

**DECISION RECORD**  
**Black Hills Bentonite, LLC., North Fork of the Powder River Amendment**  
**Bentonite (WY) Permit to Mine 339C, Mine Plan of Operation (POO), WYW-168310**  
**ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA12-16**  
**BUREAU OF LAND MANAGEMENT, BUFFALO FIELD OFFICE**

**DECISION.** I approve Black Hills Bentonite, LLC’s., (BHB or Operator) Permit to Mine 339C-North Fork Amendment (NFA) bentonite mine POO as described in Alternative B of the EA WY-070-EA12-16, which BLM incorporates here by reference. This approved POO and amendment includes: 8 mine pits, stockpiling for topsoil and overburden, associated infrastructure such as roads, and reclamation plan.

**Compliance.** This decision complies with:

- The General Mining Act of 1872(30 USC *et seq.*).
- Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701). Interior Order 3310.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- Buffalo Final Environmental Impact Statement (FEIS), 1985; and FEIS for the Powder River Basin (PRB) Oil and Gas Project, 2003.
- Buffalo Resource Management Plan (RMP), 1985, Amendments 2001, 2003, 2011.
- Supplement to Memorandum of Understanding No. WY 19 Between the USDI BLM and the WY Department of Environmental Quality (WDEQ) Land Quality Division (LQD) for Management of Surface Mining and Exploration for Locatable Minerals on Public Lands; (SUPMOU), 2003.

**The Selected Alternative.** BLM’s decision approves Alternative B as described in the EA and the EA’s mitigation measures and terms and conditions (T&Cs). A summary of the approval follows. The detailed project description, changes made at the onsite, and site-specific mitigation measures, is in the EA.

**Approvals.** I approve the following 8 bentonite mining pits, BHB Plan of Operation, and associated infrastructure:

Pit #	Projected Opening	Qtr Qtr	Section	Twn	Rng	Pit area + associated disturbances (Stockpile areas, etc.) (acres)
Pit 27	2012	NENE	26	45N	83W	1.8
Pit 60	2012	NENE	22	45N	83W	3.8
Pit 28	2013	NENE	26	45N	83W	2.3
Pit 61	2013	NENE	22	45N	83W	1.7
Pit 29	2014	NENE	26	45N	83W	2.4
Pit 62	2014	NENE	22	45N	83W	1.5
Pit 63	2015	NENE	22	45N	83W	2.3
Pit 64	2015	NENE	22	45N	83W	2.1

The projected dates are only estimates and may change based on weather and market conditions.

Permit to Mine 339C-North Fork Amendment includes an area of about surface 200 acres having mixed federal, state, and private ownership. The approved POO calls for about 17.9 acres of surface disturbance on the 80 acres of federal surface in the area of the mine footprint. BHB holds a mining contract and mineral lease agreement with the Cash Family Limited Partnership and Curuchet et. al. for the mining claims in the NFA area that are held by the Cash Family Limited Partnership and Curuchet et al. The following tabulates the mining claims on federal acreage in the boundary of WDEQ-LQD Permit to Mine No. 339C – NFA. The above 8 bentonite mining pits are spread between the federal lands on Sections 22 and 26, below.

Claim Name	Serial #	Qtr/Qtr	Section	TNP	RNG	Claimant
Cash 95-1	WMC249508	NENE	22	45N	83W	Cash & Curuchet et al
Curuchet 98-3	WMC254753	NENE	26	45N	83W	Cash & Curuchet et al

**Limitations.** There are no denials or deferrals. See the T&Cs for specific project limitations.

**Operator Committed Measures.** BHB incorporated several measures to alleviate resource impacts into their NFA POO. Refer to the POO, p. 9 to 11 of the EA section 2.2.1.4 for details of operator committed measures and design features.

**Site-specific Mitigation Measures.** BHB and BLM applied site-specific T&Cs to this project, in addition to the programmatic and standard T&Cs identified in the Buffalo and PRB FEISs and Records of Decision (RODs), to mitigate the site-specific impacts described in the EA's Section 4, Environmental Effects. For a complete description of all site-specific T&C's associated with this approval see the EA.

**FINDING OF NO SIGNIFICANT IMPACT (FONSI) and SCOPING.** The EA analyzed this project and found, along with the FONSI (incorporated here by reference) that the project had no significant impacts on the human environment so there is no requirement for an environmental impact statement. BHB's NFA POO was available for public comment for 30 days and BLM received 1 comment that identified no new issues or concerns beyond addressed by the BLM; see administrative record.

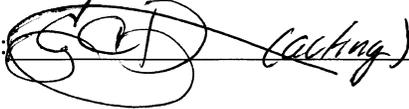
**RATIONALE.** I base the decision authorizing Alternative B, as summarized above, on the following:

1. This approval is concurrent with the WDEQ LQD's approval of Permit to Mine 339C-North Fork Amendment, Mine Plan of Operation.
2. BHB and BLM included mitigation measures to reduce environmental impacts while meeting the project's need. The environmental effects section of the EA addresses mitigation. For a complete description of all site-specific terms and conditions (T&Cs) associated with this approved project.
3. The selected alternative will not result in any undue or unnecessary environmental degradation.
4. The selected alternative will help meet the nation's need for bentonite, revenue, and stimulate local economies by maintaining workforces.
5. BHB, in their POO, shall comply with all applicable federal, state, and local laws and regulations.
6. This decision does not foreclose BHB or its successor, if any, to propose a new or supplementary plan for developing the federal minerals in this project area, including submission of additional POOs or modifications to develop minerals in accord with mining claim rights and law.
7. BHB certified there is a surface use agreement with the landowners. As a requirement of the permit, BHB has posted a reclamation bond with the WDEQ LQD, which will be reviewed periodically for adequacy, which covers the disturbance on BLM surface.
8. This approval is subject to adherence with all of the operating plans, design features, and mitigation measures in the Permit to Mine 339C-NFA POO. This approval is also subject to operator compliance with all mitigation and monitoring requirements contained in the Buffalo and PRB FEIS RODs, 1985 and 2003, respectively.

9. BHB and BLM added additional measures to the Storm Water Pollution Prevention Plan (riparian mitigation), to ensure sediment from the surface disturbance allowed inside the 500 foot buffer to the creek does not enter Wall Creek.

10. The project is clearly lacking in wilderness characteristics as it is less than 5,000 acres.

**ADMINISTRATIVE APPEAL:** This decision is subject to administrative review in accordance with 43 CFR 3809.800 to .809. An adversely affected party appealing must include information required under 43 CFR 4. The appealing adversely affected party may appeal to the BLM State Director or may bypass the BLM State Director to appeal directly to the Office of Hearings and Appeals under 43 CFR 4, 43 CFR 3809.800. Adversely affected parties appealing must use the table in 43 CFR 3809.801 to surmise their alternatives and the timelines associated with each. Adversely affected parties must appeal to a proper authority within 30 days. This decision is effective immediately. Appealing parties must submit a statement of reasons in the timeframe specified, 43 CFR 3809.802. Adversely affected parties must read and comply with the appeal guidance in 43 CFR 3809.800 to .809 or risk not having their appeal heard.

Field Manager:  \_\_\_\_\_ Date: 12/21/2012

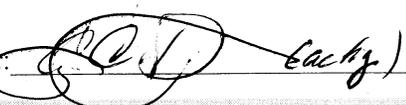
**FINDING OF NO SIGNIFICANT IMPACT**  
**Black Hills Bentonite, LLC., North Fork of the Powder River Amendment**  
**Bentonite (WY) Permit to Mine 339C, Mine Plan of Operation (POO), WYW-168310**  
**ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA12-16**  
**Bureau of Land Management, Buffalo Field Office, Wyoming**

**FINDING OF NO SIGNIFICANT IMPACT:** On the basis of the information in the EA, mine plan of operations, and North Fork Amendment (all incorporated here by reference), and all other information available to me, I determine that: (1) the implementation of Alternative B will not have significant environmental impacts beyond those already addressed in the Buffalo and Powder River Basin Final Environmental Impact Statements (PRB FEIS) to which the EA tiers; (2) Alternative B conforms to the Buffalo Field Office (BFO) Resource Management Plan (RMP) (1985, 2001, 2003, 2011) and DOI Order 3310; and (3) Alternative B does not constitute a major federal action having a significant effect on the human environment. Therefore an EIS is not required. I base this finding on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and to the intensity of the impacts described in the EA.

**CONTEXT:** Mineral development (leasable, locatable, and saleable) is a long-standing land use in the PRB. The PRB provides over 42% of the nation's coal. The Buffalo and PRB FEISs reasonably foreseeable development predicted and analyzed locatable mineral development and over 51,000 gas and 3,200 oil wells. The proposal in Alternative B is insignificant in the national, regional, and local context.

**INTENSITY:** The implementation of Alternative B will result in beneficial effects in mineral and revenue production however; there will also be adverse effects to the environment. Design features and mitigation measures were included in Alternative B to preclude undue and unnecessary environmental degradation or significant adverse environmental effects. Alternative B does not pose a significant risk to public health and safety. The geographic area of this mine POO does not contain unique characteristics identified in the RMP or FEISs, or other legislative or regulatory processes or scientific documents. This mine POO area is clearly lacking wilderness characteristics since it is less than 5,000 federal acres. BFO used relevant scientific literature and professional expertise in preparing the EA. The scientific community is reasonably consistent with their conclusions on environmental effects relative to bentonite mining. Research findings on the nature of the environmental effects are not highly controversial, highly uncertain, or involve unique or unknown risks. Bentonite mining of the nature proposed with this POO and similar POOs was predicted and analyzed in the Buffalo and PRB FEISs; the selected alternative does not establish a precedent for future actions with significant effects. There are no cultural or historical resources present that will be adversely affected by the selected alternative. No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected. The selected alternative will not have any anticipated effects that would threaten a violation of federal, state, or local law or requirements imposed for environmental protection.

**ADMINISTRATIVE APPEAL:** This finding is subject to administrative review per 43 CFR 3809.800 to .809. An adversely affected party appealing must include information required under 43 CFR 4. The appealing adversely affected party may appeal to the BLM State Director or may bypass the BLM State Director to appeal directly to the Office of Hearings and Appeals under 43 CFR 4, 43 CFR 3809.800. Adversely affected parties appealing must use the table in 43 CFR 3809.801 to surmise their alternatives and the timelines associated with each. Adversely affected parties must appeal to a proper authority within 30 days. This finding is effective immediately. Appealing parties must submit a statement of reasons in the timeframe specified, 43 CFR 3809.802. Adversely affected parties must read and comply with the appeal guidance in 43 CFR 3809.800 to .809 or risk not having their appeal heard.

Field Manager:  \_\_\_\_\_

Date: 12/21/2012

**Environmental Assessment**

**Black Hills Bentonite, LLC – North Fork  
Plan of Operations (WYW-168310), and Amendment to WDEQ LQD Permit to Mine  
339C, for Bentonite Mining**

US DOI BLM – EA WY-070-EA12-016

December 2012

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## Acronyms and Abbreviations

AO	Authorized Officer	pers. comm.	Personal communication(s)
AUM	Animal Unit per Month	PM	particulate matter
BCC	Bird of Conservation Concern	POO	Plan of Operations
BFO	Buffalo Field Office	PRB	Powder River Basin
BGEPA	Bald and Golden Eagle Protection Act	R./R	Range
BHB	Black Hills Bentonite, LLC	RB	Rocky Breaks
BLM	Bureau of Land Management	RMP	Resource Management Plan
CBNG	coalbed natural gas	ROD	Record of Decision
CFR	Code of Federal Regulations	SGCN	Species of Greatest Conservation Need
CO	carbon monoxide	SHPO	Wyoming State Historic Preservation Office
dBA	decibels	SO <sub>2</sub>	sulfur dioxide
EA	Environmental Assessment	SSS	Special Status Species
ERMA	Extensive Recreation Management Area	SWPPP	Storm Water Pollution Prevention Plan
ESA	Endangered Species Act	T./T	Township
FEIS	Final Environmental Impact Statement	ULT	Ute Ladies'-tresses orchid
FLPMA	Federal Land Policy and Management Act of 1976	USDOJ	U.S. Department of the Interior
GSG	Greater sage-grouse	USFWS	U.S. Fish and Wildlife Service
IM	Instruction Memorandum	UUD	unnecessary or undue degradation
LQD	Land Quality Division	WARMS	Wyoming Air Resource Monitoring System
MBFHI	Migratory Birds of High Federal Interest	WDA	Wyoming Department of Agriculture
MBTA	Migratory Bird Treaty Act	WDEQ	Wyoming Department of Environmental Quality
MILLEIS	multiple lands with wilderness characteristics	WEPP	Water Erosion Prediction Project
MLA	Mineral Leasing Act	WGFD	Wyoming Game and Fish Department
MM	Mineral Management action	WNv	West Nile Virus
MOU	Memorandum of Understanding	W.S.	Wyoming Statute
MSG	mixed sagebrush grass	WSEO	Wyoming State Engineer's Office
NEPA	National Environmental Policy Act	WQD	Water Quality Division
NFA/NFAA	North Fork Plan of Operations/Mine Permit Amendent Area	WYNDD	Wyoming Natural Diversity Database
NOx	nitrogen oxides		
OB	Outcrop Barrens		
OC	organic carbon		

## SECTION 1 PURPOSE AND NEED

### Introduction and Background

Black Hills Bentonite, LLC (BHB), submitted a plan of operations entitled “Permit to Mine No. 339C - North Fork Amendment” (Plan, Plan of Operations or NF Amendment) to the Bureau of Land Management (BLM) Buffalo Field Office (BFO) on October 17, 2011. BLM incorporates by reference here BHB’s Plan of Operations. The objective of this Plan is to mine sodium bentonite, also called “Wyoming-type bentonite” (bentonite). The BFO assigned the proposal BLM serial casefile number WYW-168310, and the State of Wyoming Department of Environmental Quality (WDEQ) Land Quality Division (LQD) assigned the proposed project the North Fork Amendment (Amendment) to Permit to Mine No. 339C. See Plan of Operations, Map A-1. This environmental analysis (EA) tiers to and incorporates by reference the Buffalo Final Environmental Impact Statement (FEIS), 1985; the Power River Oil and Gas Project and Amendment FEIS (PRB FEIS); those respective records of decision (RODs); the Buffalo Resource Management Plan (RMP); its amendments of 2001, 2003, 2011, maintenance actions; and the Summary of the Analysis of the Management Situation: Buffalo RMP Revision, 2009.

The BHB North Fork Plan of Operations/Amendment area lies within a larger bentonite mining district in the vicinity of Mayoworth and Kaycee, Wyoming. BHB is currently the only bentonite mine operator in this area, although several other companies operated mining operations in this area in the past. Bentonite mining occurred in this area since the 1960’s.

The Plan of Operations includes a mix of private, State, and BLM lands, totaling 200 acres. However, the only lands proposed for surface disturbance are lands that BLM administers. These lands consist of BLM-administered surface estate with BLM-administered mineral estate. Of the 80 total acres of BLM-administered lands in the Plan of Operations, 17.9 acres are proposed to be disturbed during the estimated 10 year life of the mine).

The lands included in the Plan of Operations are in Johnson County, Wyoming, 6<sup>th</sup> Principal Meridian, and listed below. Sections 22 and 26 are BLM-administered lands. BHB holds 2 active mining claims in these lands: Cash 95-1 (BLM number WMC249508), and Curuchet 98-3 (WMC254753), respectively (see Table 2.1). The remainder are administered by private entities and the State of Wyoming; see Table 1.1.

**Table 1.1. Surface and Mineral Ownership in Project Area.**

Legal Description				Surface Owner	Mineral Owner
Township	Range	Section	Aliquot		
45 North	83 West	22	NENE	BLM	BLM
45 North	83 West	26	NENE	BLM	BLM
45 North	83 West	15	S2SE	State of Wyoming	State of Wyoming
45 North	83 West	15	NWSE	Cash Family Ltd. Partnership	J.N. and E.D. Cash

An authorized Plan of Operations exists within the Permit to Mine 339C area: The BHB Mayoworth Mine is BLM serial casefile number WYW-127615, approved May 19, 1975,

totaling 1320 acres, all BLM-administered. This Plan of Operations has been modified twice, with no new lands added either time: January 1, 1986, and November 1, 1997. The National Environmental Policy Act (NEPA) requires environmental analyses on most federal actions or proposed projects since its enactment in 1970. BLM conducted such analyses for new proposed mining projects on public lands predating 1981. BHB's Permit to Mine No. 339C has been amended three times since it was approved on May, 23, 1975, and now totals 3774.5 acres. Approval of the North Fork Plan of Operations/Amendment will bring the Permit to Mine to 3894.5 total acres. This Plan of Operations area is adjacent to currently approved Mayoworth Plan of Operations/Permit to Mine 339C areas. If approved, it will expand these boundaries to the north and northwest. Of the 3774.5 total acres in the Permit to Mine 339C, 445.4 acres received surface disturbance; 349.5 acres have been reclaimed, and 170.9 acres have been released from bonding.

### **1.1 Purpose and Need**

BLM's purpose and need for the proposal is to support minerals management goal #9 (MM-9) from its 1985 Record of Decision in the Buffalo Resource Management Plan (RMP). MM-9 reads, "BLM-administered locatable minerals will remain subject to the provisions of the 1872 Mining Law except in areas that are now withdrawn from mineral location." BLM must analyze the purpose of supporting MM-9 projects through whether or not to approve the development of unpatented mining claim via an Amendment to an approved POO through on federal land, in conjunction with other applicable laws and regulations to ensure the proper handling, measurement, disposition, and site security of production while balancing the nation's goals of natural resource conservation, supporting conditional mining rights, and advancing mineral development.

The need for this proposal is furthered by BLM's two-pronged set of responsibilities: One, to protect the rights of mineral entry and use of public lands under the General Mining Law of 1872, as amended; and, two, to ensure the compliance with other laws and the requirements in 43 Code of Federal Regulations (CFR) 3809. These laws and regulations direct the review of submitted plans of operations, and modifications of plans of operations, to ensure proposals do not lead to unnecessary or undue degradation of public lands, and that proper and adequate reclamation bonding has been secured for such projects.

### **1.2 Issues Identified During Scoping**

Internal scoping was conducted in the BLM BFO by an interdisciplinary team beginning on October, 17, 2011, when the Plan of Operations was submitted, and concluding in October of 2012, when the NEPA analysis was concluded. The Mine Plan and Reclamation Plan submitted were updated several times, to include required information (see Section 1.3, BLM Responsibilities) and some information needed to complete the NEPA analysis. No unusual environmental issues were identified. Public scoping of the Plan of Operations was conducted from June 22 to July 23, 2012. BLM received 1 comment, and no issues were identified beyond those previously identified during internal scoping. Internal scoping resulted primarily in the following BLM specialist concerns:

- 1) Air quality.
- 2) Soils and vegetation: site stability, reclamation potential, riparian and wetland communities, and invasive species.
- 3) Water: ground and surface.
- 4) Surface disturbances affecting habitat for migratory birds of high federal interest.
- 5) Potential mining effects on Greater Sage-Grouse (GSG) in or around 6 leks.
- 6) Potential mining effects on wildlife habitat and use in the mining areas.
- 7) The proposed mining activities could disturb cultural resources.
- 8) Increases in the number of roads and traffic, which may increase human disturbance to cultural and wildlife resources.
- 9) The proposed mining may cause a temporary loss of forage for livestock and wildlife until the disturbed areas are revegetated.

### **1.3 Agency Roles and Responsibilities**

Both BLM and the State of Wyoming (via the WDEQ LQD) have certain requirements that must be met before their respective approval is given for the proposed mining operation. This dual authorization is necessary due to the particular lands involved: the lands included are situated in the State of Wyoming, thereby necessitating that a Wyoming State agency approve the proposed operations; and, BLM-administered lands are also included, necessitating BLM's approval of proposed operations on those particular lands. The BLM ensures that the NEPA analysis and resulting document fulfills the federal needs, as required by the various laws, regulations, policies, etc., that pertain to the project.

#### **1.3.1 Bureau of Land Management**

Sodium bentonite, also called "Wyoming-type bentonite" (bentonite), is a clay mineral, and locatable under the General Mining Law of 1872, as amended. The right to explore for and mine bentonite on federal and certain other lands is secured by properly locating, filing, and maintaining mining claims. The federal regulations that cover the regulation and administration of locatable mineral exploration and development on BLM-administered lands are 43 Code of Federal Regulations (CFR) 3809, commonly referred to as the "3809" surface management regulations. These regulations require project proponents (mining claimants and/or operators) to submit a plan of operations for cumulative disturbances greater than 5 acres to BLM for review and approval. The plan of operations must contain detailed information about the proposed mining activities, as well as protective measures to ensure that unnecessary or undue degradation does not occur on public lands. The project proponent must also comply with the performance standards set forth in 43 CFR 3809.420. BLM must, per 43 CFR 3809.411, conduct an environmental analysis under NEPA for a new plan of operations or a modification to an existing plan of operations. The following acts direct BLM to analyze the potential environmental impacts from proposed mining-related activities: the NEPA of 1969; the Environmental Quality Improvement Act of 1970. Additional guidance and regulations include 40 CFR 1500 (Protection of Environment), 43 CFR 1601 (Planning, Programming, and Budgeting), and 43 CFR 3809 (Surface Management).

##### **1.3.1.1 Decision to be Made**

The BLM authorized officer (AO), here the BLM BFO field manager, must decide whether the proposed action (proposal), as submitted (Alternative B), serves RMP goal MM-9; is likely to

result in unnecessary or undue degradation (UUD) of public lands; and complies with other laws, regulations, and policy guidance for a federal action.

### **1.3.2 State of Wyoming Department of Environmental Quality**

The legislation that regulates and controls bentonite mining operations in Wyoming is the Wyoming Environmental Quality Act. This law, and its approved rules, place operational guidance and limitations on a project during its life, and provides for the reclamation of land subjected to surface or open-cut materials mining. The basic standard is that, post-mining, the land would be stable and meet its beneficial use; such use is usually designated by the surface owner. Under the Act, all lands, even federal lands, are regulated and must meet its requirements. The State and the BLM have signed a Memorandum of Understanding (MOU) under which the agencies jointly regulate federal land under BLM administration. That MOU is presently being modified to account for recent changes in both state and federal laws. Such changes would not interfere with the agencies' ability to analyze and render a decision on BHB's North Fork Plan of Operations/Amendment, however. The Act requires that a reclamation bond, cash deposit, or other financial instrument be submitted to the state to cover the complete cost of reclaiming the site to its' approved, post-mining land use; the instrument is payable to the state. For those projects in which BLM-administered lands (surface and/or mineral estate) are involved, the instrument is payable to both the state and BLM.

## **SECTION 2 PROPOSED ACTION AND ALTERNATIVE**

### **Introduction**

This chapter discusses the Proposed Action and Alternatives to the Proposed Action, which are: No Action, and Environmentally Preferred Action. Descriptions of the current state of all resources at the proposed mining site and potential impacts to those resources resulting from the Proposed Action and alternatives are in Sections 3 and 4, respectively. Mitigation measures are identified as a result of the impact analysis, and used to develop the Environmentally Preferred Alternative.

### **2.1 Alternative A – No Action**

The No Action Alternative involves denying the proposed project in its entirety. BLM could deny or withhold approval of the proposed project if it is found that the proposal would result in unnecessary or undue degradation (UUD) of the public lands, or could not comply with the measures found in federal. If this occurs, the proponent could modify the proposal and resubmit at a later date. This would be treated as a new proposal, however, and undergo the review and analysis afresh.

### **2.2 Alternative B – Proposed Action**

Alternative B contains BHB's complete Plan for the NF Amendment and is a result of BHB and BLM working to reduce environmental impacts. This alternative summarizes the POO submitted to the BLM by BHB on October 17, 2011 – prior to site visits and any of the operator's design modifications. Alternative B includes the 2 – 40 acre tracts and additional proposed surface disturbance of 18 acres described in Section 1.1, Introduction and Background, above.

BHB holds a mining contract and mineral lease agreement with the Cash Family Limited Partnership and Curuchet et. al. for the mining claims in the NFA area that are held by the Cash Family Limited Partnership and Curuchet et al. The following tabulates the unpatented mining claims on federal acreage in the boundary of WDEQ-LQD Permit to Mine No. 339C - North Fork Amendment (NFA):

**Table 2.1. Unpatented Mining Claims in Project Area.**

Claim Name	Serial #	Qtr/Qtr	Section	TNP	RNG	Claimant
Cash 95-1	WMC249508	NENE	22	45N	83W	Cash & Curuchet et al.
Curuchet 98-3	WMC254753	NENE	26	45N	83W	Cash & Curuchet et al.

The total amount of BLM land proposed to be directly disturbed by mining and related activities on the NFA area over the life of the mine is 17.9 acres. BHB proposes new bentonite mining on the BLM land and on the unpatented Cash 95-1 and the Curuchet 98-3 claims held by the Cash Family Limited Partnership and Curuchet et al., with whom BHB has a mining lease agreement. These lands are in an amended WDEQ Permit 339C mine area. No private land is proposed to be disturbed by mining and related activities over the life of this project. The total amount of land (regardless of land status) proposed to be disturbed by mining and related activities, is 17.9 acres.

**Table 2.2. Pits in TNP 45N, RNG 83W, Projected Sequence, and Proposed Disturbances.**

Pit No.	Section	Projected Opening Dates	Pit Area + Associated Disturbance
27	26	2012-2013	1.8 acres
60	22	2012-2013	3.8 acres
28	26	2013-2014	2.3 acres
61	22	2013-2014	1.7 acres
29	26	2014-2015	2.4 acres
62	22	2014-2015	1.5 acres
63	22	2015-2016	2.3 acres
64	22	2015-2016	2.1 acres
<b>TOTAL</b>		<b>8 pits</b>	<b>17.9 acres</b>

The projected dates are only estimates and may change based on weather and market conditions.

BHB anticipates the NFA plan to have a 9-year mine life and will disturb approximately 17.9 acres on mine pits and associated stockpiles and access roads. At present, there are no plans to mine the acreage in Section 15, T45NR83W, but that, in addition to the remaining un-mined area within the 200 acres of Permit to Mine 339C comprise reasonably foreseeable development.

BHB proposes mining in the NENE Section 22 area occurring along a strip of land (approximately 225 feet wide) below The Mesa, a named topographic feature. The bentonite mined in this area is a 12 foot thick bed of bentonite referred to as the “Frontier” bed. BHB proposes mining in the NENE Section 26 occurring along a narrow strip of land (approximately 120 feet thick) for the “Second Upper” bed. The “Second Upper” bed is approximately 6 feet thick. In both locations mining will begin in the southeast part of the area and progress toward the northwest across both the NENE Section 22 and the NENE Section 26.

Access to the proposed mining in the NENE Section 22 will be through existing mine access roads and a proposed road across private land in the SWNW Section 23, T45N R83W. Access to the proposed mining in the NENE Section 26, T45N R83W will be through existing mine access roads and then through an existing pit in the SENE Section 26.

### **2.2.1. Plan of Operations**

The POO is on file in the BFO, Branch of Minerals and Lands, and is considered an integral part of this EA by reference. The contents of the submitted plan are in accordance with the content requirements cited in 43 CFR 3809.401. The operator concurrently filed certain mine plan information with the WDEQ LQD - District III - Sheridan.

#### **2.2.1.1. Use of Existing Roads**

No new rights-of-way are necessary for the proposed project. The operator would employ BLM road building standards found in the BLM Manual Section 9113 when constructing access roads. Access to the amendment area will be via BHB's existing mine access road that intersects with the Mesa Road approximately 10 miles northwest of Kaycee, Wyoming. BHB will limit the construction of new roads in the amendment area to secondary access roads. These roads will have a top width of 20 feet and a total width of 50 feet to allow for ditches along the roadside. Ditches will be approximately twelve (12) to eighteen (18) inches in depth to allow for drainage. BHB will build water turnouts along the side ditches in order to disperse runoff and to minimize erosion. BHB design will prevent water from running down roadways and ditches into drainages at crossings. Properly sized culverts will be installed, as needed, during the construction of the access roads. Typical construction details associated with culvert installations are in Figure MP-3, which is in the Mine Plan section of the POO. BHB will salvage topsoil from the access roads and adjacent ditches to a maximum depth of 15 inches. The design removes and stockpiles topsoil removed from building the access roads. BHB will reclaim all access roads upon the completion of mining.

Due to the area's remoteness and limited size of this mining operation, BHB plans no access control features. BHB will address any potential hazards to humans, livestock, or wildlife which may develop on a site specific basis using fencing or other methods determined appropriate for the conditions.

#### **2.2.1.2. Mining Operations**

##### **Mining Methods**

Bentonite mining on the amendment area will consist of a series of pits arranged in multiple cut sequences. BHB would remove topsoil, where present, from all affected areas using scrapers and dozers. BHB will stockpile the topsoil for future use in the reclamation of the mined or disturbed lands. In some instances, the topsoil may be spread directly (live-spread) onto previously backfilled areas, instead of being stockpiled. Miners will then rip the exposed overburden using dozers equipped with rippers. They will remove and stockpile the overburden using scrapers. Overburden from the first pit in a multiple cut series of pits will go in an out-of-pit overburden stockpile. The overburden from each subsequent pit will provide backfill into the previous open pit.

The bentonite is remains after removal of the overburden. BHB field dries the bentonite in the pit and on out-of-pit bentonite stockpiles which BHB will build on the backfilled pit areas and the out-of-pit overburden stockpile.

### **Topsoil Removal and Handling**

BHB will salvage topsoil from the following areas: 1) overburden stockpile areas; 2) pit areas; 3) roads; 4) equipment staging areas, and any other area where it is necessary to remove topsoil in order to protect this resource. Miners will remove topsoil in accordance with the recommended topsoil salvage depths found in the POO's Appendix D-7, Soils. If miners encounter overburden material that appears suitable as a topsoil substitute, they may also salvage and stockpile this material at the discretion of the operator. Miners will use 627G push-pull scrapers or D8R dozers to remove and stockpile topsoil. If graded and contoured areas exist, BHB may apply the topsoil directly (live-spread) instead of stockpiling it.

BHB will also remover topsoil from the edges of all pits in order to create a topsoil "buffer area" approximately 30 feet wide. This "buffer" protects the topsoil resources from the possibility of sloughing of high-walls or low-walls on the edges of pits. These buffers also facilitate the safe and complete salvage of topsoil along the edges of advancing multiple cut pit sequences.

BHB will identify all topsoil stockpiles with signs. BHB will seed topsoil stockpiles which remain for more than 1 year with the approved permanent seed mixture. Stockpile seeding will occur in the spring or fall, whichever season follows the placement of the stockpile.

### **Overburden Handling**

Miners will either stockpile or directly backfill previous pits with overburden removed from the pit areas in the advancing pit series. Overburden removed from the first pit in a multiple cut pit series will remain adjacent to the pit to form an out-of-pit overburden/bentonite stockpile. If an out-of-pit overburden stockpile is left as a reclamation feature, miners will contour it to blend with the existing topography. All slopes will be 4H:1V or less. Overburden stockpiles which will remain as a permanent reclamation feature will have a maximum height of 10 feet and will also be oriented in the same direction as nearby topographic features. BHB will place waste bentonite, referred to as "cleanings" - which remain on the overburden stockpile areas after removal of the stockpiled bentonite, at the base of a highwall prior to backfilling. This prevents this highly bentonitic material from placement on the surface prior to the application of topsoil.

### **Bentonite Handling and Field Drying**

The "field-drying" of bentonite is a process which uses the sun's radiant heat to reduce the natural moisture content of the mined bentonite. Field-drying reduces fuel consumption in both the bentonite hauling to the processing plant and drying the bentonite during processing.

During the summer months, miners plow the exposed bentonite using farm tractors and chisel plows. As a plowed layer of bentonite dries, miners remove and stockpile this dried layer. Miners repeat the plowing process in the pit until they mine and stockpile the entire seam of exposed bentonite. Miners then load the field-dried bentonite into 25 and 35 ton belly-dump trucks, and haul it to Casper, Wyoming for processing. Based upon the demand for particular qualities of

bentonite, bentonite stockpiles may remain in place for extended periods of time before processing.

### **Power and Communication Lines, Pipelines, Sediment/Treatment Ponds, and Mill/Tailings Sites**

The project requires no power or communication lines and will not affect any lines. BHB does not require sedimentation or treatment ponds or mill or tailings disposal sites for the NFA. NFA does not require nor will it impair railroad lines or conveyor systems with this project.

### **Drainage Diversions**

Drainage diversions for NFA will be temporary – during the life of the project (anticipated at about 9 years). BHB will divert some surface flow on the up-slope side of pits and other affected areas to prevent accumulation of water in pits, and to prevent down slope sedimentation. BHB will accomplish this diversion by building small v-ditches on the up-slope side of pits to divert surface flows away from these areas. Miners will normally build these small v-ditches with a motor grader or a dozer. Workers will remove and stockpile topsoil prior to constructing drainage diversions. If erosion is likely BHB will seed selected diversion sites with a temporary seed such as barley or winter wheat to provide soil stabilization. BHB may also use straw bales or water bars to stabilize erosion.

### **Solid and Liquid Waste Disposal**

BHB will collect and haul waste and trash generated as a result of NFA mining to a municipal landfill for disposal. Miners will not allow waste or trash to accumulate at the site. They will also collect, recycle, or properly dispose of used oil from heavy equipment.

### **Overburden and Bentonite Stockpiles**

The overburden/bentonite stockpiles will primarily be on private land adjacent to the NFA project area. Out-of-pit overburden stockpiles are normally only constructed in conjunction with the overburden removed from the first pit mined in an adjoining series of connected pits (multiple cut sequence). BHB will develop bentonite stockpiles in order to field dry the bentonite exposed in each pit. Miners create these bentonite stockpiles on either the overburden stockpile or the backfilled portion of previously mined pits in order to reduce impacts to the land.

#### **2.2.1.3. Reclamation**

Reclamation of the NFA area will focus on rehabilitation of wildlife habitat and livestock grazing, which constitute the pre-mine land uses. Reclamation is concurrent as much as possible with mining operations. Reclamation generally begins within 3 years at specific sub-sites and concludes within 5 years of disturbance at the sub-site.

BHB will reseed topsoil areas as soon as possible. If, due to weather or other circumstances, a fall seeding with the permanent seed mixture is not possible, miners will reseed the area with a sterile triticale hybrid such as Quickguard the following spring in order to stabilize the topsoil and reduce the presence of weedy or unfavorable plant species. The seeding rate of the sterile hybrid triticale is 50 pounds per acre. BHB will then reseed these areas with the permanent seed mixture in the fall of the same year. During mining operations, BHB would salvage all available topsoil for the NFA pit series. BHB will salvage these soils according to the soil salvage

recommendations in NFA POO's, Appendix D-7 (Soils). Miners will stabilize the piles using contour tilling and seeding with the approved permanent seed mix as appropriate. Soil would be direct haul "live-spread" on backfilled pits wherever possible, to reduce stockpiling times. BHB's designed, disciplined road plan will minimize the impact on the ephemeral drainages. Where roads will cross ephemeral drainages, BHB will install culverts with the minimum culvert size being 18 inches in diameter.

Other types of erosion control and prevention practices that BHB proposes to use during mining and reclamation activities include the use of straw bale sediment traps, and drilling or harrowing along contour to reduce rilling. Post-mine, BHB would remove any temporary sediment barriers, and reestablish drainages. BHB will reconstruct channels in approximately the original location, and at least the same length and gradient as pre-mine features. BHB will seed channels would be perpendicular to water flow. If the company anticipates excessive erosion they may install and leave water bars and/or straw bales to encourage channel meandering over time.

BHB would use only certified weed-free seed, and seeding of all disturbed areas would occur between October 1 and November 30 of each year in areas where topsoil was replaced. Miners will use a seed mix approved by both WDEQ/LQD and BLM to reseed reclaimed areas.

If necessary, BHB will fence newly reclaimed (seeded) areas to protect these areas from grazing by livestock. Any fences built would be to BLM specification to allow for the egress and ingress of wildlife species. BHB will remove any fences after release of the reclamation bond, if the surface owner requests it. The Operator will use vegetation reference areas in the NFA area to assist in determining when or if bond release is acceptable to WDEQ/LQD and BLM. BLM may also use other procedures agreed upon with WDEQ/LQD to measure reclamation success.

#### **2.2.1.4. Operator Committed Practices**

##### **Interim Management Plan**

Periods of inactivity may occasionally occur on the NFA area, when earthmoving equipment is moved to different parts of the permit area as needed, to provide the plant with certain types of clay. BHB would, during periods of inactivity, control surface runoff into pit areas, containment basins, berms, and topsoil protection. Inactive mine areas would be left in a safe, stable, and clean condition. Occasionally a piece of heavy equipment may be left in a pit area while waiting for parts. BHB will stabilize and monitor all pit highwalls, drainages, overburden areas, and points of potential runoff during periods of mining suspension.

##### **Monitoring Plan**

BHB proposes to monitor the mine site for excessive erosion, and prevent surface water runoff that would transport sediment from the mine areas, throughout the life of the mine. Critical operational phases requiring monitoring include surface water runoff, mine area drainage and berm stability, haul road stability, highwall stability, potential fuel spills or potential unnecessary or undue degradation. The operator will monitor highwalls for raptor nests, and will record and report any instances of wildlife mortality due to the mining to the Wyoming Game and Fish Department (WGFD). BHB will conduct other wildlife monitoring as required by BLM or LQD.

### **Spill Management Plan and Sediment Control**

BHB addressed spill prevention and management under the WDEQ Storm Water Pollution Prevention Plan for Permit to Mine 339C, to address leaks or hydrocarbon spills on the NFA site.

BHB will direct surface runoff around and away from mining activities in order to prevent unnecessary erosion and sedimentation. Miners will accomplish final contouring in order to return the affected lands to the approximate original contour. BHB will monitor the disturbed areas for erosion.

### **Noxious Weed Management Plan**

BHB will monitor and control the NFA area for noxious weed species.

### **Protection of Cultural and Paleontological Resources**

BHB's contractor recorded 5 isolated finds during the cultural resources inventories conducted on the project area. Any cultural resources (historic or prehistoric site or object or fossil) discovered by the holder, or any person working on his behalf, on private, state or federal lands shall be immediately reported to the authorized officer. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery would be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific materials. The BLM would be responsible for the cost of evaluation and any decision as to proper mitigation measures shall be made by the authorized officer after consulting with the operator.

### **Wildlife**

#### *Raptors*

BHB will conduct mining to minimize impacts to any active nests that are currently present and any nests that may establish during the breeding season of February through July. There were no active raptor nests identified during the 2007 wildlife surveys. Migratory birds of high federal interest (MBHFI) were not common on the study area but would receive protection wherever found. In the event that a raptor nest is on or immediately adjacent to the NFA area and it becomes necessary to "take" or remove a raptor nest, the U.S. Fish and Wildlife Service (USFWS) would be contacted as soon as a "take" situation is anticipated. Sufficient lead time would be allowed for developing and implementing a mitigation plan, and to avoid disrupting the mining operation.

#### *Species of BLM Concern*

BHB personnel would continue conducting observations for any activity of wildlife species of major concern. The Operator will conduct proper mitigation or avoidance for these species through the required coordination with the appropriate management agencies.

#### *Migratory Birds*

In order to mitigate possible impacts to migratory birds, all attempts will be made to remove vegetation outside of the nesting season (February 1 – August 31) in order to prevent take of migratory birds, nests, and chicks. If it is not possible to remove topsoil outside of the nesting season, then prior to topsoil stripping, a migratory bird survey will be conducted on the proposed disturbance area within the North Fork Amendment Area (NFAA), including a buffer of 0.5

miles (1 mile for ferruginous hawks). If migratory birds, nests, or chicks are observed on proposed disturbance areas as a result of the survey, BHB will delay mining activities until the end of the nesting season.

#### *Threatened and Endangered Species*

In the event that a threatened or endangered species (plant or animal) should become established on or immediately adjacent to the NFAA project area, BHB will contact the U.S. Fish and Wildlife Service, the Wyoming Game and Fish Department, and the BLM, as required, in order to develop and implement the necessary mitigation measures to prevent disturbances or impacts to any such species.

#### *Greater Sage-Grouse (GSG)*

No surface occupancy will be allowed within one-quarter (1/4) mile of the Mesa Corrals Lek. In order to mitigate potential audio impacts to GSG during the breeding season (March 1 – May 15), noise levels at the core lek perimeters should not exceed 10dBA above ambient noise levels from 6:00 pm to 8:00 am.

Whenever possible, reclamation will be conducted concurrently with mining activities in order to restore the lands to pre-mining conditions as soon as possible. The permanent reclamation seed mixture has been formulated in order to reestablish native grasses, shrubs, and forbs which are desirable to GSG in terms of forage and habitat.

### **2.3. 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. However, the relocation may remove the operation to lands where the quality and quantity of bentonite is not known through exploration and would not meet the operator needs, may be outside of claims located by BHB 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.

### **2.4 Conformance with Land Use Plan, Other Laws, Regulations, and Policies**

The proposed project does not diverge from the terms and conditions of the 1985 BFO RMP (BLM 1985), the amendments, (BLM 2001), (BLM 2003), (BLM 2011), and the PRB FEIS (including the Buffalo (BLM 1985) and PRB Record of Decision (ROD) (BLM 2003a, b). The proposal complies with all federal laws, regulations, policies, and Supplemental MOU. This includes, but is not limited to: the 1872 Mining Act, FLPMA, MLA, National Historic Preservation Act, Endangered Species Act (ESA), Clean Water Act, Clean Air Act, National Environmental Policy Act (NEPA), and USDOJ Order 3310.

## **SECTION 3 AFFECTED ENVIRONMENT**

### **Introduction**

Section 3 describes and analyzes the physical and regulatory environment existing and trends of issue-related items for the project area described in Section 2. Aspects of the affected environment described in this section focus on the relevant major issues. The reader may find a screening of all resources and land uses potentially affected in the administrative record. This EA does not discuss or analyze resources that would be unaffected, or not affected beyond the level analyzed in the Buffalo or PRB FEISs.

### **3.1 Mining History Since the 1985 Buffalo Final Environmental Impact Statement**

BHB has been mining bentonite by surface methods in Wyoming since the 1940's, and since the 1950's in the general vicinity of the project area. BHB currently has approximately 3774.5 acres authorized under WDEQ LQD Permit to Mine 339C. The proposed North Fork Plan of Operations/Amendment would add approximately 200 acres to the permit, with approximately 80 of these acres being BLM-administered.

### **3.2 Location and Topography**

BHB's Plan area is about 14 miles northwest of Kaycee, predominately using Wyoming Highway 191. The NF Amendment area is on semi-arid foot-slope topography adjacent to the southeastern edge of the Bighorn Mountain Range in the western PRB, a large structural basin measuring approximately 250 miles north-south by 11 miles east-west. The dominant land uses are bentonite mining, wildlife habitat, and livestock grazing. The Plans' topography has moderately rough terrain with ridges and draws that flow with the land generally easterly to the North Fork of the Powder River. The project area elevation in the project area averages 5,400 feet above sea level. Most of the project area lies on the east or right bank for here the river predominately flows southeast. The project area is in sparse dry herbaceous rangeland and sagebrush east of the Powder River. The area is in the PRB, a Level IV ecoregion, in the Northwestern Great Plains Level III ecoregion – an area of semiarid rolling plains with occasional buttes or badlands that is predominately used for livestock grazing, dryland farming, wildlife habitat, and mineral development (Chapman et al. 2004). The PRB ecoregion is a western mixed-grass/short-grass prairie (Curtis and Grimes 2004).

### **3.3 Geology and Mineral Resources**

The project area is situated on semi-arid foot-slope topography adjacent to the southeastern edge of the Big Horn Mountains in the western Powder River Basin (PRB). The PRB is a large structural basin measuring approximately 250 miles north to south by 11 miles east to west. The dominant land uses in the general area of the project are bentonite mining, wildlife habitat, and livestock grazing.

The project area is characterized by Cretaceous-age deposits intermittently capped by upland terrace benches and low, gravel-capped ridges of alluvial origin. Within the area, these are periodically dissected by gullies and draws creating areas of rough, eroded and broken terrain. Bentonite deposits in the area occur within the Frontier Formation (Upper Cretaceous-age). These once-flat deposits were uplifted, and now occur as relatively steeply dipping beds

associated with erosionally resistant, steep facial scarps and small valleys in less resistant, soft shale. Bentonite is the only locatable mineral in the project area known to be present in commercial quantities. There are no active leases for oil/gas, coal, or any other leasable mineral, nor any salable minerals (mineral materials) authorizations in or near the project area.

### **3.4 Air Quality**

Refer to the PRB FEIS pp. 3-291 to 3-299, for a 2003-era description of the air quality conditions. BLM incorporates by reference, Update of Task 3A Report for the Powder River Basin Coal Review Cumulative Air Quality Effects for 2020, BLM (AECOM), 2009, (Cumulative Air Quality Effects, 2009) as it captures the cumulative air quality effects of present and projected PRB fluid and solid mineral development. The Environmental Protection Agency (EPA) established ozone standards in 2008, finalizing them in 2011. Existing air quality in the PRB is “unclassified/attainment” with all ambient air quality standards. It is also in an area that is in prevention of significant deterioration zone. PRB air quality is a rising concern due to ozone in the oil and gas producing Upper Green River Basin that became 1 of the nation’s 40 “nonattainment” zones for ozone in 2012; in addition to PRB-area air quality alerts issued in 2011 and 2012 for particulate matter (PM), attributed to coal dust. Four sites monitor the air quality in the PRB: Cloud Peak in the Bighorn Mountains, Thunder Basin northeast of Gillette, Campbell County south of Gillette, and Gillette. In addition, the Wyoming Air Resource Monitoring System (WARMS) measures meteorological parameters from 6 sites, and particulate concentrations from 5 of those sites, monitors speciated aerosol (3 locations), and evapotranspiration rates (3 locations). These sites are at Sheridan, Taylor Reservoir, South Coal Reservoir, Buffalo, Juniper, and Newcastle. The northeast Wyoming visibility study is ongoing by the Wyoming Department of Environmental Quality (WDEQ). Sites adjacent to the Wyoming PRB-area are at Birney on the Tongue River 24 miles north of the Wyoming-Montana border, Broadus on the Powder River in Montana, and Devils Tower.

Existing air pollutant emission sources in the region include:

- Exhaust emissions (primarily CO and nitrogen oxides (NO<sub>x</sub>)) from existing natural gas fired compressor engines used in production of natural gas and CBNG; and, gasoline and diesel vehicle tailpipe emissions of combustion pollutants;
- PM (dust) generated by vehicle travel on unpaved roads, windblown dust from neighboring areas, road sanding during the winter months, coal mines, and trains;
- Transport of air pollutants from emission sources located outside the region;
- NO<sub>x</sub>, PM, and other emissions from diesel trains and,
- SO<sub>2</sub> and NO<sub>x</sub> from power plants.

### **3.5 Soils, Vegetation, and Ecological Sites**

#### **3.5.1 Soils**

The soils reflect the desert environment and the parent material over which they formed. Soil development strongly reflects the highly variable nature of inter-bedded parent materials consisting of fissile or clay shale, sandstone, siltstone and bentonite clay beds. Soil chemical and physical properties vary accordingly. Saline-sodic conditions are common, especially in soils dominated by smectic clays. The area is dominated by bare Bentonite outcrops.

Shell Valley Consulting Associates, Inc. conducted enhanced (Order 1) soils mapping in 2007. Table 3.1 includes a listing of the soil map units encountered, their descriptions, recommended

salvage depths, and the proposed disturbance acreage for the various soil map units. Detailed soils data is in the POO for BHB Permit to Mine No. 339C - North Fork Amendment, Appendix D-7.

**Table 3.1. Soil Map Units, Recommended Salvage Depths and Proposed Disturbance Acreage**

Map Unit	Description	Topsoil Salvage Depths (inches)	Subsoil Salvage Depths (inches)	Proposed Disturbance Acreage
100	Shingle-saline; 0-5% slopes	0	0	
101	Shingle; 0-5% slopes	unaffected		
200	Danko taxadjunct; 10-30%	6	6	
210	Tassel; 10-15% slopes Tassel taxadjunct	6 6	9 6	
220	Rhoame; 8-25% slopes; <30% Tassel inclusions	6	12	
230*	Samsil taxadjunct; 5-15% slopes; <10% OC	6	12	1.7
231	Samsil/Sandstone Rock Outcrop; 15-40% slopes	6	12 or lithic contact	3.3
300	Renohill taxadjunct; 3-6% slopes	4	0	
301	Renohill taxadjunct; 5-15% slopes; <20% Tassel inclusions	4	0	
310	Arvada; 3-6% slopes	6	7	
320	Petrie; 5-20% slopes; <30% Limon inclusions	6	16	0.7
330	Forkwood; 0-8% slopes	6	10	
400	Cragola, 0-6% slopes	6	30	0.1
401	Cragola Complex; 30-50% slopes; <30% inclusions Tassel, Samsil, Renohill, others	6	24	
402	Cragola taxadjunct, 10-25% slopes	6	54	
410	Big Horn taxadjunct; 0-3% slopes	6	30	
420*	Gaynor; 5-10% slopes	6	30	
430	Bowbac; 15-25% slopes	6	36	
500	Cushman; 0-8% slopes	6	54	0.2
501	Cushman; 10-20% slopes	6	36-54	
502	Cushman/Rock Outcrop Complex; 10-20% slopes	6	36-54	
510	Embry; 0-5% slopes	6	54	
SC	Steep complex; 30-50% slopes; Component soils: <30% OC with others variable (Cragola, Tassel taxadjunct, Samsil, Renohill, Big Horn, Gaynor)	6	Variable ; ranges from 0-24	6.6
RC	Ravine Complex, Component soils are	Variable	Variable	

Map Unit	Description	Topsoil Salvage Depths (inches)	Subsoil Salvage Depths (inches)	Proposed Disturbance Acreage
	Barren Outcrops (40%), Samsil (40%) Petrie (10%)	; ranges from 0-6	; ranges from 0-16	
OC & OC-s	Barren Shale and Clay Outcrops (OC) Saline seep Barren Outcrop (OC-s)	0	0	3.3
ML	Previously affected/Currently active mine land	0	0	

\*230/420 & 420/230 map units combine these 2 units in complexes dominated by the first mentioned soil type. Topsoil salvage is 6 inches and subsoil salvage is 30 inches or paralithic contact with soft platy shale (Samsil).

### 3.5.2 Vegetation and Ecological Sites

The dominant vegetation community types in the project area are mixed sagebrush grasses, rocky breaks and outcrop barrens. Species typical of the mixed-grass sagebrush prairie community type are included in the Vegetation Inventory for the project area which was conducted by Intermountain Resources in 2007 (POO Appendix D8). Total perennial species, including sagebrush and shrubs, comprise over 30 to 40 percent of the absolute vegetation cover, while annual grasses and forbs comprise over 8 percent of the absolute cover.

Mixed sagebrush grass (MSG) (comprises 55.1% of the amendment area, about 110.2 acres). Vegetation examination shows that perennial grasses made up approximately 20% of the absolute vegetative cover for this type while shrubs and subshrubs comprise 11%. The single most dominant species recorded on this vegetation type was big sagebrush (*Artemisia tridentata*). Other dominant plant species included western wheatgrass (*Agropyron smithii*), blue grama (*Bouteloua gracilis*), Sandberg bluegrass (*Poa secunda*), and desert alyssum (*Alyssum desertorum*). This community type is generally found on flat to gentle slopes with moderately deep to deep soils.

Rocky Breaks (RB) (comprises 42.8% or 85.5 acres of the amendment area). Vegetation examination shows a combination of perennial grass, shrub, and annual grass species. The single most dominant species on this vegetation type was big sagebrush. Other dominant plant species included bluebunch wheatgrass (*Agropyron spicatum*), Japanese chess (*Bromus japonicus*), western wheatgrass and cheatgrass (*Bromus tectorum*). The RB vegetation type is generally found on rolling to steep topography with shallow to very shallow soils.

Outcrop Barrens (OB) (comprises 2.1% or 4.3 acres of the amendment area). The OB type was generally found on steep slopes and ridges. Vegetation was either absent or very sparse. This ecological site includes bentonite outcrops, shale outcrops, rock outcrops and sandstone outcrops. Vegetation present on some areas includes nodding wildbuckwheat (*Eriogonum cernuum*), poverty sumpweed (*Iva axillaris*), stemmy goldenweed (*Haplopappus multicaulis*), Torrey saltbush (*Atriplex suckleyi*), and Gardner saltbush (*Atriplex gardneri*).

Historically, this plant community evolved under grazing by bison and a low fire frequency. Currently, it is found under moderate, season-long grazing by livestock in the absence of fire or brush control. Big sagebrush is a significant component of this plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grass, and miscellaneous forbs.

When compared to the Historical Climax Plant Community, big sagebrush and blue grama have increased. Green needlegrass and bluebunch wheatgrass have decreased, often occurring only where protected from grazing by the big sagebrush canopy. Production of cool-season grasses has also been reduced. Cheatgrass (downy brome) has invaded the state. The overstory of big sagebrush and understory of grass and forbs provide a diverse plant community that will support domestic livestock and wildlife such as mule deer and antelope.

### **3.6 Water Resources**

WDEQ assumed primacy from U.S. Environmental Protection Agency for maintaining Wyoming's water quality. The Wyoming State Engineer's Office (WSEO) has authority for regulating water rights issues and permitting impoundments for the containment of the State's surface waters.

#### **3.6.1. Ground Water**

The historical use for groundwater in this area is for stock water or domestic purposes. A search of the WSEO Ground Water Rights Database showed 2 registered stock and domestic water wells within 1 mile of the proposed disturbance areas with depths from 50 to 240 feet. Refer to the PRB FEIS for additional information on groundwater, pp. 3-1 to 3-36. Proposed disturbance targets the vadose (unsaturated) zone above the local and regional water table (depths less than 50 feet). The estimated depth to groundwater in this area is in excess of 400 feet (POO pg. D6-1 to 2)

#### **3.6.2. Surface Water**

The project area is in the North Fork of the Powder River drainage which is tributary to the Upper Powder River. Most of the area drainages are ephemeral (flowing only in response to a precipitation event or snow melt) to intermittent (flowing only at certain times of the year when it receives water from alluvial groundwater, springs, or other surface source – PRB FEIS, Glossary). The channels are primarily well vegetated grassy swales, without defined bed and bank. See generally the PRB FEIS for a surface water quality discussion, pp. 3-48 to 3-49.

The amendment area is characterized by finger ridges with steep slopes covered in exposed cobble fields separated by ephemeral drainages. No perennial or intermittent streams are included in the proposed mine area. Only ephemeral channels which infrequently carry water in direct response to a significant rainfall event or rapid snowmelt will be affected by mining activities.

There are three surface water rights permitted within one-half mile of the amendment area. They are listed on Table D6.2 and illustrated on Map D6-1 of the Mine POO.

There is one permitted impoundment (Frog Pond Stock Reservoir 11.4 ac-ft) located in SWNW Section 23 T45N R83W. The surface area of the impoundment is approximately 0.7 acres. Water source is surface run off from an ephemeral drainage.

Black Hills Bentonite identified one unpermitted natural spring located in the NWNW Sec 23 T45N R83W. The spring area has been excavated in the past for use as a livestock watering structure. For more information on surface water refer to the PRB FEIS, Chapter 3, pp. 3-36 to 3-56.

### 3.7 Wetlands/Riparian

BHB contractors (Intermountain Resources) identified three seep (perennially wet) areas and one spring outside the proposed mine amendment boundary as listed below. All these features are classified palustrine with emergent vegetation, isolated, non-jurisdictional based on their locations in uplands or ephemeral drainages and are located stratigraphically higher than the proposed mine areas.

ID	QtrQtr	Sec	T N	R W	Area, acres
Seep 1	NESE	26	45	83	0.18
Seep 2	NWNE	23	45	83	0.02
Spring 3	NWNW	23	45	83	0.53
Seep 4	NWNW	23	45	83	0.5
Stock Pond 5	SWNW	23	45	83	0.4

Wetland and riparian vegetation was documented in these areas, primarily foxtail barley, rushes and inland saltgrass which are classified as emergent vegetation indicator species.

### 3.8 Invasive, Non-native Plant Species

The project proponent discovered the following state-listed noxious weeds and invasive/exotic plant infestations by a search of inventory maps and/or databases or during subsequent field investigation. Noxious weeds existing in the area include poverty sumpweed, tansymustard (*Descurainia pinnata*), wild licorice (*Glycyrrhiza lepidota*), Canada thistle (*Cirsium arvense*), hound's tongue (*Cynoglossum officinale*), and quackgrass (*Agropyron repens*). Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) are known to exist in the affected environment. These species are found in high densities and numerous locations throughout NE Wyoming. However, visual observation indicates that perennial grasses are still present.

The Wyoming Weed and Pest Control Act of 1973 designated as noxious weeds non-native plants that are difficult to control, easily spread, and injurious to public health, crops, livestock, land or other property, (W.S. 11-5-102[a][xi] and W.S. 11-12-104). The cheatgrass proliferation in the semi-arid west likely contributes to increasingly frequent and violent wildfires, Balch 2013. The Wyoming Weed and Pest Council has 23 Weed and Pest Districts delineated by county boundaries, maintains a list of state designated and prohibited noxious weeds (WDA 2012b). The districts may declare additional noxious weeds in their localities (W.S. 11-5-102[a][vii] through 11-5-102[a][viii] and W.S. 11-5-105[a][vi]) (WDA 2012a). BLM identified

noxious weeds occurring in the CCE area, Table 3-2, through recent communication with the Johnson County Weed and Pest Board, Litzel; pers. comm.

**Table 3-2. Noxious or Invasive Weeds Potentially Occurring in or Near the Project Area.**

Common Name	Scientific Name	Status <sup>1</sup>	Common Name	Scientific Name	Status <sup>1</sup>
Field bindweed	<i>Convolvulus arvensis</i> L.	Designated	Scotch thistle	<i>Onopordum acanthium</i> L.	Designated
Canada thistle	<i>Cirsium arvense</i> L.	Designated	Diffuse knapweed	<i>Centaurea diffusa</i> L.	Designated
Russian knapweed	<i>Centaurea repens</i> L.	Designated	Saltcedar	<i>Tamarix</i> spp.	Designated
Common cocklebur	<i>Xanthium strumarium</i> L.	Declared	Wild licorice	<i>Glycyrrhiza lepidota</i> P.	Declared
Buffalobur	<i>Solanum rostratum</i> Dunal.	Declared	Black Henbane	<i>Hyoscyamus niger</i> L.	Declared

Source: Litzel pers. comm.

<sup>1</sup> Wyoming Weed and Pest Council (WDA 2012b; WDA 2012a) maintains the declared and designated weed lists.

### 3.9 Wildlife, Migratory Birds, and Raptors

BHB and Intermountain Resources conducted wildlife surveys in the project area in 2007, 2011, and 2012. BLM wildlife biologists performed a habitat assessment in the project area on October 26, 2011. The biologist evaluated impacts to wildlife resources. BLM wildlife biologists also consulted databases compiled and managed by BLM BFO wildlife staff, the PRB FEIS, WGFD datasets, and the Wyoming Natural Diversity Database (WYNDD) to evaluate the affected environment for wildlife species that may occur in the project area. This section describes the affected environment and impacts to wildlife known or likely to occur in the area of the proposed project.

BLM coordinated with the WGFD and the FWS regarding wildlife in the POO area. BHB discussed the results of its wildlife surveys with the USFWS and WGFD. Letters from these agencies containing recommendations for minimization and mitigation measures are available in the mine plan.

### Big Game

The project area contains winter yearlong range for mule deer and pronghorn and yearlong range for white-tailed deer. Big game animals generally were not abundant on the study area. BHB observed mule and pronghorn antelope and commonly observed their sign. BHB also saw white-tailed deer but these were transient (BHB 2012). The area may also occasionally be visited by elk or moose; however, the WGFD does not consider the area to have seasonal habitats that support a herd. Winter-yearlong use is when a population or a portion of a population of animals makes general use of the documented suitable habitat sites within this range on a year-round basis, but during the winter months there is a significant influx of additional animals into the area from other seasonal ranges. Yearlong use is when a population of animals makes general use of suitable documented habitat sites within the range on a year-round basis. Animals may leave the

area under severe conditions. BHB commonly observed mule deer on areas of proposed mining. BHB primarily observed white-tailed deer south of the study area along hay meadows and riparian areas along the North Fork Powder River. Table 3.3 below indicates the delineated seasonal ranges for each species that occur in the project area, the herd units affected by the project, the WGFD population objective, and the WGFD current population estimate for each species (WGFD 2011a).

**Table 3.3 Big Game Species, Seasonal Ranges, Herd Units, Population Objectives, and Population Estimates for Big Game Species Likely to Occur in the Project Area.**

Species	Seasonal Range in Project Area	Herd Unit	WGFD Population Objective	% Above (+) or Below (-) Objective	WGFD Report Year
Mule Deer	Winter yearlong	322 – Upper Powder River	18,000	- 44.2%	2011
Pronghorn	Winter yearlong	310 – Upper Powder River	3,000	+ 151%	2011
White-tailed Deer	Yearlong	303- Powder River	8,000	+ 108%	2011

### Raptors

No raptor nests occur within 0.5 miles of the NFA. Raptors observed on the study area include bald eagle, red-tailed hawk, golden eagle, Swainson’s hawk, prairie falcon, northern harrier, ferruginous hawk, rough-legged hawk, American kestrel, short-eared owl and great horned owl. One red-tailed hawk nest, active in 2011, occurs just over 0.5 miles to the southwest of the NFA boundary. Two golden eagle nests are over 1.5 miles to the west of the NFA area but these nest sites were inactive in 2007 and 2011. BHB provided a map of these nests in the POO - Appendix D9- Wildlife.

### Migratory Birds

A wide variety of migratory birds may occur in the proposed project area at some point during the year. Migratory birds are birds that migrate for breeding and foraging at some point in the year. The BLM-U.S. Fish and Wildlife Service (USFWS) Memorandum of Understanding (MOU) (2010) promotes the conservation of migratory birds, complying with Executive Order 13186 (Federal Register V. 66, No. 11). BLM must include migratory birds in every NEPA analysis of actions that have potential to affect migratory bird species of concern to fulfill obligations under the Migratory Bird Treaty Act (MBTA). The MBTA (and Bald and Golden Eagle Protection Act (BGEPA)) are strict liability statutes so require no intent to harm migratory birds through prosecuting a taking.

Shrub-steppe and mixed grassland habitat types dominate the project area. Many species that are of high management concern use shrub-steppe areas for their primary breeding habitats (Saab and Rich 1997). Nationally, grassland and shrubland birds declined more consistently in the last 30 years than any other ecological association of birds (WGFD 2009). The study area provides suitable nesting habitat for several species of migratory birds, including preferred habitat for a limited number of Level 1 Migratory Birds of High Federal Interest (MBHFI) species. Observed on site in 2007 were sage-grouse, Wilson’s phalarope, Brewer’s sparrow, sage sparrow,

ferruginous hawk, and bald eagle. All of these MBHFI species were also observed in 2011 with the addition of Swainson's hawk, long-billed curlew and short-eared owl. BLM sensitive migratory birds observed in the area include: bald eagle, ferruginous hawk, greater sage-grouse, long-billed curlew, loggerhead shrike, sage thrasher and Brewer's sparrow. Several other MBHFI species may occur in the study area during various seasons. These species would probably only use the area during migration for resting and feeding and would be uncommon.

### **Upland Game Birds and Small Mammals**

Suitable habitat for a wide variety of wildlife species is present in the project area. A list of mammal, herpetile, and avian species that have been observed or may be present in the project area is available in the NFA POO, Appendix D9, Wildlife Inventory.

### **3.10 Threatened and Endangered, and BLM Sensitive Species**

#### **Ute Ladies'-tresses Orchid (Threatened)**

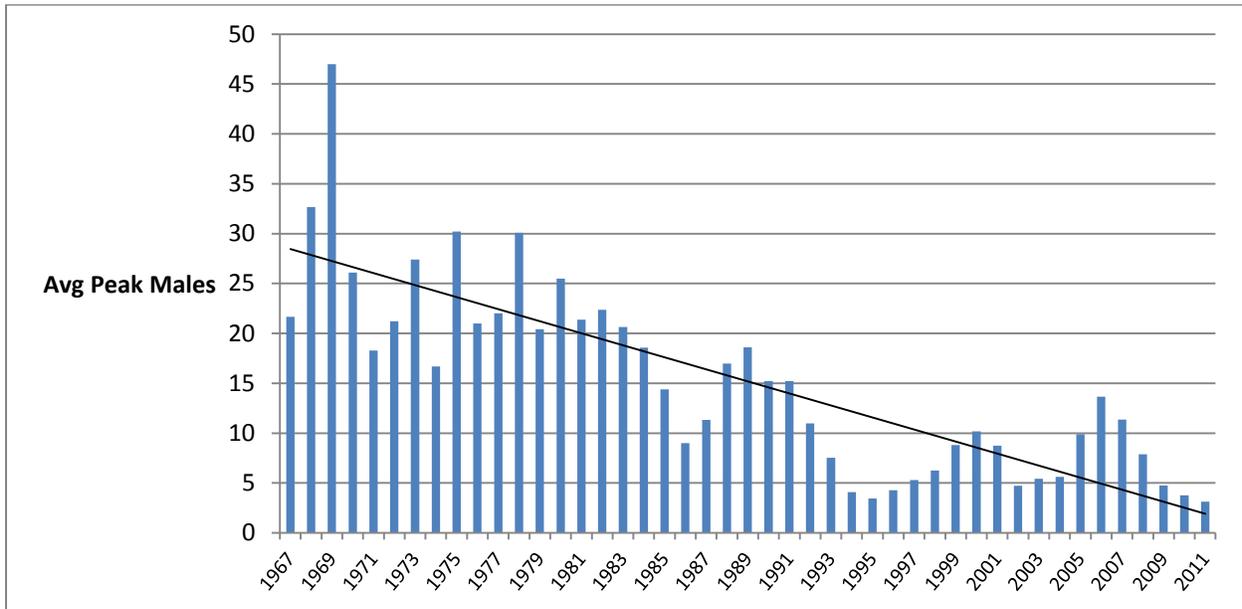
Utes ladies'-tresses orchid habitat is not present in the NFA boundary and this species has no historical occurrence at this site.

#### **Greater Sage-Grouse (GSG) (Candidate)**

In 2010, USFWS determined that the sage-grouse was warranted for federal listing across its range, but the listing was precluded by other higher priority listing actions. GSG are listed as a WGFD Species of Greatest Conservation Need (SGCN) because populations are declining, and they are experiencing ongoing significant loss of habitat. The Wyoming Bird Conservation Plan rates sage-grouse as a Level I species, indicating they are clearly in need of conservation action. They are also listed by USFWS as a Bird of Conservation Concern (BCC) for Region 17.

The GSG population in northeast Wyoming is exhibiting a steady long term downward trend, as measured by lek attendance (WGFD 2011). Figure 3.1 illustrates a 10-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. Research suggests that the declines since 2001 are a result, in part, of energy development (USFWS 2010, Taylor et. al. 2012).

**Figure 3.1. Average Peak Number of Sage-grouse Males at WGFD-Counted Leks in the Powder River Basin.**



The NFA project area is outside of the core area and connectivity areas for GSG conservation (Executive Order 2011-5), but occurs directly adjacent to the western boundary of the Natrona core area. Suitable nesting and winter habitat was verified in and surrounding the project area by the BLM biologist during the site visit. Six leks occur within 4 miles of the project and are shown in Table 3.4 below. No new leks were located during 2012 surveys (BHB 2012). The NFA occurs within the 0.6 mile buffer of the Mesa Corrals lek, however, since the project is outside of the core area boundary, only non-core conservation measures will be considered in accordance with BLM and State of Wyoming policies.

**Table 3.4. GSG leks within 4 miles of the NFA Project Area (WGFD 2012).**

Lek Name	Distance to Pit (Miles)	Occupied?	Max Males in 2012	In Core Area?
E-K Mountain Road	2.1	Yes	0	No
Mayoworth	0.6	Yes	3	Yes
Mesa Corrals	0.5	Yes	0	Yes
Mesa Cowcamp	2.6	Yes	21	Yes
Mesa Strip	1.1	Yes	0	Yes
Rim/Hanson	1.8	Yes	0	No

**BLM Special Status (Sensitive) Species (SSS)**

Wyoming BLM annually updates its list of SSS to focus management to maintain habitats to preclude listing as a threatened or endangered species. The policy goals are:

- Maintaining vulnerable species and habitat components in functional BLM ecosystems;
- Ensuring sensitive species are considered in land management decisions;

- Preventing a need for species listing under the ESA; and
- Prioritizing needed conservation work with an emphasis on habitat.

Table 1 in Appendix A lists SSS that may occur in the project area. The table also includes a brief description of the habitat requirements for each species. The authority for the SSS comes from the ESA, as amended; Title II of the Sikes Act, as amended; the FLPMA; Department Manual 235.1.1A, and BLM Manual 6840.

### 3.11 Cultural Resources and Native American Religious Concerns

A Class III cultural resource inventory was performed for the project prior to on-the-ground project work (BFO project no. 70090072). A Class III cultural resource inventory following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) and the *Wyoming State Historic Preservation Office Format, Guidelines, and Standards for Class II and III Reports* was provided to BFO. G.L. “Buck” Damone III, BLM Archaeologist, reviewed the report for technical adequacy and compliance with BLM standards, and determined it to be adequate. The following resources are located in the project area.

**Table 3.5. Cultural Resources Identified in Project Area.**

Site Number	Site Type	Eligibility
48JO4139	Prehistoric lithic scatter/historic cairn	Not Eligible

### 3.12 Visual Resources

There are no areas of critical environmental concern in the vicinity of the project area and the project will not affect the area’s visual resource classification.

### 3.13 Lands and Realty

BLM manages 80 total acres of BLM-administered lands in the Plan of Operations, as noted in the Introduction and Background, above. Only 17.9 acres are proposed to receive surface disturbance. Nothing in the proposal changes land or mineral estate ownership.

### 3.14 Transportation

Wyoming State Highway 191 is the primary public road accessing the NF Amendment area from the south. Wyoming State Highway 196 and Johnson County Highway 115 are the primary roads to access the NF Amendment area from the north and east. The state highways are paved. The county road is gravel. All are well maintained year-round roads.

### 3.15 Recreation

The proposed project is in the extensive recreation management area (ERMA) where natural recreational resources and setting aid in supporting recreational opportunities and realized benefits, but recreational resources and associated uses are not the predominant use/resource. Recreation management is of a custodial nature where management addresses resource protection, use and user conflicts, and public health and safety. There currently exists a dominant industrial presence from the current bentonite extraction activities, which, by nature of choice of the recreating visitors, precludes much recreation uses in this area. Recreation activities of those who do wish to recreate in this area include, driving for pleasure, hunting, sight-seeing, wildlife viewing, rock-hounding, and

hiking/exploring. Access for these activities in and near the NFA area is challenging due to the surrounding private lands.

### **3.16 Livestock Grazing and Range Management**

The proposed mine site is located along the western edge of the Mayoworth Stockrest (#12000). The stockrest is used to gather and rest trailing livestock, including both sheep and cattle, in the spring and autumn. Bentonite mining is already occurring in the eastern portions of the stockrest. The stockrest consists of around 1,160 acres of BLM-administered surface, and is capable of supporting at least 160 AUMs per year. In 2012, requested use of the stockrest resulted in authorization of 70 AUMs. The BLM land in Sections 22 and 26 that will be impacted by the proposed mining is separated by a fence from the majority of the stockrest.

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

Mining is an important sector of the local and regional economy. Data from the State of Wyoming Department of Workforce Services, Research, and Planning indicate that natural resource and mining jobs account for 9.2% of October 2012 statewide total nonfarm jobs, equating to approximately 3,793 jobs in Johnson County. BHB has approximately 13 full time employees and several summer part-time employees in Johnson County, the majority of which live in Kaycee or Buffalo. BHB contracts with at least 4 Johnson County companies to haul bentonite from their mines near Kaycee to their processing plants in Casper.

### **3.18 Health and Safety**

The operator would use mechanized earthmoving equipment as part of mine and reclamation activities and there would be some on-site fueling and equipment repair. BHB will not use mining specific hazardous materials substances such as cyanide or other leaching agents or explosives, and they will not generate specific hazardous wastes in the bentonite mining operations under the NFA plan.

## **SECTION 4 ENVIRONMENTAL EFFECTS**

### **Introduction**

This section describes and analyzes the environmental effects of Alternatives A and B on the affected environment described in Section 3. This section highlights the resource and then analyzes by the 2 alternatives. This effects analysis addresses the direct and indirect effects of implementing the proposed action. Then later the analysis summarizes the cumulative effect of the proposed action and discloses residual effects after mitigation, if any.

Resources and features not present, and not discussed in this EA, include: prime or unique farmlands, wild and scenic rivers, wetlands, and wilderness. There are no areas of critical environmental concern, wilderness study areas, or MILLEIS (multiple use lands with wilderness characteristics) in the area of the proposed action. 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.

BLM's analysis is that implementing the no action alternative would have no direct, indirect, or cumulative effects beyond those analyzed and disclosed in the Buffalo and PRB FEISs. BLM therefore foresees no requirement for mitigating the no action alternative. Similarly, BLM's analysis is that implementing the no action alternative has no residual effect on the project area. This summary comprises the BLM's analysis of the no action alternative.

This EA analyzes the proposed disturbance on the public lands relative to the proposed action, Alternative B (17.9 acres), and analyzes the entire proposed disturbance as part of the cumulative effects analysis (17.9 acres).

#### **4.1 Assumptions and Analysis Guidelines, and Reasonable Foreseeable Development**

Potential environmental impacts resulting from implementation of the Proposed Action and other potential future actions were evaluated based on the detailed Mine and Reclamation Plans developed by BHB for the lands involved in this Plan of Operations, and understanding the current and likely future development in the area. Given the geology of the area, it is likely that bentonite mining will continue well into the future. However, no other Plans of Operations have been submitted to BLM, or applications for Permits to Mine to WDEQ LQD. It is difficult to estimate the likely level of future bentonite mining in the area, though, as the volume mined is determined by a number of factors, including: price, customer demand, supply from other bentonite companies, amount of bentonite resource, etc. The duration of impacts due to the implementation of this Plan of Operations was analyzed as occurring from between 12-20 years. This analysis is based on previous mining and other events in the area, and experience of BLM personnel and their knowledge of resources in the area.

#### **4.2 Topography**

There should be no direct, indirect, and cumulative effects to the area's topography from either the No Action or the properly designed and mitigated Proposed Action alternative. There is no need for mitigation and therefore no residual effects from implementing the no action alternative. Mitigation measures protecting soils should adequately protect the topography from unanticipated effects from implementing the proposed action. BLM foresees no residual effects to the topography from implementing the proposed action.

#### **4.3 Air Quality**

In the project area, air quality impacts would occur during mining (due to surface disturbance by earth-moving equipment, vehicle traffic fugitive dust, and vehicle engine exhaust) and transport of the mined product. The amount of air pollutant emissions during mining would be controlled by watering disturbed soils, and by air pollutant emission limitations imposed by applicable air quality regulatory agencies. Air quality impacts modeled in the PRB FEIS and Cumulative Air Quality Effects, 2009 concluded that PRB projected fluid and solid development would not violate state, tribal, or federal air quality standards and this project is well within the projected development parameters.

## **4.4 Soils, Vegetation, and Ecological Sites**

### **4.4.1 Soils**

Impacts to the soil resource and off-site impacts from runoff and erosion are likely to occur during the time that the soil is bare. Interim reclamation would likely reduce these impacts. Successful reclamation could return the area to background conditions within 5 years following reclamation.

The Bentonite areas would be stripped of topsoil, if necessary, and the topsoil will be segregated and stabilized, if not immediately respread in ongoing reclamation activities. Overburden will be excavated and reused for continuous reclamation or stockpiled. The excavation process will totally alter the existing soil profile. Soil horizons will be mixed, eliminated and soil properties altered. The Bentonite will be removed through the mining process. During subsequent reclamation, the area will be recontoured to approximate original topography, augmented topsoil replaced and redistributed, stabilized and reseeded with an appropriate seed mix. Compaction will be relieved where necessary. The operator has provided details of soil rehabilitation in a plan for continuous and post-mining reclamation activities. In this plan, they detail their intentions to minimize the amount of bare soil as much as possible through concurrent, continuous reclamation. See also, Appendix B, Reclamation Requirements.

The operator is required to apply for and maintain an active Storm Water Pollution Prevention Plan (SWPPP) from the WDEQ. This plan, as detailed in the Reclamation Plan, provides for the continuous application of erosion protection measures to mitigate surface flow and soil movement.

### **4.4.2 Vegetation and Ecological Sites**

Approximately 18 acres of public lands would be disturbed for the mining activities. This disturbance would remove native vegetative species on the project area until revegetated and subsequent reclamation goals have been achieved. With the implementation of the Reclamation Plan, the mine area would be properly reclaimed thus increasing the available forage for livestock and wildlife and decreasing the potential for erosion to occur. For Federal surface, the operator has proposed to use an acceptable native vegetation mixture including grasses, forbs and shrub species seeds.

As the mined areas are reconstructed with excavated overburden, the original ecological sites identified pre-disturbance may or may not be re-established. The physical and chemical characteristics of the resituated overburden and re-spread topsoil will be altered from the original native site. Infiltration rates and root propagation properties will be unpredictably changed which could impact revegetation success. The operator will be required to apply and modify reclamation techniques until the site is stable and reclamation considered successful when analyzed under criteria included in the BLM Wyoming Statewide Reclamation Policy.

## **4.5 Water Resources**

### **4.5.1 Ground Water**

Isolated perched water is evidenced at the seep and spring areas which are located outside of the mine amendment area, in the Cashe Amendment permitted by the WDEQ 2012. In a personal communication with Stacy Page of the WDEQ LQD, she proposed that they would have the Cashe amendment modified to insure that there would be no mining proposed in the area of the developed spring (NWNW Sec 23). The spring has not been permitted through the WSEO and as such there are no existing water rights.

BHB has documented that a water well agreement was offered to the landowner holding the permit for the two stock water wells identified in the POO.

The disturbance associated with Bentonite extraction is limited to the depth of the deposit which is estimated to be a maximum of 50 feet. Additionally, there is no proposal to impound water in the project area. There should be no impact to groundwater in the area as a result of this project.

### **4.5.2 Surface Water**

The hydrology of the drainages would be altered temporarily by the re-routing of water around the overburden storage areas and open pits. This would change the nature of the flow patterns surrounding and downstream of the pits. Rill and gully formation would likely occur in exposed areas with no vegetative cover or no surface stabilization mitigation applied. The operator has submitted a Storm Water Pollution Prevention Plan (SWPPP) as required by the WDEQ. This plan outlines best management practices to be used in conjunction with the proposed action to reduce overall amounts of erosion into adjacent downstream drainages and prevent unnecessary and undue degradation to the hydrology of the watershed. If erosion occurs on the diversion areas, rock check dams, straw bales or water bars may be used to stabilize erosion and reduce sedimentation.

## **4.6 Wetlands and Riparian**

The identified wetlands, seeps and spring are located outside the proposed excavation areas. These areas, which are not considered to be jurisdictional, will not be disturbed by Bentonite excavation. Because these wet areas are located up drainage from the proposed mine areas, there should be no hydrologic connection to the proposed action.

## **4.7 Invasive Species**

The disturbance associated with bentonite mining will increase risk for noxious weed and invasive species establishment and spread. BHB will control and minimize the introduction of noxious weeds into the revegetated areas for a period of at least five years after the initial seeding. On BLM managed lands, a Pesticide Use Permit (PUP) will be obtained from the Authorized Officer prior to the use of herbicides.

## **4.8 Wildlife, Migratory Birds, and Raptors**

### **Big Game**

Big game may be displaced from the project area during disruptive activities such as mining and field drying of bentonite. BHB plans to be conducting activities during specific times of the year. Mining is expected to occur in February and March, while field drying and reclamation are

anticipated to occur from June to October. Activity at the pit is anticipated to be driven by market demand for bentonite. If the mine is producing, heavy truck traffic could result, with a predicted average of 7 loads per day, 6 days a week.

A study in central Wyoming reported that mineral drilling activities displaced mule deer by more than 0.5 miles (Hiatt and Baker 1981). A multi-year study on the Pinedale Anticline suggests not only do mule deer avoid mineral activities, but after three years of drilling activity the deer have not become accustomed to the disturbance, avoiding areas with higher traffic, especially during winter months (Sawyer et al. 2006, Sawyer et al. 2009). Mule deer are more sensitive to operation and maintenance activities than pronghorn, and, as the Pinedale Anticline study suggests, mule deer do not readily habituate. A study in North Dakota stated “Although the population (mule deer) had over seven years to habituate to oil and gas activities, avoidance of roads and facilities was determined to be long term and chronic” (Lustig 2003). Deer have even been documented to avoid dirt roads that were used only by 4-wheel drive vehicles, trail bikes, and hikers (Jalkotzy et al. 1997).

### **Raptors**

Raptors may avoid nesting in proximity of the project, in order to avoid impacts from noise, dust, and human activities. Human activities in close proximity to active raptor nests may interfere with nest productivity. Romin and Muck (1999) indicate that activities within 0.5 miles of a nest are prone to cause adverse impacts to nesting raptors. If disruptive activities occur during nesting, they could be sufficient to cause adult birds to remain away from the nest and their chicks for the duration of the activities. This absence can lead to overheating or chilling of eggs or chicks and can result in egg or chick mortality. Prolonged disturbance can also lead to the abandonment of the nest by the adults. Routine human activities near these nests can also draw increased predator activity to the area, resulting in increased nest predation.

### **Upland Game Birds and Small Mammals**

About 17.9 acres of native wildlife habitat on public lands would be temporarily lost for 6-10 years as a result of the NFA mining operations, depending on success of reclamation and establishment of native vegetation. Smaller animals may be directly affected by the mining. Displaced animals would have to try to move to a new area, which may already be fully occupied, resulting in stress, extra competition, and probable mortality.

Implementation of the project would likely cause wildlife to avoid the area until reclamation. If the vegetative community was changed post-mining, wildlife species using the area would change as well. The change in vegetative community from pre-mine conditions to post-mine conditions may result in a shift to plant species not specifically adapted to the local site, and would provide different and/or lesser quality of habitat across all acres affected. Habitat lost as a result of mining through such areas may be restored if their reconstruction, as laid out in the proposed action, is successful.

### **Migratory Birds**

Migratory birds may avoid nesting in proximity of the project, in order to avoid impacts from noise, dust, and human activities. Most birds would be able to avoid mining equipment; however, nests in locations subject to disturbance would be lost, as would any eggs or nestlings if

vegetation removal occurred during the breeding season. Direct mortality of a bird or destruction of an active nest due to construction activities would result in a “take” as defined (and prohibited) by the MBTA, a non-discretionary statute, and in turn a violation of the law. See also, FLPMA, Sec. 302(b). To protect nesting migratory birds, BHB has made a commitment to remove vegetation outside of the nesting season (February 1 – August 31) unless a survey determines that no nesting birds are present in the affected area, as recommended by the BLM and USFWS.

Native habitats will be lost directly with the mine. Field drying and hauling, will displace edge sensitive migratory birds from otherwise suitable habitat adjacent to the mine. Noise from heavy equipment can be troublesome for songbirds by interfering with the males’ ability to attract mates and defend territory, and the ability to recognize calls from conspecifics (BLM 2003). Habitat fragmentation will result in more than just a quantitative loss in the total area of habitat available; the remaining habitat area will also be qualitatively altered (Temple and Wilcox 1986). Ingelfinger (2004) identified that the density of breeding Brewer’s sparrows declined by 36% and breeding sage sparrows declined by 57% within 100 m of dirt roads in a natural gas field. Effects occurred along roads with light traffic volume (less than 12 vehicles per day).

#### **4.9 Threatened and Endangered, and BLM Sensitive Species**

##### **Ute Ladies’-tresses Orchid (Threatened)**

No activities are planned in potential habitat and implementation of the project will have “no effect” on ULT.

##### **Greater Sage-Grouse (GSG) (Candidate)**

Implementation of the proposed project will impact GSG habitat and individuals. Impacts to GSG are generally a result of loss and fragmentation of sagebrush habitats associated with roads and pits, as well as indirect habitat loss from proximity of noise and human activities. Research indicates that GSG hens avoid nesting in developed areas. Implementation of the project will adversely impact nesting habitat, both through direct loss and avoidance of the area by GSG due to fragmentation and anthropogenic activity.

Impacts to GSG associated with surface mining are discussed in detail in the 12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered (USFWS 2010).

Hens may avoid nesting in otherwise suitable habitat near the project due to elevated noise levels from activities occurring in the bentonite mine. Research shows that hens are sensitive to noise from oil and gas drilling operations when selecting a location for nesting, and they may therefore be sensitive to noise from other activities such as mining, field drying, and hauling of bentonite (Holloran et al. 2005, Holloran et al. 2007, Aldridge and Boyce 2007, Walker et al. 2007, Doherty et al. 2008, WGFD 2009). Brood-rearing habitat is present along the North Fork Powder River. Hens and broods traveling through the area may be negatively impacted by noise and human activities, including increased risk from direct mortality due to vehicle collision, and avoid the area.

No mining is expected to occur at the mine from March 15 through June 15, encompassing the breeding and most of the nesting season. BHB is also restricted from using the access road to the pits from April 15 through June 15 by the landowner, making it unlikely that hauling of bentonite will occur either. Noise from traffic occurring for the NFA, Cash Amendment, and already existing mining occurring on adjacent lands is likely to disrupt breeding behavior of GSG using the Mesa Corrals, Mesa Strip, Mesa Cowcamp, and Mayoworth leks by interfering with the ability to hear vocalizations, increasing stress to individuals, and causing changes in strutting patterns and avoidance (Patricelli et al. 2012, Blickley et al. 2012, Blickley and Patricelli 2012). Studies have shown that intermittent noise (such as that associated with traffic) can have a greater impact on GSG than continuous drilling noise, and cause immediate reduction in attendance at leks (Blickley et al. 2012). Light vehicular traffic (1–12 vehicles per day) has been shown to substantially reduce nest initiation rates and increase the distance of nests from lek sites (Lyon and Anderson 2003). Holloran (2005) found that traffic on roads within 0.8 miles of leks during the early morning while males are strutting is related to declines in male attendance.

Due to the increased noise and traffic levels from mining new areas, GSG may avoid the leks and surrounding nesting habitat, and eventually abandon the area.

#### **BLM Special Status (Sensitive) Species (SSS)**

Table 1 in Appendix B lists impacts to SSS that may occur as a result of implementation of Alternative B.

#### **4.10 Cultural Resources**

No historic properties will be impacted by the proposed project. Following the Wyoming State Protocol Section VI(A)(1) the Bureau of Land Management electronically notified the Wyoming State Historic Preservation Officer (SHPO) on 12/20/12 that no historic properties exist within the area of potential effects. If during the course of any ground disturbance related to this project, any bones, artifacts, foundations, or other indications of past human occupation of the area are uncovered, the ground disturbing activity will be stopped immediately and a Buffalo Field Office archaeologist contacted.

#### **4.11 Livestock Grazing and Range Management**

The proposed action would temporarily affect 17.9 acres of BLM-administered rangeland in the proposed mining area. Until the area is successfully re-seeded, there will be approximately 2-3AUMs of forage no longer available on BLM land each year. Over the life of the proposed mine, this results in a total loss of 20-30 AUMs. This accounts for less than one percent of the forage provided in the Mayoworth Stockrest. Proper topsoil handling will assist in the revegetation of disturbed sites. After the area has been successfully reseeded, several growing seasons will result in re-vegetation of the area and recovery of the lost AUMs.

Because the proposed mine site is fenced out of the majority of the Mayoworth Stockrest, effects of AUM loss on BLM range management and grazing authorizations will be minimal. If this alternative is selected, no grazing authorizations will be amended due to the minimal impact and small project area. Additionally, the existing fencing will restrict livestock using the stockrest from grazing on areas where re-seeding has occurred. This will allow seeds to germinate and establish without disturbance by livestock.

#### **4.12 Residual Impacts of the Proposed Alternative**

##### **Wildlife**

Alternative B would result in the temporary loss over the life of the mine, of approximately 17.9 acres of native wildlife habitat on public lands. It may take 1-2 years or more for this habitat to be reestablished to pre-mine conditions, and significantly longer for the sagebrush component of the habitat to reestablish. Once bentonite mining is completed in the NFA area, residual impacts should be minimal if reclamation practices are successful. Mitigation measures would reduce the negative visual effects by requiring the disturbed areas to be reclaimed and re-vegetated, to blend into the surrounding topography. Suitability of the project area for wildlife will be negatively affected due to habitat loss and fragmentation and proximity of human activities associated with implementation of the project.

Activities occurring after June 15 are anticipated to impact GSG using the area for nesting or brood-rearing. Suitability of the project area for sage-grouse will be negatively affected due to habitat loss and fragmentation and proximity of human activities and noise associated with the project.

If no vegetation removal occurs during the breeding season, it is unlikely that active nests will be destroyed by surface disturbing activities, as most nestlings will have fledged by the end of August. Migratory birds nesting adjacent to the mine may be disturbed by activities occurring during the breeding and nesting season.

##### **Livestock Grazing and Range Management**

The Proposed Action may have residual effects on livestock grazing if the vegetation does not reestablish after reclamation. Invasive weed species would also be given a chance to establish in the area, replacing native vegetation. If this happens, the number of AUMs in the allotments included in the proposed mining would likely be reduced for years until desirable vegetation reestablishes.

#### **4.13 Cumulative Impacts of the Proposed Alternative**

##### **Wildlife**

At the present time, displacement of various wildlife species to adjacent areas as a result of mining activity is not likely to have negative cumulative effects over the anticipated life of the project. Displaced wildlife species normally adapt to changing conditions and resume activity in adjacent areas where suitable habitat is found. In the event that future potentially wildlife displacing activities are considered near these project areas, additional consideration should be given to the fact that wildlife has already been displaced and an evaluation of the land area and habitat required for various wildlife species should be conducted.

##### **GSG**

The GSG population in the PRB is declining. Declines in lek attendance may be a result of a suite of factors including avoidance (Holloran et al. 2005, Holloran et al. 2007, Aldridge and Boyce 2007, Walker et al. 2007, Doherty et al. 2008, WGFD 2009), loss and fragmentation of habitat (Connelly et al. 2000, Braun et al. 2002, Connelly et al. 2004, WGFD 2004, Rowland et al. 2005, WGFD 2005, Naugle et al. 2011), reductions in habitat quality (Braun et al. 2002,

WGFD 2003, Connelly et al. 2004, Holloran et al. 2005) and changes in disease mechanisms (Naugle et al. 2004, WGFD 2004b, Walker et al. 2007, Cornish pers. comm.). Leks within 4 miles of the NFA are currently experiencing impacts from existing bentonite mining and livestock grazing. Approximately 13,000 acres of federal fluid minerals have been leased in the Natrona core area, within 4 miles of the project area, and the Coyote Springs lek complex. Development of the lease is likely to negatively impact the leks further and decrease the effectiveness of the core area.

The 2012 population viability analysis for the Northeast Wyoming GSG found there remains a viable population of GSG in the PRB (Taylor et al. 2012). Threats from energy development and West Nile Virus (WNV) are impacting future viability (Taylor et al. 2012). The study indicated that effects from energy development, as measured by male lek attendance, are discernible out to a distance of 12.4 miles. The Cellars Ranch oil field occurs within 12.4 miles of the 6 leks identified in Table 3.5 above.

Timing limitations do nothing to mitigate loss and fragmentation of habitat and changes in disease mechanisms. Rather than limiting mitigation to only timing restrictions, more effective mitigation strategies may include, at a minimum, burying power lines (Connelly et al. 2000b); minimizing road and well pad construction, vehicle traffic, and industrial noise (Lyon and Anderson 2003, Holloran 2005); and managing produced water to prevent the spread of mosquitoes with the potential to vector West Nile Virus in GSG habitat (Walker et al 2007).

Several guidance documents are available that recommend practices that would reduce impacts of development on GSG. These include Northeast Wyoming Sage-Grouse Conservation Plan (Northeast Wyoming Sage-grouse Working Group 2006), Sage-Grouse Habitat Management Guidelines for Wyoming (Bohne et al. 2007), Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats (WGFD 2009), Bureau of Land Management National Sage-Grouse Habitat Conservation Strategy (USDI 2004), and Greater Sage-Grouse Comprehensive Conservation Strategy (Stiver et al. 2006).

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**Appendix A. Table 1. Summary of Sensitive Species Habitat and Project Effects Associated with Alternative B.**

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
<b>Amphibians</b>				
Northern leopard frog ( <i>Rana pipiens</i> )	Beaver ponds and cattail marshes from plains to montane zones.	NS	NI	Surface disturbance is planned over 0.25 miles from habitat.
Columbia spotted frog ( <i>Rana pretiosa</i> )	Ponds, sloughs, small streams, and cattails in foothills and montane zones. Confined to headwaters of the S Tongue R drainage and tributaries.	NP	NI	The project area is outside the species' range, and the species is not expected to occur.
<b>Fish</b>				
Yellowstone cutthroat trout ( <i>Oncorhynchus clarki bouvieri</i> )	Cold-water rivers, creeks, beaver ponds, and large lakes in the Upper Tongue sub-watershed	NP	NI	The project area is outside the species' range, and the species is not expected to occur.
<b>Birds</b>				
Baird's sparrow ( <i>Ammodramus bairdii</i> )	Shortgrass prairie and basin-prairie shrubland habitats; plowed and stubble fields; grazed pastures; dry lakebeds; and other sparse, bare, dry ground.	S	MIIH	Direct loss of habitat will occur from removal of vegetation. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area. A timing limitation on vegetation will reduce the likelihood that active nests are destroyed.
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Mature forest cover often within one mile of large water body with reliable prey source nearby.	K	MIIH	Surface disturbing and maintenance activities may impact foraging eagles and the species may avoid the area.
Brewer's sparrow ( <i>Spizella breweri</i> )	Sagebrush shrubland	K	MIIH	Direct loss of habitat will occur from removal of vegetation. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area. A timing limitation on vegetation will reduce the likelihood that active nests are destroyed.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Ferruginous hawk ( <i>Buteo regalis</i> )	Basin-prairie shrub, grasslands, rock outcrops	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Loggerhead shrike ( <i>Lanius ludovicianus</i> )	Basin-prairie shrub, mountain-foothill shrub	K	MIIH	Direct loss of habitat will occur from removal of vegetation. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area. A timing limitation on vegetation will reduce the likelihood that active nests are destroyed.
Long-billed curlew ( <i>Numenius americanus</i> )	Grasslands, plains, foothills, wet meadows	K	MIIH	No surface disturbing activities are planned in suitable nesting habitat. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Mountain Plover	Short-grass prairie with slopes < 5%	S	MIIH	No plover have been observed in the study area, however, suitable nesting habitat is present. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area
Northern goshawk ( <i>Accipiter gentilis</i> )	Conifer and deciduous forests	NP	NI	Habitat not present.
Peregrine falcon ( <i>Falco peregrinus</i> )	Cliffs	NP	NI	Habitat not present.
Sage sparrow ( <i>Amphispiza billneata</i> )	Basin-prairie shrub, mountain-foothill shrub	K	MIIH	Direct loss of habitat will occur from removal of vegetation. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area. A timing limitation on vegetation will reduce the likelihood that active nests are destroyed.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Sage thrasher ( <i>Oreoscoptes montanus</i> )	Basin-prairie shrub, mountain-foothill shrub	K	MIIH	Direct loss of habitat will occur from removal of vegetation. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area. A timing limitation on vegetation will reduce the likelihood that active nests are destroyed.
Trumpeter swan ( <i>Cygnus buccinator</i> )	Lakes, ponds, rivers	NS	NI	Surface disturbance is planned over 0.25 miles from habitat.
Western Burrowing owl ( <i>Athene cunicularia</i> )	Grasslands, basin-prairie shrub	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
White-faced ibis ( <i>Plegadis chihi</i> )	Marshes, wet meadows	NS	NI	Surface disturbance is planned over 0.25 miles from habitat.
Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	Open woodlands, streamside willow and alder groves	NS	NI	Surface disturbance is planned over 0.25 miles from habitat.
<b><i>Mammals</i></b>				
Black-tailed prairie dog ( <i>Cynomys ludovicianus</i> )	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	NS	NI	There are no known colonies present.
Fringed myotis ( <i>Myotis thysanodes</i> )	Conifer forests, woodland chaparral, caves and mines	S	NI	Foraging habitat is not expected to be impacted by mining activities.
Long-eared myotis ( <i>Myotis evotis</i> )	Conifer and deciduous forest, caves and mines	S	NI	Foraging habitat is not expected to be impacted by mining activities.
Swift fox ( <i>Vulpes velox</i> )	Grasslands	S	MIIH	Foraging habitat may be impacted by dust, noise, and human activities.
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	Caves and mines.	S	NI	Foraging habitat is not expected to be impacted by mining activities.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
<b>Plants</b>				
Limber Pine ( <i>Pinus flexilis</i> )	Mountains, associated with high elevation conifer species	NP	NI	Habitat not present.
Porter's sagebrush ( <i>Artemisia porteri</i> )	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5300-6500 ft.	NP	NI	Habitat not present.
William's wafer parsnip ( <i>Cymopterus williamsii</i> )	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides, 6000-8300 ft.	NS	NI	Project area outside of species' range.
<p align="center"><b>Presence</b></p> <p><b>K</b> - Known, documented observation within project area.  <b>S</b> - Habitat suitable and species suspected, to occur within the project area.  <b>NS</b> - Habitat suitable but species is not suspected to occur within the project area.  <b>NP</b> - Habitat not present and species unlikely to occur within the project area.</p>		<p align="center"><b>Project Effects</b></p> <p><b>NI</b> - No Impact.    <b>BI</b> -Beneficial Impact  <b>MIH</b> - May Impact Individuals or Habitat, but will not likely contribute to a trend towards Federal listing or a loss of viability to the population or species.  <b>WIPV</b> - Will Impact Individuals or Habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species.</p>		

## **Appendix B. Reclamation Requirements for BHB's Mine Plan of Operation**

The following reclamation requirements apply to all surface disturbing activities and must be addressed in each reclamation plan. These requirements also must be met prior to release of the bond and/or the reclamation liability. Where these reclamation requirements differ from other applicable federal laws, rules, and regulations, those requirements supersede this policy. State and/or local statutes or regulations may also apply.

### **1. Manage all waste materials.**

- a. Segregate, treat, and/or bio-remediate contaminated soil material.
- b. Bury only authorized waste materials on site. Buried material must be covered with a minimum of three feet of suitable material or meet other program standards.
- c. Ensure all waste materials moved off-site are transported to an authorized disposal facility.

### **2. Ensure subsurface integrity, and eliminate sources of ground and surface water contamination.**

- a. Properly plug all drill holes and other subsurface openings (mine shafts, adits etc.).
- b. Stabilize, properly back fill, cap, and/or restrict from entry all open shafts, underground workings, and other openings.
- c. Control sources of contamination and implement best management practices to protect surface and ground water quality.

### **3. Re-establish slope stability, surface stability, and desired topographic diversity.**

- a. Reconstruct the landscape to the approximate original contour or consistent with the land use plan.
- b. Maximize geomorphic stability and topographic diversity of the reclaimed topography.
- c. Eliminate highwalls, cut slopes, and/or topographic depressions on site, unless otherwise approved.
- d. Minimize sheet and rill erosion on/or adjacent to the reclaimed area. There shall be no evidence of mass wasting, head cutting, large rills or gullies, down cutting in drainages, or overall slope instability on/or adjacent to the reclaimed area.

### **4. Reconstruct and stabilize water courses and drainage features.**

- a. Reconstruct drainage basins and reclaim impoundments to maintain the drainage pattern, profile, and dimension to approximate the natural features found in nearby naturally functioning basins.
- b. Reconstruct and stabilize stream channels, drainages, and impoundments to exhibit similar hydrologic characteristics found in stable naturally functioning systems.

### **5. Maintain the biological, chemical, and physical integrity of the topsoil and subsoil (where appropriate).**

- a. Identify, delineate, and segregate all salvaged topsoil and subsoil based on a site specific soil evaluation, including depth, chemical, and physical characteristics.
- b. Protect all stored soil material from erosion, degradation, and contamination.
- c. Incorporate stored soil material into the disturbed landscape.
- d. Soil storage piles to be stored beyond one growing season, should be seeded with appropriate vegetation (native or sterile non-native species).
- e. Identify stockpiles with appropriate signage.

### **6. Prepare site for revegetation.**

- a. Redistribute soil materials in a manner similar to the original vertical profile.

- b. Reduce compaction to an appropriate depth (generally below the root zone) prior to redistribution of topsoil, to accommodate desired plant species.
- c. Provide suitable surface and subsurface physical, chemical, and biological properties to support the long term establishment and viability of the desired plant community.
- d. Protect seed and seedling establishment (e.g. erosion control matting, mulching, hydro-seeding, surface roughening, fencing, etc.)

**7. Establish desired self-perpetuating native plant community.**

- a. Establish species composition, diversity, structure, and total ground cover appropriate for the desired plant community.
- b. Enhance critical resource values (e.g. wildlife, range, recreation, biodiversity, etc.), where appropriate, by augmenting or accelerating restoration of plant community composition, diversity, and/or structure.
- c. Select genetically appropriate and locally adapted native plant materials (e.g. locally sourced or cultivars recommended for seed zone) based on the site characteristics and ecological setting.
- d. Use locally sourced and/or collected seeds to the extent possible (local collection and logistics should be included in the Reclamation Plan).
- e. Select non-native plants only as an approved short term and non-persistent (i.e. sterile) alternative to native plant materials. Ensure the non-natives will not hybridize, displace, or offer long-term competition to the endemic plants, and are designed to aid in the re-establishment of native plant communities.

**8. Reestablish a complementary visual composition.**

- a. Ensure the reclaimed landscape features blend into the adjacent area and conform to the land use plan decisions.
- b. Ensure the reclaimed landscape does not result in a long term change to the scenic quality of the area.

**9. Manage invasive plants.**

- a. Assess for invasive plants before initiating surface disturbing activities.
- b. Develop an invasive plant management plan.
- c. Control invasive plants utilizing an integrated pest management approach.
- d. Monitor invasive plant treatments.

**10. Develop and implement a reclamation monitoring and reporting strategy.**

- a. Conduct compliance and effectiveness monitoring in accordance with a BLM (or other surface management agency) approved monitoring protocol.
- b. Evaluate monitoring data for compliance with the reclamation plan.
- c. Document and report monitoring data and recommend revised reclamation strategies.
- d. Implement revised reclamation strategies as needed.
- e. Repeat the process of monitoring, evaluating, documenting/reporting.