

# **2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION**

## **2.1 HISTORY OF ALTERNATIVE DEVELOPMENT**

The alternative development process began in February 2003 when the decision to prepare an EIS was made. Alternative development was initiated with a series of Interdisciplinary Team meetings. The team developed three alternatives within constraints imposed by existing policy and guidance.

The Proposed Action (Alternative A) is to hold a competitive lease sale for Federal coal tracts in the WMA. The Proposed Action assumes the applicant (Coteau) would be the successful bidder and that tracts would be mined as a maintenance lease for the Freedom Mine.

The No Action alternative (B) assumes the lease application would be rejected and Federal tracts withheld from leasing. Some 11,480 acres (about 60%) of the WMA is underlain by non-Federal coal, which could be mined even if Federal coal is not leased. Mining of non-Federal coal could have substantial impacts on private surface lands above Federal coal.

The modified leasing alternative (C) considers ways of preserving, mitigating, and minimizing impacts to cultural resources, which are meaningful to American Indian Tribes of the Great Plains and the historic-preservation community.

## **2.2 MANAGEMENT COMMON TO ALL ALTERNATIVES**

Coteau would mine non-Federal coal of the WMA, including some 11,480 acres of private and state-owned reserves. Historic properties affected by coal mining would be mitigated under North Dakota State Law (North Dakota Century Code) in concert with SMCRA requirements.

Through year 2000 approximately 220 million tons of lignite coal had been removed from the Freedom mine, averaging 15-16 million tons/year. Surface disturbances associated with coal extraction are present as follows:

- Previously mined area (to yearend 2002): 16,400 acres
- Active mine area (at yearend 2002): 3,106 acres
- Area completely reclaimed (yearend 2002): 8,425 acres
- Area mined and regraded without respread soil (at year end 2002): 404 acres

- Areas in long-term use, including office/shop, coal handling, haul roads, stockpiles, and ponds (to yearend 2002): 4,465 acres

BLM would comply with laws, regulations, acts, Executive Orders, policy, and formally adopted agreements as described in sections 1.4 and 1.5.

## **2.3 ALTERNATIVE A (PROPOSED ACTION)**

Coteau proposes to lease 5,571 acres of Federal coal beneath private surface in Mercer County, North Dakota. The coal (an estimated 90 million tons of Federal lignite) would complement reserves of the Freedom Mine. Lease tracts would be subject to standard and special lease stipulations developed for this sale. Under this action, physical disturbance of a Traditional Cultural Property (turtle effigy) and the only recorded unmarked burial would be stipulated for "No Surface Disturbance." To abide by the NHPA of 1966, as amended, 13 Historic Properties located over Federal coal would be avoided or mitigated for their potential to yield scientific contributions to prehistory. Archeological investigations are planned on 26 other Historic Properties located over non-Federal coal within the WMA.

## **2.4 ALTERNATIVE B (NO ACTION)**

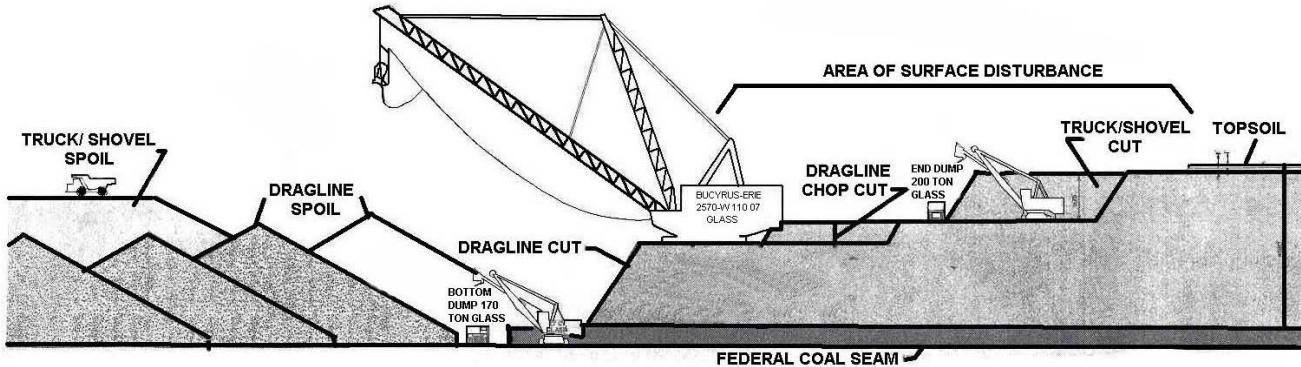
Under Alternative B the application to lease Federal coal would be rejected and Federal coal reserves bypassed during mining. Private surface over Federal coal would still be affected (for example, by highwall layback, topsoil stockpiles, haul roads and other activities) as 11,480 acres of non-Federal coal are mined.

The most severe surface impacts would occur in a 500-foot wide zone lying adjacent to the highwall (Figure 2.1). Mining would directly affect some 250 acres (roughly 40% of a 640-acre section) of surface surrounded on all sides by an open pit.

Analysis of an unleased Federal section, situated adjacent to an open pit, indicates that approximately one half the section would experience direct impacts. Another 40 percent would experience indirect impacts (roads, topsoil piles), while approximately 10 percent would remain undisturbed. Figure 2.2 indicates potential impacts that could occur on unleased lands adjacent to the mining operation.

Historic Properties located on private and state land would be mitigated under the North Dakota Century Code in concert with the requirements of SMCRA as set forth in the North Dakota coal program. All Historic Properties would remain in private ownership and use. The only recorded

**Figure 2.1**  
**Private surface above unmined Federal coal would go through substantial disturbances**



unmarked burial would be protected from disturbance under North Dakota Century Code (Citation: §23-06-27, Section Title: Protection of human burial sites, human remains and burial goods).

## **2.5 ALTERNATIVE C (MODIFIED LEASING)**

BLM would lease 5,571 acres of Federal coal beneath private surface. Under an existing Programmatic Agreement and its approved Management Plan, the W<sup>1/2</sup> Section 4, T. 145 N., R. 88W. would be offered for lease with the surface stipulated as “No Surface Disturbance to protect significant sites.” Likewise, Section 14 T. 145 N., R. 88W. would be offered for lease, with eight acres stipulated as “No Surface Disturbance” to protect the Traditional Cultural Property (effigy) and the only recorded unmarked burial site.

This alternative also includes a donation of lands and monies by the lessee to a recently established North Dakota State Indian Cultural Education Trust. The trust was established for the purpose of generating income to benefit Indian cultural education. By donating lands to the trust, a segment of the cultural landscape and the archeological sites they contain would be preserved. These sites, which would be transferred from private ownership into the trust, would become readily accessible to American Indians.

Donor agreements would provide for a donation of lands into the trust containing four of the 13 Historic Properties located above Federal coal. The only recorded Traditional Cultural Property (effigy) and unmarked burial would also be preserved. In addition, lands holding seven Historic Properties located above private or state coal would be donated to the trust with similar provisions. Sixteen non-National Register eligible sites would also be preserved. Nine other Historic Properties located above Federal coal would be mitigated through planned archeological investigations in conjunction with 19 other Historic Properties of the WMA. Donor Agreements would put 1,720 acres into the Education Trust, preserving 29 archeological sites, a Traditional Cultural Property, an unmarked burial, and 439 stone rings, cairns, alignments, and stone lined depressions.

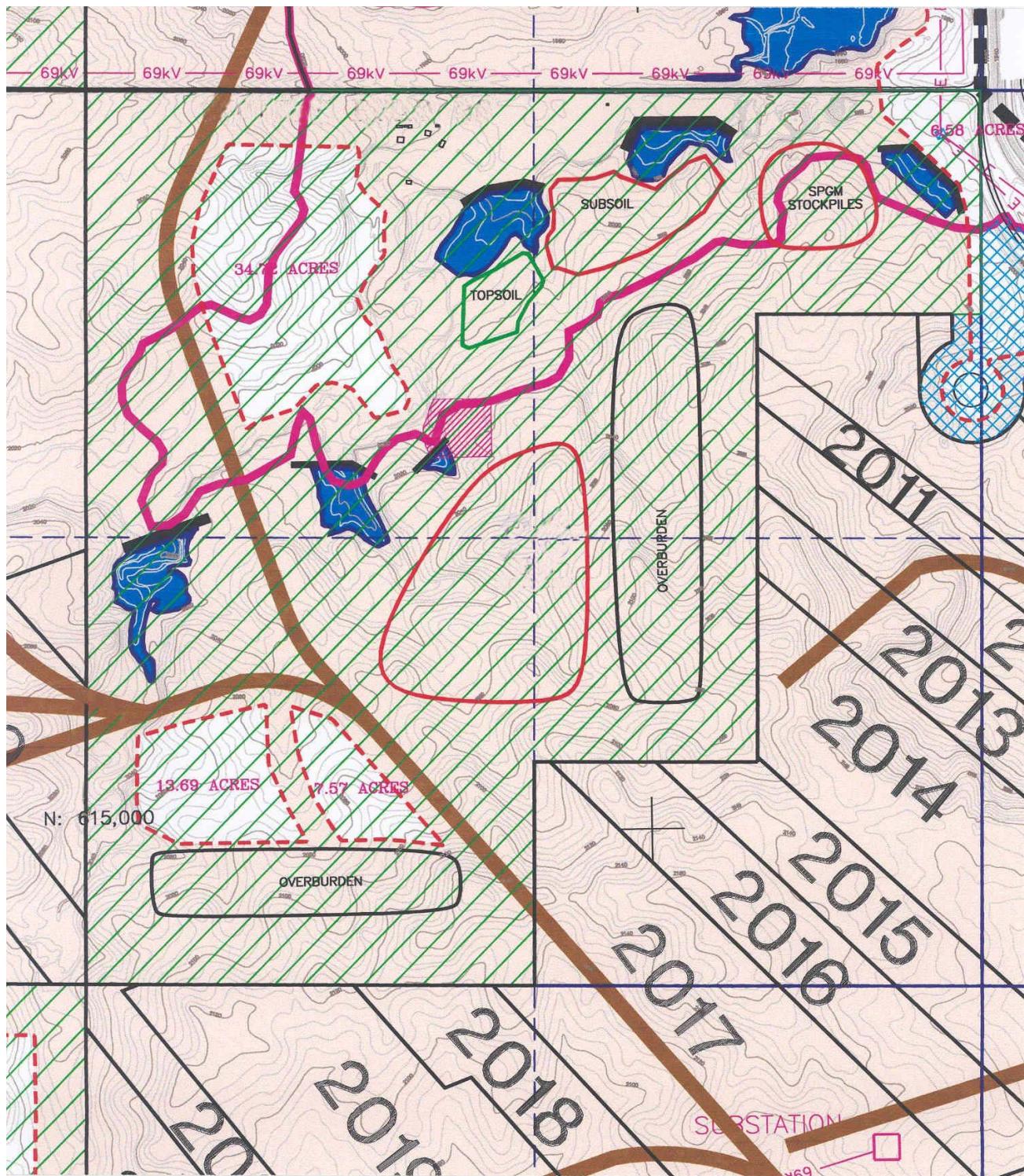
## **2.6 SUMMARY COMPARISON OF ALTERNATIVES**

See Tables 2.1 through 2.3.

## **2.7 IDENTIFICATION OF THE PREFERRED ALTERNATIVE**

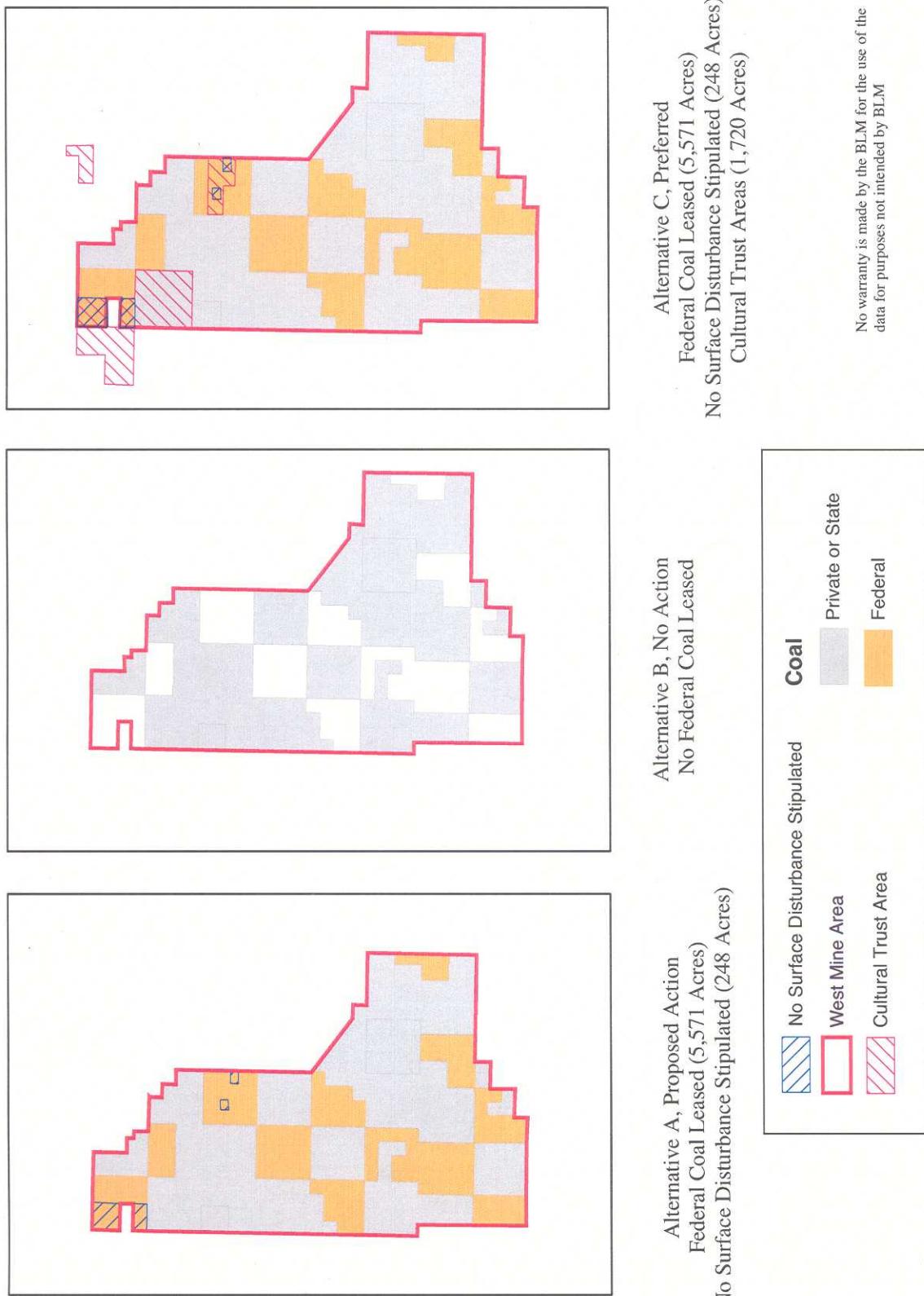
Alternative C is the Preferred Alternative.

**Figure 2.2**  
**Hypothetical impacts on an unleased Federal Coal Tract**



In addition to the 500-foot-wide zone of direct impacts, surface disturbances might include sedimentation ponds (blue), top/subsoil piles (red and green), and haul roads (brown). It is estimated that a “substantial” portion (up to 90%) of the surface over unleased coal would be affected.

**Figure 2.3**  
Comparison of Impacts According to Alternative



**Table 2.1**  
**Summary Comparison of Alternatives**

Indicator/Action	Alternative A Proposed Action	Alternative B No-Action	Alternative C Modified Leasing
<b>Management in Common:</b> 11,480 acres of non-Federal coal would be mined. Approximately 220 million tons (from 16,000 acres) have been mined beginning in 1983. Historic Properties affected by coal mining would be mitigated under the North Dakota Century Code in concert with SMCRA requirements. Lease tracts would be subject to standard and special lease stipulations.			
<b>Acres/Estimated reserves of Federal coal leased beneath private surface</b>			
Federal coal withdrawn from leasing	0 acres	5,571 acres	0 acres/ 0 tons
Federal coal leased but subject to “No Surface Disturbance” to protect cultural resources	248 acres (see Alternative C for legal description)	0 acres	240 acres in Sec. 4, T. 145 N., R. 88 W 8 acres in Sec. 14, T. 145 N., R. 88 W.
Historical Properties over Federal coal	5 properties would be avoided; 9 properties would be investigated for their information value.	5 properties would be avoided; 9 properties would be investigated for their information value.	6 properties donated to the ND State Indian Cultural Education Trust (includes Bee’s Nest site which is outside of the WMA). 9 properties would be investigated for their informational value.
Historical Properties over non-Federal coal	7 properties would be avoided; 20 properties would be investigated for their information value.	7 properties would be avoided; 20 properties would be investigated for their information value.	9 properties donated to the ND State Indian Cultural Education Trust (includes Boeckel-Renner site which is outside of the WMA). 20 properties would be investigated for their information value.
Additional Compensation for cultural resource losses.	None.	None.	\$200,000 (more or less) donated to the ND State Indian Cultural Education Trust. 1085 additional private acres subject to “No Surface Disturbance”. 26 non-National Register sites donated to the Trust.

**Table 2.2**  
**Summary Comparison of Magnitude and Duration of Direct and Indirect Impacts for No-Action,  
 Proposed Action, and Alternative C (Modified leasing)**

Description of Potential Impacts by Resource	No-Action Alternative (B)	Magnitude and Duration of Impact	Proposed Action (A) and Alternative C
<b>Air Quality</b> IMPACTS ASSOCIATED WITH MINING OPERATIONS would include: Elevated concentrations of particulate matter Elevated concentrations of gaseous emissions	Moderate, short term on active mine areas Moderate, short term on active mine areas	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	
<b>Water Resources</b> IMPACTS ASSOCIATED WITH MINING OPERATIONS would include: <i>Surface Water</i> Disruption of surface drainage systems Increased runoff and erosion rates	Moderate, short term on active mine area Moderate, short term near active mine area	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	
<i>Ground Water</i> Removal of shallow aquifers Replacement of shallow aquifers with spoil aquifers Depressed water levels in aquifers adjacent to mine Change in groundwater quality in backfilled areas	Moderate, short term on active mine area Moderate, long term on disturbed areas Moderate, short term near active mine area Moderate, long term near active mine area	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	
<b>Soils</b> IMPACTS ASSOCIATED WITH MINING OPERATIONS would include: Loss of soil productivity Soil instability and increased erosion Disturbance of prime farmland	Moderate, short term on active mine areas Moderate, short term on active mine areas Moderate, short term on active mine areas	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	
<b>Land Use/Vegetation</b> PROGRESSIVE LOSS OF NATIVE VEGETATION would result in: Increased erosion Wildlife and livestock habitat loss Wildlife habitat carrying-capacity loss	Moderate, short term on active mine areas Moderate, short term on active mine areas Moderate, short term on active mine areas	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	

Description of Potential Impacts by Resource	Magnitude and Duration of Impact		
	Resource Name	No-Action Alternative (B)	Proposed Action (A) and Alternative C
AFTER RECLAMATION the following could result:			
Changes in vegetation patterns:	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
Reduction in vegetation diversity	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
<b>Wildlife</b>			
DURING MINING the following could occur:			
Wildlife displacement	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
Increased mortality rate of small mammals, amphibians, and reptiles	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
Temporary displacement of mammals, amphibians, reptiles, and birds	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
Loss of habitat for migratory birds	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
Reduction in waterfowl resting and feeding habitat	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
Temporary wildlife habitat loss	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
Continued road kills by mine-related traffic	Moderate, short term on active mine areas	Same as No-Action on expanded mine areas	
<b>Cultural</b>			
IMPACTS ASSOCIATED WITH MINING OPERATIONS would include:			
Loss of 91 sites (14 are NR eligible); 624 stone features (rings, cairns, and alignments); and 5,323 acres of cultural landscape.	Major, long term on active mine areas	Same as No-Action on expanded mine areas Under Alternative C (Preferred) 38 sites, 14 NR-eligible sites, 431 stone features, 1,325 acres placed in American Indian Education Trust as an offset to impacts.	
<b>Environmental Justice</b>			
EFFECTS DURING MINING would include: (See Cultural impacts)	See Cultural impacts	See Cultural impacts	
<b>Socio-economics</b>			
EFFECTS DURING MINING would include: Employment Potential (no additional jobs in mine are expected)	Moderate, beneficial, short term on existing mine area	Same as No-Action on expanded mine areas	

**Table 2.3**  
**Summary Comparison of Magnitude and Duration of Cumulative Impacts**

<b>Description of Potential Impacts by Resource</b>	<b>Magnitude and Duration of Impact</b>		
	<b>No-Action Alternative (B)</b>	<b>Proposed Action (A) and Alternative (C)</b>	
<b>Air Quality</b> IMPACTS ASSOCIATED WITH MINING OPERATIONS would include: Elevated concentrations of particulate matter Elevated concentrations of gaseous emissions	Moderate, short term on active mine areas Moderate, short term on active mine areas	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	
<b>Water Resources</b> IMPACTS TO SURFACE WATER could result in: Temporary reduction in soil infiltration rates and increase runoff IMPACTS ON GROUNDWAER could result in: Depressed water levels in aquifers adjacent to mine Change in groundwater quality in backfilled areas	Moderate, short term on active mine area Moderate, long term near active mine area	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	
<b>Soils</b> RECLAIMED SOILS could result in: Increased soil productivity Reduced erosion	Negligible, long term on existing mine areas Negligible, long term on existing mine areas	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	
<b>Land Use/Vegetation</b> IMPACTS ON LAND USE could result in: Loss of agricultural production Reduction of wildlife habitat SURFACE DISTURBANCE would result in: Loss of common native vegetation types for wildlife Regional loss of vegetative diversity	Moderate, short term on existing mine areas Moderate, short term on existing mine areas	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	
<b>Wildlife</b> IMPACTS ON WILDLIFE FROM SURFACE MINING could result in: Loss of habitat for migratory birds Reduction in waterfowl habitat Permanent reduction in wildlife habitat diversity Permanent reduction in some wildlife carrying capacity	Negligible, short term on existing mine areas Minor, short term on existing mine areas Minor, long term on existing mine areas Minor, long term on existing mine areas	Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas Same as No-Action on expanded mine areas	

Description of Potential Impacts by Resource	Magnitude and Duration of Impact		
	Resource Name	No-Action Alternative (B)	Proposed Action (A) and Alternative (C )
<b>Cultural</b> IMPACTS ASSOCIATED WITH MINING OPERATIONS would include: Loss of 740 sites, 2,491 features, 68,683 acres of cultural landscape. Destruction of cultural features and landscape, archeological sites eligible for National Register are mitigated for purposes of NHPA by data recovery or avoidance.	Major, long term on existing/active mine areas	Same as No action on expanded/active mine areas Under Alternative C, (Preferred), 38 sites, 14 NR-eligible sites, 431 stone features, 1,325 acres placed in American Indian Education Trust as offset to cultural/social impacts.	
<b>Socio-economics</b> IMPACTS ON SOCIO-ECONOMICS could include: Mineral and energy related development Employment Housing market Economic development Revenues and royalties	Minor, beneficial, short term on existing mine Minor, beneficial, short term on existing mine Minor, short term due to existing mine Minor, beneficial, short term due to existing mine Minor, beneficial, short term due to existing mine	Same as No Action on expanded mine areas Same as No Action on expanded mine areas	

