precipitation event.

Reclamation backfill would follow the castback mining sequence illustrated in Figure MP- 2a in the Mine Plan Section. Following backfilling and contouring, all compacted surfaces would be ripped to improve water infiltration and retention. Subsoil and topsoil would be replaced from stockpiles or hauled directly during the castback mining sequence. Average topsoil and subsoil redistribution depths are reported in Table 5. Where necessary on initial pit cuts, out-of-pit overburden stockpiles would be contoured in-place and used for temporary bentonite and soil stockpile locations (C.O.P. locations on the Mine Plan Map).

Final reclamation of these areas would include deep-ripping, spreading topsoil/subsoil and seeding. Reclamation of the steep-sloped A and B beds of the Mowry Formation may include leaving the upper portion of the post mine base rock exposed, with backfilling and contouring of overburden occurring below that point. Contouring would simulate the "pie-pan" nature of premine topography, with the lateral outside edges of those features fanning reclaimed drainages that will tie into native drainages.

Wyo-Ben, Inc. will comply with the requirements regarding the timeliness of reclamation.

Wyo-Ben, Inc. would coordinate with both Wyoming DEQ and BLM to consider alternative innovative techniques for reclamation in order to achieve bond release. Some of these innovative techniques may include pitting, broadcasting, drilling, or hydro-seeding, the crimping of straw, candy-striping of soil where there is little to spread, seed coating, additives to the soil (including but not limited to mycorrhizac, boron, gypsum, limestone, fertilizers, mulch, grass clippings, wood chippings, weed free manure/compost, polymers, sugar), sagebrush seedlings, fencing, spraying of invasive species before and/or after mining, alternative irrigation techniques, alternative seed mixtures which may include approved non-native species, or other methods that will require BLM and DEQ approval prior to application.

2.2.4 Isolation and Control of Acid-forming, Toxic, or Deleterious Material

Wyo-Ben, Inc. characterizes the overburden from the surface down to the bentonite in each pit it plans to mine at a rate of approximately 1 hole per mile of proposed pit. In this process, a material sample is obtained every five feet down to the bentonite and sent to Intermountain labs in Sheridan, Wyoming for testing of chemical and physical parameters. If it is shown that a particular pit has the potential for acidic, deleterious or toxic material near the surface, Wyo-Ben would attempt to cover it with at least two feet of a more neutral spoil material from adjacent pits in a lateral castback procedure, or bury that layer deeper in the profile during backfill. If deleterious material (bentonite, spoil) would be intentionally placed on the surface, it then would be bermed to prevent off-site sedimentation of the material.

In the situation of unintentional placement of deleterious materials on native lands (i.e. a large bentonite spill) Wyo-Ben is committed to remove the deleterious material from the lands as soon as possible and reseed the disturbed area with an appropriate seed mixture.

2.2.5 Post Closure Management

Wyo-Ben plans to monitor all its 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 is 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 is monitored on a regular basis. If after two to four growing seasons vegetation establishment is not adequate, Wyo-Ben will determine the reason for failure and mitigate the problem including reseeded of the site.

2.2.6 Revegetation Techniques and Seed Mixtures

Revegetation considerations include use of the area for domestic livestock grazing and wildlife habitat. Revegetation procedures would begin following contouring and topsoiling of the disturbed areas as previously described.

Seedbed preparations may include deep-ripping after soil replacement to break up the surface 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, the Company may exercise its discretion to attempt spring seeding on areas where live topsoil has been directly placed during winter months to reduce destruction of native species volunteering 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.

Reclamation of haul roads would be accomplished by contouring to restore drainage patterns, remove culverts, and blend with surrounding topography. These areas would then be deep-ripped, subsoiled/topsoiled and seeded.

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

Table 3. Proposed Seed Mix	
Seed Species	Rate-lb PLS/acre
Gardner saltbush (<i>A. gardneri</i>)	4.0
Fourwing saltbush (<i>A. canescens</i>)	2.0
Rubber Rabbitbrush (<i>Chrysothamnus nauseosus</i>)	2.0
Russian wildrye (<i>Elymus junceus</i>)	2.0
Indian ricegrass (<i>Oryzopsis hymenoides</i>)	1.5
Bottlebrush squirreltail (<i>Silanion hystrix</i>)	0.5
Sandberg bluegrass (<i>Poa sandbergii</i>)	1.5
Evening primrose (<i>Oenothera pallida</i>)	0.5
Annual sunflower (<i>Helianthus annuus</i>)	1.0
Biscuitroot (<i>Lomatium ambiguum</i>)	1.0
Total	16.0 lb/acre

This mixture would be supplemented with big sagebrush (*Artemisia tridentata*) at a rate of 1 to 2 pounds per acre in targeted areas of greater moisture potential (i.e. drainages and depressions) and higher quality soil, rubber Rabbitbrush (*Chrysothamnus nauseosus*) at a rate of 0.5 to 1 pound per acre, basin wildrye (*Elymus cinereus*) broadcast onto uplands and reconstructed drainages and other low-lying areas at a rate of 0.5 to 2 pounds per acre, and Fringed Sagewort (*A. jrigida*) at a rate of 0.5 to 1.0 pounds per acre. Monitoring of past reclamation successes and failures may influence seed mixture composition and surface preparation techniques.

2.2.7 Quality Assurance

Wyo-Ben utilizes two drill trucks to characterize the volume and quality of bentonite in the various beds during the development of pits. This allows the company to tighten planned disturbance boundaries of the pits, which in many cases, reduces the amount of disturbance that would otherwise occur. Soils of proposed mine areas are characterized to an order 2 level. This allows the company to determine the quality and volume of soils that can be saved to produce quality reclamation. As stated previously, Wyo-Ben commits to save all available top and subsoil for reclamation during the initial stripping part of the mining process, and would either stockpile or spread it live. The stripping of pit phases is accomplished using a castback mining procedure. This practice allows reclamation to be concurrent with mining. Typically, previously mined phases of a pit are reclaimed through backfilling and contouring almost adjacent to the open phase of a pit, with soiled and seeded phases not far from this. Before a pit is backfilled, bentonite cleanings are pushed against the bottom of the highwall to ensure they are buried deep. In the reclamation of bentonite stockpile areas, the pad (portion of bentonite near the bottom of a stockpile that is not used) is buried, followed by the ripping and soiling of the area. All compacted areas, such as roads and other stockpile areas are also ripped prior to soiling to reduce compaction. The movement of overburden during the mining process is done in a tiered castback process, which places material from the current phase of mining into a previous open pit in approximately the same order as it was removed. This process is employed unless overburden testing reveals the need to place at least two feet of neutral spoil material over a toxic layer near the surface (i.e., very high SAR or acid potential).

2.2.8 Monitoring Plan:

Wyo-Ben utilizes contractors to conduct the mining and reclamation operations of their business. The mining supervisor works with the contractor's field supervisors to ensure that mining is being conducted in a lawful and environmentally responsible manner. He also supervises and directs the

reclamation of pits. Monitoring of field operations and contact with the contractor's field supervisors occurs on an almost daily basis. Wyo-Ben would plan to monitor its reclaimed lands as explained above in post closure management.

Wyo-Ben personnel plans to record the number and locations of pronghorn and mule deer noted when they observed are in the Potato Ridge Block E Amendment Area. Any known raptor nests in the Amendment area would be monitored for activity starting in February and continuing to July 15th. MBHFI nest searches would be conducted prior to any initial surface disturbing activities during the dates April 15 to July 15.

2.2.9 Interim Management Plan:

In the event Wyo-Ben temporarily closes a pit, interim management procedures as per 43 CFR 3809.401 (5) would be implemented as follows: A berm would be placed in all areas around the pit phase where a highwall occurs. A berm would also be installed at the ramps of the pit to prevent entrance. Temporary water diversions would be made around the pit to prevent water from entering the particular pit phase. Bentonite stockpiles and stockpiles with potential deleterious material (spoil piles, etc.) would be bermed to prevent off-site sedimentation. Ephemeral drainages that have the potential to receive deleterious material will have check dams installed. All equipment and supplies would be kept within the disturbance area. Any fuel storage tanks would either have a perimeter berm or placed within an excavated containment pit to control any potential spills. Annual and semi-annual inspections would be completed by Wyo-Ben employees, a representative from the DEQ, and a representative from the BLM.

2.3 Design Features of the Proposed Action

2.3.1 Wyo-Ben Standard Operating Procedures & Best Management Practices

Mining Operations:

Equipment operators and other contractors will be monitored on a regular basis in order to maintain control of acceptable standards of mining and reclamation.

Topsoil and Subsoil Handling:

Wyo-Ben will save all available soil for reclamation during the initial stripping part of mining. If soil piles are expected to be in place for an extended period due to the temporary closure of the pit, they will be seeded to prevent erosion and loss of soil. The pit area will be monitored on a regular basis to determine if problems are occurring that need to be addressed.

Surface water/Groundwater/Riparian:

Wyo-Ben will install check dams, where necessary, in newly constructed drainages, and establish vegetation communities in those reclaimed drainages to control sediment runoff in the waterways.

Vegetation/Invasive Plant Species:

Yearly monitoring of the proposed disturbance area for noxious weeds will occur. If any are found, Wyo-Ben will contract Big Horn County Weed and Pest (or a licensed herbicide applicator contractor) for treatment of those noxious species after obtaining proper permits from BLM.

Wildlife:

Wyo-Ben will continue to monitor the proposal area for antelope and mule deer herds to determine impacts due to mining. If it is determined that impacts are occurring, Wyo-Ben will contact BLM for mitigation recommendations. Wyo-Ben commits to stay current with reclamation of mine sites in order to reduce potential hardships to antelope and mule deer, and to reestablish habitat as climatic and soil conditions allow.

To mitigate impacts to sage grouse and other sage brush obligate species, Wyo-Ben will reseed sagebrush during reclamation in areas that contained sagebrush premine. The WGFD also expressed concern for offsite sedimentation to waterways near the project area. Wyo-Ben will install check dams, where necessary, in newly constructed drainages, and establish vegetation communities in those reclaimed drainages to control sediment runoff in the waterways.

Wyo-Ben will continue to search for nests in the proposed disturbance area, and if found, they will be monitored during the nesting season (February to July) to determine activity status. If an active golden eagle nest is observed, Wyo-Ben will contact FWS personnel and avoid activity within a ½ mile radius from mining activity until it has been determined that the chicks have fledged.

If eagles or ferruginous hawks are found, Wyo-Ben will mitigate their nesting activity and other raptor nesting activity as follows. In general, as a standard operating procedure of Wyo-Ben, Inc., if bald eagle or ferruginous hawk nesting activity occurs within a 1 mile unobstructed sight distance or ½ mile for other raptors, Wyo-Ben will proceed as follows: (1) In areas where mining or hauling activity is ongoing prior to February and bald eagle/raptor activities such as nest prepping occurs within a 1 mile unobstructed view for bald eagle and ½ mile for other raptors including golden eagles, Wyo-Ben will continue operations and monitor the nest on a regular basis. At the sign of nesting activity, Wyo-Ben will cease activity and notify the USFWS or (2) in areas where nesting occurs within 1 mile for bald eagles or ferruginous hawks, and ½ mile for other raptors unobstructed sight distance prior to commencement of mining or hauling activity, Wyo-Ben will not initiate activity until consultation with the USFWS and BLM have been allowed evaluation of site specific mitigation options.

Within the proposed disturbance area and the half mile buffer there is suitable mountain plover habitat. Wyo-Ben, Inc. will mitigate potential impacts to this species by conducting ground searches between April 15 and July 15 within suitable habitat subject to surface disturbing activities. If nesting activity is observed, Wyo-Ben, Inc. will notify the USFWS for mitigation suggestions, and avoid activity in the immediate nesting area (100 meter buffer) until the young can safely leave the nest.

USFWS did not express concern for Migratory Birds of High Federal Interest (MBHFI) in the project area; however, Wyo-Ben, Inc. personnel will conduct bird-call surveys within the proposed affected area during the spring breeding period to help determine presence or absence of MBHFI species. Surveys will be conducted according to methodology provided by the FWS. If nesting activity by these species, or any species listed as a “species of special concern” in the Wyoming Natural Diversity Database (Fertig and Beauvais, 1999) is noted, the USFWS and/or LQD will be notified for mitigation recommendations. Along with MBHFI bird surveys, Wyo-Ben personnel will survey for nesting chukars when doing bird surveys during the spring of the year. If nesting chukars are located near planned mining areas, they will be noted and recorded.

If previously unidentified significant habitat or significant wildlife usage are observed during the course of conducting this proposed activity, Wyo-Ben, Inc. will implement mitigation and notify BLM and WYDEQ-LQD.

Spill Management Plan:

Wyo-Ben Inc. will immediately notify both the Wyoming Water Quality Division of the Department of Environmental Quality and the Worland Field Office of the BLM for any accidental spills of petroleum or other industrial products involving more than twenty-five gallons. Soils contaminated by smaller spills will be removed to the Wyo-Ben Stucco Mill Site for natural weathering treatment.

No solid wastes, either hazardous or non-hazardous, will be disposed of at these sites. All bulk fuel storage tanks will either be bermed for spill containment or placed in an excavated containment pit.

Noxious Weed Management Plan for Federal Lands:

Wyo-Ben Inc. will 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, located in the DEQ/LQD Guideline2, Appendix I, or in the approved BLM list of Prohibited or Noxious Weeds located at the following website:

<http://www.wyoweed.org/statelist.html> will be used to identify noxious weeds and other weeds that may reduce wildlife habitat. This list of noxious weeds will be monitored and addressed for treatment once they are identified.

All Wyo-Ben, Inc. activity areas and access routes will be inventoried for infestations of noxious weeds of particular concern. Wyo-Ben Inc. personnel will 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 Big Horn County Weed and Pest, to remove noxious weeds when located, under terms of BLM permits when on public lands.

All off-road access will be limited to only necessary routes to minimize impacted areas and reduce spread of weeds.

Wyo-Ben will control its access through infested areas until weed removal is accomplished.

Wyo-Ben, Inc. will train mining personnel (including contractor representatives) to identify noxious weeds of particular concern to assist in the monitoring process. Weed identification materials will be made readily available to assist in field identification.

Wyo-Ben will manage field and mining equipment to reduce the possibility of spreading noxious or invasive weeds on Federal Lands. Wyo-Ben will agree to monitor and, if necessary, treat areas of disturbance and to the use of weed free certified materials (seed, straw, and gravel). Wyo-Ben will inspect and clean equipment as needed when leaving areas of noxious or invasive weed concern if the equipment will next be used in an area that is void of any noxious or invasive weeds of concern.

Vegetation will 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 will be laboratory tested for the presence of noxious weed seed. Native seed offered by local collectors will 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 will be certified weed-free.

All herbicides used on the Bureau of Land Management (BLM)-administered public land will be approved by the BLM prior to its application.

Livestock Grazing Management

Wyo-Ben, Inc. will voluntarily work in cooperation with the BLM-WFO and the allotment permittees to upkeep the allotment boundary fence between the Potato Ridge and West Red Mountain pastures of the Potato Allotment #01525. To maintain this partnership with the BLM-WFO and the allotment permittees, Wyo-Ben will construct a temporary fence or, in lieu of fencing, timed activity to eliminate the need for

temporary fencing or fence realignment along the boundary where the proposed mining would disturb the existing fence. During reclamation, Wyo-Ben will voluntarily work in cooperation with the BLM-WFO and the allotment permittees to ensure that a permanent fence is reconstructed on or near the original boundary.

2.3.2 Stipulations

2.3.2.1 Cultural/Paleontology

The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If paleontological, historical or archaeological materials are uncovered during operations, the operator is to immediately stop work that might further disturb such materials, and contact the authorized officer (AO).

(i) Operators shall not knowingly disturb, alter, injure, or destroy any scientifically important paleontological remains or any historical or archaeological site, structure, building or object on Federal lands.

(ii) Operators shall immediately bring to the attention of the authorized officer any cultural and/or paleontological resources that might be altered or destroyed on Federal lands by his/her operations, and shall leave such discovery intact until 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.

(iii) The Federal Government shall have the responsibility and bear the cost of investigations and salvage of cultural and paleontology values discovered after a plan of operations has been approved, or where a plan is not involved.

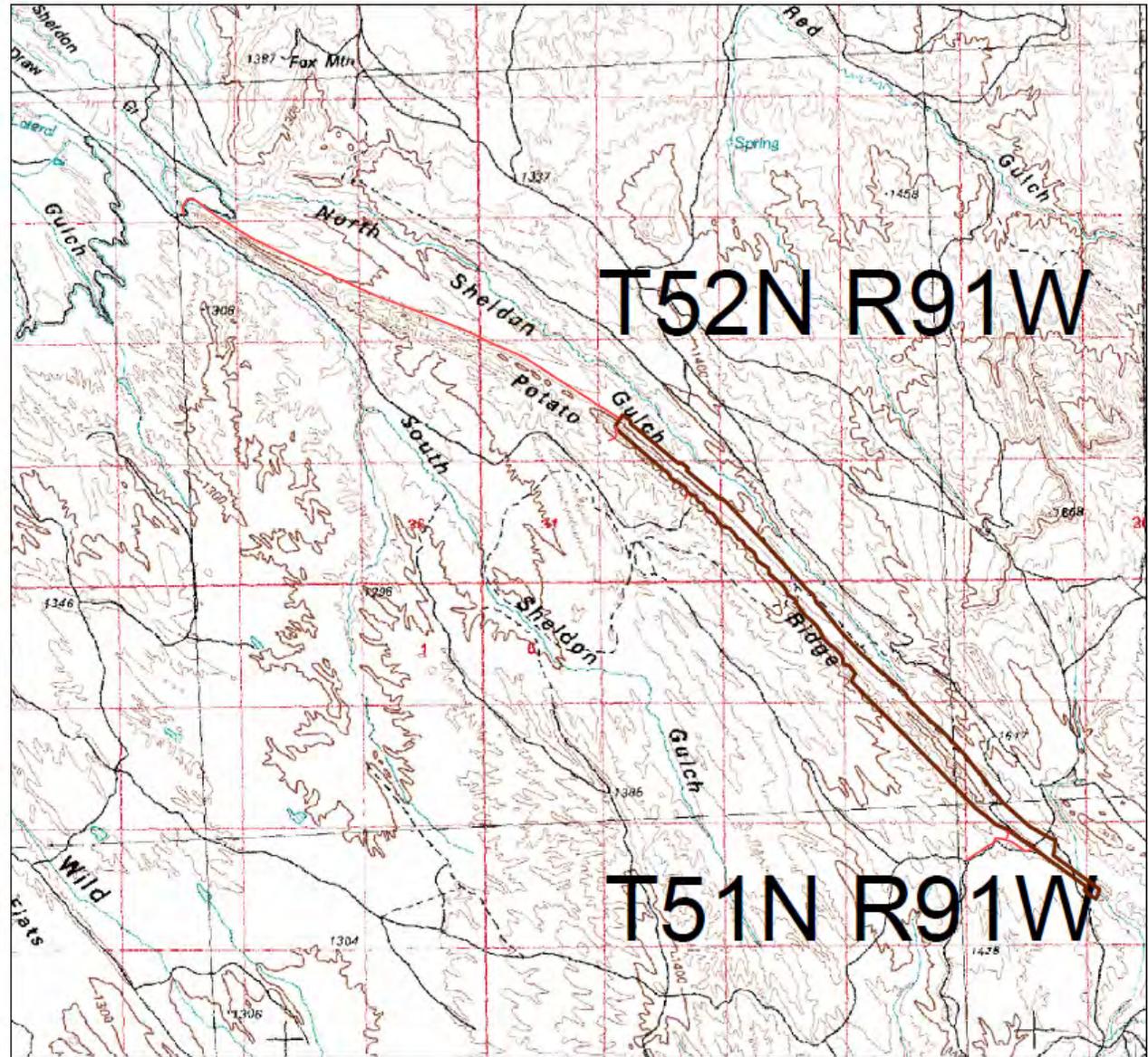
Figure 1. General location of the proposed bentonite mine areas.

U.S. DEPARTMENT OF INTERIOR
 Bureau of Land Management
 Worldland Field Office
 Worldland, WY

Potato Ridge
 Permit 321C; Block E
 WYW-165211

Legend

-  New Haul Road
-  Disturbance Boundary



0 0.45 0.9 1.8 Miles
 1:75,000

This map is intended for display purposes only. No warranty is made on the accuracy, reliability, or completeness of information displayed. Spatial information may not meet National Map Accuracy Standards. Information in this map may be updated without notification.

2.4 Alternative 2 – No Action

No action implies that on-going development and other land use activities would be allowed to continue in the area, but the proposed action would be disapproved. Additional plans of operation would be considered by the BLM on a case-by-case basis.

2.5 Alternatives Considered but Eliminated from Detailed Analysis

The surface location of the proposed action could be situated at different locations. Different surface locations may result in a deviation of effects from the proposed alternative, and may result in a net positive or net negative change in potential effects. Relocation may remove the operation from lands where the quality or quantity of bentonite is known through exploration and would not meet the operator needs, may be outside of placer claims located by the Wyo-Ben Inc., or beyond the outcropping of the bentonite clay layer itself. The proposed locations appear to be the best feasible to minimize potential direct effects upon protected resources. This left no unresolved resource conflicts and no identified needs to consider additional alternatives.

2.6 Conformance with Land Use Plans

The proposed action conforms to the Record of Decision and Approved Resource Management Plan for the Washakie area dated 1988. The decisions in the Washakie Resource Management Plan provide general management direction and allocation of uses and resources on the public lands in the area. The Washakie RMP provides that plans of operations are required for locatable minerals development consistent with regulations (§43 CFR 3809), on lands open to the staking of mining claims and operation of the mining laws for locatable minerals.

3.0 AFFECTED ENVIRONMENT

Resources and features not present, and not discussed in this EA, include: Environmental Justice, Class I and Class II visual management areas, Class I Airsheds, prime or unique farmlands, T&E Plant/Animals, Wild and Scenic Rivers, fisheries, floodplains, wetlands, wilderness, and lands with wilderness characteristics.

Bentonite mining is the dominant land use in the Potato Ridge area. Other than livestock grazing, and wildlife use there are no known land uses, or proposals for use, that occur in the area such as special recreation areas that would be affected by, or have the potential for cumulative impacts with this proposed action.

3.1 Land Use

The proposed bentonite pits and related roads are located in Big Horn County Wyoming, and 6th principal meridian. Legal descriptions are found at the beginning of this document. The pits would be located on public lands managed by the federal government (BLM). Historically, these lands have been used for livestock grazing (sheep and cattle), wildlife habitat, recreational hunting, and bentonite mining. Present land uses remain the same.

3.2 Geology

The Big Horn Basin is an area 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 sedimentary rocks, with progressively more complex folding and faulting in Mesozoic and Paleozoic strata as the flanks of the mountains are approached. Economically-important bentonite is limited to middle-lower Cretaceous, identified as the Frontier, Mowry, and Thermopolis Formations. The mining activity proposed with this application will eventually affect one bentonite bed in two of the Major bentonite bearing Formations of the Northern Big Horn Basin, all of which have been successfully mined by Wyo-Ben, Inc. in the past.

Four of the proposed pit areas occupy the Thermopolis Shale geologic formation and are known as the Canadian (Pit 205G), D (Pit 206G), Rusty (Pit 207G), and 3rd (Pit 208G) bentonite beds. The proposed pit of the Frontier geologic formation includes the Beaver bed (Pit 202G). Finally, the Mowry A (Pit 203G) and Mowry B (Pit 204G) occur on the Mowry geologic Formation.

3.3 Hydrology

3.3.1 Surface Water / Surface Water Quality / Riparian.

No perennial or intermittent streams will be affected by the proposed disturbances. There exist ephemeral drainage segments on public land within the project area. These drainages flow, primarily following storm events north into Shell Creek which is a primary tributary to the Bighorn River. The drainage patterns would be temporarily re-routed around the proposed pits.

There are three stock reservoirs that are found within these sub-watersheds, these are located within a one mile radius of the project area. These reservoirs capture surface flow, trap sediment and provide water sources for livestock and wildlife.

3.3.2 Groundwater/Water Quality

According to the Wyoming State Engineers database records there are no groundwater wells within a one mile radius of the project area. Test holes up to fifty feet in depth that were bored in the vicinity did not encounter groundwater or intersect the water table. The surface water quality runoff from geologically similar areas within the basin have elevated amounts of suspended sediment, total dissolved solids, and

pH levels above 8.5. This is due to the high salinity content of Cretaceous shales and derivative soils in an arid environment.

3.4 Air Quality

Concentrations of Criteria Air Pollutants and Background Air Quality for the Bighorn Basin Planning Area (BLM, 2009).

The primary air-borne pollutant within the plan of Operation area is Particulate Matter (PM) in the form of fugitive dust (uncontrolled wind-carried particulates) generated from natural and human sources. 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, mining operations, agricultural and forest burning, and operation of fireplaces and woodstoves. There is one air quality monitoring station located in Big Horn County, however to date no local background air quality information is available. The closest air quality monitors providing data are in Cody, Sheridan, Lander and Casper (Wyoming DEQ, 2008). No monitoring of past and current open pit bentonite mines has been conducted, so quantitative information about pollutant emissions are not available. An air quality permit from the Wyoming Department of Environmental Quality has not been required for the operation of bentonite mines within the Bighorn Basin.

Although no site-specific climatic information is available for this Area, the following information was obtained for the Lovell, Wyoming area. Average annual precipitation is 6.79 inches; and the average annual temperature is 44.5 degrees Fahrenheit (Table 4). The climate of the area is typical of cold desert regions of the intermountain west. Over fifty percent of the yearly precipitation occurs in April, May, June and July. The annual average snowfall is 16.3 inches with an average of 124 frost-free days per year (Martner, 1986).

No wind speed or direction information is available for this specific area. However, the average wind speed at the Greybull Airport ASOS (KGEY), 34 miles south of Lovell, has the average wind speed at 6.9 mph from 1998 – 2006 according to the website for automated stations (ASOS) at (<http://www.wrcc.dri.edu/htmlfiles/westwind.final.html>).

Table 4. Average Monthly Climatic Information				
Precipitation Average 1970 to 2000 Lovell, Wyoming				
	Average Maximum Temperature Fahrenheit	Average Minimum Temperature Fahrenheit	Average Ave. Temp. Temperature Fahrenheit	Average Total Precipitation Inches
January	29.5	5.0	17.2	0.24
February	38.1	12.0	25.0	0.17
March	49.5	22.6	36.0	0.31
April	58.8	31.2	45.0	0.60
May	68.3	41.4	54.8	1.20
June	78.7	49.5	64.1	1.06
July	86.1	54.0	70.0	0.71

August	85.0	51.5	68.2	0.63
September	73.7	40.9	57.3	0.77
October	60.2	30.5	45.3	0.60
November	42.4	18.2	30.3	0.27
December	32.3	8.2	20.2	0.23
Annual Ave.	58.6	30.4	44.5	6.79

3.5 Soils

Soil Properties

The soils of the proposed mine area have formed in residuum, colluvium, and slopewash of shale and sandstone, and from alluvium in drainages. They are generally well to moderately well drained. Most of the soils contain a suit of neutral salts, such as the sulfates, carbonates, and chlorides of sodium and calcium. In addition, some have a considerable amount of exchangeable sodium, are soluble and as such 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 a clay texture and are generally very shallow to shallow (<10- 20 inches). Topsoil depths (referred to as the A horizon only) are 1 to 3 inches deep; salvageable topsoil for reclamation purposes ranges from 2 to 14 inches.

Topsoil Suitability

The suitability of the soil for reclamation potential was determined based on topsoil suitability criteria established by the Wyoming Department of Environmental Quality (WYDEQ, 1994). These criteria are shown in the table below.

Based on the criteria established by WDEQ there are 293,902 yd³ of soil suitable as surface reclamation material. This is referred to as topsoil in the table below. An additional 367,826 yd³ of subsoil is suitable for use as reclamation material referred to as subsoil in the table below.

Table 5. AVERAGE SOIL REPLACEMENT DEPTHS

Pit #	Acres	Topsoil	Subsoil	Depths	Volumes
202G	93.6	15,000 yd ³	4,000 yd ³	7"/ 4"	88,108 yd ³ / 49,335 yd ³
203G/204G	74.5	6,000yd ³	7,000yd ³	4"/2"	40,064 yd ³ / 18,032 yd ³
T.S Pits	176.1	5,400yd ³	24,000yd ³	7"/14"	165,730 yd ³ / 300,459 yd ³

Erosion Rates

The dominant soils on the landscape have slow infiltration rates with naturally high runoff and erosion rates (Hydrologic Group C and D). Nonetheless, even the sparse vegetation communities present on the landscape greatly reduce runoff and erosion. The Water Erosion Prediction Project (WEPP), US Forest Service web-based interphase Disturbed WEPP Model, predicts a 4 percent probability of runoff with a 2 percent probability of erosion when the plant community is intact. WEPP only predicts soil loss in the event of a 50-year storm cycle and then only predicts an erosion rate of 0.33 tons per acre per year.

For greater details on the regarding the soil resource, including reclamation potential, refer to the detailed soil investigation in the Bentonite Mine Plan of Operation Update To Wyoming Mining Permit 321C Potato Ridge Block E WYW-16521.

3.6 Native Vegetation and Noxious/Invasive Plant Species

3.6.1 Native Vegetation

The proposed disturbance areas will affect vegetation map units variously dominated and/or codominated by Gardner Saltbush (*Atriplex gardneri*), Big Sagebrush (*Artemisia tridentata*), Rubber Rabbitbrush (*Chrysothamnus nauseosus*), Greasewood (*Sarcobatus vermiculatus*), Prickly Pear Cactus (*Opuntia polyacantha*), Black Seepweed (*Suaeda nigra*), Sandberg Bluegrass (*Poa sandbergii*) and Indian Ricegrass (*Oryzopsis hymenoides*). Barren outcrops also occur throughout much of the proposed disturbance area.

3.6.2 Invasive Species

The project area has numerous small drainages and reservoirs, many of which have been invaded to some extent by tamarisk. Annual grasses and weeds (especially cheatgrass) are common in previously disturbed areas.

3.7 Livestock Grazing

The proposed action is located on Potato Ridge which is the boundary between the Potato Ridge and West Red Mountain pastures of the Potato Allotment #01525. These pastures are used by only one permittee, Flitner Ranch. Wyo-Ben, Inc. proposes to mine through approximately 3.3 miles of fence between these two pastures. The AUMs permitted is 1348. The area of potential disturbance within these pastures is predominately Saline Upland 5 to 9 inch precipitation zone range sites.

3.8 Wildlife

The area associated with this proposal was evaluated for potential significant or critical/important wildlife habitat during the spring and summer of 2006, and in the Spring of 2009. This habitat information was sent to the United States Federal Fish and Wildlife Service (USFWS) and the Wyoming Game and Fish Department (WGFD) for review.

The WGFD indicated possible concern for (1) Antelope (Big Horn Herd Unit) (2) Year-round habitat for mule deer (Paintrock herd unit) (3) Sage grouse in the Hyattville sage grouse Core Area, (4) Chukars and (5) Aquatic considerations (see Exhibit D-9.1). The USFWS responded by informing Wyo-Ben, Inc. that they will correspond with the Worland BLM field office for any possible threatened or endangered species of concern. However the service did indicate in their letter a possible concern for Raptor and other migratory species.

During wildlife surveys and other site visits to the Potato Ridge Block E (PR-E) Amendment area by Wyo-Ben personnel, pronghorn were sighted on several occasions, and minimal sightings of mule deer that would presumably be from the Paint Rock mule deer herd unit.

Golden eagles have been seen in the area, but no nests were located during wildlife habitat searches. Due to the lack of appropriate habitat the presence of Bald Eagles is not anticipated.

3.9 Recreation and Visual Resources

3.9.1 Recreation

The project area is located in BLM-administered public lands that are not managed under either special or extensive recreation management areas (RMA). Public lands that are not designated as RMAs are managed to meet basic recreation and visitor services and resource stewardship needs. Recreation is not emphasized within this area, but is recognized that recreational activities occur; primarily motorized touring, limited hunting, sightseeing, hiking, and general dispersed outdoor recreational use. The Dinosaur Tracksite Recreation Area (Tracksite), Dinosaur Tracksite Area of Critical Environmental

Concern (ACEC), and the Red Gulch/Alkali Road Back Country Byway (Byway) are located west of the proposed mining location. These areas are very popular sites for recreational enthusiasts wishing to learn more about Wyoming's geologic history, to view the dinosaur tracks, and to explore the scenic vistas along the Slope of the Bighorns and throughout the Bighorn Basin. Recreational visits have increased steadily since the Tracksite, Byway, and the ACEC have been developed and managed for recreational and scientific research and enjoyment.

Recreational settings within the project area are identified as middle to front country, which can be described as:

- On or near primary highways, and within ½ of low-clearance or passenger vehicle routes;
- Areas within the project area the character of the natural landscape is retained, whereas other areas the landscape is partially modified, but none overpower the natural landscape;
- Social component of the project area is back country, where 3-6 encounters/day off travel routes;
- Four-wheel drives, all-terrain vehicles, dirt bikes are observed in most of the area, whereas other portions of the project area have observed two-wheel drive vehicles are predominant.

3.9.2 VRM

The project area is located on BLM –administered public lands identified as visual resource inventory (VRI) Class IV. The area is within a scenic quality rating unit (SQRU) inventoried and scored with a scenic quality C rating, low sensitivity levels, and is within the front country distance zone. The landscape is identified as an arid “badlands” type of landscape, characteristic of rolling hills, desert shrub, and flat lands. However, a rather unique and well known land feature known as Potato Ridge is located within this SQRU. It is this landmark which give the SQRU most of its scenic quality rating. Potato Ridge is composed of repeating hills and ridges jutting out of the landscape. This dominant landform can be observed along the Red Gulch/Alkali Road Back Country Byway, which frames the western edge of the observation window from travelers along the Byway. The sensitivity ratings are scored as low due to the current accepted land uses. Management objectives allocate this area for industrial use and the majority of major surface disturbing activities, due to the rural settings, go unnoticed. However, any surface disturbing activities located on Potato Ridge will be noticed due to the recognized land feature. BLM manages the project area as VRM Class IV.

3.10 Cultural and Historic Resources

A Class III cultural resources inventory was completed of the proposed disturbance area plus a minimum 100ft buffer (BLM Cultural Project #1510020). Twenty-nine cultural sites and thirty-eight isolated resources were identified. The cultural site types identified include an historic canal, prehistoric lithic scatters, prehistoric stone circle sites, and historic debris. Two sites were evaluated as eligible for the National Register of Historic Places. One historic property is within the project area.

3.11 Paleontology

The surface formations within the proposed disturbance area are Mowry Shale, Cody Shale and Frontier Formation which have a PFYC (Potential Fossil Yield Classification) rating of 3 or moderate. This means the formations have a moderate sensitivity for paleontological resources. Typical fossils within these formations include invertebrates and marine vertebrates. Significant localities are not common within these formations. Due to the low probability for affecting significant localities no paleontological inventory was required.

3.12 Socioeconomics

The Potato Ridge Block E Amendment/Update area is located approximately 12-15 miles southeast of the Town of Greybull, Wyoming. The Town of Lovell to the north and surrounding area was settled in the early 1900's by early Mormon farmers. The Town of Greybull was also settled in the early 1900's by

farmers as well as a result of the discovery of oil. The land between Greybull and Lovell is an arid dry region; therefore no farming activity has occurred due to the lack of water. Some lands adjacent to a portion of the Potato Ridge Block E proposed mining area are used for irrigated crop production. Ranchers have used public and state lands for grazing livestock in a regulated manner.

Local oil & gas and mining companies have been extracting the natural resources that are found in this area such as bentonite, gypsum, and oil and gas for decades. Unregulated bentonite mining occurred in the Greybull and Lovell area in the 1950's and 1960's. Regulated mining began in the 1970's with the establishment of the Wyoming Environmental Quality Act; and regulated mining continues today.

Established roads include US HWY 310 running from Lovell to Greybull, and US HWY's 14 and 16 which provide routes over the Big Horn Mountains. Wyo-Ben's HR-23 will access the proposed pits of this update from highway 14. The Burlington Northern Santa Fe railroad is 12 miles to the west.

The proposed plan is within Big Horn County, Wyoming. The principal industries in Big Horn County are gas and oil development, bentonite mining, farming, ranching, and tourism. According to the US Census Bureau the population of Big Horn County was 11,581 (Wyoming Community Development Authority, 2011) In 2008 the average per capita income for Big Horn County was \$30,079.00. Mining at 30% and government at 25% were the largest contributors to earnings by place of work within the County, with health care and social assistance at 10%. For a complete listing see Table 2-50 in the Analysis of the Management Situation for the Bighorn Basin Resource Management Plan Revision Project, BLM 2009. The mining sector includes jobs in oil and gas sector.

The population of Big Horn County consisted of 28.7% who are classified as minority (non-White) and 11% that are low income; i.e., live below the poverty level. Bureau of Land Management Instruction Memorandum no. 2002-164 implements Executive Order 12898 of Feb. 11, 1994 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Such populations would be able to review information about this mine plan during a 30 day review period.

3.13 Hazardous Materials/Public Health and Safety

The operator would utilize mechanized earthmoving equipment as part of mine and reclamation activities and there would be some on-site fueling and repairing of equipment. The public and public land users who travel any existing improved dirt roads that the operator would use to access the pits would notice an increase in traffic when equipment is being mobilized or demobilized from the pits or hauling of bentonite is taking place.

4.0 ENVIRONMENTAL IMPACTS

4.1 Land Use

4.1.1 Alternative 1 – Proposed Action

The dominant land use for the proposed mine areas is bentonite mining and domestic grazing. Additional uses include wildlife habitat, hunting and other recreational opportunities.

Disturbances over the life of the mine would potentially disturb up to 594 acres over a period up to 20 years in length.

The operator proposes a castback mining method that would minimize the acreage disturbed at each pit at any particular time and promotes concurrent reclamation. The Wyoming DEQ-LQD would hold a reclamation bond that is only releasable when the reclamation is found to be to the satisfaction of both the BLM and the DEQ. The bond amount held by the DEQ is re-evaluated annually.

4.1.2 Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. No effects on additional land resources would be expected to occur beyond the current land uses of the project area.

4.2 Geology

4.2.1 Alternative 1 – Proposed Action

The continued mining of bentonite will result in a depletion of that locatable mineral by the amount of bentonite removed in total wet bank tons. There is no established threshold of significance regarding removal of minerals although the resource management planning decisions permit such activities. Surface mining of bentonite is practiced in many other parts of the Bighorn Basin where beds of bentonite are exposed at the surface.

4.2.2 Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. No effects on additional land resources would be expected to occur beyond the current land uses of the project area.

4.3 Hydrology

4.3.1 Alternative 1 – Proposed Action

The hydrology of the drainages would be altered temporarily by the re-routing of water around the pits. The proposed mine plan as submitted states that the all drainages would be returned to pre-mine gradients and cross sectional shapes. This would change the nature of the flow patterns surrounding the pits and downstream of the pits. Possible new sediment would be introduced into the watershed if the area received a precipitation event greater than 2 year, 6 or the 100 year 6 hour maximum precipitation events as defined in the Non-coal rules, chapter 3, section 2 (e) (iv) to be erosionally stable. The operator has committed to the practice of using sediment control fabric fences that would minimize the impacts.

4.3.1.1 Surface Waters/Water Quality (surface) Riparian

Surface Water

Surface water quality could be affected by the Proposed Action. During the proposed mining process, natural drainage patterns would temporarily be disrupted, altering drainages and increasing overland flow mainly following precipitation events. Due to the lack of vegetation, biological crusts, and desert pavement, run-off from the proposed mining areas may transport excess sediment and water with higher

level of sediment load into the watershed than was previously present in the system. Significant ephemeral channels (drainage basins of greater than 5 acres) would be temporarily directed around open pits during active mining stages and straw bale sediment barriers would be utilized as sedimentation control measures.

Through drainage would be required to be reestablished during final reclamation. Channel design for both temporary and permanent diversions would match pre-mine channel gradients and cross-sectional shapes and dimensions. After reclamation, drainage would temporarily be affected until vegetation has recovered to pre-mine conditions. Mitigation is listed and incorporated as part of the Plan of Operation.

Water Quality

The drainages following storm event flow into Sheldon Gulch, then in to Shell Creek and then the Big Horn River as it flows to the northeast. Increased runoff and sedimentation caused by removal of vegetation and changes to land cover from the proposed action would have an indirect effect on water quality by increasing water temperature and suspended sediment that would remain in downstream water following storm events. The impacts would be limited to when surface runoff occurs due to the ephemeral flow regime of the drainages in the area. The best management practices and stormwater pollution prevention plan for the mine as submitted would mitigate and minimize water quality impacts from the proposed action.

The surface water quality runoffs from geologically similar areas within the basin tend to have elevated amounts of suspended sediment, total dissolved solids and pH levels above 8.5.

4.3.1.2 Ground Water/Water Quality

Ground water quality may be affected by the proposed mining. It could be effected either by water infiltration in the proposed mining area or by sedimentation or run-off leaving the site that may eventually make its way into the ground water. It is not likely that ground water would be directly affected through infiltration in the pits. Not only is there a few hundred feet of material above the water table to filter out any additives from the bentonite, but the water would have to penetrate through the remaining bentonite in the ground, which swells and has almost zero permeability once it is wet; it is more likely to evaporate than to infiltrate. If water escapes Wyo-Ben, Inc.'s berms and runs off site, it may make it to an area where it would eventually make it into the groundwater. Sediment escape from the site caused by wind, water, or mining related activities (bentonite on haul truck tires falling off out of the mine area) could introduce trace amounts of bentonite into water that may eventually make it into the ground water.

4.3.2 Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. Current water quality would continue at current conditions.

4.4 Air Quality

4.4.1 Alternative 1- Proposed Action

The operator committed practices of watering haul roads and cast back mining should reduce the release of fine earthen particulate materials into the air. The tail pipe emissions from the operation of internal combustion engines as part of mining, hauling and reclamation activities should quickly dissipate and would not cause the ambient air quality standards to be exceeded. No mitigating measures are recommended.

4.4.2 Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. Background air quality would continue as cited in Table 4. This would mean the air quality in the area would not exceed the National or Wyoming Ambient Air Quality Standards.

4.5 Soils

4.5.1 Alternative 1 - Proposed Action

Surface disturbance from mining activities would consist of removing of the vegetative cover and the excavation of the overburden. The excavation of the overburden would totally alter the soil profile. Soil horizons would be obliterated and mixed. The overall soil health would be impacted through the alteration of the soil physical properties; there would be less organic matter in the surface layers and soil structure and soil depths would be altered. The exposed soil would be susceptible to the erosive forces of raindrop impact and overland flow.

The proposed action would allow for a more rapid recovery of soil health with respect to soil physical properties. Concurrent reclamation practices would reduce the time that the soil is bare. The soil reclamation material, including both subsoil and topsoil, would not have been stockpiled for a long period of time and, would retain much of its original physical properties such as organic matter content and structure, thus ensuring better reclamation.

Surface disturbance would increase runoff and erosion. During active mining, WEPP predicts a 30 percent probability of runoff with a 36 percent probability of erosion averaging 1.23 tons per acre per year. In the event of a 50-year storm cycle erosion could be as high as 43 tons per acre per year. During the reclamation phase, WEPP predicts a 6 percent probability of runoff and erosion with erosion rates averaging only 0.1 tons per acre per year. In the event of a 50-year storm cycle erosion could be as high as 4.59 tons per acre per year.

Mitigation measures required under the Storm Water Pollution Prevention Plan are designed to keep sediment from leaving the mine site. No off-site impacts are anticipated.

A soil loss threshold of 5 tons per acre per year has historically been the established threshold for agricultural lands. Given the arid setting of the proposed action, the extent soils with depths less than 40 inches deep, and the minimally developed topsoil layer (the prime reclamation material), a threshold of 2 tons per acre per year has been established. Average erosion rates predicted by WEPP are within this threshold. This threshold would be exceeded in the event of a 50-year storm cycle in both the area of active mining and on recently reclaimed areas. Only the area of active mining would exceed this threshold during a 25-year storm cycle.

Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. There would be no additional impacts to the soil resources. Runoff and erosion rates would remain at background levels.

4.6 Native Vegetation and Noxious/Invasive Plant Species

4.6.1 Alternative 1- Proposed Action

4.6.1.1 Native Vegetation

Due to drought and the saline soils of bentonite areas, re-vegetation is often a slow process taking anywhere from two to twenty years. Any islands of native vegetation left in the mined area would aid in the spread of native plants throughout the disturbance. Also, when topsoil is replaced quickly, viable native seeds can sometimes still be present to reestablish themselves in the reclaimed areas. If reclamation

would not be done correctly, a potentially different plant community could replace the native one. Often, even successful reclamation would result in a change from the existing native plant community for decades.

Impacts of the Proposed Action to vegetation would require mitigation (required by both BLM and LQD), as per the terms of any approved mining and reclamation plan(s) and as presented in the Plan application and any accompanying mitigation measures. According to Wyo-Ben, Inc.'s proposed Reclamation Plan, a vegetative community dominated by native shrubs and grasses would be reestablished over time.

4.6.1.2 Noxious and Invasive Species

Continued or additional surface disturbance in the project area will increase risk for noxious weed and invasive species establishment and spread. Sources for weed seeds exist within and around the project site, and equipment can serve as a vector for spread.

Clearing many acres of land at a time leaves areas open to invasive weed species that establish quickly and flourish in disturbed areas. Speedy re-vegetation with native plants would be necessary to prevent a non-native weed invasion. The operator has provided a comprehensive weed management plan as part of their mine and reclamation plan listed in this EA that provides for the monitoring for and control of noxious weeds; and includes the assurance that seed, hay or straw used would be weed free. No mitigation is needed if the operator abides by their weed management plan.

4.6.2 Alternative 2- No Action

Under the No Action Alternative, the development of the Proposed Action would not occur. No effects on additional land resources would be expected to occur beyond the current land uses of the project area.

4.7 Livestock Grazing

4.7.1 Alternative 1- Proposed Action

According to the mining plan, 593.4 acres of rangeland would be potentially disturbed, including 40.9 acres outside the area of active disturbance for additional haul roads. The 593.4 acres of potential disturbance would displace 47 public AUMs (593.4 acres/12.5 acres/AUM) or 58 total AUMs (public and private) within the two pastures. This pit extension impacts/displaces 3% of the public AUMs in these two pastures of the Potato Allotment for the life of the mining and reclamation project. No changes would be made to the Flitner Ranch grazing permit as a result of this proposed action.

Wyo-Ben, Inc.'s proposed mining would mine through an existing pasture fence; the company would voluntarily work with the BLM-WFO and the permittee to maintain its integrity or construct a temporary fence to prevent trespass issues during the proposed mining. Wyo-Ben, Inc. would work with the BLM-WFO to maintain and/or replace the fence during and before completing the mining process.

Reclamation could be successful if proper topsoil handling and drought do not make it exceptionally difficult for seedlings to germinate and grow. Once the reseeded is successful, the vegetation would be reestablished well enough to provide forage for wildlife and livestock.

Usually reclaimed mining areas are not fenced out of grazing allotments. Because of this, cattle are rarely prevented from grazing on reclaimed lands where seeds are trying to germinate and establish themselves. This can be detrimental to both the grazing and the mining effort. Grazing before plants have established stresses seedlings and makes it very difficult for them to survive, spread, or create healthy rangeland. Grazing during the early stages of revegetation can lead to an increase of weed growth; native seeds in the seed mix are more desirable to cattle and are quickly grazed off, leaving the barren area to be established by weeds.

Wyo-Ben, Inc. would be responsible for successful reseeding - revegetation and would be held accountable for the reseeding - revegetation by WDEQ-LQD and the BLM until an acceptable vegetative community has established.

Livestock would be present during portions of the mining activity. It is not expected that the activity would affect the livestock and prevent them from grazing.

4.7.2 Alternative 2- No Action

There would be no effect on livestock, grazing under Alternative 2, except that cattle grazing would not have to halt for the proposed mining disturbance, and the forage would not change to post-mining species.

4.8 Wildlife

4.8.1 Alternative 1- Proposed Action

Seasonal and year-long use of the area by large ungulates such as elk, mule deer, and antelope would likely be altered during periods of increased vehicular traffic and operation of heavy equipment associated with the mining activity. If present, these animals would likely be displaced to adjacent areas where suitable habitat exists. A period of non-use by these species may occur as a result of mining areas being void of vegetation until revegetation takes place. Numerous small mammals, predators, passerines, and reptiles which may be present would likely move to adjacent areas where suitable habitat is found.

The WGFD expressed concern for sage grouse that may be encountered in the Hyattville sage grouse core area. Since receiving the referenced letter, Wyo-Ben's proposed disturbance area has been removed from the Hyattville core area. Tom Easterly, wildlife biologist for WGFD, made Wyo-Ben personnel aware of a sage grouse lek located within 1-mile of planned mine disturbance in Section 29 of T52N, R91W; and the WGFD indicated the presence of another lek within 2-miles of planned disturbance located in section 7-8 T51N, R90W. Due to the habitat types Wyo-Ben will disturb during mine activities associated with this proposal, no sage grouse encounters, during any time of the year are anticipated. There are no anticipated visual or auditory conflicts with the surrounding leks due to several topographic barriers to the leks.

USFWS did not express concern for Migratory Birds of High Federal Interest (MBHFI) in the project area. Concern was expressed for raptor species, including the golden eagle by both the USFWS and WGFD. The operator has proposed mitigation to conduct inventory of the mine area and respond to active nesting sites appropriately to reduce impacts of the proposed action.

4.8.2 Alternative 2- No Action

Alternative 2 would not add to the effects that already exist in the area because the proposed bentonite mining would not take place.

4.9 Recreation and Visual Resources

4.9.1 Alternative 1 – Proposed Action

Recreation

The greatest degree of impacts to recreation from the proposed project will be observed at the project area. The proposed project will further reduce the opportunity for local recreationists to enjoy the resources and opportunities the area's front country settings have to offer, such as ATV use, hunting, hiking, rock hounding, exploring, and sightseeing. With historic mining in the Potato Ridge area in the last 40 years, the Front Country settings have been altered to a more urban setting, which may contradict with the desired recreational settings most of the users wish to pursue. These desired activities and

experiences will have to be pursued in alternative and possibly less desirable areas. It is not known how many users will be displaced due to this impact, but these impacts will be present.

The proposed project will not directly impact the recreational resources or settings along the Tracksite, ACEC, or the Byway, but may indirectly impact recreational experiences by introducing unnatural elements to the viewshed for those exploring and enjoying the scenic opportunities the Red Gulch/Alkali Road Back Country Byway (Byway) has to offer, and the desired settings surrounding the Dinosaur Tracksite. Mining operations will be observed from these locations, which will include fugitive dust, noise, industrial presence, and the high degree of contrasting elements caused by the surface disturbing activities. In addition, Potato Ridge, a unique, known, and recognized land feature in the area, frames the western observation window of those traveling along the Byway. Travelers along the Byway will view Potato Ridge for approximately 7 miles. Visitors who enjoy the area will notice the impacts to Potato Ridge from the mining activities. This change in the landscape may impact the desired experiences of those along the Byway. This impact may not be observed by visitors from other areas who do not recognize or is familiar with Potato Ridge. Refer to the VRM section for more information regarding impacts to Potato Ridge.

VRM

The proposed project will impact the scenic quality of the SQRU by eliminating and manipulating the natural elements of form, line, color, and texture exhibited from the of Potato Ridge. Mining activities will remove up to 593.4 acres of the noticeable, recognized, and well known rolling and repeating ridges that make up Potato Ridge, changing the character of the landform. Although the SQRU was rated as a 9, or a class C, this feature stands out and adds natural contrasts of form, line, and texture against the surrounding natural elements.

Visual impacts may be observed by those traveling along the Red Gulch/Alkali Road Back Country Byway, primarily along 7 miles along Red Gulch Road. Potato Ridge is typically observed from southbound travelers along the first 5 miles of Red Gulch Road, and observed from northbound travelers 7 miles from U.S. Highway 14 along Red Gulch Road. The Byway is framed by the Bighorn Mountains to the east, and Potato Ridge to the west.

To measure the degree of contrast from the proposed project, 8 Key Observation Points (KOP) were selected along U.S. Highway 14, Red Gulch Road, and the Dinosaur Tracksite Recreation Area (refer to Section 7.0, VRM Contrast Rating, to view the VRM analysis.)

From KOP 1, along the East bound lane on U.S. Highway 14, the project will be in the middle ground, and more in the periphery of the casual observer. Other naturally contrasting and dominant elements may distract the attention of the casual observer from the natural elements. Bentonite extraction will be noticed from this KOP due to the fact that the work will be on the west aspect, which faces the KOP. Mining activities are some distance away from KOP, which the contrasting elements will not be very noticeable. However, contrasting elements may be noticed once the mining activity is observed. Impacts from this location will be minimal.

From KOP 2, the first good view of Potato Ridge along Red Gulch Road from U.S. Highway 14, the project is nearly in the center of the observation window, with linear elements exhibited from the road directing the line of site to the project, as well as Potato Ridge's dominant and distinct landscape framing the west edge of the observation window. Impacts will be more noticeable at this KOP than observed from KOP 1, U.S. Highway 14. For visitors traveling south bound along Red Gulch Road, this KOP will be the first good view of the rugged Potato Ridge, complemented by the interesting landscape and the Bighorn Mountains framing the east edge of the observation window. Mining activities will be more in the middle ground, so contrasting elements will not be as obtrusive, but will be noticeable.

From KOP 3, visitors at the Dinosaur Tracksite will observe the bentonite operations along what is visible of Potato Ridge. Operations on the visible hogbacks will introduce contrasting elements of form, line, color, and texture, which will be observed from visitors at the Dinosaur Tracksite. Mining operations will likely alter the hogbacks within the viewshed from the Tracksite, until completion of reclamation objectives. For those visitors familiar with this unique and recognizable landscape, mining will be very noticeable. Mining activities, and contrasting elements exhibited from activities will be more visible from the Red Gulch Road directly east of the Dinosaur Tracksite.

From the remainder of the KOPs (4-8) along Red Gulch Road, impacts to VRM from the proposed project are especially noticeable and will distract the casual observers' attention due to the close proximity of the mining activities, as well as the ability to observe the entire mining project from these locations. Potato Ridge is the dominant form on the west end of the observation window, and the contrasting elements from the mining activities may distract the attention of the casual observer away from the natural elements. The rate of contrast from the mining activities from these KOPs will be very strong, most especially for north bound travelers along KOPs 6, 7, and 8.

The SQRU is managed under VRM Class IV objectives. 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. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. The rolling reclamation mining practices utilized by Wyo-Ben will minimize immediate contrasting elements caused by surface disturbing activities, but cumulatively will introduce a high degree of contrast against the surrounding natural elements.

4.9.2 Alternative 2 – No Action

Recreation

Under the No Action Alternative, the development of the proposed Action would not occur. No resulting effects on recreation would be expected to occur beyond the current situation.

VRM

Under the No Action Alternative, the development of the proposed Action would not occur. No resulting effects on visual resource inventories (scenic quality and sensitivity levels) would be expected to occur beyond the current situation.

4.10 Cultural Resources

4.10.1 Alternative 1

A Class III cultural resources inventory of the project area identified two historic properties. Site 48BH1860, an historic canal, will be affected by Alternative 1; however the portion of the site within the project area is considered non-contributing. The effects will not diminish the characteristics that make the property eligible for listing in the National Register of Historic Properties. Site 48BH4072, is outside the project area and will not be affected. In addition, based on comments received during Tribal consultation, prehistoric stone circle sites 48BH4077, 48BH4080, and 48BH4086 will be avoided by Alternative 1. The proposed project will have no adverse effect on historic properties. Standard cultural stipulations apply (43CFR§3809.420(8)).

Tribal consultation identified no additional resources or concerns.

4.10.2 Alternative 2

Under the No Action Alternative, the development of the proposed Action would not occur. No resulting effects on cultural resources would be expected to occur beyond the current situation.

4.11 Paleontology

4.11.1 Alternative 1—Proposed Action

Surface formations within the project area have a moderate sensitivity for paleontological resources and significant localities are not common. No significant impacts to paleontological resources are anticipated under Alternative 1. Standard paleontology stipulations apply (43CFR§3809.420(8)).

4.11.2 Alternative 2 –No Action

Under the No Action Alternative, the development of the proposed Action would not occur. No resulting effects on cultural resources would be expected to occur beyond the current situation.

4.12 Socioeconomics

4.12.1 Alternative 1 – Proposed Action

Under the Proposed Action, the proposed Potato Ridge Block-E Plan would be approved and bentonite mining would proceed into the proposed mining area. The proposed mining area would be a job site for Wyo- Ben, Inc. workers in future years once Wyo-Ben, Inc. begins mining the area.

4.12.2 Alternative 2 – No Action

There would be an affect to Wyo-Ben, Inc. and its employees if Alternative 2 was selected because the company would not have access to the bentonite resource; if the bentonite could not be mined, the workers could lose their jobs. The supply of bentonite may be reduced, potentially causing a rise in the price of bentonite products, affecting those who use them.

4.13 Hazardous Materials/Public Health and Safety

4.13.1 Alternative 1 – Proposed Action

There may be accidental spills of fuels, lubricants, antifreeze, and battery acids. The operator submitted a spill management plan with their plan which outlines how spills would be handled.

Existing dirt roads were constructed to resource functional classification as per BLM manual section 9113. Wyoming allows a speed limit of 55 mph when roads are not posted. Wyo-Ben personnel and its contractors will observe a haul road maximum speed limit of 45 mph, unless situations dictate a slower rate of speed. The operator has committed to dust control measures as needed when bentonite is actively being hauled along the dirt portions of their existing designated haul roads and to upgrade and maintain such segments to the standards in the BLM's road standards manual section 9113.

4.13.2 Alternative 2 – No Action

Under the No Action Alternative, the development of the proposed Action would not occur. No resulting effects on public lands and health and safety would be expected to occur beyond the current situation.

4.14 Cumulative Impacts

Under the Proposed Action, mining and reclamation occur concurrently as part of the castback method. Based on the known affected environment and environmental consequences of the Proposed Action; the cumulative effects analysis relative to the Proposed Action indicates that, at this time, the incremental effects of the Proposed Action, coupled with other existing and planned land uses on wildlife habitats/species, vegetation, cultural resources, recreation, and soils, could be mitigated or reduced over time, depending on recovery time, adequate precipitation, and reclamation success, using the stipulations,

BMPs, mitigation and monitoring measures outlined in the proposed Mine and Reclamation Plans, if approved by the WDEQ-LQD and the BLM, and properly implemented by Wyo-Ben, Inc.

4.14.1 Cumulative Effects Analysis (CEA) Area

The general analysis area selected for this CEA includes an area of approximately 8.9 square miles, or 6363.33 acres and is defined by the DEQ 321C permit boundary and amendment boundary. Within the CEA area, approximately 560 acres have been disturbed by bentonite mining (~8.0% of the total area) in the past 40 years, and approximately 593.4 acres of potential disturbance are proposed for new mining (~9.0% of the total area) over the next 15-20 years.

Map 2 Cumulative Effects Analysis Area (not to scale)

U.S. DEPARTMENT OF INTERIOR
Bureau of Land Management
Worldland Field Office
Worldland, WY

Potato Ridge
Permit 321C; Block E
WYW-165211

Legend

WDEQ_PERMIT#

321C

Potential Disturbance Boundary

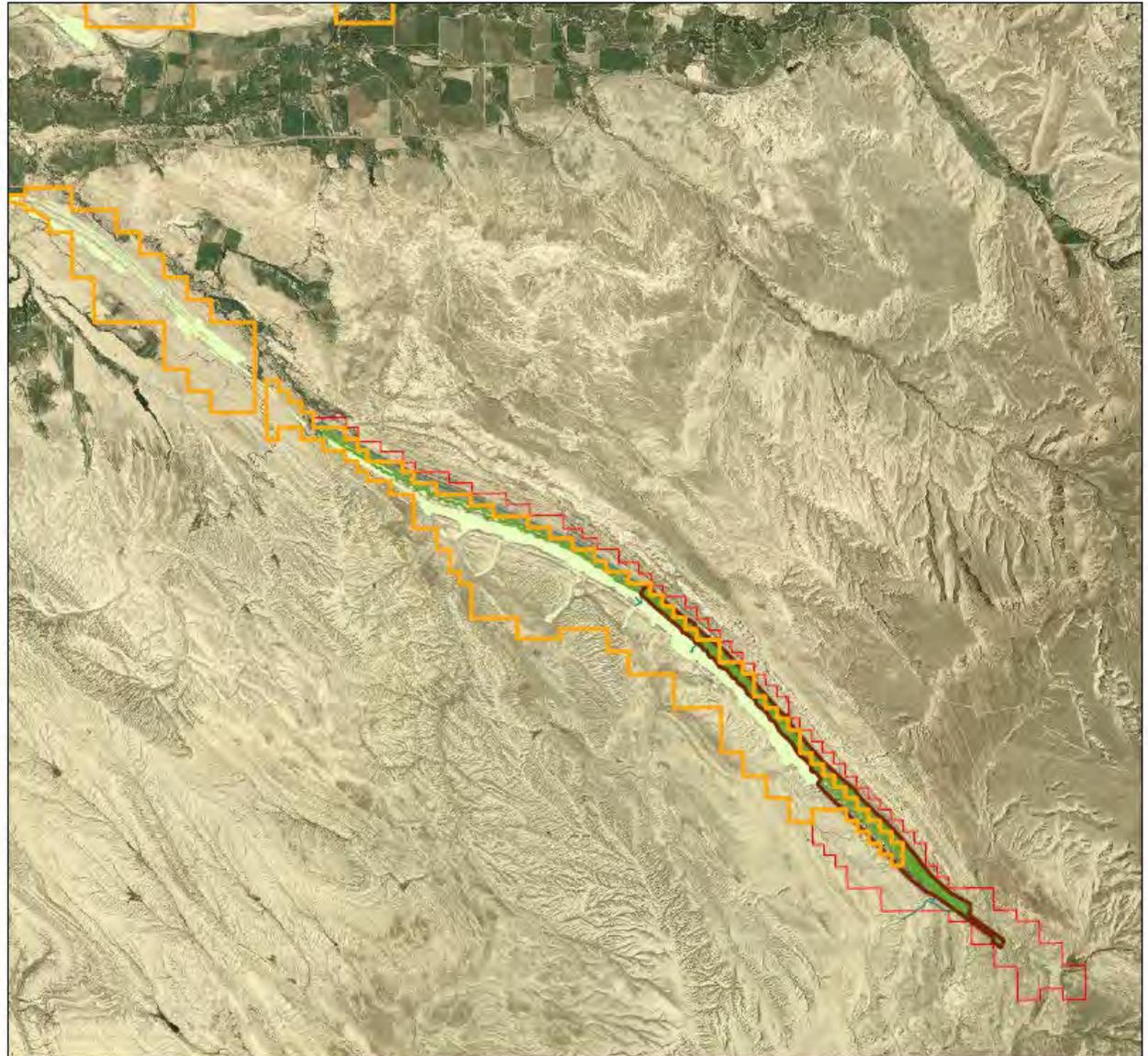
Proposed Plan of Operation

AMENDMENT BOUND

Greg mine plan

PROPOSE HAULROAD

Previously Disturbed Areas



0 0.5 1 2 Miles

1:100,000

This map is intended for display purposes only. No warranty is made on the accuracy, reliability, or completeness of information displayed. Spatial information may not meet National Map Accuracy Standards. Information in this map may be updated without notification.

4.14.2 Past, Present, Reasonably Foreseeable Future Actions

4.14.2.1 Past Actions

Bentonite Mining

Wyo-Ben has been mining Potato Ridge for over 40 years; since mining commenced there has been:

Total disturbance: 560 acres

Total Seeded Acres: 491.4 acres

Total Bond Released: 100.6

Livestock Grazing

Historically, these lands have been used for livestock grazing (sheep and cattle). Approximately 560 acres have been disturbed in the CEA area and 491.4 acres reclaimed and seeded with native vegetation. No change in permitted AUMs has occurred based on this disturbance; and in some unquantifiable instances, with successful reclamation, vegetation is present in areas that were documented as bare-ground prior to disturbance.

4.14.2.2 Present Actions

Bentonite Mining

In 2009 Wyo-Ben mined 247, 889 bank tons of bentonite (Adcock, 2009). Mining of the proposed Potato Ridge Block E extension could eventually result in 278,456 wet bank tons of material being permanently deleted from the total resources over the life of the mine plan.

Under the Proposed Action, the projected maximum incremental amount of new disturbance per year by Wyo-Ben, Inc. would be between 10 and 15 acres, anticipated over the life of the mine. The Proposed Action would incrementally add 593.4 acres of mining disturbance within the CEA area.

Livestock Grazing

The proposed action is located on Potato Ridge which is the boundary between the Potato Ridge and West Red Mountain pastures of the Potato Allotment #01525. The AUMs permitted for the area 1348. The area of disturbance within these pastures is predominately Saline Upland 5 to 9 inch precipitation zone range sites. The 593.4 acres of potential disturbance would displace 47 public AUMs (593.4 acres/12.5 acres/AUM) or 58 total AUMs (public and private) within the two pastures. This pit extension impacts/displaces 3% of the public AUMs in these two pastures of the Potato Allotment for the life of the mining and reclamation project. No changes would be made to the Flitner Ranch grazing permit as a result of this proposed action.

4.14.2.3 Reasonably Foreseeable Future Actions

Bentonite Mining

Bentonite is a very important locatable mineral that has as some of its uses kitty litter, drilling mud to lubricate oilfield drilling equipment, as a binding agent for taconite iron pellets, crayons, medicines, food thickeners, and cosmetics. Sodium bentonite deposits in Wyoming make up about 70% of the world's known supply, suggesting that bentonite mining will continue well into the future in Wyoming and the Bighorn Basin. It is currently economical to mine bentonite at a rate of 10:1.

Wyo-Ben has approximately 65 Federal locatable mineral claims and 2 State Leases along Potato Ridge. Based on current economic conditions, the BLM estimates additional proposals to mine bentonite may be received in the Worland Field Office area in the future.

Livestock Grazing

Livestock grazing on public lands has been occurring for over 100 years in the Bighorn Basin. With the cast-back system Wyo-Ben incorporates into their activities, the present kind and number of livestock and the number of days/seasons they graze is expected to continue in the future.

4.15 Residual Impacts

4.15.1 Alternative 1-- Proposed Action

The following are potential residual impacts that could occur as a result of the Proposed Action:

Though recontouring and reseeding of the land would follow the proposed mining process, the landscape would not look as it did prior to mining and an irretrievable commitment of surface resources, such as vegetation and habitat, would be made for the life of the project. Ridges may be lost or changed, reclaimed road beds may be present, drainages would be altered, and vegetation would be modified. Until reclamation is deemed successful the aesthetics of the area could be affected during mining operations.

Removal of the bentonite resource under the Proposed Action would constitute an unavoidable irreversible impact on the locatable bentonite resource.

4.15.2 Alternative 2-- No Action

There would be no residual impacts under the No Action Alternative, as the proposed mining would not be approved; there would be no new disturbance or impact on the land.

5.0 CONSULTATION AND COORDINATION

5.1 Tribes, Individuals, Organizations, or Agencies Consulted

Tribal Consultation with Eastern Shoshone, Crow, Northern Arapaho, and Northern Cheyenne tribes was conducted with regards to this project.

Air Quality Division, Wyoming Dept of Environmental Quality, Cheyenne and Lander Offices

Land Quality Division, Wyoming Dept. of Environmental Quality, Lander District Office

Wyoming Game & Fish Department, 5400 Bishop Blvd., Cheyenne, WY 82006

Wyoming State Office, Bureau of Land Management

5.2 BLM Reviewers

Name	Title	Responsible for the Following Section(s) of this Document
Marilyn D. Wegweiser	Geologist; CME	Project Lead/Geology
Mike Bies	Archaeologist	Cultural Resources
Marit Bovee	Archaeologist	Cultural Resources/Paleontological Resources
Carol Sheaff	Realty Specialist	Land Use
Teryl Shryack	Range Management Specialist	Range, Forage, Vegetation
Ted Igleheart	Wildlife Biologist	Wildlife
CJ Grimes	NRS	Invasive Species/Noxious Weeds
Paul Rau	Outdoor Recreation Planner	Recreation/Visual Resources
Steve Kiracofe	Soil Scientist/Hazmat Specialist	Soils
Karen Hepp	T&E/Range Management Specialist	T&E Plant Species
Monica Goepferd	Civil Engineer	Engineering
Jared Dalebout	Hydrologist	Water Resources
Holly Elliott	Planning & Environmental Coordinator	NEPA compliance, RMP conformance

6.0 REFERENCES, GLOSSARY AND ACRONYMS

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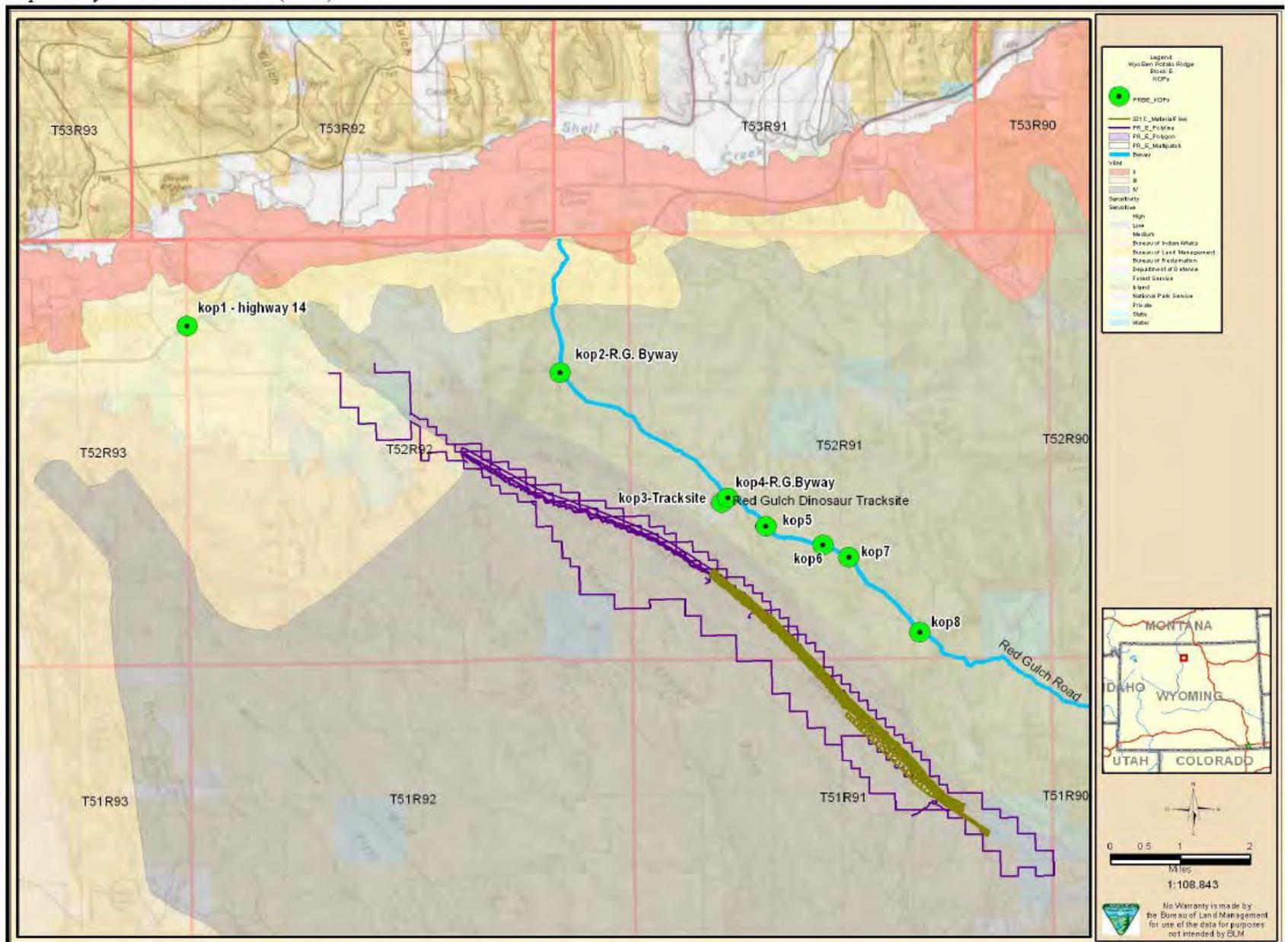
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Instruction Memorandum No. WY-2009-022; BLM Wyoming Reclamation Policy

7.0 Visual Resources KOPs

Map 3 Key Observation Points



KOP 1-- (U.S. Highway 14) bearing SE



KOP 2 – Red Gulch Road bearing South



KOP 3 – From Dinosaur Tracksite looking SW bound



KOP 4 – From Red Gulch Road above Dinosaur Tracksite, bearing southwest



KOP 5 – Photo along Red Gulch Road, bearing west, north-west



KOP 6 – Along Red Gulch Road, bearing northwest



KOP 7 – Along Red Gulch Road, bearing southwest



KOP 8 –Along Red Gulch Road, bearing northwest

