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Environmental Impact Statement

Dewey Conveyor Project

DOI-BLM-MT-040-2009-0002-EIS

January 2009

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Dewey Conveyor Project
Draft Environmental Impact Statement

CUSTER COUNTY, SOUTH DAKOTA

Lead Agency Bureau of Land Management

Cooperating Agencies US Forest Service

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Abstract

The Dewey Conveyor Project was proposed by GCC Dacotah as a means to transport limestone from a future quarry location to a rail load-out facility near Dewey, South Dakota. GCC Dacotah has submitted an Application for Transportation and Utility Systems and Facilities on Federal Lands. If the application is approved a special use permit would be required from the Forest Service and a right-of-way (ROW) would be required from the Bureau of Land Management for the conveyor to cross federal lands.

This environmental impact statement considers four alternatives (Alternatives A, B, C, and D). Alternative A is the proposed action, which includes a 6.6 mile long, above-ground, enclosed conveyor system beginning at the quarry and terminating at a new railroad load-out facility. The route would cross 1.4 miles of the Black Hills National Forest and 1.1 mile of public land administered by the Bureau of Land Management.

Alternative B is the No Action Alternative. Under the No Action alternative the proposed action to grant a ROW or issue a special use permit along which to construct a conveyor system would not be approved. The analysis for this alternative assumes GCC Dacotah would not choose to haul limestone in trucks over the existing county Dewey Road.

During public scoping, concerns about potential visual impacts from the conveyor were raised and therefore a truck hauling alternative was developed. Alternative C would include hauling limestone by truck from the quarry to the proposed load-out facility using the county road. The current condition of the county road is inadequate for hauling and this use would create public safety concerns due to the road alignment and width. Under this alternative, the county road would be widened for approximately 7.2 miles for public safety and use by haul trucks, and several curves may require straightening. Widening and straightening the county road where it crosses federal lands would require a special use permit and ROW grant from the federal agencies.

The amount of haul traffic under Alternative C is undesirable, primarily for public safety, when mixed with the existing local passenger/ranch traffic. Therefore, Alternative D was developed to construct another road generally following the route of the proposed conveyor that would only be used for hauling limestone by truck and eliminate the potential visual impact from the proposed conveyor. This would allow the local traffic to be largely separated from the hauling traffic. Approximately 1.4 miles of the existing county road would need to be straightened and widened over the pass that crosses the Elk Mountains on National Forest as it is the only feasible location over this portion. Both a ROW grant and special use permit would be required for the new road construction across federal lands.

EXECUTIVE SUMMARY

Introduction

GCC Dacotah, Inc. (GCC Dacotah) seeks approval of an Application for Transportation and Utility Systems and Facilities on Federal Lands that requires issuing a right-of-way (ROW) and a special use permit to cross federal lands associated with the construction of a 6.6 mile long conveyor near Dewey, South Dakota (the Dewey Conveyor Project).

The legal description of the project area includes portions of:

- T5S, R1E, Sections 36
- T6S, R1E, Sections 1, 2, , 9, 10, 11, 12, 15, 16, 17, 18,19, and 20
- T5S, R2E, Sections 31

The proposed route for the conveyor crosses Bureau of Land Management (BLM)-administered public lands, US Forest Service administered National Forest System lands and GCC Dacotah privately owned land (**Figure S-1**). The activities on BLM and National Forest require an analysis and decision process consistent with the National Environmental Policy Act; therefore, this environmental impact statement (EIS) has been prepared.

The BLM is the lead agency. The Forest Service is a cooperating agency.

Background

GCC Dacotah has located a limestone deposit several miles north of Dewey, South Dakota in a geologically favorable area where the Minnekahta Limestone lies at, or close enough to, the surface to make mining economically feasible. The nearby town of Dewey is located along an existing rail transportation corridor.

The surface of the land currently proposed for mining is mostly private property, largely owned by GCC Dacotah. Within the area proposed for mining, all of the mineral rights are controlled by GCC Dacotah either by direct ownership or leasing on privately-owned lands, or alternatively have been acquired by the staking of mining claims on lands underlain by federally-owned mineral rights. Within these areas of federally–owned mineral rights, a statutory right to prospect, explore, develop and mine certain minerals, including limestone, can be acquired from the federal government by the staking of mining claims, such as GCC Dacotah has done, under authority and guidelines established by the *General Mining Law of 1872*, as amended.

GCC Dacotah also has a license to mine limestone in the state of South Dakota issued by the South Dakota Department of Environment and Natural Resources (DENR). Therefore, GCC Dacotah is authorized by the State to proceed with mining at the site. At the present time, there are no legal or regulatory impediments to GCC Dacotah's mining of the limestone.

In reviewing the options for its need to transport limestone from the proposed mine-site to the rail transportation corridor near the town of Dewey, GCC Dacotah determined that there were a number of potential problems associated with hauling limestone by truck along the existing county road. These potential problems included: public safety along the road resulting from the extensive use by haul traffic, road maintenance, and environmental issues related to noise, dust and potential risks of mortality to livestock and wildlife. This led GCC Dacotah to propose the construction of a 6.6 mile long conveyor between the proposed mine site and a newly proposed rail load-out facility south of Dewey. Although most (4.1 miles) of the proposed construction corridor for the conveyor would be on land privately owned by GCC Dacotah, segments of the proposed conveyor corridor would need to cross approximately 1.0 miles of BLM lands and 1.4 miles across National Forest. Therefore, GCC Dacotah submitted an Application for Transportation and Utility Systems and Facilities on Federal Lands to provide legal access across these federal lands. The results of submitting this Application are described under the Purpose and Need section immediately below.

Purpose and Need

GCC Dacotah has submitted an Application for Transportation and Utility Systems and Facilities

on Federal Lands in order to accommodate their need to construct a proposed conveyor system across federal lands to transport mined limestone from a quarry to a rail load-out facility south of Dewey, South Dakota, both of which are located on GCC Dacotah privately owned lands. If the transportation corridor is approved a ROW grant for BLM lands and a special use permit for National Forets System lands are both required for access across federal lands. The "agency action" in this case is the approval of the Application and granting of the ROW (BLM) or special use permit (Forest Service).

Decisions to Be Made

BLM and Forest Service will decide whether or not to approve the Application for Transportation and Utility Systems and Facilities on Federal Lands and grant a 100-foot wide ROW for a conveyor crossing and grant a ROW and a special use permit.

If BLM and Forest Service decide not to approve the Application for Transportation and Utility Systems and Facilities on Federal Lands and grant the ROW and special use permit, they will need to choose another alternative, and mutually agree to the deny the application, or to approve the construction of a new road, or reconstruction of the County Road.

BLM and Forest Service will decide whether stipulations or mitigation will be attached to the ROW grant and special use permit.

Key Issues

The following issues were used in the development of alternatives.

- The physical appearance of the conveyor on the landscape as viewed from private land or the roadway.
- Public safety concerns due to mixed use traffic on the county road for hauling limestone.

Alternatives Studied In Detail

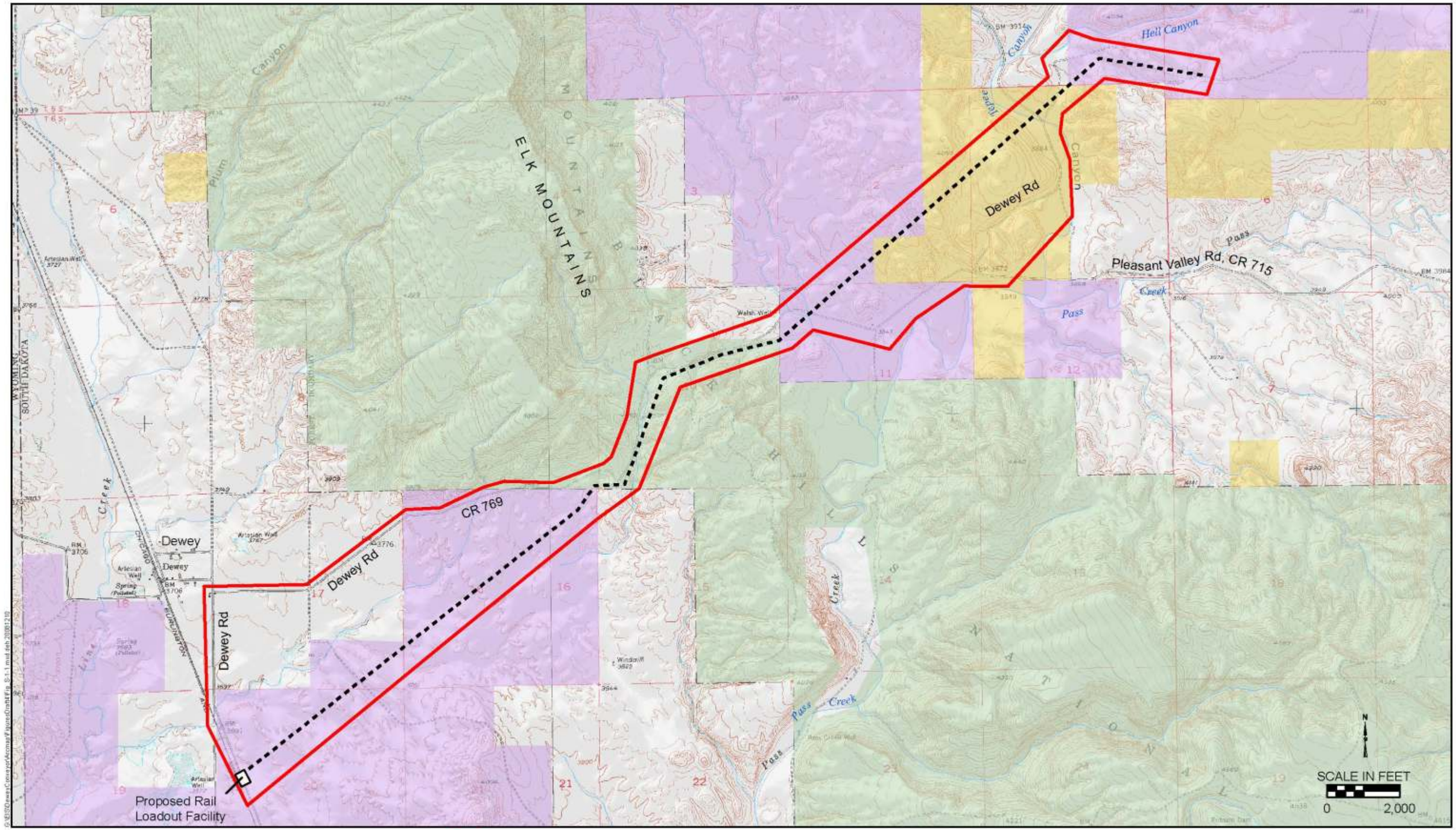
Based on key issues and NEPA requirements, this EIS addresses four alternatives in detail. Briefly, they are:

- Alternative A is the proposed action.
- The no action alternative is Alternative B. Under this alternative the proposed action of granting the ROW and special use permit would not be approved.
- An alternative that would use trucks along existing county roads to move limestone from the quarry to the rail load-out is described as Alternative C; and
- An alternative that would construct new haul roads along most of the ROW and use some existing roads is described as Alternative D.

Alternative A - Proposed Action

GCC Dacotah seeks approval of an Application for Transportation and Utility Systems and Facilities on Federal Lands. Approval of the Application would require granting a 100-foot wide ROW for a conveyor crossing 1.1 miles of lands administered by BLM, and a special use permit for the above-ground conveyor to cross 1.4 miles of National Forest land (**Figure S-2**). The conveyor would also cross other private land owned by GCC Dacotah. The ROW and permit will include associated roads to access the proposed conveyor route for construction and maintenance purposes. GCC Dacotah is proposing to construct the enclosed, above-ground 6.6-mile long conveyor to transfer limestone from a new quarry site, southwest to a new rail load-out facility along an existing rail line near Dewey, SD. Both the quarry and the rail load-out facility would be on GCC Dacotah's land.

The proposed action includes an elevated, enclosed conveyor belt, a one lane service road and access points. On level ground, the elevated conveyor would be about 16-feet high, and would provide approximately nine-feet of vertical clearance beneath the structure. Constructed support structures would be required at intervals of 25 to 40 feet depending on terrain. The proposed conveyor system is capable of moving about 1,500 tons per hour and would, therefore, only need to operate about 2.5 to 3 hours per day. However, limestone may be stockpiled at the mine providing for longer periods of operation of the conveyor at more intermittent periods. At the rail load-out facility limestone would be stockpiled in a storage dome with a capacity of about 30,000 tons (about 7 days of mining at 4,000 tons per day). Limestone would



Conveyor Project Area
Proposed Conveyor Right-of-Way

GCC Property
Public Land Ownership
BLM
State
USFS

September 2008
Figure S-1
Project Map
Custer County, South Dakota
Dewey Conveyor Belt Project

be likely shipped out of the rail load-out facility in unit trains consisting of 60 to 100 cars per train to processing facilities in Rapid City. Each rail car has a capacity of 100-tons (6,000 to 10,000 tons per train) representing 1.5 to 2.5 days of mining, requiring about 8 to 13 trains per month. Forty railcars could be loaded in 5 to 7 hours. GCC Dacotah has requested a 200 year ROW or permit for their year-round operation.

GCC Dacotah estimates the project would cost about $7 million to construct (2007 value).

The Proposed Action includes the following design features:

- An extensive, site-specific evaluation of cultural resources has been performed. Should any additional sites be discovered during the construction, construction activities within 100 feet of the site would cease, and SHPO and the surface owner BLM or U.S. Forest Service would be notified. A determination of the sites eligibility for the NRHP would be evaluated. If the site is determined to be eligible the site would be avoided if possible or mitigated. GCC Dacotah would inform its construction supervisors how to identify potential sites, inform them of the need to cease construction, and establish a protocol for proper notification procedures.
- All necessary state and federal air quality and reclamation permits governing mitigation of fugitive dust emissions would be obtained. State of South Dakota Air Quality Permits do not allow exceedences of ambient air quality standards in areas assessable to the public. Dust control measures would be used, as necessary, to insure meeting the ambient air quality standards including optimized operational and construction practices or the use of water sprays, surfactants and collection systems.
- The conveyor would be designed and constructed to provide emergency vehicle and ranch equipment access locations beneath the conveyor on National Forest or BLM managed lands.
- The conveyor would be designed and constructed with an average of 9 feet of clearance to allow both livestock and wildlife to freely and adequately cross beneath.
- GCCD would paint the conveyor segments and towers a low reflectivity, neutral earth-tone color in order to minimize visual impacts of contrast and color.
- The conveyor would be constructed on GCC Dacotah deeded property, BLM land and National Forest lands. Adequate signage would be posted to prevent any potential trespass by GCC Dacotah employees or invitees onto adjacent private property owned by others. GCC would also mark and instruct all employees and contractors regarding the location of property boundaries.
- Security lights would be shielded, and night lighting applications would be covered so as to illuminate the local work area only.

Alternative B – No Action

Under the No Action alternative the proposed action to grant a ROW or issue a special use permit along which to construct a conveyor system would not be approved.

Alternative C – Trucking on Existing County Road

This alternative was developed to address the issue of the potential visual impacts from the conveyor by finding a feasible alternative to transporting limestone without the conveyor.

As discussed in the Background section above, GCC Dacotah controls the mineral rights, owns the surface in the area currently proposed for mining and also has a license from the state of South Dakota with approval to mine the limestone deposits. Therefore, there are no legal or regulatory impediments to GCC Dacotah's mining of the limestone. GCC Dacotah believes that if it were to decide to truck limestone from the proposed mine area to the proposed rail load-out facility (both located on its own private land) it could do so along the existing county road. This could only

occur on federal lands, if no modification to the existing road requiring reissuing of the existing special use permit or changes to the existing prescriptive easement were required.

This alternative would include hauling limestone by truck to the proposed railroad load-out facility on 7.1 miles of the existing county road and 0.8 miles of new road (on BLM and private lands) for a total length of 7.9 miles (**Figure S-2**). Alternative C would use 25-cubic yard haul trucks with 12-cubic yard double axle pup-trailers; containing a total of about 37 cubic yards of material per truck (or 48 tons per truck at 1.3 tons per cubic yard). Therefore, it would require about 83 round trips per day to haul the anticipated 4,000 tons of limestone mined per day to the rail load-out facility (or approximately one truck every three minutes of an 8-hour haul day).

GCC Dacotah already has the right to haul on the county road. However, this alternative would require straightening and widening the road for public safety and use by haul trucks. This alternative would also likely require a ROW from the BLM and a new special use permit from the US Forest Service for the road re-alignment.

Alternative C includes the following design features:

- An extensive, site-specific evaluation of cultural resources has been performed. Should any additional sites be discovered during the construction, construction activities within 100 feet of the site would cease, and SHPO and the surface owner BLM or U.S. Forest Service would be notified. A determination of the sites eligibility for the NRHP would be evaluated. If the site is determined to be eligible the site would be avoided if possible or mitigated. GCC Dacotah would inform its construction supervisors how to identify potential sites, inform them of the need to cease construction, and establish a protocol for proper notification procedures.
- All necessary state and federal air quality and reclamation permits governing mitigation of fugitive dust emissions would be obtained. State of South Dakota Air Quality Permits do not allow exceedences of ambient air quality standards in areas assessable to the public. Dust control measures would be used, as necessary, to insure meeting the ambient air quality standards including optimized operational and construction practices or the use of ater sprays, surfactants and collection systems.
- The conveyor would be designed and constructed to provide emergency vehicle and ranch equipment access locations beneath the conveyor on National Forest or BLM managed lands.
- The conveyor would be designed and constructed with an average of 9 feet of clearance to allow both livestock and wildlife to freely and adequately cross beneath.
- GCCD would paint the conveyor segments and towers a low reflectivity, neutral earth-tone color in order to minimize visual impacts of contrast and color.
- The conveyor would be constructed on GCC Dacotah deeded property, BLM land and National Forest lands. Adequate signage would be posted to prevent any potential trespass by GCC Dacotah employees or invitees onto adjacent private property owned by others. GCC would also mark and instruct all employees and contractors regarding the location of property boundaries.
- Security lights would be shielded, and night lighting applications would be covered so as to illuminate the local work area onl

Alternative D – Trucking Along ROW Corridor

As in Alternative C, this alternative was developed to address the issue of potential visual impacts from the conveyor by finding a feasible alternative to transporting limestone without the conveyor. In addition, this alternative would address the issue of public safety caused by mixed use (heavy haul trucks and passenger vehicles) by reducing the length of the county road used.

An alternative has been identified where limestone is hauled by truck from the mine quarry to the proposed railroad load-out facility on a new road, where feasible, to decrease the effect on the county road. The haul route would cross US Forest Service and BLM land. Total road length required is about 7.2 miles including approximately 5.7 miles of new road and 1.5 miles of existing, but reconstructed county road in the pass area (**Figure S-2**). Trucking would take place as described under Alternative C.

This alternative would require straightening the existing county road alignment and widening the road for public safety and use by haul trucks.

This alternative would also require a ROW grant from the BLM and a new special use permit from the Forest Service.

Alternative D includes the following design features:

- An extensive, site-specific evaluation of cultural resources has been performed. Should any additional sites be discovered during the construction, construction activities within 100 feet of the site would cease, and SHPO and the surface owner BLM or U.S. Forest Service would be notified. A determination of the sites eligibility for the NRHP would be evaluated. If the site is determined to be eligible the site would be avoided if possible or mitigated. GCC Dacotah would inform its construction supervisors how to identify potential sites, inform them of the need to cease construction, and establish a protocol for proper notification procedures.
- All necessary state and federal air quality and reclamation permits governing mitigation of fugitive dust emissions would be obtained. State of South Dakota Air Quality Permits do not allow exceedences of ambient air quality standards in areas assessable to the public. Dust control measures would be used, as necessary, to insure meeting the ambient air quality standards including optimized operational and construction practices or the use of water sprays, surfactants and collection systems.
- The conveyor would be designed and constructed to provide emergency vehicle and ranch equipment access locations beneath the conveyor on National Forest or BLM managed lands.
- The conveyor would be designed and constructed with an average of 9 feet of clearance to allow both livestock and wildlife to freely and adequately cross beneath.
- GCCD would paint the conveyor segments and towers a low reflectivity, neutral earth-tone color in order to minimize visual impacts of contrast and color.
- The conveyor would be constructed on GCC Dacotah deeded property, BLM land and National Forest lands. Adequate signage would be posted to prevent any potential trespass by GCC Dacotah employees or invitees onto adjacent private property owned by others. GCC would also mark and instruct all employees and contractors regarding the location of property boundaries.
- Security lights would be shielded, and night lighting applications would be covered so as to illuminate the local work area only.

Alternatives Considered but Eliminated from Detailed Study

Other alternatives were considered by the BLM and Forest Service, but not studied in detail for a variety of reasons as described below.

A suggestion was made to move conveyor and crusher (at the north end of the proposed ROW) to a location along the west side of the BLM property. This alternative was not studied in detail because moving the crusher is out of scope for the BLM/US Forest Service decision because it is on mine property and would eventually be part of the mine plan, not the conveyor right-of-way.

Another suggestion from the public was to “Permit livestock grazing on the public lands in question (in the ROW request)”. This alternative is essentially

the same as no action. The option of grazing livestock within the identified sections of public land could occur independent of the proposed action and is not influenced by the proposed action.

Relocate the last three miles of the northwest part of the Pass Creek Road to the south onto land owned by GCC Dacotah. This alternative is out of scope for the BLM and Forest Service decision and is not related to the decision on the conveyor ROW.

"Build and use a railroad spur or tunnel." These alternatives are not considered viable because they would be far more expensive to construct safely, making them cost prohibitive, and therefore would not meet the purpose and need of the proposed action. The quality of the rock, for tunneling purposes, where outcrops occur, is believed to be very poor, creating additional engineering constraints. Land disturbance and environmental impacts associated with a railroad spur would be significantly more than the conveyor belt alternative, and when coupled with the greater cost would make this alternative unfeasible.

A variation on Alternative D (new haul road construction) considered a different haul route location at the northeast end of the project area that took it away from existing Project Area roads. This route crosses a very steep cliff area in the northwest corner of Section 1 (T6S, R1E), and generally contains areas of considerably more topographic relief than the haul road route chosen for Alternative D. This alternative was eliminated from detailed analysis because it was considered very difficult to construct technically through the cliff area in the northwest corner of Section 1, would likely be significantly more expensive to construct and contain more areas of cut and fill due to the generally more rugged terrain, and provided no environmental advantage over the route chosen as Alternative D as presented in the EIS.

Comparison of Alternatives

In this section, Alternatives A through D are compared based on the type of major construction components required and by effects of implementation of each alternative.

Table S-1
Construction by Alternative (Miles)

	Alternative			
	A	**B**	**C**	**D**
ROW (BLM)	1.1	0	1.4	1.4
Special Use Permit (US Forest Service)	1.4	0	1.5	1.5
Total County Road Reconstruction	0	0	7.1	1.5
Total New Road Construction	0	0	0.8[1]	5.7
Total Conveyor Construction	6.6	0	0	0

[1] In pass area only.

Under Alternatives A, C, and D, approximately 1 acre would be disturbed for access roads within the ROW.

Major Construction Components

Table S-1 presents a comparison of alternatives based on the miles of each major construction components required to complete each Alternative.

Effects by Alternative

Table S-2 presents a comparison of effects on various resources that result from various characteristics of the actions required to complete the alternatives.

Connected Action

Mining of the limestone resource to be produced and transported to a proposed rail load-out facility near Dewey, either by the proposed conveyor belt or one of the trucking action alternative haul routes is considered by the agencies to be a Connected Action. It would occur under Alternatives A, C, and D (**Figure S-2**) and will be analyzed for each resource. **Figure S-2** shows the area where the outcrop of the Minnekahta Limestone with GCC Dacotah controlled mineral rights is near enough to the surface to make mining feasible. These mineral rights are controlled either by ownership or leasing on private lands, or may have been acquired by the staking of claims on lands underlain by federally held mineral rights. This area includes portions of the following sections:

- T5S, R1E, Sections 24, 25, and 36.

- T5S, R2E, Sections 17, 19, 20, 21, 29, 30, 31, and 32.
- T6S, R1E, Sections 1, and 2.
- T6S, R2E, Sections 5, and 6.

The details of the proposed mining operations near Dewey have not been fully developed or finalized by the company to date. However, for the purposes of this EIS the company has provided the following preliminary information with regard to the mining operations as it may affect the proposed conveyor or one of the limestone hauling action alternatives under consideration.

GCC Dacotah plans to mine approximately 4,000 tons of limestone per day for 250 days per year for a total of about one-million tons of limestone per year. The limestone to be mined is approximately 40 to 50 feet thick, and therefore, mining activities would be limited to about 10 new acres of quarry per year. Reclamation would be concurrent with mining operations and GCC Dacotah envisions that only 20-30 acres would remain unreclaimed at any one time. Limestone quarrying operations are expected to occur over about 8 to 10 hours per day, five days per week. Limestone would be transported from the quarry to the rail load-out facility and shipped as described in the Proposed Action and Action Alterative sections above.

GCC Dacotah would consider visual quality and set-backs from canyon walls or rims within the mining area. A mine reclamation plan would be required as part of the final mine permit application approval process.

Preferred Alternative

Alternative A, the Proposed Action is the preferred alternative.

Compliance with Agency Plans

Surface disturbing activities on BLM and National Forests require an analysis and decision process consistent with the applicable land use plan, in this case, the South Dakota Field Office's Resource Management Plan (1984) and the Black Hills National Forest Forest Plan as amended (2001 and 2005).

The actions were reviewed and it was determined that all standards, guidelines, goals, objectives, and management actions would be met by implementation of any of the alternatives.

Table S-2
Comparison of Effects by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Transportation and Public Safety				
-Disturbance	6.6 miles	0 miles	7.9 miles	7.2 miles
-Public Safety	No impact	None	Increase risk of accidents (.7 annually) due to mixed traffic (166 trips/day) on 7.1 miles of county road during operations.	sLow risk on construction of remaining 5.7 miles of private road with limited public access. Increase risk of accidents due to mixed traffic (166 trips/day) on 1.5 miles of county road during operations.
Land Ownership and Land Use Authorizations	No effect on ownership patterns and existing land uses. Granting the ROW and special use permit creates a new occupancy on the land. Requires coordination with existing utilities during construction.	No impacts	No effect on ownership patterns and existing land uses. Creates a need for BLM ROW and changes in existing FS easement for reconstruction of county road. Requires coordination with existing utilities during road reconstruction and maintenance.	Same as Alternative C.
Air quality	Minor impacts from fugitive dust during construction. Increase in vehicle emissions during construction.	No Impacts	Increase in vehicle emissions and increase in dust during construction and operation.	Same as Alternative C.
Geology and Paleontology				
-Geology	Limited excavation and relocation	No Impact	Same as Alternative A.	Same as Alternative A.
- Paleontology	No Impact	No Impact	No Impact	No Impact
Soils	16 acres permanently disturbed (2.7 BLM, 3.0 FS, 10.3 GCC Dacotah)	0 Acres disturbed	17.2 acres permanently disturbed (2.9 BLM, 3.3 FS, 11 GCC Dacotah)	27.8 acres permanently disturbed (4.7 BLM, 5.3 FS, 17.8 GCC Dacotah)
Vegetation				

Table S-2
Comparison of Effects by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
- Weeds	Potential to introduce weeds on 16 acres (2.7 BLM, 3.0 FS, 10.3 GCC Dacotah)	No Impact	Potential to introduce weeds on 17.2 acres (2.9 BLM, 3.3 FS, 11 GCC Dacotah)	Potential to introduce weeds on 27.8 acres (4.7 BLM, 5.3 FS, 17.8 GCC Dacotah)
- Wetlands	No impact	No impact	No impact	No impact
Wildlife disturbance (noise, dust, and collisions)	No long term permanent disturbance	No Disturbance	Long term permanent disturbance from traffic (166 trips/day)	Long term permanent disturbance from traffic (166 trips/day)
Special Status Species				
- T&E	No Effect	No Effect	Same as Alternative A.	Same as Alternative A.
- Sensitive	May Impact*	No Impact	Same as Alternative A.	Same as Alternative A
Grazing Management	Improved grazing access, increased grazing pressure near conveyor structures	No effect	Improved grazing access and increased risk of vehicle collision with livestock.	Same as Alternative C.
Water Resources	Estimated water use of 30,000 gallons per day during construction. 2 million gallons of water per year for dust abatement in the conveyor	No impact	Estimated water use of 60,000 gallons per day during construction. 6 million gallons of water per year for dust abatement on the road.	Same as Alternative C.
-Water quality	Minimal impact from suspended sediment, regulated by stormwater permit.	No Impact	Minimal impact from suspended sediment, regulated by stormwater permit.	Minimal impact from suspended sediment, regulated by stormwater permit.
Social and Economic Conditions				
-Population	Up to 25 additional people in local population	No impact	Same as Alternative A	Same as Alternative A
-Employment	50 workers for construction, 12 workers for the mining and maintenance.	No impact	50 workers for construction, 20 workers for the mining, hauling, and maintenance.	Same as Alternative C

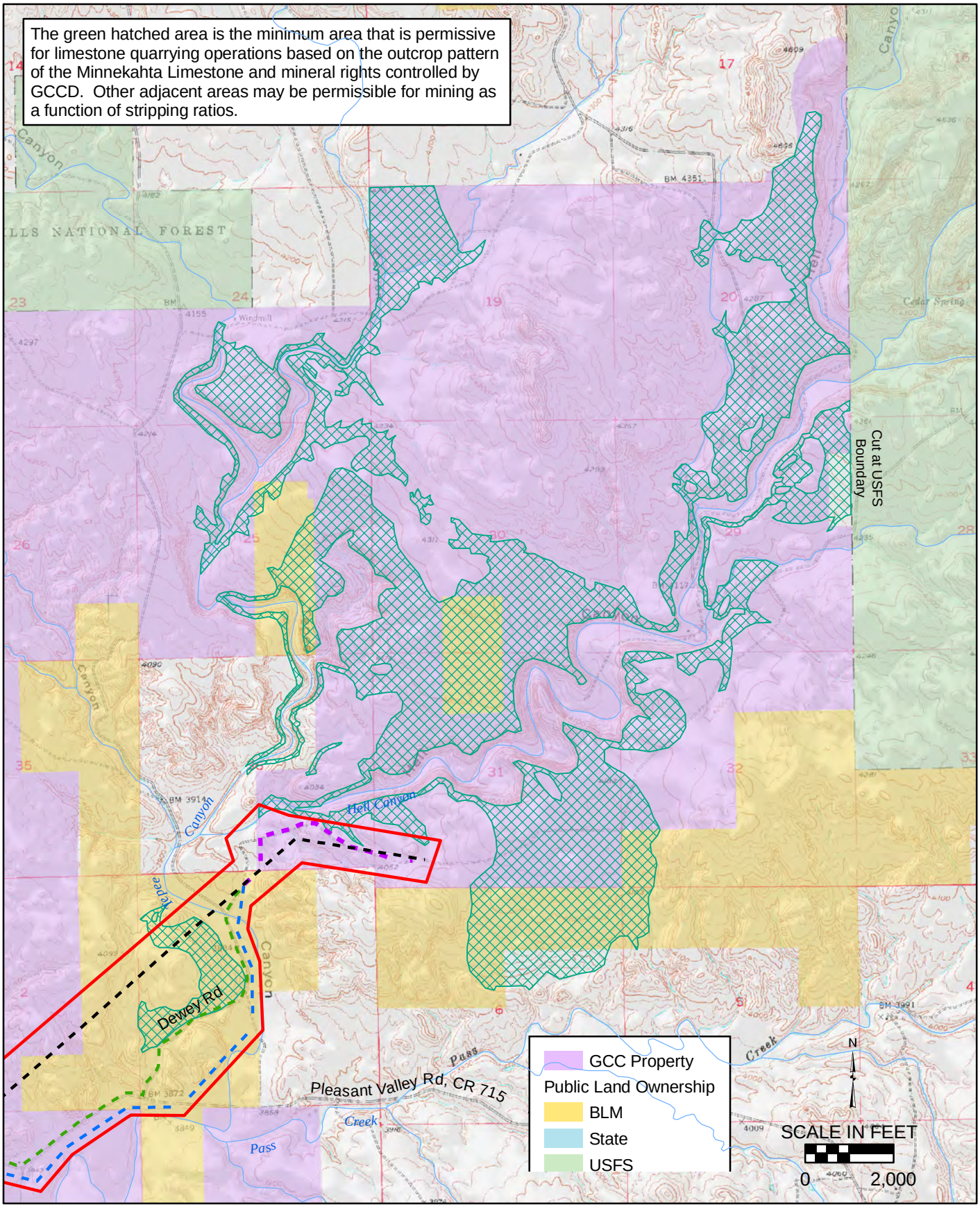
Table S-2
Comparison of Effects by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
-Housing	No Impact	No Impact	No Impact	No Impact
-Local Government Services	Small increases in services required, few new students	No Impact	Same as Alternative A	Same as Alternative A
-Taxes	Small increase in tax revenue	No impact	Same as Alternative A	Same as Alternative A
Environmental Justice	No impact	No impact	No impact	No impact
Noise (L_{dn} 50 dBA)	Would meet EPA noise guidelines. Within 115 feet of drive motor on the conveyor or 40 feet of conveyor, or 1,050 feet of rail loadout facility people would notice an increase in noise. The town of Dewey is 6,800 feet distant, therefore, no impact anticipated.	No impact	Would meet EPA noise guidelines. Within 1,370 feet of haul road people would notice an increase in noise from the haul road. The town of Dewey is 1,056 feet from haul road.	Same as Alternative C.
Visuals	Elevated lineal structure. Viewing distance dependent on reflectivity and color. The most obvious visual impact would be where the conveyor is close to or crossing the Dewey Road. SIO would be met.	No impacts	Haul road feature flat and low-lying. SIO would be met.	Same as Alternative C, except a new road also visible from Dewey road. SIO would be met.
- Dust	Fugitive dust from rail loadout facility	No impact	Fugitive dust from hauling and the loadout facility.	Fugitive dust from hauling and the loadout facility.
- Lighting	No impact	No impact	No impact	No impact
Cultural Resources	No NRHP eligible site affected. Two sites have not had eligibility tested.	No Impact	One NRHP potentially affected. Others could be located when surveys completed. One site has not had eligibility tested.	One NRHP potentially affected. Others could be located when surveys completed. Two sites have not had eligibility tested.

Table S-2
Comparison of Effects by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Hazardous Materials	Low risk of spills, low impacts from spills.	No additional impact	Slightly higher risk of spills than Alternative A, low impact from spills.	Slightly higher risk of spills than Alternative A, low impact from spills.

* May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.



Minnekahta Limestone Outcroppings
Conveyor Project Area
Proposed Conveyor Right-of-Way
Alternative C Haul Road
Alternative D Haul Road
Alternative C and D Common Segments

September 2008

Figure S-2

Connected Action

Custer County, South Dakota

Dewey Conveyor Belt Project

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LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
ANFO	Ammonium nitrate fertilizer and fuel oil
APE	Area of Potential Effects
ARSD	Administrative Rules of South Dakota
BEA	Bureau of Economic Analysis
bgs	below the ground surface
BHM	Black Hills Meridian
BHNF	Black Hills National Forest
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	Best Management Practices
C	centigrade
CDP	Census-designated Place
CEQ	Council on Environmental Quality
cfs	cubic feet per second
cm	centimeter
CO	carbon monoxide
Co.	County
dB	unit used to measure sound
dBA	sound pressure level in dB
DENR	Department of Environment and Natural Resources
DWP	Drinking Water Program
E	East
EAC	Early Action Compact
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Planning and Management Act
FRTA	Forest Road and Trail Act
FS	Forest Service
FTA	Federal Transit Administration
g	acceleration due to gravity

GCC Dacotah	GCC Dacotah, Inc.
GIS	Geographic Information Systems
gpm	gallons per minute
km	kilometer
L	liter
LRMP	Land and Resource Management Plan
m	meter
mg	milligrams
mi	mile
MIS	Management Indicator Species
N	nitrogen
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFSR	National Forest System Road
NHPA	National Historic Preservation Act
NO2	nitrogen dioxide
NOI	Notice of Intent
NOA	Notice of Availability
NOx	oxides of nitrogen
NPS	Non-Point Sources
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historical Places
NWI	National Wetlands Inventory
OMB	Office of Management and Budget
Pb	lead
PCI	per capita income
pH	negative log of hydrogen activity (measure of acidity)
PK	Pre-kindergarten
PM_{10}	particulate matter smaller than 10 microns
$PM_{2.5}$	particulate matter smaller than 2.5 microns
ppm	parts per million
PWS	Public Water Supply
R	Range
RMP	Resource Management Plan

ROI	region of influence
ROW	Right of Way
SD	South Dakota
SDDLA	South Dakota Department of Legislative Audit
SDDOE	South Dakota Department of Education
SDGAP	South Dakota Gap Analysis Program
SDGFP	South Dakota Department of Game, Fish, and Parks
SDWA	Safe Drinking Water Act
SDDORR	South Dakota Department of Revenue and Regulation
SIO	Scenic Integrity Objectives
SO2	sulfur dioxide
SOC	Synthetic Organic Chemicals
SOLC	Species of Local Concern
SPCC	Spill Prevention, Control, and Countermeasures Plan
sq mi	square miles
std	standard
SW	southwest
SWPP	Storm Water Pollution Prevention Plan
T	Township
TER	Technical Evaluation Report
TMDL	Total Maximum Daily Loads
TVA	Tennessee Valley Authority
UBC	Uniform Building Code
ug	micrograms
uohms	micro ohms
US	United States
USCB	United States Census Bureau
USCOE	United States Core of Engineers
USDA	United States Department of Agriculture
US Forest Service	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V	volt
VMS	Visual Management System

VOC	Volatile Organic Chemicals
VP	View Points
VQO	Visual Quality Objectives
VRM	Visual Resource Management
W	West
WMA	Wyoming Mining Association
WRCC	Western Region Climate Center
WY	Wyoming
yrs	years

CHAPTER 1
PURPOSE AND NEED

1.1 Introduction

GCC Dacotah, Inc. (GCC Dacotah) seeks approval of an Application for Transportation and Utility Systems and Facilities on Federal Lands that requires issuing a right-of-way (ROW) and a special use permit to cross federal lands associated with the construction of a 6.6 mile long conveyor near Dewey, South Dakota (the Dewey Conveyor Project) (**Figure 1-1**).

The legal description of the project area includes portions of:

- T5S, R1E, Sections 36
- T6S, R1E, Sections 1, 2, , 9, 10, 11, 12, 15, 16, 17, 18,19, and 20
- T5S, R2E, Sections 31

The proposed route for the conveyor crosses Bureau of Land Management (BLM)-administered public lands, US Forest Service administered National Forest System lands and GCC Dacotah privately owned land (**Figure 1-2**). The activities on BLM and National Forest require an analysis and decision process consistent with the National Environmental Policy Act; resulting in this environmental impact statement (EIS).

The BLM is the lead agency. The Forest Service is a cooperating agency.

1.2 Background

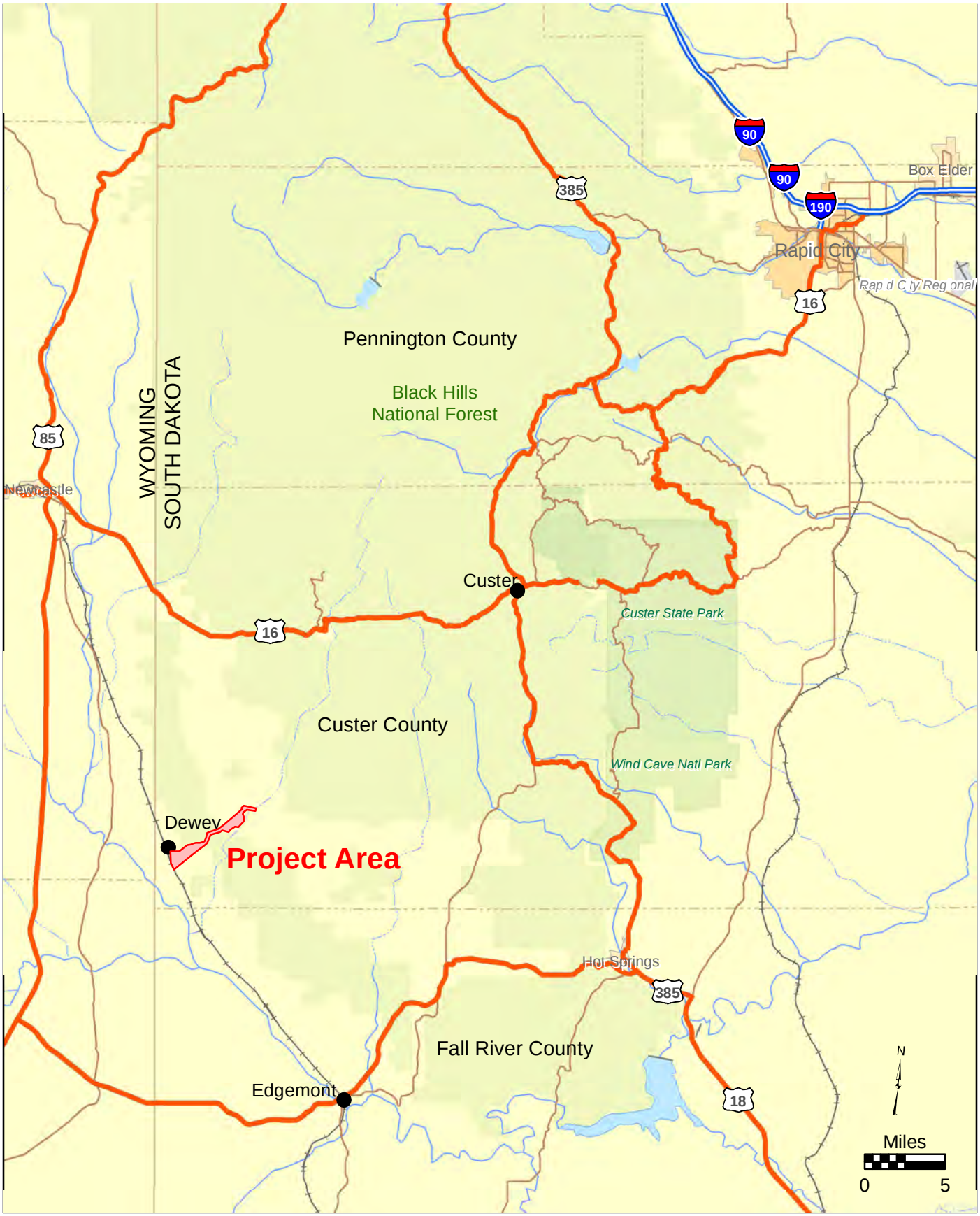
GCC Dacotah, Inc currently owns and operates a limestone quarry and an adjacent cement production facility located in Rapid City, South Dakota. This facility has an annual cement production capacity of approximately 950,000 tons. GCC Dacotah sells its products in nine western states, distributing it through a network of terminals located South Dakota, Wyoming and Colorado. The location of the Rapid City plant is critical to GCC Dacotah western US business model with the established processing facility (plant and kilns) being located close to its quarrying operations. Rapid City is also a transportation-distribution hub that is located central to GCC Dacotah's markets. Mineable limestone reserves for use as mill-feed for its cement plant are limited at the Rapid City quarry location, and therefore, GCC Dacotah must identify new off-site mining reserves in order to continue producing cement into the future. Limestone reserves need to be located in geologically favorable areas and their economics evaluated many years (often even one or two decades or more) in advance of their actual use in order to ensure a continuous supply of limestone-feed for cement manufacture.

Although new processing facilities could be constructed at the site of newly identified mineable limestone reserves, the construction of new cement processing facilities is time consuming, costly, and permitting can often be difficult. Therefore, cement producing companies typically look for new limestone mining reserves near their existing processing facilities that are also located along major transportation corridors. Transportation by rail to the processing facility is particularly desirable in order to minimize the cost of shipping the large volumes of limestone required.

GCC Dacotah has located a limestone deposit several miles north of Dewey, South Dakota in a geologically favorable area where the Minnekahta Limestone lies at, or close enough to the surface to make mining economically feasible. The town of Dewey is located along an existing rail transportation corridor.

The land proposed for mining is mostly private property, largely owned by GCC Dacotah; and, a much smaller portion is owned by the federal government, and administered by the Bureau of Land Management (BLM). GCC Dacotah has no near-term intention to mine on lands for which the federal government owns the surface; and a proposal to do so would require NEPA analysis of the proposed mining operation by the agencies involved in accordance with federal regulations.

Within the area proposed for mining, all of the mineral rights are controlled by GCC Dacotah



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September 2008

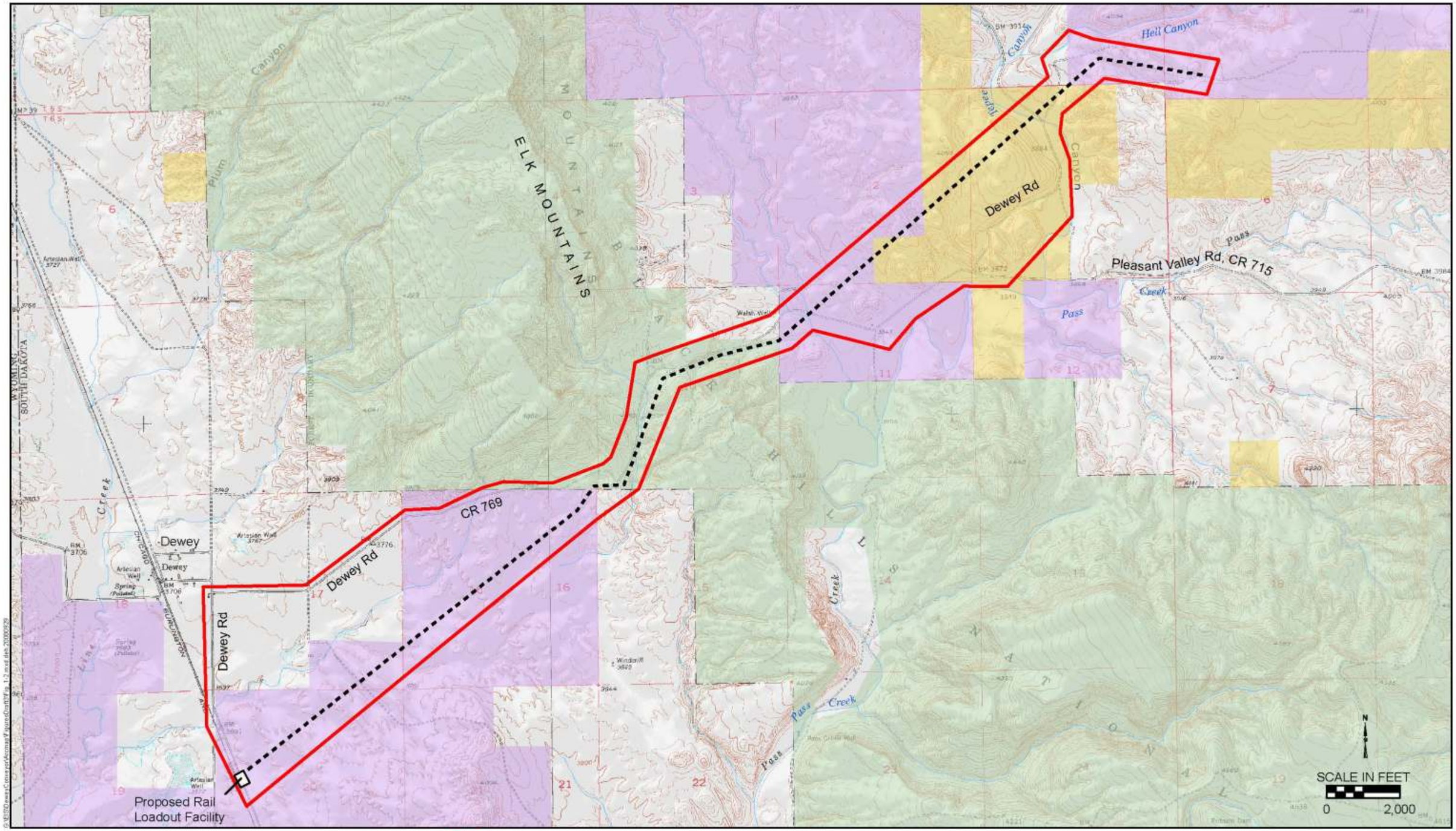
Project Area

Figure 1-1

Location Map

Custer County, South Dakota

Dewey Conveyor Belt Project



Conveyor Project Area
Proposed Conveyor Right-of-Way

GCC Property
Public Land Ownership
BLM
State
USFS

September 2008

Figure 1-2
Project Map
Custer County, South Dakota
Dewey Conveyor Belt Project

either by direct ownership or leasing on privately-owned lands, or alternatively have been acquired by the staking of mining claims on lands underlain by federally-owned mineral rights. Within these areas of federally–owned mineral rights, a statutory right to prospect, explore, develop and mine certain minerals, including limestone, can be acquired from the federal government by the staking of mining claims, such as GCC Dacotah has done, under authority and guidelines established by the *General Mining Law of 1872*, as amended.

GCC Dacotah also has a license to mine limestone in the state of South Dakota that was issued by the South Dakota Department of Environment and Natural Resources (DENR). In South Dakota, a mining license may be used to cover any number of mining sites. In order to mine at additional sites, an operator only needs to publish a *Notice of Intent to Mine*, notify the appropriate government agencies, and submit additional reclamation surety. GCC Dacotah has filed with the DENR a *Notice of Intent to Mine* limestone at the location described above and has also published the *Notice of Intent to Mine* in local newspapers in order to allow the public to comment on the proposed mining operation. The *Notice of Intent to Mine* received no public comments. GCC Dacotah has also submitted a statewide reclamation surety to cover all of its operations throughout the state. Therefore, GCC Dacotah is authorized by the State to proceed with mining at the site.

Under the guidelines discussed above, GCC Dacotah has a right either by ownership or leasing of existing privately held mineral rights, or statutorily by the staking of mining claims over areas of privately- owned surface rights underlain by federally owned mineral rights, to mine mineral deposits underlying these properties. In addition, GCC Dacotah has a license from the state of South Dakota and has completed the requirements for state approval to mine the deposits. Therefore, there are no legal or regulatory impediments to GCC Dacotah's mining the limestone.

In reviewing the options for its need to transport limestone from the proposed mine-site to the rail transportation corridor near the town of Dewey, GCC Dacotah determined that there were a number of potential problems associated with hauling limestone by truck along the existing county road including; public safety along the road resulting from the extensive use by haul traffic; road maintenance; and environmental issues related to noise, dust and potential risks of mortality to livestock and wildlife. This led GCC Dacotah to propose the construction of a 6.6 mile long conveyor between the proposed mine site and a newly proposed rail load-out facility south of Dewey. Although most (4.1 miles) of the proposed construction corridor for the conveyor would be on land privately owned by GCC Dacotah, segments of the proposed conveyor corridor would need to cross approximately 1.0 mile of BLM lands and 1.4 miles of National Forest. Therefore, GCC Dacotah submitted an Application for Transportation and Utility Systems and Facilities on Federal Lands to provide legal access across these federal lands. The results of submitting this Application are described under the Purpose and Need (Section 1.3).

1.3 Purpose and Need

GCC Dacotah has submitted an Application for Transportation and Utility Systems and Facilities on Federal Lands in order to accommodate their need to construct a proposed conveyor system across federal lands to transport mined limestone from a quarry to a rail load-out facility south of the town of Dewey, both of which are located on GCC Dacotah privately owned lands. If the transportation corridor is approved a ROW grant for BLM lands and a special use permit for National Forest are both required for access across federal lands.. The "agency action" in this case is the approval of the Application and granting of the ROW (BLM) or special use permit (Forest Service).

1.4 Management Direction

1.4.1 BLM Resource Management Plan

Management of public lands by the BLM is governed by the Federal Land Policy and Management Act of 1976 (FLPMA)(43 U.S.C. 1701 et. seq.). FLPMA directs the preparation of resource management plans (RMPs) that are used as a guide to land management for specific resource areas. The South Dakota Resource Area RMP (1987) states:

"Rights-of-way applications will continue to be approved on a case-by-case basis…rights-of-way are issued under the Mineral Leasing Act of 1920 for activities associated with minerals development and under Title V of FLPMA for all other development. Applicants are encouraged to locate new facilities within existing rights-of-ways where possible." and "Public lands are open and available for mineral exploration and development unless withdrawn or administratively restricted. Mineral development may occur along with other resource uses. Programs to obtain and evaluate current energy and mineral data are encouraged".

The proposed Dewey Conveyor Project and alternatives have been reviewed for compliance with BLM policies, plans, and programs and the proposal conforms to mineral and ROW policies of the South Dakota Resource Area, Resource Management Plan (1987).

1.4.2 Black Hills Forest Plan

Goals, objectives, standards and guidelines for management of the National Forest are presented in the 1997 Land and Resource Management Plan for the Black Hills National Forest, as amended (Black Hills National Forest Plan, as amended, 2005). The Forest Plan was prepared to meet the National Forest Management Act of 1976.

The Forest Plan as amended (2005) assigns a management emphasis to each portion of the Forest to meet overall multiple-use objectives. For each designated management area (MA), the Forest Plan as amended (Chapter 3) includes a description of the desired future condition, goals, objectives, standards, and guidelines for the management area. National Forest land in the Dewey Conveyor project area is included in the Management Area 5.1A Southern Hills Forest and Grassland Area. The Forest Plan as amended contains broad goals including Goal 3: Provide for sustained commodity uses in an environmentally acceptable manner; Goal 7: Emphasize cooperation with individuals, organizations and other agencies while coordinating planning and project implementation; and Goal 8: Promote rural development opportunities. The proposed use would fall under special use code number 771, conveyor, and would be permitted by the Forest Supervisor under the authorities provided in the Federal Land Policy and Management Act (FLPMA).

The proposed Dewey Conveyor Project and alternatives have been reviewed for compliance with National Forest policies, plans, programs, guidelines and objectives and the proposal conforms to policies of the Forest Plan.

1.4.3 Regulatory Responsibilities

A number of federal, state and local agencies have jurisdiction over certain aspects of the proposed action. **Table 1-1** provides a listing of these agencies and their respective permitting and authorizing responsibilities.

1.5 Proposed Action

GCC Dacotah seeks approval of an Application for Transportation and Utility Systems and Facilities on Federal Lands requiring a 100-foot wide right-of-way (ROW) for a conveyor crossing 1.1 mile of lands administered by BLM, and a special use permit for the conveyor to cross 1.4 miles of National Forest land (**Figure 1-2**). The conveyor would also cross other private land owned by GCC Dacotah. GCC Dacotah is proposing to construct the enclosed, 6.6-mile long conveyor belt to transfer limestone from a new quarry site, southwest to a new rail load-out facility along an existing rail line near Dewey, SD. Both the quarry and the rail load-out facility are proposed to be located on GCC Dacotah's privately owned land.

The proposed action includes an elevated, enclosed conveyor belt, a one lane service road and access points. On level ground, the elevated conveyor would be about 16-feet high, and would provide approximately nine feet of vertical clearance beneath the structure. Constructed support structures would be required at intervals of 25 to 40 feet depending on the terrain. GCC Dacotah has requested a 200 year ROW grant or permit for their year-round operation, however, a ROW grant from the BLM can only be granted for 30 years, therefore, the proposed action includes a 30 year ROW. Near the expiration date of the ROW, an extension will likely be requested.

Table 1-1 Regulatory Responsibilities	
Authorizing Action	**Regulatory Agency**
Rights of Way	Bureau of Land Management (BLM)
Special Use Permit	US Forest Service
National Environmental Policy Act	BLM / Forest Service
National Historic Preservation Act	BLM / Forest Service
Native American Graves Protection and Repatriation Act	BLM / Forest Service
American Indian Religious Freedom Act	BLM / Forest Service
Clean Water Act (Section 404)	United States Army Corps of Engineers, South Dakota Department of Environment and Natural Resources (DENR)
Air Quality Permit	South Dakota DENR
Mining License	South Dakota DENR
Endangered Species Act of 1973	United States Fish and Wildlife Service (USFWS)

1.5.1 Decisions to be made

BLM and Forest Service will decide whether or not to approve the Application for Transportation and Utility Systems and Facilities on Federal Lands and grant a 100-foot wide ROW for a conveyor crossing and grant a ROW and a special use permit.

If BLM and Forest Service decide not to approve the Application for Transportation and Utility Systems and Facilities on Federal Lands and grant the ROW and special use permit, they will need to choose another alternative, and mutually agree to the deny the application, or to approve the construction of a new road, or reconstruction of the County Road.

BLM and Forest Service will decide whether stipulations or mitigation will be attached to the ROW grant and special use permit.

CHAPTER 2
ALTERNATIVES

2.1 Introduction

This chapter discusses the scoping process, the alternatives considered in the EIS and how they were developed. Additionally, it provides a comparison of activities and effects of the alternatives considered in detail, and finally, the preferred alternative is identified.

2.2 Scoping

The purpose of scoping is to identify public concerns, agency concerns, and information sources to be used in developing alternatives and conducting effects analysis. The process of "Scoping" is defined by NEPA implementing regulations promulgated by the Council on Environmental Quality (CEQ, Regulation 1501.7) as "… an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action."

Once a description of the proposed action was developed, scoping meetings were held and comments collected to identify issues and develop alternatives needing to be considered in the analysis. In addition, the BLM and Forest Service discussed the project, and identified resource issues that needed to be analyzed based on applicable laws, regulations, and information they have on the project area. The public involvement process and outcome is documented in a Scoping Report (Tetra Tech 2008) (available in the administrative record at the BLM South Dakota Field Office) and is summarized below.

2.2.1 Scoping Summary

The BLM published a Notice of Intent (NOI) to prepare an environmental impact statement on October 2, 2007 in the Federal Register. Publication of the NOI began a 60-day public comment period. The comment period was further extended to January 11, 2008 to extend the time available to the public to submit project related comments. BLM provided a website with project information that also described the various methods of providing public comment on the proposed action including an e-mail address where comments could be sent electronically.

Four public meetings in towns near the project area were scheduled to facilitate information exchange and gather public comments regarding the proposed Dewey Conveyor Project. Meeting locations and times were reported in five local and regional newspapers including one in Wyoming, along with instructions as to the various methods for providing public scoping comments. Meetings were held in Edgemont, SD on November 5th, Custer, SD on November 6th, Newcastle, WY on November 7th, and Dewey, SD on December 3rd, 2007. Fifty-one attendees were documented by signing in on a voluntary sign-in sheet at the respective public meetings

The public meetings used an "open house" format. Information on the project was provided on poster boards showing the purpose and need, location (including 2 maps), a list of preliminary issues identified by the agencies, and photographic simulations of the proposed conveyor belt. Representatives from BLM, Forest Service, and GCC Dacotah were on hand to provide additional information and discuss the project with attendees. Comment forms were provided at the meetings, along with information on other ways to provide comments during the scoping process. Ten written comment letters or forms were received.

2.2.2 Issues

Comments were paraphrased, analyzed and sorted into categories by issue, which include:

- alternative development issues (issues that require an alternative be developed to fully resolve the issue);
- issues that can be addressed through alternative design criteria and/or mitigation;
- issues or concerns that will be analyzed in the effects analysis; and
- issues that are outside the scope of the EIS.

2.2.2.1 Alternative Development (Key Issues)

These issues were used in the development of alternatives.

- The physical appearance of the conveyor on the landscape as viewed from private land or the roadway.
- Public safety concerns due to mixed use traffic on the county road for hauling limestone.

Alternative Design Criteria and Mitigation Measures

Comments assigned to this category can be addressed through design criteria in the alternative descriptions or through mitigation measures developed to reduce impacts or protect resources.

- Describe the obligatory relationship that the federal government shares with Tribal Nations and the American public.
- Document how the proposed project will meet federal laws that require the preservation of important historic, archeological, and cultural aspects of our national heritage.
- Avoid displacement of Native American cultural resources.
- There may be historic Indian campsites with many teepee rings in the conveyor route.
- Describe how the impacts of dust will be monitored.
- Make the conveyor high enough to allow fire fighting equipment to pass underneath it.
- Make the conveyor high enough to allow livestock to pass underneath it.
- Document guarantees to protect the pristine area (mining area).
- Describe the daily use of the conveyor.
- Describe how the scenic vistas of the Canyon will be protected.
- Address concerns regarding trespass on private property adjacent to the project area.

2.2.2.2 Effects Analysis

Comments assigned to this category are described in detail in the affected environment section of the EIS and/or addressed in the effects analysis for each alternative.

Air Quality

- Analyze the impacts of trucking or otherwise transporting the limestone to the load-out facility on air quality.
- Analyze the impact the future quarry will have on air quality.
- How much dust will be generated?
- How much dust will be generated in Dewey at the rail spur?
- Analyze the impacts of dust. Will dust be worse with more traffic?

Tax or Property Value Assessment

- What agency would assess the real estate values?

Project Cost

- What is the cost of the project in today's dollars?

Social and Economic Impacts

- What are the long term economic effects on the community?
- How many people will be employed in the short and long term?
- How will property values and taxes change?
- How would this property be classified (for tax purposes), real estate or other?
- How many potential workers with school age children will reside in the school district?
- Would the tax burden of individuals change in the area with taxation of this project?
- How will the conveyor system be taxed?

- Will road maintenance costs increase and raise taxes?

Effects During Construction

- How will the environment be affected during construction and over the long term?
- Noise
- How much noise will be generated?
- What will the noise level be in Dewey associated with the rail spur.
- What noise will be generated by trucking or otherwise transporting the limestone to the load-out facility?
- Noise from the train is bad enough.

Private Property

- Analyze issues regarding trespass on private property adjacent to the project area.

Public Safety

- What will be the impacts on the health of humans, livestock, wildlife, streams, and wetlands from dust?

Rail Load-Out Facility

- The rail load-out facility is a connected action and should be analyzed as such in the DEIS.

Threatened and Endangered Species

- Analyze the impacts of trucking or otherwise transporting the limestone to the load-out facility on threatened and endangered species.

Transportation

- How would the conveyor affect road access and other roads in the area?
- Custer County cannot keep up with road maintenance now, so with more traffic, including heavy equipment, the roads in this area will worsen. The wash boards and ice (in winter) are a continual problem.
- Fire equipment, livestock, people, wildlife, ranch equipment all need to pass freely as they do now.

Visuals

- The conveyor would be an eyesore compared to the natural landscape.
- What will be the impact on visual quality of the natural area from this project?
- What will be the impact on visual quality from the future quarry?
- What is the long term effect on the landscape and how will the conveyor fit in?
- Canyon Beauty should remain intact.
- Residents do not want the view from their land ruined - nor do they want their property value lower because of the production of cement - whatever it may be.
- Object to the physical appearance of the conveyor.
- Move conveyor and crusher to the west side of the BLM property.

Water

- How much water would be required and where would it come from for the operation?
- What will be the impact of trucking or otherwise transporting the limestone to the load-out facility on ground and surface water?
- What will be the impact of the future quarry on water quality and the effects of diesel fuel and ammonium nitrate on ground water quality? Note: this issue will be analyzed as either a connected action or a cumulative effect.
- Residents live in a dry area and concerns that their ranches already rely on inadequate wells, so water is a very real issue.
- Residents do not welcome a large enterprise coming in to take water, or lower the water table, water that is so necessary to ranchers.

Wetland and Riparian Areas

- What will be the impact of trucking or otherwise transporting the limestone to the load-out facility on wetlands and riparian areas?

Wildlife

- What will be the impact that the future quarry will inflict on wildlife? Note: this issue will be analyzed as either a connected action or a cumulative effect.

2.3 Alternatives Studied In Detail

Based on key issues and NEPA requirements, four alternatives were studied in detail. They are:

- The proposed action is Alternative A
- The no action alternative is described as Alternative B. Under this alternative the proposed action of granting the ROW and special use permit would not be approved.
- An alternative that would use trucks along existing county roads to move limestone from the quarry to the rail load-out is described as Alternative C; and
- An alternative that would construct new haul roads along most of the ROW and use some existing roads is described as Alternative D.

2.3.1 Alternative A - Proposed Action

GCC Dacotah seeks approval of an Application for Transportation and Utility Systems and Facilities on Federal Lands. Approval of the Application would require granting a 100-foot wide ROW for a conveyor crossing 1.1 miles of lands administered by BLM, and issuing a special use permit for the above-ground conveyor to cross 1.4 miles of National Forest land (**Figure 1-2**). The conveyor would also cross other private land owned by GCC Dacotah. The ROW and permit would include associated roads to access the proposed conveyor route for construction and maintenance purposes. GCC Dacotah is proposing to construct the enclosed, above-ground 6.6-mile long conveyor to transfer limestone from a new quarry site, southwest to a new rail load-out facility along an existing rail line near Dewey, SD. Both the quarry and the rail load-out facility are proposed to be located on GCC Dacotah's privately owned land.

The proposed action includes an elevated, enclosed conveyor belt, a one lane service road and access points. On level ground, the elevated conveyor would be about 16-feet high, and would provide approximately nine-feet of vertical clearance beneath the structure. Constructed support structures would be required at intervals of 25 to 40 feet depending on terrain. The proposed conveyor system can move about 1,500 tons per hour and would, therefore, only need to operate about 2.5 to 3 hours per day. However, limestone may be stockpiled at the mine providing for longer periods of operation of the conveyor at more intermittent periods. At the rail load-out facility limestone will be stockpiled in a storage dome with a capacity of about 30,000 tons (about 7 days of mining at 4,000 tons per day). Limestone will be likely shipped out of the rail load-out facility in trains of 60 to 100 cars to processing facilities in Rapid City. Each rail car has a capacity of 100-tons (6,000 to 10,000 tons per train) representing 1.5 to 2.5 days of mining, requiring about 8 to 13 trains per month. Forty railcars could be loaded in 5 to 7 hours. GCC Dacotah has requested a 200 year ROW grant or permit for their year-round operation.

GCC Dacotah estimates the project would cost about $7 million to construct (2007 value).

The Proposed Action includes the following design features:

- An extensive, site-specific evaluation of cultural resources in the project area has been performed. Should any further sites be discovered during the construction, adequate actions governing training, notification and response would be established and required. GCC Dacotah would develop and put in place appropriate protocols to ensure proper identification, notification and treatment.
- All necessary state and federal air quality and reclamation permits governing mitigation of fugitive dust emissions would be obtained. Additional dust control measures may be used, as necessary,

including optimized operational and construction practices or the use of water sprays and surfactants.

- The conveyor would be designed and constructed to provide emergency vehicle and ranch equipment access locations beneath the conveyor on National Forest or BLM lands.
- The conveyor would be designed and constructed to allow both livestock and wildlife to freely and adequately cross beneath.
- All mining operations would be conducted in accordance with all State mining regulations. GCC would consider "special areas" that could be avoided in the mining operations.
- Cost effective means to mitigate the visual impact of the proposed conveyor would be evaluated and used.
- The conveyor would be constructed on GCC Dacotah deeded property, BLM land and National Forsest System lands. Adequate signage would be posted to prevent any potential trespass by GCC Dacotah employees or invitees. GCC would also train all employees and others regarding property boundaries.
- Surveys would be conducted for sensitive plants. If sensitive plants would be adversely affected by the conveyor or access roads, the roads or conveyor would be moved where possible to avoid the effect.
- Security lights would be shielded, and night lighting applications would be covered so as to illuminate the local work area only.

2.3.2 Alternative B – No Action

Under the No Action alternative the proposed action to grant a ROW or issue a special use permit along which to construct a conveyor system would not be approved.

2.3.3 Alternative C – Trucking on Existing County Road

This alternative was developed to address the issue of the visual impacts from the conveyor by finding a feasible alternative to transporting limestone without the conveyor.

As discussed in the Background (Section 1.2) above, GCC Dacotah controls the mineral rights, owns the surface in the area currently proposed for mining and also has a license from the state of South Dakota with approval to mine the limestone deposits. Therefore, there are no legal or regulatory impediments to GCC Dacotah's mining of the limestone. GCC Dacotah believes that if it were to decide to truck limestone from the proposed mine area to the proposed rail load-out facility (both located on its own private land) it could do so along the existing county road. This could only occur on federal lands, if no modification to the existing road requiring reissuing of the existing special use permit or changes to the existing prescriptive easement were required.

This alternative to the proposed action would include hauling limestone by truck from the mine quarry to the proposed railroad load-out facility on 7.1 miles of the existing county road and 0.8 miles of new road (on BLM and private lands) for a total length of 7.9 miles. Alternative C envisions the use of 25-cubic yard haul trucks with 12-cubic yard double axle pup-trailers; containing a total of about 37 cubic yards of material per truck (or 48 tons per truck at 1.3 tons per cubic yard). Therefore, it would require about 83 round trips per day to haul the anticipated 4,000 tons of limestone mined per day to the rail load-out facility (or approximately one truck every three minutes of an eight hour haul day).

This alternative would require straightening the existing road alignment and widening the road for public safety and use by haul trucks. This alternative would also require a ROW grant from the BLM and a new special use permit from the Forest Service for the road re-alignment work.

Alternative C includes the following design features:

- An extensive, site-specific evaluation of cultural resources in the project area has

been performed. Should any further sites be discovered during the construction, adequate actions governing training, notification and response would be established and required. GCC Dacotah would develop and put in place appropriate protocols to ensure proper identification, notification and treatment.

- All necessary state and federal air quality and reclamation permits governing mitigation of fugitive dust emissions would be obtained. Additional dust control measures may be used, as necessary, including optimized operational and construction practices or the use of water sprays and surfactants.
- All mining operations would be conducted in accordance with all State mining regulations. GCC would consider "special areas" that could be avoided in the mining operations.
- Adequate signage would be posted to prevent any potential trespass by GCC Dacotah employees or invitees. GCC would also train all employees and others regarding property boundaries.
- Surveys would be conducted for sensitive plants. If sensitive plants would be adversely affected by the roads, the roads would be moved where possible to avoid the effect.

2.3.4 Alternative D – Trucking Along ROW Corridor

As in Alternative C, this alternative was developed to address the issue of the visual impacts from the conveyor by finding a feasible alternative to transporting limestone without the conveyor. In addition, this alternative would address the issue of public safety caused by mixed use (heavy haul trucks and passenger vehicles) by reducing the length of the county road used.

An alternative has been identified where limestone is hauled by truck from the mine quarry to the proposed railroad load-out facility on a new road, where feasible, to decrease the effect on the county road. The haul route will cross US Forest Service and BLM land. Total road length required is about 7.2 miles including approximately 5.7 miles of new road and 1.5 miles of existing, but reconstructed county road in the pass area. Trucking would take place as described under Alternative C.

This alternative would require straightening the existing county road alignment and widening the road for public safety and use by haul trucks.

This alternative would also require a ROW grant from the BLM and a new special use permit from the Forest Service.

Alternative D includes the following design features:

- An extensive, site-specific evaluation of cultural resources in the project area has been performed. Should any further sites be discovered during the construction, adequate actions governing training, notification and response would be established and required. GCC Dacotah would develop and put in place appropriate protocols to ensure proper identification, notification and treatment.
- All necessary state and federal air quality and reclamation permits governing mitigation of fugitive dust emissions would be obtained. Additional dust control measures may be used, as necessary, including optimized operational and construction practices or the use of water sprays and surfactants.
- All mining operations would be conducted in accordance with all State mining regulations. GCC would consider "special areas" that could be avoided in the mining operations.
- Adequate signage would be posted to prevent any potential trespass by GCC Dacotah employees or invitees. GCC would also train all employees and others regarding property boundaries.
- Surveys would be conducted for sensitive plants. If sensitive plants would be adversely affected by the roads, the roads would be moved where possible to avoid the effect.

2.4 Summary of Potential Impacts and Environmental Protection Measures

Table 2-1 contains a list of environmental protection measures that the environmental analysts suggested to reduce potential impacts. At the time of the decision, the agencies will select all, some, or none of these measures.

Table 2-1
Potential Environmental Protection Measures

Concern	Measure
Transportation and Public Safety	Limit truck hauling if used to daytime hours as much as feasible. Limit truck and equipment speeds. Develop a traffic plan The long conveyor segments will be held at an approximately constant grade while topography varies beneath them, therefore the towers will of necessity have to be of variable height. There will undoubtedly be sections of the conveyor that would be of sufficient height (i.e., 12-feet) to allow passage of off-road fire equipment beneath it. If a long stretch of conveyor does not provide the minimum height requirement then passage through swales beneath the conveyor could be excavated and marked. The risk of impacts from fuel spills can be minimized through the use of a traffic plan and a Spill Prevention, Control, and Countermeasures Plan (SPCC).
Air Quality	Roads and rail load out facility area would be watered and chemically treated as necessary to limit fugitive dust. Enclosed conveyor system, would use dust inhibiting designs, treatments or collection systems sufficient to meet DENR air quality standards at all transfer points including the rail load-out facility. Monitor air quality for fugitive dust (Pm_{10}, $Pm_{2.5}$) during construction and initial stages of operations.
Paleontology	If vertebrate fossils or another significant fossil find is discovered during construction excavation activities, GCC Dacotah would cease excavation in the vicinity of the fossil discovery, and contact BLM, US Forest Service and/or the South Dakota Department of Environment and Natural Resources to determine steps necessary to evaluate the discovery.
Soils	Topsoil and sub-soils where possible should be stripped and stockpiled separately for use in reclamation Stockpiles should be revegetated id the are to stand unused for a significant length of time Minimize soil erosion through use of Best Management Practices and revegetation of recontoured sites or areas. Rip areas of compacted soils resulting from equipment use prior to revegetating.
Vegetation	Revegetation of disturbed areas post construction using a native seed mix approved by BLM and US Forest Service. Amend soils as necessary with organic carbon, Ni, P, and K enhance revegetation success. May need to restrict access of livestock during revegetation of conveyor disturbance to prevent livestock loitering that may impede vegetation establishment. Fence wetland, riparian, and spring areas to reduce effects of livestock on vegetation and stream banks. Develop wetland/spring complexes to provide water for livestock if feasible. Require GCC Dacotah and contractors to wash construction equipment before use at the site.

Table 2-1 Potential Environmental Protection Measures	
Concern	**Measure**
	Certified weed free straw bales would be used for sediment and erosion control. Implement an annual noxious weed monitoring program to direct weed control and treatment program.
Wildlife	Limit construction equipment and haul truck speeds. Maintain lowest possible road density Restrict access to private sections of new roads. Fence wetland, riparian, and spring areas to reduce effects of livestock on vegetation and stream banks.
Grazing Management	Develop wetland/spring complexes to provide water for livestock if feasible. Revegetate disturbed areas as soon as possible with seed mix approved by BLM and US Forest Service Restrict grazing access during reestablishment of vegetation
Water Resources	Construction monitoring of water quality for suspended solids/ turbidity. Use of water trucks for dust suppression principally during construction and mining operations, but may not be required on the conveyor access road. Drainage ditches along constructed roads used to control runoff and minimize erosion potential. Sediments ponds used where necessary. Riprap would be installed to prevent severe erosion (i.e., culvert areas). Active and reclamation areas sloped and revegetated to prevent erosion Use of Madison aquifer for project water requirement, this is an aquifer that is much deeper than that used for domestic and agricultural use elsewhere in the area. Monitor depth to groundwater in project production wells and adjacent domestic/stock wells
Cultural Resources	Unless authorized by the BLM/US Forest Service, no surface disturbance shall occur within 100 feet of the boundary of the three identified National Register eligible properties prior to completion of the field phase of a data recovery plan that has been reviewed and approved by the BLM/US Forest Service and the South Dakota State Historical Society. Unless otherwise authorized by the BLM/US Forest Service, no surface disturbance shall occur within 100 feet of the boundary of the 14 unevaluated sites until their National Register eligibility has been determined. Additionally, no surface disturbance shall occur within 100 feet of the 14 sites recommended not eligible by Augustana College until the BLM and South Dakota State Historical Society have concurred with this recommendation. If one of more of these sites is determined to be National Register eligible, no surface disturbance shall occur within 100 feet to the boundary of sites prior to completion of the field phase of a data recovery plan that has been reviewed and approved by the BLM/US Forest Service in consultation with the South Dakota State Historical Society.
Noise	Consider constructing a sound barrier (wall or earthen) between rail load-out facility and the town of Dewey, and between the quarry's cone crusher and the nearest residence. Combine noisy operations to occur for short durations during the same time periods. Replace standard back-up alarms with manually adjustable, ambient-sensitive, directional sound technology, or strobe light alarms. Limit rail loading and truck hauling if used to daytime hours as much as feasible. Limit truck speed. Install high-grade mufflers on the diesel-powered equipment.

Table 2-1 Potential Environmental Protection Measures	
Concern	**Measure**
	Use new equipment where possible and maintain all equipment. Ensure that the conveyor idlers (i.e., rollers) are balanced and machined to a smooth surface and that the conveyor belt is smooth and without defects.
Visual Resources	GCC Dacotah should review with the conveyor manufacturer the options for color and reflectivity of the conveyor segments and towers, in order to minimize visual impacts of contrast and color. GCC Dacotah should maintain a 200-foot setback or buffer zone between canyon rims and operations or facilities.
Hazardous Materials	Hazardous substances would be transported to the Dewey area by US Department of Transportation regulated transporters (49 CFR Part 172) and stored in approved containers. Develop and implement a Spill Prevention, Control, and Countermeasures Plan (SPCC).

2.5 Alternatives Considered but Eliminated from Detailed Study

Other alternatives were considered by the BLM and US Forest Service, but not studied in detail for a variety of reasons as described below.

A suggestion was made to move the conveyor and crusher (at the north end of the proposed ROW) to a location along the west side of the BLM property. This alternative was not studied in detail because moving the crusher is out of scope for the BLM/FS decision because it is on mine property and will eventually be part of the mine plan, not the conveyor right-of-way.

Another suggestion from the public was to “Permit livestock grazing on the public lands in question (in the ROW request)”. This alternative is essentially the same as no action. The option of grazing livestock within the identified sections of public land could occur independent of the proposed action and is not influenced by the proposed action.

Relocate the last three miles of the northwest part of the Pass Creek Road to the south onto land owned by GCC Dacotah. This alternative is out of scope for the BLM and Forest Service decision and is not related to the decision on the conveyor ROW.

“Build and use a railroad spur or tunnel.” These alternatives are not considered viable because they would be far more expensive to construct safely, making them cost prohibitive, and therefore would not meet the purpose and need of the proposed action. The quality of the rock, for tunneling purposes, where outcrops occur, is believed to be very poor, creating additional engineering constraints. Land disturbance and environmental impacts associated with a railroad spur would be significantly more than the conveyor belt alternative, and when coupled with the greater cost would make this alternative unfeasible.

A variation on Alternative D (new haul road construction) considered a different haul route location at the northeast end of the project area that took it away from existing Project Area roads. This route crosses a very steep cliff area in the northwest corner of Section 1 (T6S, R1E.), and generally contains areas of considerably more topographic relief than the haul road route chosen for Alternative D. This alternative was eliminated from detailed analysis because it was considered very difficult to construct technically through the cliff area in the northwest corner of Section 1, would likely be significantly more expensive to construct and contain more areas of cut and fill due to the generally more rugged terrain, and provided no environmental advantage over the route chosen as Alternative D as presented in the EIS.

2.6 Comparison of Alternatives

In this section, Alternatives A through D are compared based on the type of major construction

components required and by effects of implementation of each alternative.

2.6.1 Major Construction Components by Alternative

Table 2-2 presents a comparison of Alternatives A through D based on the number of miles of each of the major construction components required to complete each Alternative.

2.6.2 Effects by Alternative

Table 2-3 presents a comparison of effects on various resources that result from various characteristics of the actions required to complete the alternatives.

Table 2-2
Comparison of Construction Components in Miles by Alternative

	Alternative			
	A	**B**	**C**	**D**
ROW (BLM)	1.1	0	1.4	1.4
Special Use Permit (US Forest Service)	1.4	0	1.5	1.5
Total County Road Reconstruction	0	0	7.1	1.5
Total New Road Construction	0	0	0.8 [1]	5.7
Total Conveyor Construction	6.6	0	0	0

[1] In pass area only.

Under Alternatives A, C, and D, approximately 1 acre will be disturbed for access roads within the ROW.

Table 2-3
Comparison of Effects by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Transportation and Public Safety				
-Disturbance	6.6 miles	0 miles	7.9 miles	7.2 miles
-Public Safety	No impact	None	Increase risk of accidents (.7 annually) due to mixed traffic (166 trips/day) on 7.1 miles of county road during operations.	sLow risk on construction of remaining 5.7 miles of private road with limited public access. Increase risk of accidents due to mixed traffic (166 trips/day) on 1.5 miles of county road during operations.
Land Ownership and Land Use Authorizations	No effect on ownership patterns and existing land uses. Granting the ROW and special use permit creates a new occupancy on the land. Requires coordination with existing utilities during construction.	No impacts	No effect on ownership patterns and existing land uses. Creates a need for BLM ROW and changes in existing FS easement for reconstruction of county road. Requires coordination with existing utilities during road reconstruction and maintenance.	Same as Alternative C.
Air quality	Minor impacts from fugitive dust during construction. Increase in vehicle emissions during construction.	No Impacts	Increase in vehicle emissions and increase in dust during construction and operation.	Same as Alternative C.
Geology, Minerals, and Paleontology				
-Geology	Limited excavation and relocation	No Impact	Same as Alternative A.	Same as Alternative A.
- Paleontology	No Impact	No Impact	No Impact	No Impact

Table 2-3
Comparison of Effects by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Soils	16 acres permanently disturbed (2.7 BLM, 3.0 FS, 10.3 GCC Dacotah)	0 Acres disturbed	17.2 acres permanently disturbed (2.9 BLM, 3.3 FS, 11 GCC Dacotah)	27.8 acres permanently disturbed (4.7 BLM, 5.3 FS, 17.8 GCC Dacotah)
Vegetation				
- Weeds	Potential to introduce weeds on 16 acres (2.7 BLM, 3.0 FS, 10.3 GCC Dacotah)	No Impact	Potential to introduce weeds on 17.2 acres (2.9 BLM, 3.3 FS, 11 GCC Dacotah)	Potential to introduce weeds on 27.8 acres (4.7 BLM, 5.3 FS, 17.8 GCC Dacotah)
- Wetlands	No impact	No impact	No impact	No impact
Wildlife disturbance (noise, dust, and collisions)	No long term permanent disturbance	No Disturbance	Long term permanent disturbance from traffic (166 trips/day)	Long term permanent disturbance from traffic (166 trips/day)
Special Status Species				
- T&E	No Effect	No Effect	Same as Alternative A.	Same as Alternative A.
- Sensitive	May Impact*	No Impact	Same as Alternative A.	Same as Alternative A
Grazing Management	Improved grazing access, increased grazing pressure near conveyor structures	No effect	Improved grazing access and increased risk of vehicle collision with livestock.	Same as Alternative C.
Water Resources	Estimated water use of 30,000 gallons per day during construction. 2 million gallons of water per year for dust abatement in the conveyor	No impact	Estimated water use of 60,000 gallons per day during construction. 6 million gallons of water per year for dust abatement on the road.	Same as Alternative C.
-Water quality	Minimal impact from suspended sediment, regulated by stormwater permit.	No Impact	Minimal impact from suspended sediment, regulated by stormwater permit.	Minimal impact from suspended sediment, regulated by stormwater permit.

Table 2-3
Comparison of Effects by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Social and Economic Conditions				
-Population	Up to 25 additional people in local population	No impact	Same as Alternative A	Same as Alternative A
-Employment	50 workers for construction, 12 workers for the mining and maintenance.	No impact	50 workers for construction, 20 workers for the mining, hauling, and maintenance.	Same as Alternative C
-Housing	No Impact	No Impact	No Impact	No Impact
-Local Government Services	Small increases in services require, few new students	No Impact	Same as Alternative A	Same as Alternative A
-Taxes	Small increase in tax revenue	No impact	Same as Alternative A	Same as Alternative A
Environmental Justice	No impact	No impact	No impact	No impact
Noise (L_{dn} 50 dBA)	Would meet EPA noise guidelines. Within 115 feet of drive motor on the conveyor or 40 feet of conveyor, or 1,050 feet of rail loadout facility people would notice an increase in noise. The town of Dewey is 6,800 feet distant, therefore, no impact anticipated.	No impact	Would meet EPA noise guidelines. Within 1,370 feet of haul road people would notice an increase in noise from the haul road. The town of Dewey is 1,056 feet from haul road.	Same as Alternative C.
Visuals	Elevated lineal structure. Viewing distance dependent on reflectivity and color. The most obvious visual impact would be where the conveyor is close to or crossing the	No impacts	Haul road feature flat and low-lying. SIO would be met.	Same as Alternative C, except a new road also visible from Dewey road. SIO would be met.

Table 2-3
Comparison of Effects by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
	Dewey Road. SIO would be met.			
- Dust	Fugitive dust from rail loadout facility	No impact	Fugitive dust from hauling and the loadout facility.	Fugitive dust from hauling and the loadout facility.
- Lighting	No impact	No impact	No impact	No impact
Cultural Resources	No NRHP eligible site affected. Two sites have not had eligibility tested.	No Impact	One NRHP potentially affected. Other could be located when surveys completed. One site has not had eligibility tested.	One NRHP potentially affected. Other could be located when surveys completed. Two sites have not had eligibility tested.
Hazardous Materials	Low risk of spills, low impacts from spills.	No additional impact	Slightly higher risk of spills than Alternative A, low impact from spills.	Slightly higher risk of spills than Alternative A, low impact from spills.

* May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

2.7 Connected Action

Mining of the limestone resource to be produced and transported to a proposed rail load-out facility near Dewey, either by the proposed conveyor belt or one of the trucking action alternative haul routes is considered by the agencies to be a Connected Action. It would occur under Alternatives A, C, and D (**Figure 1-2**) and will be analyzed for each resource. **Figure 2-1** shows the area where the outcrop of the Minnekahta Limestone with GCC Dacotah controlled mineral rights is near enough to the surface to make mining feasible. These mineral rights are controlled either by ownership or leasing on private lands, or may have been acquired by the staking of claims on lands underlain by federally held mineral rights. This area includes portions of the following Sections:

- T5S, R1E, Sections 24, 25, and 36.
- T5S, R2E, Sections 17, 19, 20, 21, 29, 30, 31, and 32.
- T6S, R1E, Sections 1, and 2.
- T6S, R2E, Sections 5, and 6.

GCC Dacotah has a license to mine limestone in the state of South Dakota that was issued by the South Dakota Department of Environment and Natural Resources (DENR). In South Dakota, a mining license may be used to cover any number of mining sites. In order to mine at additional sites, an operator only needs to publish a *Notice of Intent to Mine*, notify the appropriate government agencies, and submit additional reclamation surety. GCC Dacotah has filed with the DENR a *Notice of Intent to Mine* limestone at the location described above and has also published the *Notice of Intent to Mine* in local newspapers in order to allow the public to comment on the proposed mining operation. The *Notice of Intent to Mine* received no public comments and therefore, GCC Dacotah is authorized by the State to proceed with mining at the site. GCC Dacotah has no near-term intention to mine on lands for which the federal government controls the surface; and a proposal to do so would require NEPA analysis by the agencies involved.

The details of the proposed mining operations near Dewey have not been fully developed or finalized by the company to date. However, for the purposes of this EIS the company has provided the following preliminary information with regard to the mining operations as it may affect the proposed conveyor or one of the limestone hauling action alternatives under consideration.

GCC Dacotah plans to mine approximately 4,000 tons of limestone per day for approximately 250 days per year for a total of about one-million tons of limestone per year. The limestone to be mined is approximately 40 to 50 feet thick, and therefore, mining activities will be limited to about a 10 new acres of quarry per year. Reclamation will be concurrent with mining operations and GCC Dacotah envisions that only 20-30 acres would remain unreclaimed at any one time. Limestone quarrying operations are expected to require one shift per day, five days per week. To the extent possible quarry reclamation will go on concurrently with mining. Limestone would be transported from the quarry to the rail load-out facility and shipped as described in the Proposed Action and Action Alterative sections above.

GCC Dacotah will consider visual quality and set-backs from canyon walls or rims within the mining area. A mine reclamation plan would be required as part of the final mine permit application approval process.

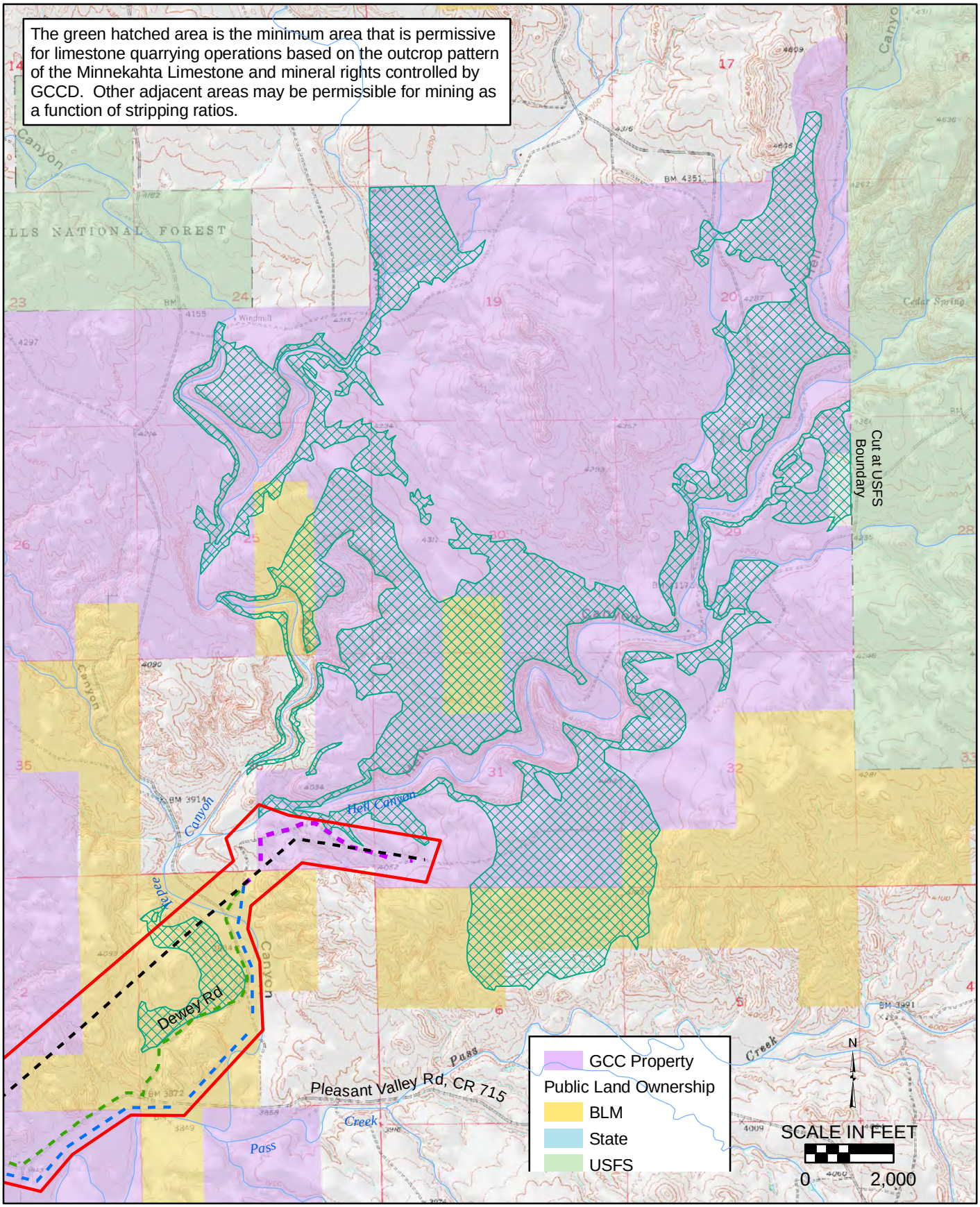
2.8 Compliance with Agency Plans

Surface disturbing activities on BLM and National Forests require an analysis and decision process consistent with the applicable land use plan, in this case, the South Dakota Field Office's Resource Management Plan (1984) and the Black Hills National Forest Forest Plan as amended (2001 and 2004). The Dewey Project is located in Management Area 5.1A, called the Southern Hills Forest and Grassland Area of the Forest Plan.

A preliminary review of the actions indicated that all standards, guidelines, goals, objectives, and management actions would be met by implementation of any of the alternatives.

2.9 Preferred Alternative

Alternative A, the Proposed Action, is the preferred alternative.



Minnekahta Limestone Outcroppings
Conveyor Project Area
Proposed Conveyor Right-of-Way
Alternative C Haul Road
Alternative D Haul Road
Alternative C and D Common Segments

September 2008

Figure 2-1

Connected Action

Custer County, South Dakota

Dewey Conveyor Belt Project

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CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter includes a discussion of the current conditions for resources that may be affected by any of the alternatives (Affected Environment), then describes the primary or secondary effects (Direct and Indirect Effects) caused by the project activities by implementation of the alternatives described in Chapter 2, the effects of the connected action described in Chapter 2, and cumulative effects described in this chapter.

3.1.1 Cumulative Effects

Cumulative effects are the effects of the alternatives, added to past, present, and reasonably foreseeable future actions (**Table 3-1**) within the general project area over a defined period of time. These actions are presented in the table below

Table 3-1
Cumulative Effects Analysis - Past, Present and Reasonably Foreseeable Future Actions

Time Period	Action	Significance	Resource Affected
Past and Present Actions			
1956 to 1973	Uranium Mining	Historical and ongoing land use Moderate-term (2-10 yrs), moderate scale construction project disturbance impacts	Land Use Land Use, Soils, Vegetation, Wildlife, Grazing, Water, Visual and Hazardous materials
1950s to 1970s, 2006 to present	Uranium Exploration	Historical and ongoing land use Short-term (1-2 yrs), small scale construction project disturbance impacts	Land Use Land Use, Soils, Vegetation, Wildlife, Grazing, Water, Visual and Hazardous materials
1954 to Present	Utility and Transmission Corridors	Long Term Occupancy Special use permits on National Forest Right-of-Way on BLM lands	Land Use
1954 to Present	Utility and Transmission Corridors	Large scale construction project surface disturbance impacts on National Forest and BLM lands	Land Use, Soils, Vegetation, Wildlife, Grazing, Water, Visual and Hazardous materials
1985 to Present	County Road Special Use Permit to cross US Forest Service lands	Long-Term Occupancy	Land Use
Presently proposed	Oil and Gas Leasing	Occupancy	Land Use
1970s to Present	Oil and Gas exploration drilling	Short-term (1-2 yrs), small scale construction project disturbance impacts	Land Use, Soils, Vegetation, Wildlife, Grazing, Water, Visual and Hazardous materials
1991 to present	Thirty-one Rocky Mountain bighorn sheep (*O. c. canadensis*) were transplanted into Spring Creek Canyon in the Black Hills.	Introduced special status species	Wildlife
1950 to Present	Grazing Permits	On-going land use	Land use

along with their historical or potential future effects on specific resources. In addition to delineating cumulative effects, these actions establish a pattern of historical land use and levels of surface disturbance associated with specific action related construction activities.

3.1.1.1 Past and Present Action

Past and present actions that contribute to cumulative effects are described in detail in the Affected Environment sub-sections of the respective resource sections of Chapter 3.

3.1.1.2 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions considered in the cumulative effects analysis are described in detail below and include uranium exploration, oil and gas leasing and grazing permit changes.

Uranium Exploration

Uranium exploration activities on mining claims on federal lands, and on leased mineral rights on private land, including lands owned by GCC Dacotah in and near the Dewey Conveyor Project area have recently been undertaken by Powertech Uranium Corporation. Powertech's exploration project is the Dewey-Burdock Project and covers more than 11,000 total acres in South Dakota on the southwest flank of the Black Hills uplift in T. 6 and 7 S., R 1 E. The 11,000 acres cover portions of a 6 mile wide (east-west), 4 mile tall (north-south) exploration block centered on the Dewey-Burdock town site areas and astride the Custer/Fall River County lines immediately east of the Wyoming/South Dakota State line. Powertech recently reported an inferred mineral resource of 7.6 million pounds of uranium within the Dewey-Burdock project area, averaging 0.21 percent eU3O8 based on the results of historical drilling by Silver King Mines and Energy Fuels Nuclear, Inc. and more recent in-fill delineation drilling by Powertech. These deposits are amenable to in-situ leach mining methods. The sandstones are a major local groundwater aquifer (Powertech 2008).

In January 2007, Powertech received approval of an exploration permit application from the South Dakota Department of Environment and Natural Resources to complete 155 drill holes within this project area. Powertech's 2007 exploration program was designed to confirm the presence of the previously defined exploration potential and to begin a systematic evaluation of these mineralized trends in order to expand the project's total resource base. As of January 2008, the Company had completed 70 exploratory drill holes, totaling 44,000 feet, in the evaluation of these trends (Powertech 2008). Additional exploration drilling is planned for 2008 and 2009 (Powertech 2008). The locations of the individual drill holes (actual or proposed) within the lease blocks are unknown at this time. The level of activity associated with these ongoing exploration activities (85 remaining holes at about 600 feet per hole, or a total of 51,000 feet of drilling) probably requires two rotary or reverse circulation exploration drills working from 30 to 80 drill pads (30' x 100') drill pads over a period of 25 to 50 days (depending on the number of shifts per day per drill). Temporary access roads may also be needed for drilling.

In July 2007, Powertech contracted with a consulting engineering company to manage permitting for all required regulatory authorities including Fall River and Custer counties, the State of South Dakota, the US Nuclear Regulatory Commission, the US Environmental Protection Agency and the BLM. The agreement covers baseline data collection, environmental impact analysis, cost/benefit analysis and permit/license applications. In August of 2008, Powertech announced that activities are advancing on schedule. Major sections of the Technical Evaluation Report (TER) that will be submitted to the US Nuclear Regulatory Commission (NRC) have been completed and baseline studies are underway. Powertech plans to submit a mine permit application during the third quarter of 2008 (Powertech 2008).

Also in August of 2008, a new uranium exploration permit application for 30 additional core drill holes was submitted to the South Dakota Department of Environment and Natural Resources. The purpose of this new drill program is to identify an area for a proposed Satellite Plant Site through the drilling of condemnation holes ensuring that the processing facility will not be built over potential ore. The proposed Satellite Plant Site is proposed to be located in T6S, R1E. in the southwest quarter of Section 29, a little more than one mile southeast of GCC Dacotah's proposed rail load-out facility.

Drilling will begin upon issuance of the permit and acceptance of surety bond. The level of activity associated with this drilling (30, 500-foot core holes) would likely use two core drills from 15 (40' x 100') drill pads, working two shifts per day/ drill for about 40 days. Temporary access roads may also be required for drilling. The level of activity associated with the proposed in-situ leach Satellite Plant Site is also unknown at this time.

Oil and Gas Leasing

Seven tracts of land have been requested to be made available for future oil and gas leasing within the immediate vicinity of the Dewey Conveyor Project area. These tracts all occur within T. 6 S., R. 1 E. immediately northeast of Dewey. The BLM and the US Forest Service are in the process of evaluating surface occupancy stipulations for these various proposed lease tracts. Once this process is complete the BLM may or may not make them available for leasing.

Once leased, companies may file applications to drill, which if approved might lead to the drilling of one or more specific exploration drill holes. Effects from this level of drilling probably include temporary access roads to approximately 3-acre drill pads for each drill site. Length of drilling periods for each hole is a function of hole depth.

Grazing Permit Changes

It is possible that implementation of the Proposed Action or one of the Action Alternatives could result in potential changes to existing grazing permits, or alternatively grazing permits could change as the result of other activities or decisions made for the area in the future. As such, potential changes to grazing permits are considered another reasonably foreseeable action (See Grazing permits section).

3.2 Transportation and Public Safety

3.2.1 Study Area Boundaries

For Transportation and Public Safety, the study area is the "project area" as shown on **Figure 1-2**.

3.2.2 Affected Environment

The affected environment for transportation and public safety lie within the study area boundaries and includes two county roads, access roads to public land, and access roads to private land as shown on **Figure 3-1**. The study area boundary is entirely within Custer County, South Dakota. State highways or interstates do not exist within the study area boundary, however, the relationship of the study area to these roads are shown on the general location map, **Figure 1-2**. The affected roads include County Road 769 (Dewey Road) and to a lesser extent County Road 715 (Pleasant Valley Road). Pleasant Valley Road exists within the study area boundary at its intersection with Dewey Road which may require improvements as part of the trucking action alternatives (Alternatives C and D). The Dewey County Road is about 7.1 miles long within the study area.

Both Dewey Road and Pleasant Valley Road consist of a gravel surface and are generally narrower than a standard two lane travel-way of 20 to 24 feet. Drainage and creek crossings consist of low water crossings and culverts. No bridges exist within the study area boundary. County records indicate that Dewey Road has been repaired 12 times in response to flooding since 1987 and an additional three times in 2008. No records were available for traffic counts. However, the Custer County Highway Department believes that traffic on Dewey Road may be as small as 25 cars per day or less (Culbertson 2008).

Custer County has had a Special Use Permit issued by the US Forest Service in 1985 to cross National Forest; whereas county roads crossing BLM lands have been "grandfathered in" as a prescriptive right for use because the road was in place before right-of ways were required, and no formal ROW has been granted. The County's Special Use Permit establishes a historical precedent for occupancy for road use activities on National Forest; and there is a record of surface disturbance activities associated with road improvement and maintenance requirements with the Special use Permit.

3.2.3 Direct and Indirect Effects

3.2.3.1 Alternative A - Proposed Action

The proposed 6.6 mile long (**Table 3-2**) above-ground conveyor alignment is shown on **Figure 3-1**. The conveyor alignment is proposed to begin at Dewey Road approximately 1.1 miles south of the town of Dewey. The alignment heads east-northeast for approximately 2.4 miles across GCC-owned property prior to paralleling Dewey Road. There are no other public transportation corridors along this segment of the proposed action. At the location where the conveyor begins to parallel Dewey Road, the conveyor would be constructed approximately parallel the road for 1.5 miles as it make its way over a topographic pass through the Elk Mountains. The conveyor crosses Dewey Road for the first time, on the east flank of the Elk Mountains near an unnamed tributary to Pass Creek prior to leaving the roadway alignment, and crosses Dewey Road yet again, at Teepee Creek approximately 1.8 miles east of the base of the Elk Mountains. The final 1.0 mile of the conveyor is located outside the Dewey Road corridor on BLM and private land owned by GCC. No other transportation corridors exist within the final 2.8 miles of the proposed conveyor alignment. The Dewey Road continues both north and south of the Project Area.

Table 3-2 shows the number of lineal miles of conveyor or haul road length for each alternative by property owner. As shown in the table, Alternative A - Proposed Action impacts the fewest total number of lineal miles of disturbance when compared with all alternatives except the No Action alternative.

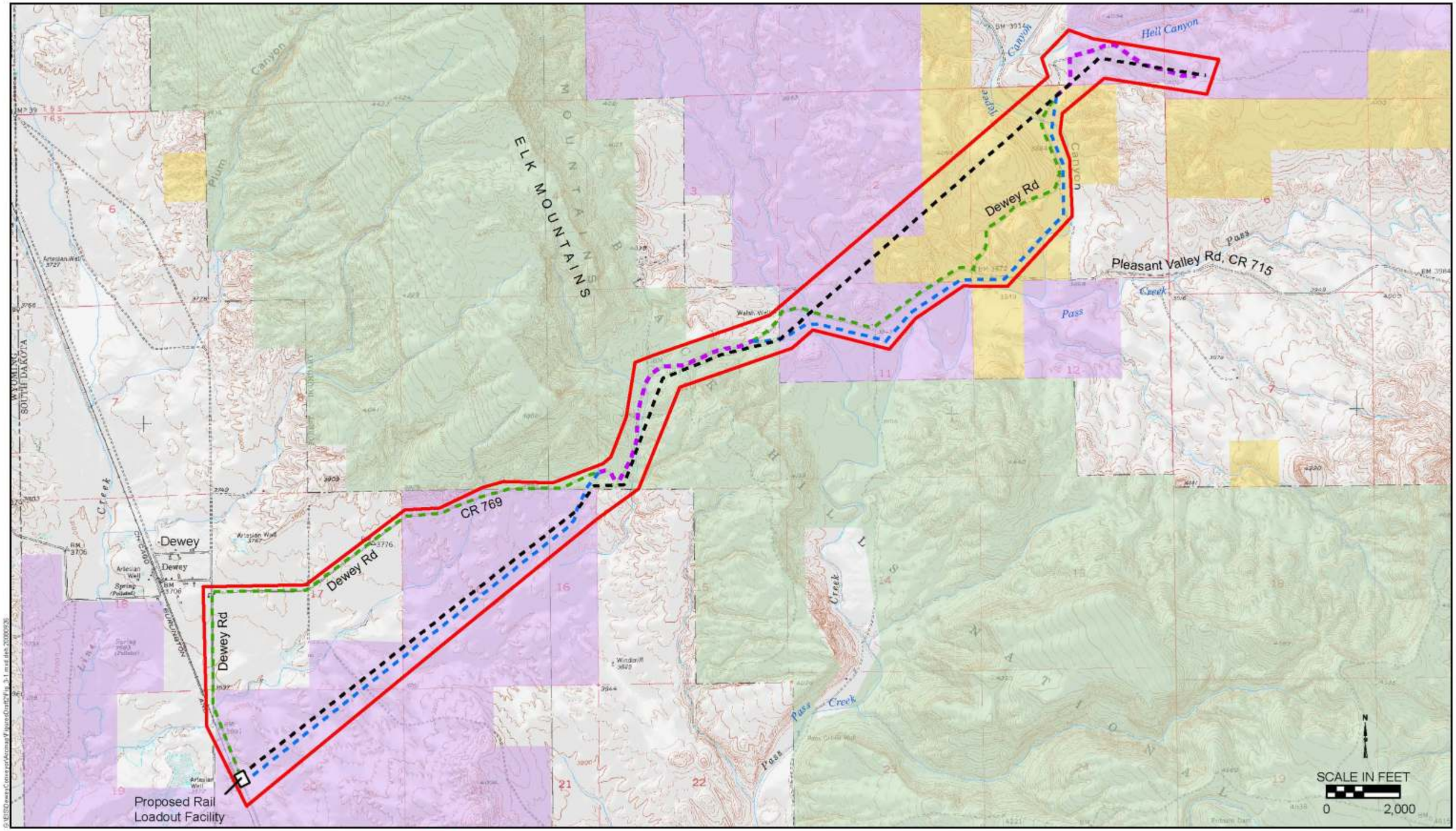
Table 3-2
Miles of Disturbance Per Owner

	Alternative			
	A	**B**	**C**	**D**
Other Private Property	0	0	1.8	0
BLM	1.1	0	1.4	1.4
National Forest	1.4	0	1.5	1.5
GCC Dacotah Private Property	4.1	0	3.2	4.3
Total	6.6	0	7.9	7.2

Features associated with the proposed conveyor include towers constructed on a concrete piers or foundations to support the conveyor, the elevated conveyor attached to the towers, and a one lane construction/maintenance access road within the conveyor right-of-way to allow for visual inspection and maintenance. Due to the steep topography along the proposed alignment through the Elk Mountains, an access road is likely not possible along this section of conveyor. Inspections and maintenance would be performed from the County Road. The above-ground conveyor also may have some supports placed adjacent to the Dewey Road right-of-way along the 1.5 mile section through the Elk Mountains.

The above-ground conveyor segments will be held at a constant grade while topography varies beneath them, there will undoubtedly be sections of the conveyor that would be of sufficient height (i.e. 12 feet) to allow passage of off-road fire equipment beneath it. If a long stretch of conveyor on National Forest or BLM lands does not provide the minimum height requirement, then passages beneath the conveyor would be constructed at specific intervals and their locations marked.

Table 3-3 compares estimates of the operational areas of new surface disturbance (in acres) required for the various alternatives by property owner. As shown in the table, Alternative A – the Proposed Action, impacts the fewest number of acres of new disturbance during operation. However, a greater number of acres are disturbed during the temporary construction phase. The conveyor's maintenance and construction access road corridor may require an average disturbed width of about 50 feet during construction which would be recontoured and vegetated after construction leaving an operational disturbed corridor of 20-foot for the conveyor and maintenance road. The portion of the access road using the county road through the Elk Mountains, as discussed above, may need minor improvements for access spurs or turnouts at the tower locations. A total area of 1.0 acres was assumed for these minor disturbances associated with access to the towers. A discussion of the assumptions related to



Conveyor Project Area

Alternatives
- Proposed Conveyor Right-of-Way
- Alternative C Haul Road
- Alternative D Haul Road
- Alternative C and D Common Segments

GCC Property

Public Land Ownership
- BLM
- State
- USFS

September 2008

Figure 3-1

Conveyor and Haul Road Alternatives

Custer County, South Dakota

Dewey Conveyor Belt Project

the new disturbance area calculation for Alternatives C and D is contained under those sections respectively.

Table 3-3
Acres of New Disturbance and Land Owner

	Alternative				
	A[1]	**A[2]**	**B**	**C**	**D**
Other Private Property[3]	0	0	0	3.5	0
BLM	6.7	2.7	0	2.7	6.1
National Forest	8.5	3.4	0	2.9	2.9
GCC Private Property	24.8	9.9	0	8.1	18.8
Total	40	16		17.2	27.8

[1] Construction
[2] Operation
[3] Other Private Property is defined as the locations where the alternative uses Dewey Road to cross private property other than GCC property with the assumption that Dewey Road is within the existing County right-of-way

3.2.3.2 Alternative B – No-Action

No-action would not have any effects on the existing transportation system.

3.2.3.3 Alternative C – Trucking Existing County Road 769 (Dewey Road)

Alternative C requires a total of 7.9 miles haul road, using predominantly the existing county road for much of its alignment (**Table 3-2**). This alternative would use 7.1 miles of existing County Road 769 (Dewey Road) for the truck hauling route, all of which would require reconstruction. The final 0.8 miles of the proposed road required at the northeast end of the permit area requires new road construction and is located on GCC and BLM property outside the Dewey County Road corridor. **Table 3-3** shows the length of road miles relative to each land owner for the two trucking Alternatives C and D. The Dewey County Road is a dedicated right-of-way to the County in some locations, has a Special Use Permit through National Forest, and is by prescriptive right through BLM property. The specific segments of the road to which the dedicated county road right-of-way pertains is unknown.

The segment of the trucking route located on BLM and GCC property at the farthest northeast end of the Project Area would require construction of a new 0.8 mile haul road segment. The Dewey Road portion would need to be widened. Improvements would involve widening or reconstruction of an approximate 24-foot travel-way, consisting of two, 12-foot travel lanes. Safety improvement to the road width would also be needed including shoulders, guardrails, and sight distance improvements. Sight distance improvements would include larger radius of curvatures both horizontally and vertically. The establishment of consistent road grade improvements through the Elk Mountains would require excavations and fills. Shoulder may range in width from approximately 2 to 8 feet depending on the desired speed. For the purpose of calculating new acres of disturbance required for upgrading this road, an addition 4 feet of roadway width and an average shoulder width of 6 feet on each side of the road was assumed for a total average width of new disturbance of 16 feet. The reconstruction and new construction would primarily involve installation of culverts at drainage crossings, grading operations and placing a gravel wearing course. The new road construction at the northeast end of the permit area is assumed to have an average width of new disturbance of 36 feet. **Table 3-3** in the Proposed Action section above tabulates the anticipated acres of disturbances for Alternative C.

The development of a voluntary traffic plan, and required spill prevention and response procedures would help minimize the potential effects of a spill on the environment.

Using 48 ton trucks to transfer the limestone from the quarry to the rail load-out facility would increase large truck traffic on the county roads substantially. At the proposed production rates, truck traffic would increase to approximately 83 round-trips per day (166 one-way trips) resulting in a loaded or unloaded truck trip being initiated on average every 2.9 minutes for an 8-hour haul day.

Although Dewey Road would be improved in order to handle the additional truck traffic, the increased vehicle miles traveled could result in an increased number of traffic accidents. Based on national

statistics for 2005 (National Highway Traffic Safety Administration), 442,000 reportable truck accidents occurred at a rate of 209 reportable accidents per 100 million miles traveled Based on the operational information provided in the **Table 3-4**, a total of approximately 330,000 vehicle miles per year would be traveled for this alternative. By comparison with the national statistics, approximately 0.70 accidents per year may occur as a result of this increase in trucking. There is no specific traffic safety data for increased truck traffic on two-lane, rural, gravel surfaced roads.

3.2.3.4 Alternative D – Trucking ROW Corridor

This alternative would use a new and separate road from Dewey Road for 5.7 miles of the 7.2 mile route, consisting of 2.4 miles west of the pass and 3.3 miles east of the pass. The existing Dewey Road alignment would be used for approximately 1.5 miles through the Elk Mountains pass area which is on National Forest. This portion of Dewey Road would likely need to be reconstructed. New road construction is assumed to have an average width of new disturbance of 36 feet, and new disturbance required for upgrading the road along the 1.5 mile segment over the pass would require an additional 4-foot roadway width and an average shoulder width of 6 feet on each side of the road for a total average width of new disturbance of 16 feet. As with Alternative C, safety improvements would also be needed including shoulders and sight distance improvements through the Elk Mountain pass area.

As in Alternative C, truck traffic would increase significantly on the country road in the pass area at the rates described above for Alternative C. One direct effect of the use of a new haul road (minimizing the use of county road segments) for hauling the limestone to the rail load-out facility, in comparison to using the county road for the entire length of hauling (Alternative C), would be an decrease in the potential for traffic accidents especially those involving the public. The risk of accidents involving spills of diesel fuel and motor oil is however, likely similar to that of alternative C. As described previously (Alternative C), the development of a voluntary traffic plan, and required spill prevention and response procedures would help minimize the potential effects of a spill on the environment. Direct impacts related to noise and dust from this trucking alternative are discussed and analyzed in sections Noise and Air Quality sections respectively.

Table 3-4
Operational Hauling Information

Production Tons Per Day	4000
Truck size (tons)	48
Number of Trucks Per Day	83
Hours of Operation Per Day	8
Days of Operation Per Year	250
Haul Miles (one way)	8

As Alternative D uses only 1.5 miles of existing county road versus 7.1 miles for Alternative C, there is a. 4.7 times greater risk for accidents involving the general public, for Alternative C over Alternative D. This alternative also has a slightly lower risk of an accident occurring due to the shorter haul route of 7.2 miles compared with 8.0 miles for Alternative C. Approximately 0.63 accidents per year may occur from this alternative. In addition, there should be no public traffic on the restricted access segments of new road constructed on BLM or GCC privately owned property.

3.2.4 Connected Action

Limestone mining as a connected action is most important to transportation and public safety in that it determines the amount of truck traffic required to haul material from the quarry to the rail-load-out facility for the truck hauling action alternative C and D. Additional light truck traffic should also be expected from the daily activities of the approximately 12 workers associated with the limestone quarry and load-out facilities, and from heavier trucks as equipment and materials are delivered to the quarry site.

3.2.5 Cumulative Effects

Historically uranium exploration and mining, and oil and gas exploration activities in the vicinity of the project area have used the county roads for access intermittently since as early as the mid-1970s. Future oil and gas or uranium mining could potentially benefit from the reconstruction of the county road in both Alternative C and D. There could be additional equipment and truck traffic on

the Dewey County Road associated with uranium or oil and gas exploration in the future. However, there are no other anticipated or predictable cumulative effects on the affected environment for transportation from the proposed alternatives, past actions or the foreseeable actions which include grazing, oil and gas development and/or uranium mining.

3.3 Land Ownership and Land Use Authorizations

3.3.1 Study Area Boundaries

For land use, the study area is the "project area" as shown on **Figure 1-2**.

3.3.2 Affected Environment

Lands are owned by GCC Dacotah or are public lands managed by BLM or the Forest Service. Most of the private lands are owned by GCC Dacotah (**Table 3-5**), and they administer private grazing leases on this land (**Figure 3-9**). Although there is other privately owned property within the project area, this land is also used principally for grazing. There is currently no residential or industrial use of property.

BLM lands are grasslands with grazing allotments. GCC Dacotah holds the grazing lease for these lands. Custer County has a prescriptive easement but not a formal right-of-way from BLM where the Dewey Road crosses BLM administered lands because the road was in place before the easements were required.

National Forest System lands are grasslands and timber covered. The following Special Uses have been authorized on the National Forest in Sections 9, and 10, T6S, R1E, BHM, Custer County, South Dakota:

Table 3-5
Land Ownership

Owner/Manager	Acres	Percent
GCC Dacotah	910	48
National Forest	172	9
BLM	406	22
Other Private Ownership	390	21
Project Total	1,877	

- Black Hills Electric Cooperative-Authorization # CEM14 Master Permit - Pringle to Dewey Distribution Line (electric) - last issued in 1999, first recorded in 1972.
- Black Hills Power-Authorization # CEM155 Master Permit- 230kV Transmission Line (electric) last issued in 2004, first recorded in 1954.
- Golden West Telecommunications, Inc.-Authorization # CEM4-Telephone Service – last issued in 1999, first recorded in 1976.
- Forest Road and Trail Act (FRTA) Easement issued to Custer County for the Dewey Road National Forest System Road (NFSR) 769. – issued in 1985.

These Special Use Permits establish a historical precedent for the granting of occupancy, and approval of construction activities for utility and transportation corridors on National Forest.

Several grazing allotments are active. Grazing is discussed in greater detail in the Grazing Management section.

Within the area shown as potentially favorable for limestone mining on the connected action figure (**Figure 2-1**) the mineral rights are either owned or controlled by GCC Dacotah. Most of the mineral rights are on land whose surface is also owned by GCC Dacotah, however GCC Dacotah has also staked 73 claims on 1,460 acres for which the Federal Government owns the surface and has retained mineral rights. The BLM administers these 1,460 acres. GCC Dacotah's privately owned surface in this area is currently used exclusively for grazing.

3.3.3 Direct and Indirect Effects

3.3.3.1 Alternative A - Proposed Action

Lands that would be crossed under the proposed action would include approximately 1.1 mile of BLM-administered public lands and 1.4 miles of National Forest. All of the remaining area to be crossed by the proposed conveyor is owned by GCC Dacotah.

The Proposed Action would not affect existing land uses. Measures have been included as part of the Proposed Action description to eliminate conflicts with grazing, such as the movement of cattle, fencing, access, or trespass on private property (by the public or GCC Dacotah). The conveyor would not interfere with the transmission or distribution line operation or maintenance. The conveyor would not result in any changes in the Dewey Road Easement.

The conveyor would cross under the existing transmission, distribution, and telecommunication lines; however, it would be low enough that its construction, operation, and maintenance would not interfere with the existing lines. Maintenance would need to be coordinated between GCC Dacotah and the utility operators and safety measures specified for the conveyor construction crews.

3.3.3.2 Alternative B - No Action

As far as land use is concerned, the No Action Alternative would have no effects on current land uses.

3.3.3.3 Alternative C – Trucking Existing County Road

As discussed in the transportation section, using the county road for hauling would require reconstruction of the existing county road. As the road would need to be realigned, widened, and reshaped, the County would need to obtain a Right-of-Way from BLM (as none are currently in place or needed for the existing road).

Effects on land use would include the additional area on BLM, National Forest, GCC Dacotah and other private landowners needed for the County road ROW and permit. Grazing permits would not be affected.

Granting the ROW and special use permit creates a new occupancy on the land, which would affect (restrict or conflict with) future land use requests.

Reconstructing the county road would occur near and under the existing transmission, distribution, and telecommunication lines. Maintenance would need to be coordinated between GCC Dacotah and the utility operators and safety measures specified for the road construction crews.

Although it is uncertain how trespassing on private property would be affected by an improved county road, it is most likely that the mixed use of the county road would discourage additional public traffic and therefore, trespass would not increase. As GCC Dacotah is the owner of most of the private lands, they would bear the consequences of public trespass if any occurs. Other private land ownership along the existing county road occurs in Section 17 (north half and southwest quarter) and in the north half of the northeast quarter of Section 10 of T6S, R1E.

3.3.3.4 Alternative D – Trucking ROW Corridor

As discussed in the transportation section, using the southwestern portion of the proposed conveyor alignment, a segment of county road on National Forest over the pass, and new road construction on the northeast end of the haul route for hauling would require reconstruction of the county road and new road construction. As the county road would need to be realigned, widened, and reshaped as it crosses the pass, the county would need to obtain a new Special Use Permit from the Forest Service.

Effects on land use would include the additional area on BLM, National Forest, and GCC Dacotah needed for the new haul road ROW/special use permit. Effects on grazing permits are discussed in the Grazing section.

Reconstructing the county road would occur near and under the existing transmission, distribution, and telecommunication lines. Maintenance would need to be coordinated between GCC Dacotah and the utility operators and safety measures specified for the road construction crews.

GCC Dacotah would not allow public access to the new segments of their haul road, so, if enforcement or closure is effective, there would be little risk that public trespass onto private lands would increase. It is difficult to make access control measures 100 percent effective, however, the private land adjacent to the new road are owned by GCC Dacotah, therefore, the consequences of public trespass onto private lands along the new haul road would fall on them.

3.3.4 Connected Action

Under Alternatives A, C, and D, grazing is the only land use that would be affected by the mining. Impacts of the connected action on grazing are discussed in the grazing section. Measures have been included in the alternative description to eliminate the potential for trespass on private property from GCC Dacotah.

Under Alternative B, No Action, there would be no impacts on land use.

3.3.5 Cumulative Effects

As described in the affected environment section above, Special Use Permits and/or Rights-of-Ways have been historically granted and required construction activities approved for the establishment of transportation and utility corridors on Federal lands. The effects of Alternatives A, C, and D would also have cumulative effects when considered with past, present, and foreseeable future actions related to oil and gas leases and uranium mining and exploration drilling. These activities contribute to additional surface disturbance related to exploration drilling and mining activities, potentially increase the frequency and character of vehicles using roadways, and would affect grazing, as discussed in the grazing section. Uranium drilling on private lands could affect future limestone mining uses in the area; however, GCC Dacotah owns the mineral rights on its privately-owned land in the area envisioned for limestone mining.

Because No Action would not have any effect on land use, there would be no cumulative effects from this alternative.

3.4 Air Quality

3.4.1 Study Area Boundaries

The study area for Air Quality is air basin defined by the Cheyenne River Basin as shown on **Figure 3-10** in the Water Resource section.

3.4.2 Affected Environment

Southwestern South Dakota is a semiarid area with cold, dry winters and moderately hot summers. Annual precipitation is 16 to 18 inches. Annual mean temperatures vary from a high of 71° F to a low of 12° F as measured at the Custer, SD station.

The federal government has established ambient air quality standards for criteria air pollutants under the Clean Air Act, and the State of South Dakota has adopted these standards (**Table 3-4**). The standards are designed to protect human health and the environment. Criteria pollutants are carbon monoxide (CO), lead (Pb), sulfur dioxide (SO_2), particulate matter smaller than 10 microns (PM_{10}), particulate matter smaller than 2.5 microns ($PM_{2.5}$), ozone, and nitrogen dioxide (NO_2).

Ambient air quality standards must not be exceeded in areas accessible to the general public. **Table 3-4** lists the national primary and secondary air quality standards which South Dakota has adopted by rule. National primary standards are the levels of air quality necessary, with an adequate margin of safety, to protect public health. National secondary standards are levels of air quality necessary to protect public welfare from known or anticipated adverse effects of a regulated air pollutant.

Attainment concentrations or status for pollutants is determined by monitoring levels of criteria pollutants for which National Ambient Air Quality Standards (NAAQS) and South Dakota Ambient Air Quality Standards exist. Attainment or unclassified designation means no violations of South Dakota or national air quality standards have been documented in the region.

The proposed project is located in Custer County. The area is classified as attainment by the South Dakota DENR for all criteria pollutants. The attainment designation means that no violations of South Dakota or national air quality standards have been documented in the region, including the project area.

The nearest ambient air quality monitoring in the area is performed at Wind Cave National Park.

Pollutants monitored include particulate matter, sulfur dioxide, nitrogen dioxide, and ozone. The

Table 3-4
National Ambient Air Quality Standards

	Primary Standards		Secondary Standards	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour(1)	None	
	35 ppm (40 mg/m^3)	1-hour(1)		
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour(2)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual(3) (Arithmetic Mean)	Same as Primary	
	35 µg/m^3	24-hour(4)	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour(5)	Same as Primary	
	0.08 ppm (1997 std)	8-hour(6)	Same as Primary	
	0.12 ppm	1-hour(7) (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m3)	3-hour(1)
	0.14 ppm	24-hour(1)		

(1) Not to be exceeded more than once per year.

(2) Not to be exceeded more than once per year on average over 3 years.

(3) To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.

(4) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).

(5) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

(6) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

(7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

measured concentrations of all pollutants are well below the National Ambient Air Quality Standards. Monitoring data from 2006 for particulate matter, which would represent the largest quantity of pollutants from the Proposed Action or any of the Action Alternatives, is shown in **Table 3-6**.

Very little dust would be generated by the enclosed, above-ground conveyor system since it is fully enclosed preventing material from escaping

into the atmosphere. The belt would have 5 or 6 transfer points as it changes direction and grade to the next belt segment, these transfer points would also be enclosed and dust inhibiting designs, treatments or collection systems sufficient to meet DENR air quality standards would be used to control dust at these points. Water volumes required for misters (if used) have been estimated in the Water Resource section. It is estimated that enclosing a structure such as a conveyor results in a 99 percent reduction in dust generation. Utilization of this transportation alternative would result in significantly less dust generation and impact upon air quality than either of the two truck hauling alternatives.

Table 3-6
Particulate Monitoring Data from 2006

Pollutant	Averaging Time	Avg. Concentration, micrograms/m^3
$PM_{2.5}$	24 hours	13
$PM_{2.5}$	Annual	5.3
PM_{10}	24 hours	26
PM_{10}	Annual	7.0

3.4.3 Direct and Indirect Effects

3.4.3.1 Alternative A- Proposed Action

The rail load-out and dome storage facilities would require an air quality permit from the South Dakota Department of Environment and Natural Resources which would contain requirements for minimizing dust generation by using air pollution control equipment and other applicable operational Best Management Practices.

The state and federal authorities will not grant air quality permits for these facilities without a demonstration that any air quality impacts will result in no exceedances of any applicable ambient air quality standards. Particulate matter emissions will be the most prevalent air pollutant and the use of appropriate control technology and Best Management Practices would reduce emissions significantly. Fugitive dust could be monitored during construction and during the initial stages of operation using particulate dust collectors (PM_{10} and $PM_{2.5}$ samplers). This monitoring may be required by the State of South Dakota's Air Quality Permit for various facilities at the Project site.

3.4.3.2 Alternative B – No Action

No action will not have any effects on the air quality of the region.

3.4.3.3 Alternative C – Trucking on Existing County Road

There would be minor air quality impacts associated with reconstructing the Dewey County road and construction of the required new segment of roadway at the northeast end of the Project Area for use by haul trucks. These would be short term activities and would cause no violations of ambient air quality standards. The improved roadway may attract some additional traffic in the future which would cause a slight increase in vehicle emissions in the area. Dust from trucks along the existing 7.1 miles of Dewey County Road would provide an additional risk to safe travel of the public and the haul trucks on the roadway.

Approximately 83 round trips per day by truck, or a trip per 2.9 minutes for an eight hour day, will be necessary to transport 4,000 tons per day of limestone. The generation of dust will be controlled at the source by various water and chemical application abatement techniques, and therefore, the potential to produce fugitive dust would be reduced. Water volumes required for dust suppression are presented in the Water Resources.

Alternative C would have a more impact on air quality from dust and diesel truck emissions than the Proposed Action, however the impact would not be expected to cause a violation of ambient air quality standards. Fugitive dust could be monitored during construction and during the initial stages of operation using particulate dust collectors (PM_{10} and $PM_{2.5}$ samplers). This monitoring may be required by the State of South Dakota's Air Quality Permit for various facilities at the Project site.

3.4.3.4 Alternative D – Trucking on ROW Corridor

There would be minor air quality impacts associated with reconstructing and constructing the short segment of Dewey Road over the pass and the construction of the new roadway for use by trucks. These would be short term activities and would

cause no violations of ambient air quality standards. Dust from trucks along the existing 1.5 miles of the Dewey County Road in the vicinity of the pass would provide an additional and increased risk to safe travel of the public and the haul trucks on the roadway.

Similar to Alternative C, approximately 83 round trips per day by truck, or a trip per 2.9 minutes for an eight hour day, will be necessary to transport 4,000 tons per day of limestone. The generation of dust will be controlled at the source by various water and chemical application abatement techniques, and therefore, the potential to produce fugitive dust will be significantly reduced. Water volumes required for dust suppression are presented in the Water Resource section.

Alternative D would have more impact on air quality from dust and diesel truck emissions than the Proposed Action, however the impact would not be expected to cause a violation of ambient air quality standards. Fugitive dust could be monitored during construction and during the initial stages of operation using particulate dust collectors (PM_{10} and $PM_{2.5}$ samplers). This monitoring may be required by the State of South Dakota's Air Quality Permit for various facilities at the Project site.

3.4.4 Connected Action

The quarrying operation would require an air quality permit from the South Dakota Department of Environment and Natural Resources which would contain requirements for minimizing dust generation by using air pollution control equipment and other operational Best Management Practice measures. The rail storage and load out facilities would also need an air quality permit which also would have requirements for the use of control technology to reduce emissions including particulates.

The permitting authorities will not grant air quality permits for either facility without a demonstration that any air quality impacts will result in no exceedances of the ambient air quality standards. Particulate matter emissions will be the most prevalent air pollutant and the use of appropriate control technology and Best Management Practices would reduce emissions significantly.

The train locomotive running during loading operations and during the shipping of 8 to 13 more trains a month would contribute a small amount of particulate and regulated pollutants, but not enough to exceed standards.

3.4.5 Cumulative Effects

The cumulative effects on air quality from reasonably foreseeable actions related to oil and gas, and uranium exploration drilling result principally from the construction of new access roads and drill pads and traffic resulting from the execution of the drilling programs. Each of these activities is likely to occur near the Project Area and uranium exploration drilling is likely to occur. Air quality effects of these activities would result in a small incremental increases in ambient particulate concentrations when combined with the effects of the action alternatives considered in this EIS. Past actions are not contribute cumulative impacts to air quality.

None of the cumulative air quality effects would be expected to result in violations of particulate ambient air quality standards.

3.5 Geology, Minerals and Paleontology

3.5.1 Study Area Boundaries

The project area is located within the Dewey and Jewel Cave SW 7 ½ minute topographic quadrangles in the southwestern part of the Black Hills in Custer County, S. D., about midway between Edgemont, S. D., and Newcastle, WY (**Figure 1-1)**. The geology of both of these quadrangles has been mapped by the US Geological Survey: the Dewey Quadrangle by Brobst (1961), and the Jewel Cave SW Quadrangle by Braddock (1961).

The study area boundary for geology, minerals and paleontology is the Project Area (**Figure 1-2**). A geologic map is presented as **Figure 3-2** and the explanation portion of this figure lists the names and ages of stratigraphic units and also illustrates the stratigraphic relationships among these geologic units. A larger study area has been chosen to include the Dewey Project area and the area currently envisioned (but not formally proposed) for limestone mining by GCC Dacotah, Inc. The

envisioned limestone mining area is covered by the light-grey-blue colored Minnekahta Limestone in the northeast corner of the geologic map (**Figure 3-3**) and is shown more explicitly on **Figure 2-1**.

3.5.2 Affected Environment

3.5.2.1 Regional Geology

The Black Hills are an exceptional, large-scale example of a structural dome. A structural dome is an approximately symmetrical fold about which the beds dip more or less equally in all directions away from a central point. The dome structure is oval-shaped in map view, and is regional in scale, approximately 120 miles long in a north-south direction and 60 miles wide in an east–west direction (**Figure 3-3**). The Black Hills structural dome was formed about 65 million years ago, at which time the central Black Hills uplift probably attained an elevation of more than 15,000 feet.

Weathering since the dome was formed has resulted in a rock outcrop pattern that when viewed in map view resembles a target, in this case a central core area of older crystalline rock with rings or oval-shaped bands of younger sedimentary rock dipping away from the center. One of these bands comprises a geographic feature called the "Race Track" which is a concentric ring of soft, easily eroded red shale that surrounds the Black Hills that resembles the oval of a race track (**Figure 3-4**).

3.5.2.2 Geologic History and Stratigraphy

Some of the oldest rocks in North America (more than 2 billon years old) occur at the center of the dome that forms the Black Hills (**Figure 3-3**). These rocks are metamorphic rocks (shales and sandstones that have been baked and altered to slates/schists and quartzites, respectively) and granitic intrusives such as those that form Mount Rushmore and Harney Peak (highest point in the Black Hills at an elevation of 7,424 feet).

Later, the surface of the Black Hills area was subjected to a long geologic period of erosion. Subsequently, a series of transgressions and regressions by an intercontinental sea occurred depositing the overlying sandstone, shale and limestone sedimentary units briefly described below (Gries 1996).

Overlying and surrounding the core of the Black Hills are a series of progressively younger sedimentary rocks (**Figure 3-3**). The oldest of these sedimentary units is greater than 570 million years old, the Deadwood Formation, a sandstone. Overlying the Deadwood formation is the Devonian Englewood Formation (limestone) and the Mississippian Pahasapa Limestone that forms prominent grey limestone cliffs in the northern part of the Black Hills and is a stratigraphic equivalent of the regionally widespread Madison Limestone elsewhere in the northern Rocky Mountains. Weathering and erosion occurred including a major erosional event that allowed for sinkholes and caverns to form in the upper part of the eroded limestone surface. The limestone is the host for Jewel and Wind caves and more than 200 other caves in the Black Hills (Gries 1996).

Just outside and to the northeast of the Project Area, the lower part of the stratigraphic section begins in outcrops of the Permian Minnekahta Limestone and passes through about 2,000 feet of progressively younger, west dipping strata until encountering the near horizontal Cretaceous and Tertiary strata, near the town of Dewey (see the graphic "Explanation" and geologic map). All the rocks that crop out are of sedimentary origin and range in age from Pennsylvanian to Late Cretaceous (Traveling from near the northeast end of the proposed conveyor, southeast toward the town of Dewey, South Dakota the overlying units are the compositionally variable units of sandstone, shale and limestone of the Pennsylvanian-Permian Minnelusa Formation (limestone) (1000 feet thick), the Opeche Shale (75 to 115 feet thick) and Minnekahta Limestone (about 40-50 feet thick) (Braddock, 1961). The Minnekahta limestone is the geologic unit envisioned for limestone mining for cement by GCC Dacotah. The Minnekahta Limestone in the Dewey area is an extremely pure thin-bedded limestone with very few fossils. The geologic unit overlying the Minnekahta limestone is the Triassic Spearfish Formation. The Spearfish Formation is about 550 feet thick and is comprised principally of easily eroded red shale with interbeds of gypsum that form a topographic valley that surrounds the Black Hills called the Red Valley. The Red Valley comprises the so-called "Race Track" feature described above (**Figure 3-3**) and is

the loci for many of the regions prominent cultural resource features.

The end of Triassic time was a period of erosion in South Dakota. Later in the Jurassic period, shallow continental seas again submerged parts of western South Dakota and deposited the marginal marine Sundance Formation (sandstone) (360 feet thick), the Morrison Formation (shale) (60 to 120 feet thick) and the Unkpapa sandstone that unconformably overlie the Spearfish Formation.

A large, centrally located, intercontinental north-south seaway was present in western North America during most of Cretaceous time that locally accumulated thick deposits of marine and marginal marine sediments. The outermost hogback ridge of the Black Hills dome is comprised of the basal transgressive marine Lakota Formation sandstone (about 200-300 feet thick) and Fall River sandstone (120-130 feet thick) which are collectively called the Inyan Kara Group. Sandstones of the Lakota and Fall River Formations are locally important aquifers in the Dewey area and are hosts to roll-front type deposits of uranium mineralization (described below). The end of the Cretaceous period marks the final retreat of the continental seas and the onset of the Laramide Orogeny (mountain building event) that is responsible for the rise of the Black Hills.

Gravel, which caps hills at altitudes of 4,460 to 4,620 feet, is believed to have been deposited by a Pleistocene stream that drained southeastward toward the town of Minnekahta (Braddock, 1961). More recent intermittent stream channels are filled with alluvial material and small elevated gravel-covered terraces mark the former high levels of these streams.

3.5.2.3 Geologic Structure

The three major geographic or structural domains, from east to west, are the Black Hills monocline, the Elk Mountains, and the Dewey terrace (Brobst 1961). The Black Hills monocline consists of the steeper west-dipping sediments of the Black Hills dome (locally a monoclinal fold along the southwest side of the dome) and is located to the east of the Elk Mountains. The Dewey Terrace is an area of less steeply dipping rocks along the southwest portion of the Black Hills monocline to the west of the Elk Mountains, in the vicinity of the town of Dewey.

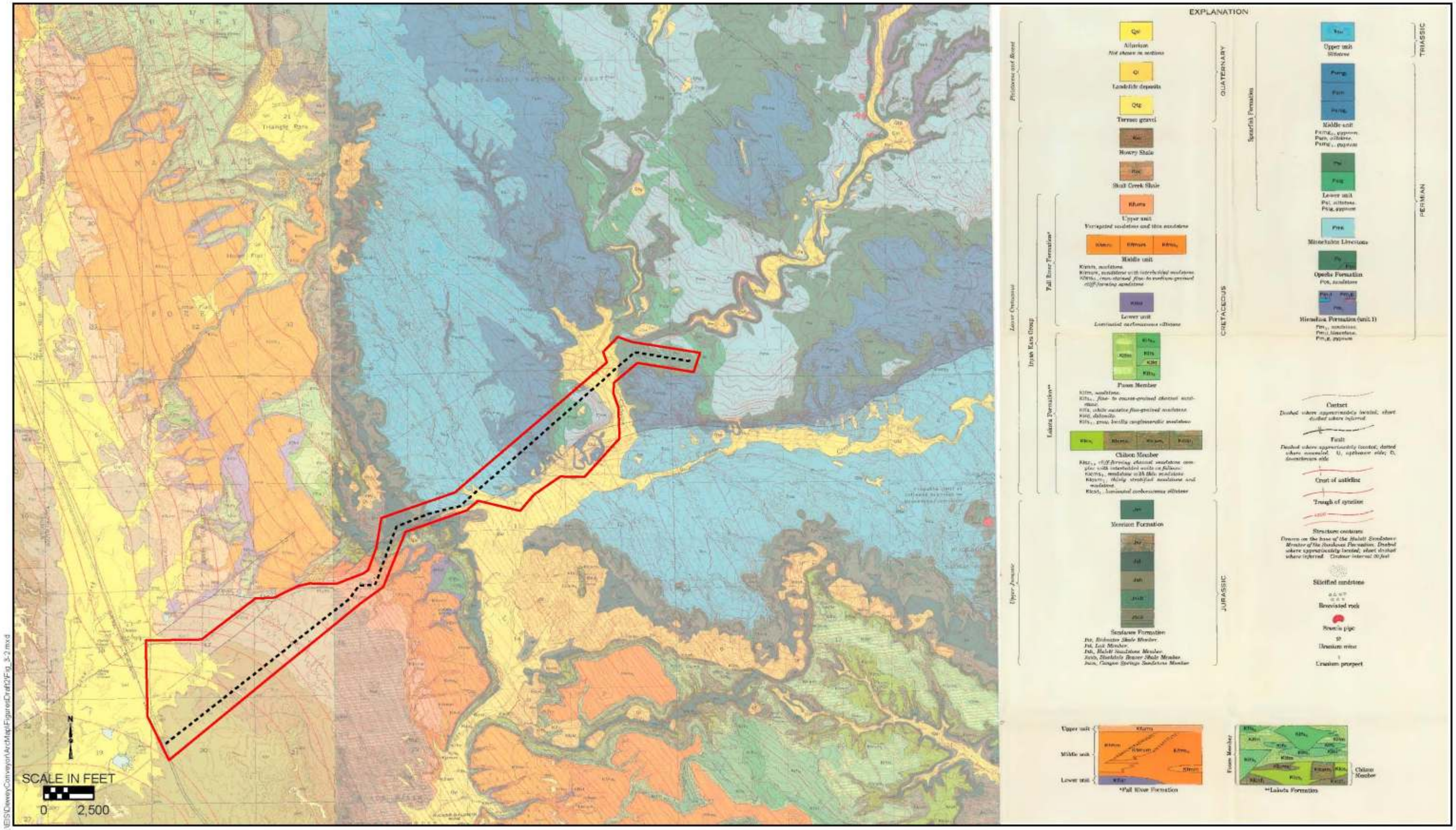
On a regional scale, all three of these structural domains are cross-cut by the Dewey fault, a near vertical dip-slip fault that trends N. 75° E., with approximately 250 to 440 feet of vertical displacement that is down-dropped along the south side of the fault (Brobst 1961; Braddock 1961).

The Dewey fault is likely the reason for the location of the eroded topographic pass between Teepee Canyon and the Lime Creek drainages on either side of the Elk Mountains. The entire length of the proposed conveyor route literally follows the Dewey fault trace. Two northwest-trending anticlines are located east of the Elk Mountains and in the vicinity of the north end of the proposed conveyor.

The upper part of the Minnelusa Formation consists of gray sandstone, very fine-grained dolomite, and beds of anhydrite (gypsum). The anhydrite has been dissolved from the formation during the late Cretaceous Period and early part of the Cenozoic Era, and has resulted in subsidence that has created collapse breccias in the Minnelusa and milder deformational folding in the overlying units. One of these breccia pipe structures occurs just a few hundred feet north of the county road at the base of the pass on the east flank of the Elk Mountains near the proposed conveyor ROW.

3.5.2.4 Area Seismicity

The Black Hills Physiographic Province is an area of moderately low rates of seismic activity compared with many other areas of the Rocky Mountain Physiographic Province. No work has been undertaken to establish recent movement on fault structures in the Dewey Conveyor Project area. Although, many of the high-angle faults shown on the area geologic map (**Figure 3-2**) (including the Dewey fault that closely parallels the proposed conveyor alignment), most have very long recurrence intervals where the return period of seismic activity is on the order of thousands of



September 2008

Figure 3-2

Geologic Map of Project Area

Custer County, South Dakota

Dewey Conveyor Belt Project

Conveyor

Conveyor Project Area

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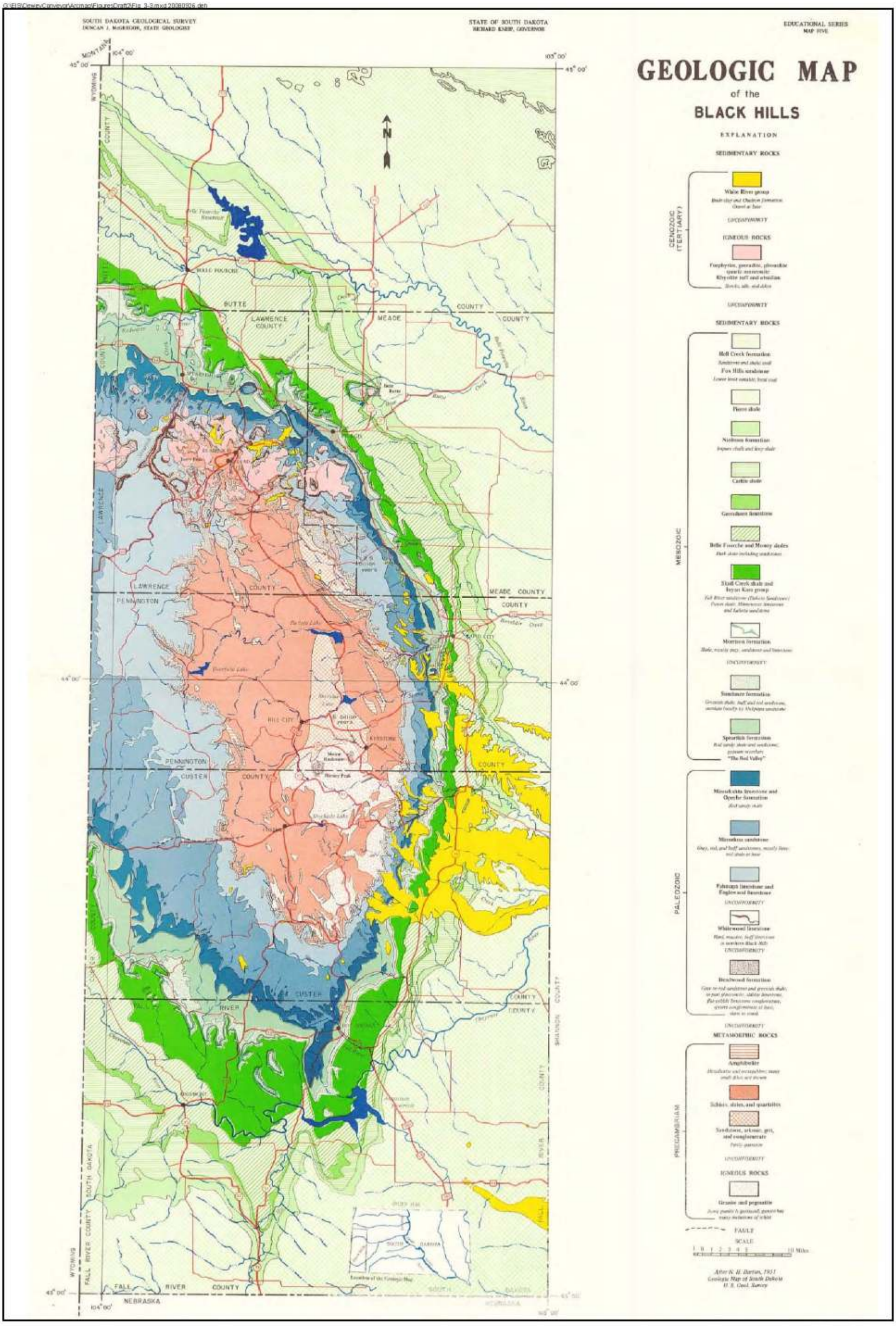

from South Dakota Geological Survey, Educational Series Map 5

September 2008

Figure 3-3

Geologic Map of the Black Hills

Custer County, South Dakota

Dewey Conveyor Belt Project

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from: Bird's eye view of the Black Hills to illustrate the geological structure. Geographical and Geological Survey of the Rocky Mountain Region (U.S.); Jenney, Walter Proctor, and Newton, Henry. 1877

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Figure 3-4

Birds Eye View of the Black Hills Illustrating Geologic Structure

Custer County, South Dakota

Dewey Conveyor Belt Project

years (most recent movement typically within Quaternary period). No geologic hazard mapping other than regional scale mapping by the US Geological Survey using topographic or geomorphologic data exists for the project area.

Based on information from the USGS earthquake database website (USGS 2008a), approximately 12 earthquakes with magnitudes ranging from 2.3 to 3.7 have occurred within a radius of 62 miles (100 km) of the town of Dewey during the period 1974 to 2008 (**Table 3-7**). The earthquake epicenters ranged in distance from 17 to 43 miles (28 to 73 km) of the town of Dewey. The closest recorded earthquake event was magnitude 3.7, about 17.4 miles (28 km) from the town of Dewey.

The US Geological Survey database also recorded several other "significant" historical earthquakes in South Dakota including a magnitude 4.5 in 1911 and a magnitude 4.0 centered on the South Dakota - Nebraska border in 2003.

Figure 3-5 is a regional seismic hazard map for the State of South Dakota (USGS 2008b). This map predicts that an earthquake with peak horizontal acceleration of 0.08g (8 percent of gravity) only has a 2 percent probability of being exceeded in any given 50 year period. The dense soil materials and soft bedrock of the project area place the Dewey Project in Zones 2B and 3 of the Uniform Building Code (UBC 2000). Based on these criteria an earthquake with a magnitude of greater than 5.0 (the maximum credible earthquake for the area) occurring within 50 km of the town of Dewey over the mine life is about 1 in 10, or 10 percent. Earthquakes with a Richter magnitude of 5.0 are often felt but rarely cause significant damage, especially to properly engineered structures.

3.5.2.5 Mineral Resources in the Black Hills

The Black Hills area has been an important historical and recent gold and silver mining area and the State of South Dakota is ranked third among the states in the historical production of gold. Gold was also the leading mineral commodity in South Dakota in 2007 terms of value. There are currently 11 mine permits that cover six large scale gold mining operations in South Dakota.

Several small uranium deposits and numerous other radioactive anomalies and occurrences are known in the vicinity. The known occurrences of uranium minerals are all within the Cretaceous Inyan Kara Group (Braddock, 1961) and occur as roll-front type, sandstone-hosted deposits in fluvial channels and marginal marine units within the Fall River and Lakota Formations. Of these occurrences only the Wicker-Baldwin property in the Fall River formation has been mined (Brobst 1961). The Wicker-Baldwin property is located in Section 16

Table 3-7
Earthquakes reported from 1974 to present within 100 Km radius of Dewey, South Dakota.

Year	Month	Day	Latitude	Longitude	Magnitude	Depth (Km)
1975	May	16	43.24	-103.68		5
1987	Jan	1	42.79	-103.48	3.5	5
1991	Nov	5	44.35	-103.75	2.5	0
1992	Nov	2	42.74	-104.39	3.0	5
1993	Sep	5	44.4	-103.80	2.7	5
1994	Mar	18	43.4	-103.50	2.8	5
1994	Mar	20	43.4	-103.50	2.3	5
1996	Feb	6	43.98	-103.73	3.7	5
1996	Apr	9	43.07	-104.10	3.7	5
1996	May	3	43.04	-104.02	3.1	5
2004	Jan	5	43.6	-104.00	2.8	5
2004	Jan	24	44	-103.20	2.5	5

Source: Data from USGS National Earthquake Information Center, August 27, 2008.

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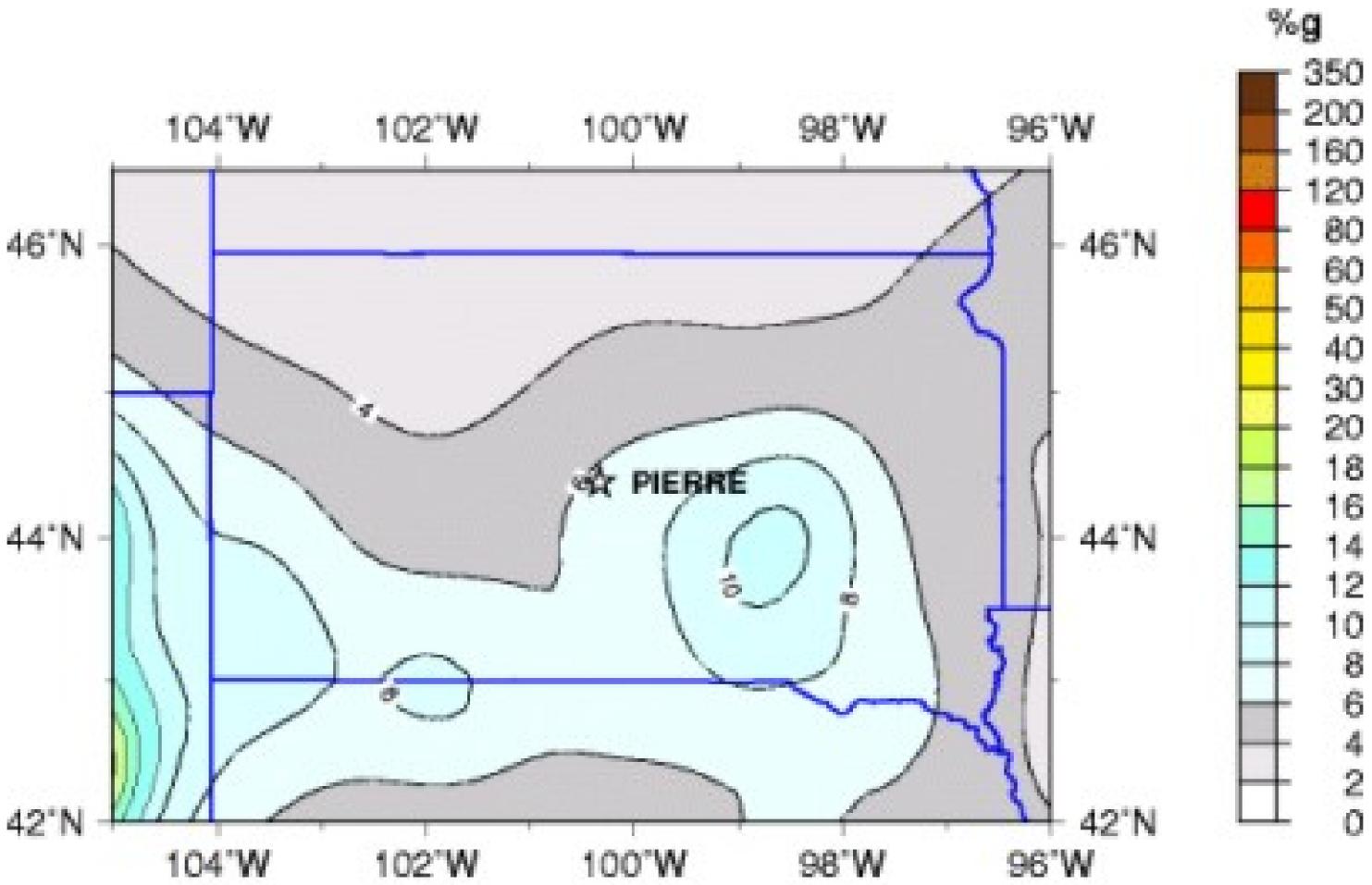

Peak Acceleration (%g) with 2% Probability of Exceedance in 50 Years
site: NEHRP B-C boundary
National Seismic Hazard Mapping Project

September 2008

Figure 3-5

Seismic Hazard Map of South Dakota (USGS 2008b)

Custer County, South Dakota

Dewey Conveyor Belt Project

of T42N, R60W, along Lime Creek in Weston County, Wyoming about 7 miles northwest of Dewey.

Considerable additional exploration drilling has taken place over a number of years on some of the uranium occurrences near Dewey (for example those located in T. 6 and 7 S., R. 1 E). This area is part of the northern extension of the Edgemont uranium district discovered in the 1950's. Historical drilling in this area by Silver King Mines (a TVA subsidiary) in the 1980s, and Energy Fuels Nuclear, Inc. in the mid-1990s, consists of almost 4,000 exploration holes that have been drilled to depths of 500-800 feet. The results of this exploration drilling have been acquired by a company called Powertech Uranium Corporation who is conducting additional drilling and mine permitting activities discussed under the Cumulative Effects section for Uranium.

In South Dakota an operator must obtain a license to mine sand, gravel, pegmatite minerals, materials used in the process of making cement or lime, and rock to be crushed and used in construction. During 2007, 501 companies and individuals had active mine licenses for industrial minerals in South Dakota. There are also mine permits that cover mining slate, bentonite, placer gold, and dimension stone. Principal industrial materials mined in western South Dakota include limestone and gypsum for cement, quartzite for dimension building stone, and bentonite for drilling mud. Non-metallic mineral production for 2007 from western South Dakota is summarized in **Table 3-8**.

Table 3-8
2007 Non-Metallic Mineral Production

Mineral	Production (Tons)
Agricultural Lime	2,000
Bentonite	0
Dimension Stone	252,592
Gypsum	53,016
Iron Ore	72,017
Limestone	3,539,908
Mica Schist	2,000
Pegmatite Minerals	3,375
Placer Gold Ore	61
Quartzite	3,244,475
Shale	227,453
Slate	2,333
Sand and Gravel	14,826,098

After Holm and others 2007.

Limestone remained the second most prolific non-metallic mineral commodity produced during 2007 with 3,539,908 tons reported. Limestone is produced in the Black Hills of western South Dakota and is used primarily in the production of cement and for construction projects (Holm and others 2007). In exploration activities in the state, GCC Dacotah drilled two exploration holes for limestone in Pennington County in 2006 (Holm and others 2007).

3.5.2.6 Oil and Gas Leasing

There are no active oil and gas leases in the immediate vicinity of the project area, that is, to north and east of the town of Dewey, South Dakota. However, there are several existing leases in the two townships and ranges west of Dewey in Wyoming (T41N, R60W and T42N, R60W). In T41N, R60W Section 9 about two (2) miles northwest of Dewey, an exploration well produced minor amounts of oil, and another exploration well in Section 19, about 3 miles south-southwest of Dewey, produced a mix of oil and water. Therefore, there is a potential for oil and gas leasing and exploration in at least the general vicinity of the project area (see cumulative impact section for geology and minerals below).

3.5.2.7 Paleontological Resources

Fossils or paleontological resources of Paleozoic age sediments of the Black Hills consist of invertebrate species including fragmental trilobites and trace fossils (tracks, trails tracings and burrows) in the Cambrian age Deadwood formation; teeth of marine worms and conodonts of the Ordovician age units; and brachiopods, corals, crinoids, marine snails, straight (belemnites) and coiled ammonites and various trace fossils from the Silurian through Permian age units (Gries 1996).

Paleontological resources of the Mesozoic rocks of the Black Hills consist of invertebrate clams, oysters, cephalopods (belemnites and ammonites), and marine snails from the very fossiliferous late Jurassic Sundance Formation, and terrestrial dinosaurs from the late Jurassic Morrison Formation. Extensive and thick Cretaceous age marine sediments contain a variety of marine fossils similar to those found in the Sundance Formation, and marginal marine and terrestrial sediments of Cretaceous age contain dinosaur bones and skeletons (Gries 1996).

In general, exposures of Paleozoic and Mesozoic stratigraphic units and fossil assemblages of the Project Area are similar to those found elsewhere in the Black Hills and in equivalent units in Montana and Wyoming and are not considered either unusual or unique. Noteworthy fossil resources are generally considered to be vertebrate fossils (i.e., dinosaurs). No important paleontological sites or resources have been identified to date.

3.5.3 Direct and Indirect Effects

3.5.3.1 Alternative A - Proposed Action

Geology

The construction of the proposed conveyor belt would have direct impacts on geologic resources. Impacts would be limited to excavation and relocation of disturbed bedrock and unconsolidated surficial materials associated with surface disturbances along the various rights of way during construction.

The surface disturbances resulting from the construction of the conveyor would not result in any loss of known mineral resources.

Area Seismicity

Earthquakes with characteristics determined for the project area (i.e., maximum acceleration of 0.08 g, with long recurrence intervals) and a maximum intensity rating of 5.0 on the Richter scale represent very limited risk to the geotechnical stability of proposed conveyor. Therefore it can be assumed that earthquakes of these magnitudes would likely cause no critical damage to a conveyor system on properly constructed and engineered concrete footings.

Should an actual break occur in the conveyor system as a result of an earthquake particularly one that results in movement along the Dewey fault (a highly unlikely event) there should be no direct impacts to the environment or other resources as a result of the failure. The company would of necessity need to repair the break to place the conveyor back into operation.

Paleontological Resources

Physical surface disturbance associated with the proposed action could result in limited direct impacts to paleontological resources. The location of potential buried paleontological deposits can not necessarily be predicted by surface inspections and may not be identified until encountered in actual construction excavations. Vertebrate fossils are considered to be the most significant types of fossils that might be encountered during excavation of principally Mesozoic age units. If vertebrate fossils or another significant fossil find is discovered during construction excavation activities, GCC Dacotah would cease excavation in the vicinity of the fossil discovery, and contact BLM, US Forest Service and/or the South Dakota Department of Environment and Natural Resources to determine steps necessary to evaluate the discovery. No specific fossil localities, quarries or significant vertebrate fossil remains are known to be located in the area to be disturbed

3.5.3.2 Alternative B - No Action

The no action alternative would avoid direct and indirect impacts of construction activities to geologic resources associated with the proposed action or other action alternatives. The area would be subjected to periodic earthquakes, probably in a pattern similar in intensity and frequency to that of the recent past as describe above (**Table 3-7**). No paleontological resources would be disturbed.

3.5.3.3 Alternative C – Trucking Existing County Road

Geology

The construction activities associated with the modification of the existing county road for haul traffic (Alternative C) would have direct impacts on geologic resources. Impacts would be limited to excavation and relocation of disturbed bedrock and unconsolidated surficial materials associated with

surface disturbances along the various rights of way during construction. No mineral resources would be lost.

Area Seismicity

Earthquakes with characteristics determined for the project area (i.e., maximum acceleration of 0.08 g, with long recurrence intervals) and a maximum intensity rating of 5.0 on the Richter scale represent very limited risk to the geotechnical stability of proposed haul roads.

Should an earthquake occur which causes structural damage to a proposed haul road (probably by landslides onto the road surface in the vicinity of the pass, or failure of the roadbed elsewhere) the company would repair the damage to place the haul road back into operation.

Paleontological Resources

Direct impacts for this alternative are the same as those described for Alternative A.

3.5.3.4 Alternative D – Trucking ROW Corridor

Direct impacts resulting for Alternative D would be the same as those described for Alternative C.

3.5.4 Connected Action

The direct effects of limestone quarrying operations as a connected action on geological resources include the mining and permanent removal of the limestone mineral resource. Limestone mining operations are proposed to take place exclusively in the Paleozoic age Minnikata Limestone and may involve local stripping of the immediately overlying basil portion of the Opeche Formation red-beds. Geologic and mineral resources within the area affected by mining of the Dewey limestone deposit would ultimately extract and relocate of approximately 200 million tons of limestone and associated waste rock (one million tons of limestone per year for 200 years). Mining operations are expected to remove all mineable mineral resources based on available technology at reasonably foreseeable limestone prices.

Quarrying of the limestone resource also results in the modification of existing topography and natural geomorphic features.

Area seismicity may trigger rock falls from the excavated wall of the quarry but should not otherwise pose any significant risks to the quarrying operations or the environment.

While the impact of limestone mining may result in loss or destruction of invertebrate marine fossils, these fossil assemblages are similar to those found elsewhere and are not considered either unusual or unique. No important paleontological sites or resources have been identified to date.

The indirect effects of limestone quarrying operations as a connected action results in the permanent removal of geological resources would make them unavailable for use by future generations.

Modification of existing topography and natural geomorphic features and any reclamation activities using mine wastes and salvaged soils usually do not result in an additional loss of mineral resources.

Introducing the new activity of quarrying as a connected action has the potential to cause indirect impacts to several other resources including:

- Water quality - erosion and transport of sediment into surface waters, addition of nitrates from blasting residues, the risk of a spill of hazardous materials such as fuels and oil.
- Noise - from mining equipment operation and blasting to human and wildlife and domestic animal receptors
- Air Quality – from fugitive dust
- Socio-economic – generates jobs, increases tax base, but increase pressure on local infrastructure.

These and other indirect impacts are discussed in grater detail in the connected action section of the other resources.

Removal of limestone would be an irretrievable and irreversible impact on the mineral resource.

3.5.5 Cumulative Effects

Cumulative effects identified that relate directly to geology and mineral resources include historical and ongoing uranium exploration/mining and potential oil and gas leasing in the vicinity of the Dewey Conveyor project area (**Figure 3-6**).

The direct effects of both of these types of exploration activities on geological resources hinge on their surface disturbing activities during the creation of new access roads and drill pad. During construction of these roads and pads direct impacts to geology would be limited to excavation and relocation of disturbed bedrock and unconsolidated surficial materials associated with surface disturbances. No geologic mineral resources are expected to be lost. Because these construction features are roads and pad there is likely to be no significant impact from seismic activities except for possibly some very local slumps and slope failures. Paleontological resources effects are similar to those described for the Alternatives of the Dewey conveyor proposal. Indirect effects are expected to be similar to those described for Alternative C and D above. Other indirect impacts would include noise from equipment and dust from road construction and traffic related to construction related activity components of cumulative impacts.

3.6 Soil Resources

3.6.1 Study Area Boundaries

The study area boundary for soil resources is the project area as depicted on **Figure 3-7**; however, it should be noted that the project area boundary encompasses a considerable amount of land, much of which would not be subjected to soil impacts under any of the alternatives described below. Where applicable, the following sections report acreages of soil types and potential impacts that may occur in both the overall project area as well as within the proposed 100-foot conveyor ROW.

3.6.2 Affected Environment

Soils map data obtained from the Natural Resources Conservation Service (http://soildatamart.nrcs.usda.gov/) (NRCS 2008) were used to evaluate potential impacts of the Proposed Action and the action Alternatives. Locations of each soil map unit are shown on **Figure 3-7**.

The distribution of soil types throughout the project area are geographically intermixed and range in texture from silty-to-gravelly-loam to clay (**Figure 3-7**). Most soils in the area are located on upland areas such as terraces, hill slopes, and ridges. While a smaller portion of soils are located in floodplains; flooding of these soils is rare and ponding does not occur as all of the soils are well- to excessively-drained. Area soils are poorly suited for agriculture as they are typically shallow and easily eroded. Approximately 95 percent of the project area is covered with soils rated as having moderate- to high-susceptibility to wind erosion (i.e. USDA Wind Erosion Groups 3 to 6). Less than 5 percent of the project area has soils with a low susceptibility to wind erosion and these are areas consisting of rock outcrop or areas covered by the Butche or Winetti soil series.

3.6.3 Direct and Indirect Effects

3.6.3.1 Alternative A - Proposed Action

Direct effects on soil resources from the Proposed Action would include changes to soil physio-chemical characteristics due to excavation and disturbance, loss of soil to wind and water erosion, and decreased soil biological activity over a disturbed area totaling approximately 40 acres temporarily. This acreage is calculated based on the assumption that soil disturbance would occur (50 feet) corridor running the length of the project area where the 6.6 mile long conveyor and access / maintenance road would be located. Of this total, about 5.7 acres are located on public lands administered by the BLM or US Forest Service (**Table 3-3** in the Transportation Section).

Chemical changes to soils would result from mixing topsoil with subsoil during salvage activities, and a reduction in the amount of organic matter in surface soil due to erosion during handling activities. Impacts on physical characteristics of soil during salvage, stockpiling, and redistribution include soil mixing, compaction, and pulverization from equipment and traffic. Soil compaction and pulverization would result in loss

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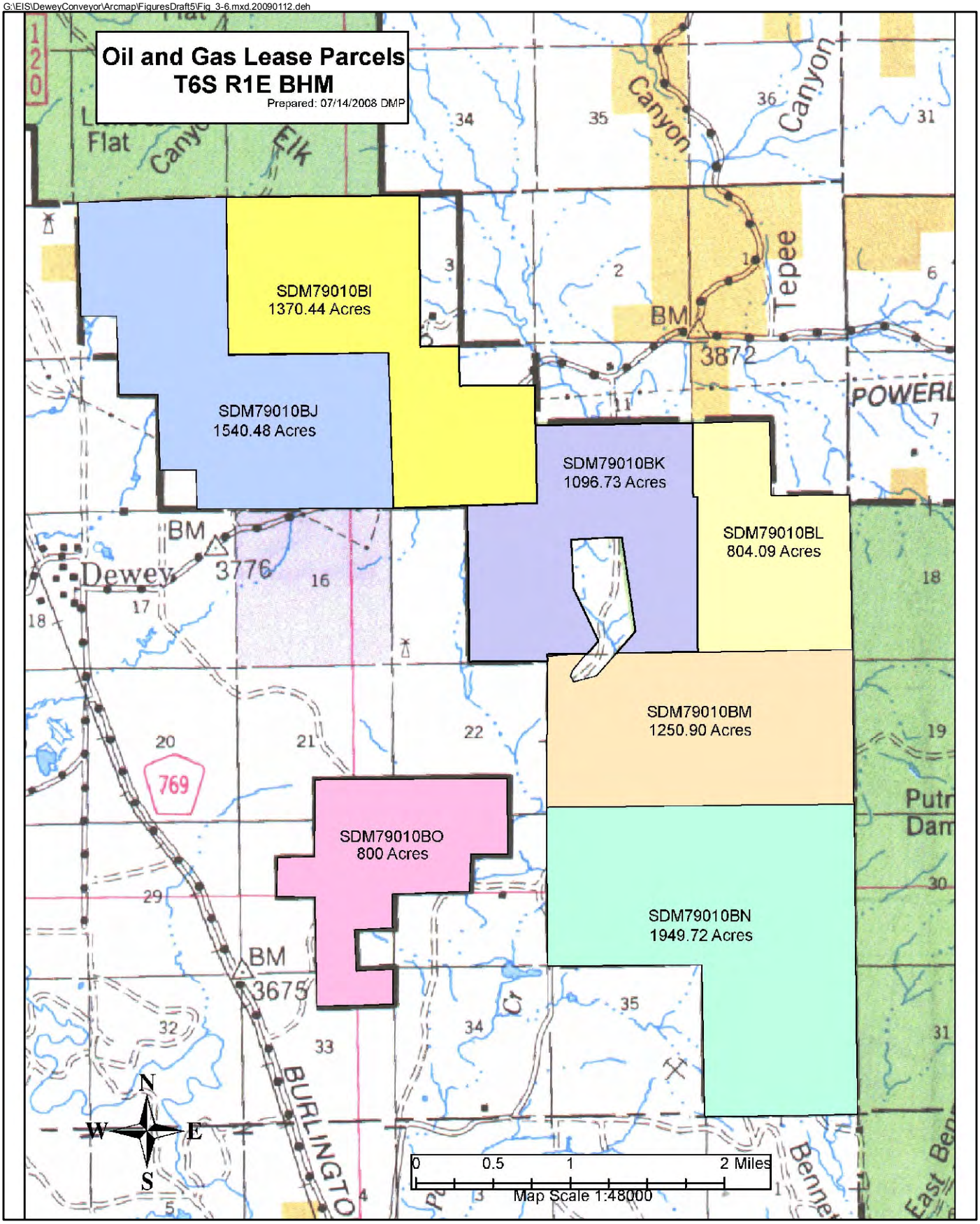

Figure provided by Black Hills National Forest based on data from BLM's LRS-2000 land database system: http://www.mt.blm.gov/plats/search.php?meridian=07

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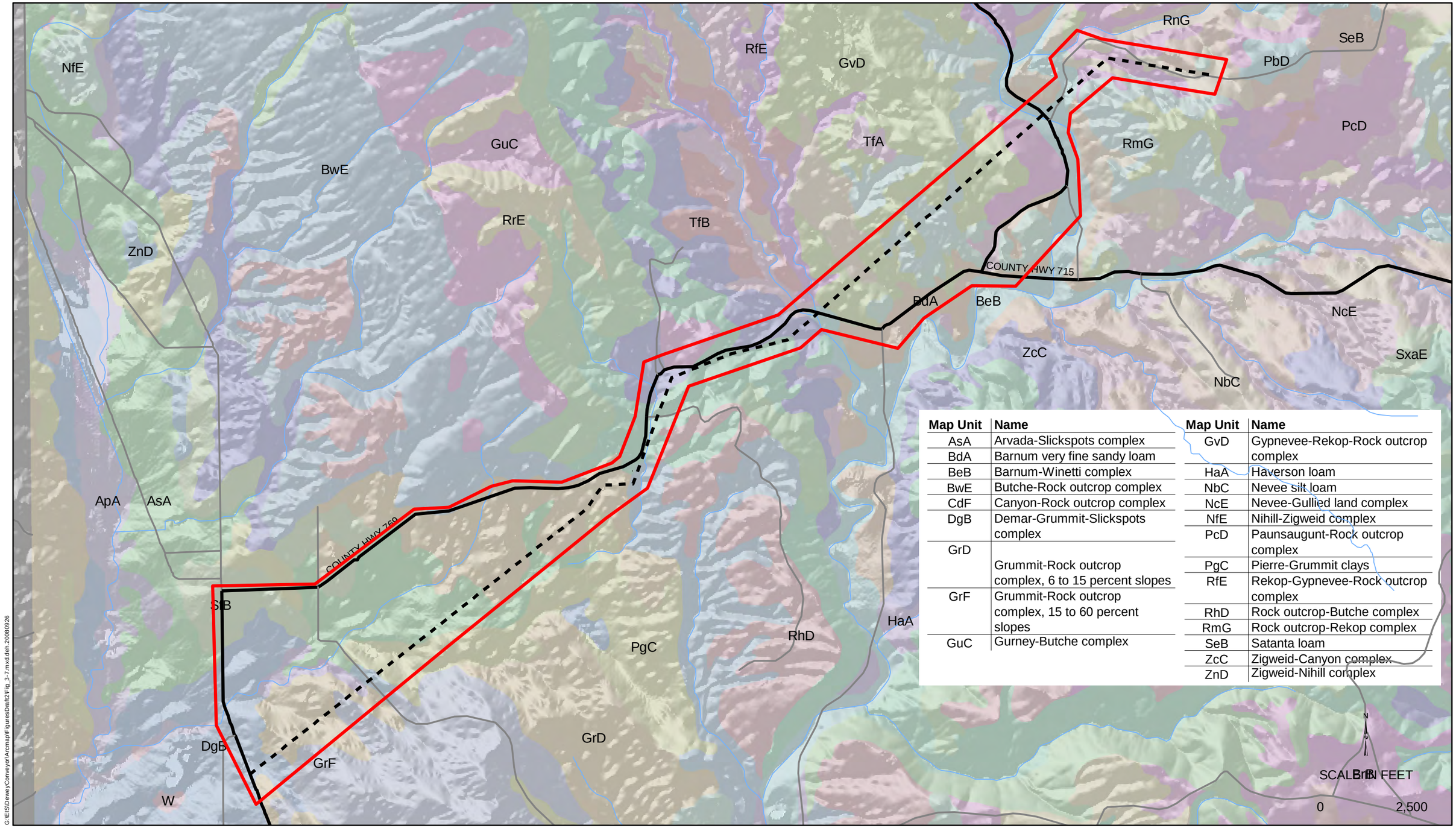
Figure 3-6

Pending Oil and Gas Lease Tracts
Custer County, South Dakota

Dewey Conveyor Belt Project



Map Unit	Name
AsA	Arvada-Slickspots complex
BdA	Barnum very fine sandy loam
BeB	Barnum-Winetti complex
BwE	Butche-Rock outcrop complex
CdF	Canyon-Rock outcrop complex
DgB	Demar-Grummit-Slickspots complex
GrD	Grummit-Rock outcrop complex, 6 to 15 percent slopes
GrF	Grummit-Rock outcrop complex, 15 to 60 percent slopes
GuC	Gurney-Butche complex

Map Unit	Name
GvD	Gypnevee-Rekop-Rock outcrop complex
HaA	Haverson loam
NbC	Nevee silt loam
NcE	Nevee-Gullied land complex
NfE	Nihill-Zigweid complex
PcD	Paunsaugunt-Rock outcrop complex
PgC	Pierre-Grummit clays
RfE	Rekop-Gypnevee-Rock outcrop complex
RhD	Rock outcrop-Butche complex
RmG	Rock outcrop-Rekop complex
SeB	Satanta loam
ZcC	Zigweid-Canyon complex
ZnD	Zigweid-Nihill complex

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Conveyor Project Area

Proposed Conveyor Right-of-Way

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Figure 3-7

Soils Map

Custer County, South Dakota

Dewey Conveyor Belt Project

of soil structure and a subsequent decrease in permeability and water-holding capacity.

Soil loss from wind erosion is potentially high across most of the project area due to fine grained soil textures and dry soil conditions. Soil loss associated with wind erosion from the areas of project excavation would be greater than normal within half of the 100-foot wide proposed ROW until vegetation becomes re-established. The potential for loss of salvaged soil would be greatest during reclamation after topsoil is redistributed on disturbed areas. Potential for loss of subsoil would be greatest between the period of initial disturbance and subsequent reclamation cover soil distribution. The volume of soil loss would depend on wind velocity, size and condition of exposed area, and soil texture.

Redistributed soil would have decreased organic matter content as a result of salvage and stockpiling. Soil biological activity would be reduced or eliminated during stockpiling as a result of anaerobic conditions created in deeper portions of soil stockpiles. After soil redistribution, biological activity would slowly increase and eventually reach pre-salvage levels.

Water erosion potential could be high during heavy precipitation events due to exposed unvegetated soil, fine soil texture, soil surface conditions, and slope. However, GCC Dacotah would prepare a Reclamation Plan (to be approved by the State of South Dakota) describing best management practices (BMPs) that would be implemented to minimize soil loss from disturbed areas (e.g., SedimentSTOP®, water diversion, etc.) throughout the life of the Project and during reclamation activities.

Loss of soil would be an irretrievable impact on soils.

3.6.3.2 Alternative B - No Action

There would be no impacts on soils from the No Action Alternative.

3.6.3.3 Alternative C – Trucking Existing County Road

The direct effects described for Alternative A would occur in conjunction with reconstruction of the existing county road and any additional road building activities. Assuming that the entire 6.4 mile length of the county road is widened approximately sixteen feet (four feet of roadway surface and six feet of shoulder on each side of the road), and that an additional 0.8-mile of 36-foot wide road is constructed, it is estimated that a total of about 17.2 acres of soil would be disturbed. Of these, 2.9 acres would be on BLM, 3.3 would be on National Forest, and 11.0 would be GCC Dacotah.

3.6.3.4 Alternative D – Trucking ROW Corridor

Direct effects on soil resulting from Alternative D would be of the same type as described for Alternative A. This alternative would use a new and separate right-of-way from the Dewey Road for 5.8 miles of the of the 7.3 mile route. The Dewey Road right-of-way would be used for approximately 1.5 miles through the Elk Mountains pass area. New road construction is assumed to have an average width of new disturbance of 36 feet, and new disturbance required for upgrading the road along the 1.5 mile segment over the pass would require an additional 4-foot roadway width and an average shoulder width of 6 feet on each side of the road for a total average width of new disturbance of 16 feet. It is estimated that a total of 28.2 acres of soil would be disturbed. Of these, 4.7 would be on BLM, 5.3 would be on National Forest, and 17.8 would be on GCC Dacotah.

3.6.4 Connected Action

Mine operations would result in the eventual disturbance of about 2,000 acres of soil. Effects of this disturbance on soil resources within the mining area would be identical to those occurring within the proposed ROW as described for Alternative A. However these effects would be reduced under a Plan of Operations prescribing only 10 new acres of mine pit placed into operation each year and concurrent reclamation that would result in only 20 to 30 acres of non-reclaimed disturbance to exist at any given time. In addition, the State of South Dakota would require an approved Reclamation Plan from GCC Dacotah prior to approval any mining activity.

The connected action of mine operation is discussed more fully in the Connected Action Section of Chapter 2.

3.6.5 Cumulative Effects

Because historical stock grazing, road and utility corridor construction, and exploration drilling for oil, gas and uranium are expected to continue as major activities in the Dewey area, soil related impacts from these activities would continue to occur to varying degrees. Past and future exploration drilling and road and utility corridor construction has and would require the construction of access roads and drill pads that result in the excavation and disturbance of soils. Impacts from these activities include loss of soil productivity due primarily to wind erosion of dry, fine-grained soil. Other effects include changes in soil structure from soil handling, erosion-driven soil losses, sediment delivery to surface water resources, and compaction from equipment and livestock pressure.

Reclamation of past mining disturbances and restoration of sites disturbed by exploration and construction activities would mitigate loss of soil and soil productivity associated with these effects. Salvaged and replaced soil would become viable soon after vegetation is established.

3.7 Vegetation

3.7.1 Study Area Boundaries

The analysis area for vegetation resources is the proposed conveyor belt Project Area.

3.7.2 Affected Environment

Vegetation in this area is typical of semiarid South Dakota flora, where precipitation and soil parent material influence vegetation composition. Vegetation types (**Figure 3-8**) were identified through use of the Landfire database. Common vegetation types encountered throughout the proposed conveyor belt route are grassland, ponderosa pine woodland, and shrubland communities (**Table 3-9**).

The Black Hills ecosystem is often considered a crossroads between east and west, north and south and is predominately a Rocky Mountain Coniferous Forest Complex dominated by ponderosa pine (Pinus ponderosa) (US Forest Service 1996). The project area incorporates an elevational gradient from dry shortgrass prairie up through sage and mahogany shrubland to pockets of Ponderosa pine woodlands (**Table 3-9**).

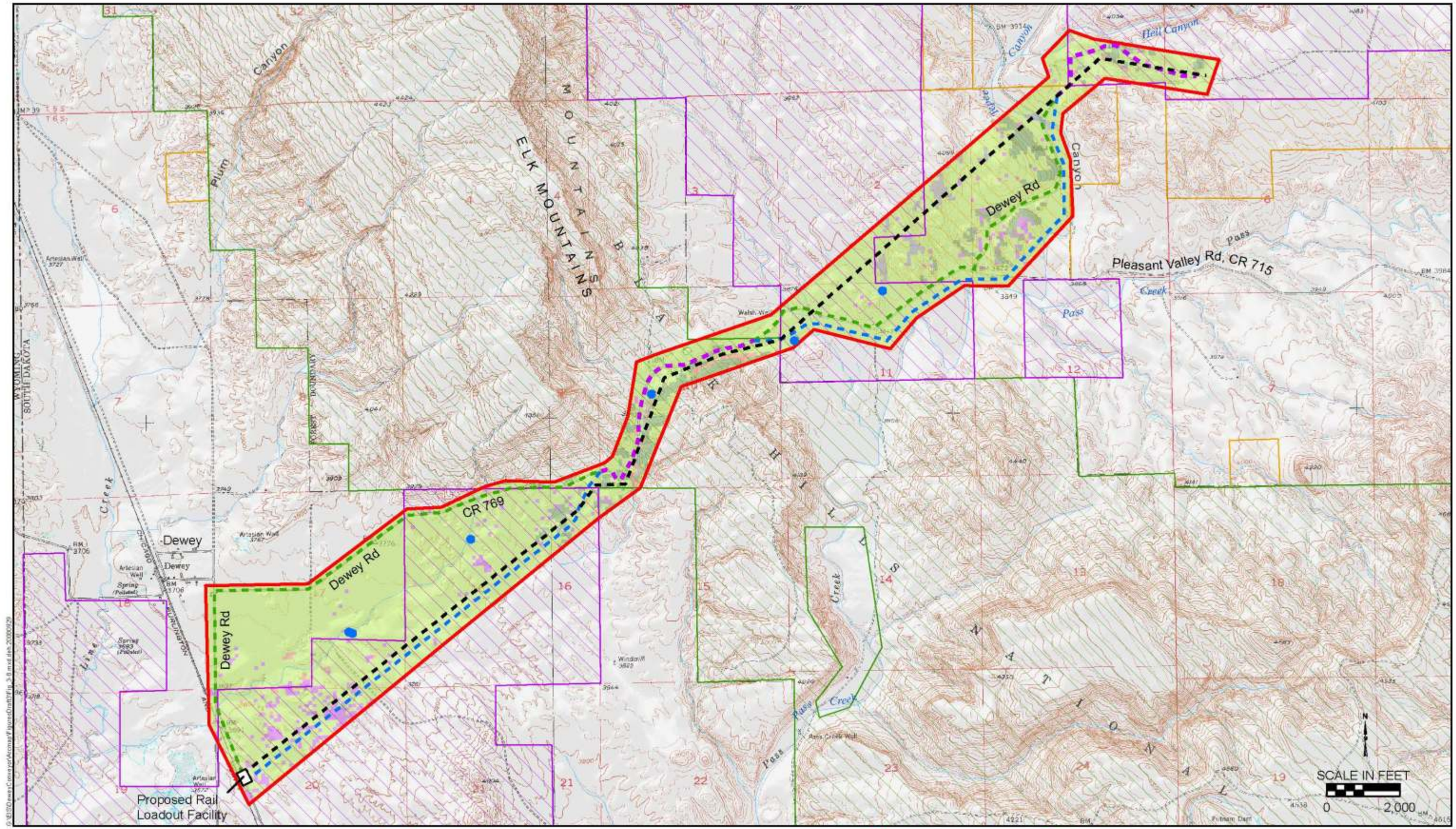
3.7.2.1 Grasslands and Meadow Community

Grassland habitat within the Black Hills ecosystem provides critical habitat for a variety of plant and animal species. Grasslands within this region can be medium tall grass species or short grass species communities. Common species within the medium tall grass communities include: western wheatgrass (*Pascopyrum smithii*) and needle grass (*Nassella viridula*), the major cover forming grasses within this region. Other grass species include: blue grama (*Bouteloua gracilis*), little bluestem (*Schizachyrium scoparium*), buffalo grass (*Buchloe dactyloides*), and side-oats grama (*Bouteloua curtipendula*).

Table 3-9
Vegetation Communities In Project Area

Community	Total Project Area		BLM	National Forest
	Acres	Percent	Acres	Acres
Grassland	1,166.5	85	259.9	113.7
Ponderosa Pine	105.8	7.7	35.1	45.7
Sagebrush Shrubland	56.9	4	5.2	0.2
Mountain Mahogany Shrubland	5.3	0.4	2.4	
Riparian	16.7	1.2	0	10.8
Agriculture	0.7	<1	0	0
Barren	24.7	1.8	21.5	0.2

Note: Table current as of September 15, 2008 pending update project boundary and buffer changes.



Wetlands (NWI)

Vegetation Communities

- Agriculture
- Barren
- Sagebrush
- Mountain Mahogany
- Grassland
- Ponderosa Pine
- Floodplain/riparian/aquatic

Alternatives

- Proposed Conveyor Right-of-Way
- Alternative C Haul Road
- Alternative D Haul Road
- Alternative C and D Common Segments

Conveyor Project Area

GCC Property

Public Land Ownership

- BLM
- USFS

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Figure 3-8

Vegetative Cover of the Project Area

Custer County, South Dakota

Dewey Conveyor Belt Project

There is also a diverse mixture of forb species in this community. Some common forbs found within these grasslands include: pasque flower (*Anemone patens*), prairie golden aster (Heterotheca villosa), dotted blazing star (Liatris punctata), stiff sunflower (*Helianthus pauciflorus*), silky aster (*Symphyotrichum sericeum*), prairie smoke (*Geum triflorum*) and tooth-leaved evening primrose (*Calylophus serrulatus*). Short grass communities are dominated by blue grama and buffalo grass. Forb species common within these communities include: white aster (*Symphyotrichum ericoides*), beardtongue (*Penstemon spp.*), purple coneflower (*Echinacea angustifolia*), bluebells (*Mertensia spp.*), silver-leaf scurf pea (*Pediomelum argophyllum*), and goldenrod (*Solidago spp.*).

3.7.2.2 Ponderosa Pine Community

Ponderosa pine is the most dominant tree within the Black Hills as it occurs at all elevations, on all soil types, and on all aspects. The majority of the ponderosa pine communities that occur can be classified as Dry Coniferous Forest. Typically in the southern Black Hills, plant species found within the ponderosa pine type include: little bluestem, yucca (*Yucca glauca*), sagebrush (*Artemisia spp*.), sand lily (*Mentzelia nuda*), and various gramas and needlegrasses.

3.7.2.3 Sagebrush Shrubland Community

Sagebrush shrubland habitat within the Black Hills ecosystem increases the diversity of the region and provide habitat for a variety of flora and fauna. Sagebrush provides vertical structure that creates small micro-climates suitable for late-seral and climax grass and forb species as well as providing valuable wildlife nesting and hiding cover.

3.7.2.4 Mountain Mahogany Community

Mountain-mahogany (*Cercocarpus montanus*) is a small shrub that is valuable as forage and cover species for mule deer and other ungulates and as cover and nesting habitat for many smaller species of wildlife. While this community is limited, it is utilized by a variety of species and increase the habitat diversity of the area.

3.7.2.5 Riparian

Riparian areas and wetlands occur along floodplains associated with perennial and intermittent rivers and creeks, and typically support a combination of herbaceous vegetation, shrubs, and trees. These areas are a form of transition zones between permanently saturated wetlands and upland areas. The Project Area has limited aquatic habitat. There are approximately 5.8 miles of intermittent streams. As intermittent, these streams generally only flow during the wet season in response to spring run off or precipitation events and thus, do not provide stable aquatic habitat to support fisheries. Based on an analysis of soil type and the National Wetland Inventory less than 2 acres of emergent wetland exist (http://www.nwi.fws.gov) (USFWS NWI 2008).

Riparian areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence, and exhibit vegetation dependent upon free water in the soil. Riparian habitat along the floodplain can often contain species such as: plains cottonwood (*Populus deltoides*), peachleaf willow (*Salix amygdaloides*), sandbar willow (Salix exigua), American elm (*Ulmus americana*), American plum (*Prunus americanus*), box elder (*Acer negundo*), common chokecherry (*Prunus virginiana*), green ash (*Fraxinus pennsylvanica*), silver buffaloberry (*Shepherdia aregentea*), and western snowberry (*Symphoricarpos occidentalis*). These riparian areas can provide cover, forage and nesting habitat for a variety of wildlife species.

Wetlands are commonly associated with riparian areas and landscape depressions that have adequate soil moisture throughout the growing season to support a prevalence of hydrophytic vegetation species. Wetlands are defined areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil condition. Wetland habitat is also scarce as the National Wetland Inventory database shows only 2.6 acres (less than 1 percent) of wetland habitat (USFWS NWI 2008). These wetland areas consist of approximately 1.3 acres of open water pond and 1.3 acres of emergent wetland.

3.7.2.6 Special Status Plant Species

A list of federally endangered, threatened, and proposed species has been provided by US Fish and Wildlife Service via their South Dakota Field Office. No federally listed or proposed plant species occur on the Black Hills National Forest. However, habitat for two US Forest Service sensitive species, narrowleaf grapefern (*Botrychium lineare)* and Iowa moonwort (*Botrychium camestre*) may exist. Narrowleaf grapefern are long-lived colonizing plants that grow in variety of habitats, often on grassy sites where disturbance has occurred. This species is considered a habitat generalist with elevational ranges varying from sea level to 10,000 feet. An occurrence of this species was documented in the Black Hills in an old, deteriorating roadbed dominated by graminoids and forbs. Iowa moonwort is among the smallest of moonworts that also occurs in a variety of habitats, on well-drained soils typically with a limestone substrate. This species is less associated with disturbance than narrowleaf grapefern but in the past couple of years the Black Hills National Forest having been finding these two species intermingled. Distribution of these species is difficult to assess because they are small and easily overlooked, their growth rate is slow, typically only a single leaf is produced each year, and may undergo periods of dormancy, where the plant will not appear for several years and then re-emerge in the exact same location some time later. Other plants known to occur on the US Forest Service Regional Forester's Sensitive list (2008) and the Black Hills National Forest Species of Local Concern (2005) were considered but due to the lack of habitat they were eliminated from the effects analysis.

3.7.2.7 Noxious Weeds

The introduction and spread of noxious weeds is a major concern for any area where surface disturbance activities occur. Noxious weeds are defined under South Dakota Weed Act (SDCL 38-22) and the federal Noxious Weed Act of 1974 as any species of plant that is or is likely to be detrimental or destructive and is difficult to control or eradicate. Noxious weeds are not native to the United States because they are introduced into an environment where they did not naturally evolve. As a result, noxious weeds typically do not have natural enemies (insects or other plants) to limit their development and spread. Weeds can displace and fragment native plant communities, which in turn reduces forage for wildlife and livestock, reduces protective soil cover, and detracts from aesthetics. Not only are weeds considered an ecological threat but also an economic burden due to the high cost in controlling them.

Seven species are listed as state noxious weeds in South Dakota. These noxious weed species include leafy spurge (*Euphorbia esula*), Canada thistle (*Cirsium arvense*), perennial sow thistle (*Sonchus arvensis*), hoary cress (*Cardaria draba*), Russian knapweed (*Centaurea repens*), purple loosestrife (*Lythrum salicaria*), and salt cedar (*Tamarix spp.*). Custer County lists five weed species on their local list. These weeds include: musk thistle (*Carduus nutans*), spotted knapweed (*Centaurea maculosa*), plumeless thistle (*Carduus sp.*), St. Johnswort (*Hypericum sp.*) and yellow toadflax (*Linaria sp.*).

Of the listed species only Canada thistle is abundant along roads and trails near the project and probably exists but a formal inventory has not been conducted (Buckert pers. comm. 2008). This rhizomatous plant can establish a monoculture; threatening native plant populations and diversity, especially in riparian areas.

3.7.2.8 Agriculture

Agricultural lands are limited. Limited information is available on the types of agriculture within the area, but these lands are likely used for dryland hay.

3.7.3 Direct and Indirect Effects

3.7.3.1 Alternative A- Proposed Action

Under the Proposed Action, both temporary and permanent impacts on existing vegetation would result from construction activities such as blading, grading, and trenching of the ROW, or superficial damage from vehicles and foot traffic in the ROW. Direct effects would occur primarily in grassland communities, consisting of removing and reducing growth and productivity. Two species of local concern the narrowleaf grapefern and Iowa moonwort were identified to have potential habitat within the project are. Under the Proposed Action, impacts may provide a niche or inhibit populations

of these species. While there is no documentation of these plants occurring, there is the potential that they may exist in the area. Due to variability in habitat preferences, difficulty in identification due to diagnostic characteristics, and high morphological variability (Paris et al. 1989) it is difficult to assess whether activities associated with the conveyor belt would have an adverse or beneficial impact. The Proposed Action would not result in any alteration of the 2.6 acres of wetlands identified by the National Wetland Inventory therefore, a Section 404 Permit from the US Army Corp of Engineers to address loss of jurisdictional would not be necessary. If construction activities occur in close proximity to any wetlands appropriate sediment control actions such as silt fencing and other BMPs would be implemented before the onset of ground disturbance.

Reclamation would occur in disturbed areas surrounding the project area after construction. Reestablished vegetation communities in semiarid climates in the first couple of years often consist of annual forbs and native cool season grasses with little shrub establishment (Bowen et al. 2005 and Wick et al. 2007). Even though this vegetation composition differs than the pre-disturbance these species are considered beneficial for the development of soil structure, which leads to organic matter accumulation, as indicated by an increase in carbon and nitrogen concentrations. Tree and shrub communities in disturbed areas may require more than 20 years to become established (Holl and Cairns 1994, Hall 2002). Establishment of a productive, diverse community dominated by native species would take longer.

Approximately 16 acres of vegetation (2.7 BLM, 3.0 FS, 10.3 GCC Dacotah) would be permanently impacted. If impacts are proportionally distributed among the vegetation communities, approximately 85 percent would occur in grasslands. Construction of the one lane service road and access points would result in vegetation being removed in the roadbed and adjacent communities. This disturbance could incrementally add to reduction in native plant community productivity and diversity. Vehicle traffic could introduce weed seed and lead to proliferation and spread of noxious weed species. To offset effects of disturbance, revegetation would occur in disturbed areas post construction using a native seed mix approved by BLM and US Forest Service.

3.7.3.2 Alternative B- No Action

Under the No Action Alternative, vegetation communities would not be impacted by construction of a conveyor belt. No conveyor belt related disturbance would occur to vegetation and impacts would continue at present levels as a result of natural conditions and existing and adjacent development.

3.7.3.3 Alternative C- Trucking Existing County Road

A new road would not be developed. However, re-engineering and modifying the alignment and width of the existing county road would result in 17.2 acres (2.9 BLM, 3.3 FS, 11 GCC Dacotah)where changes in vegetation composition and community structure of grassland, shrubland, and ponderosa pine communities would occur. This modification of the existing road corridor may provide a niche or inhibit populations of narrowleaf grapefern and Iowa moonwort, could incrementally add to a reduction in native plant community productivity and diversity, and lead to proliferation and spread of noxious weed species.

3.7.3.4 Alternative D- Trucking ROW Corridor

A new road would be constructed. Vegetation would be removed in the roadbed and adjacent communities would be disturbed. This disturbance may provide a niche or inhibit populations of narrowleaf grapefern and Iowa moonwort, could incrementally add to a reduction in native plant community productivity and diversity. In addition, adjacent communities could experience fugitive dust resulting in decreased productivity. Vehicle traffic could introduce weed seed and lead to proliferation and spread of noxious weed species. Approximately 27.8 acres (4.7 BLM, 5.3 FS, 17.8 GCC Dacotah) of disturbance would occur.

3.7.4 Connected Action

Vegetation would be removed in the active mining area at a rate of approximately 10 acres per year. Additional disturbance for the rail load-out area and access roads around each facility would contribute to the area of surface disturbance. The

surface disturbances associated with the Connected Action could incrementally add or cause a reduction in habitat available for the two species of local concern, and contribute to a reduction in native plant community productivity and diversity. Vehicle traffic could introduce weed seed and lead to proliferation and spread of noxious weeds.

Mine reclamation would take place concurrently with active quarrying and would help mitigate the effects. Reestablished vegetation communities in the first couple of years often consist of annual forbs and native cool season grasses. Tree and shrub communities in disturbed areas may require more than 20 years to become established (Holl and Cairns 1994, Holl 2002). Establishment of a productive, diverse community dominated by native species will take longer.

3.7.5 Cumulative Effects

Cumulative effects in the form of past and reasonably foreseeable actions include additional surface/vegetation disturbance and the potential for noxious weed spread on vegetation resulting from livestock and wildlife grazing; mining, exploration roadway and utility corridor construction; fire; and recreational use. The continued creation of these disturbances could remove or damage existing vegetation, add to fugitive dust emissions, and introduce weed species.

Cumulative effects on riparian and wetland areas from wildlife and livestock use could lead to changes in wetland productivity due to modification in surface and subsurface flow patterns. These modifications may alter wetland vegetation community composition and structure. Impacts on wetland and riparian communities would depend on the individual vegetation communities present and site-specific soil and moisture conditions received post-construction.

3.8 Wildlife

3.8.1 Study Area Boundaries

The wildlife resources analysis area is located within the Black Hills ecosystem, and focused on a three-mile buffer area around the Project Area.

3.8.2 Affected Environment

3.8.2.1 Habitat Description

The Black Hills ecosystem is often considered a crossroads between east and west, north and south. The region represents a unique composition of flora and fauna. There are approximately 139 bird, seven amphibian, 15 reptile, 62 mammalian, and 29 fish species and four major vegetative complexes within the Black Hills region. This diversity of species and habitat is because the Black Hills is located at the periphery of their respective ranges and whose population cores are generally located elsewhere in North America (US Forest Service 1996).

The Black Hills ecosystem is predominantly a Rocky Mountain Coniferous Forest Complex dominated by ponderosa pine (*Pinus ponderosa*). Species common to the region include: mule deer (*Odocoileus hemionus*), mountain bluebird (*Sialia currucoides*) and western tanager (*Piranga ludoviciana*). Northern species such as: white spruce (*Picea glauca*), paper birch (*Betula papyrifera*), pine marten (*Martes americana*), red-breasted nuthatch (*Sitta canadensis*), golden-crowned kinglet (*Regulus satrapa*), gray jay (*Perisoreus Canadensis*); and Eastern deciduous hardwood species (e.g., bur oak, eastern hophornbeam,) and other eastern species (e.g., white-tailed deer, broad-winged hawk, and ovenbird) also reside within the Black Hills ecosystem. See the Vegetation section for a detailed description of habitat types. For a description of the vegetation communities that occur, refer to the *Section 3.7, the Vegetation Section.*

Game Species

The Black Hills ecosystem provides habitat for a range of game species. Big game species utilizing habitat include: mule deer (*Odocoileus hemionus*), white-tail deer (*Odocoileus virginianus*), elk (*Cervus canadensis),* big horn sheep (*Ovis canadensis*), mountain lions (*Puma concolor*), and pronghorn (*Antilocapra americana*).

Current population estimated for Black Hill for deer herds are approximately 12,000 mule deer and 50,000 white-tailed (SDDGFP 2008c). These estimates are based on fall fawn/doe surveys, harvest data, and population modeling.

Management considerations for these herds include: habitat quality and quantity; depredation on private lands; adequate population numbers to insure sustainability; and public acceptance of management direction. Current methodology to determine population trends include: fawn recruitment into the population determined by fall fawn/doe surveys, hunter success, age structure of harvested deer, landowner tolerance of current population, available forage, and estimated populations numbers (SDDGFP 2008c).

Elk populations within the Black Hills have been healthy over recent years. In 2008, the South Dakota Department of Fish, Game and Parks have switched from a population reduction harvest strategy to a maintenance harvest strategy. Since a reduction in elk numbers is no longer necessary, license numbers for 2008 have been reduced and will likely stabilize over the next few years.

Big horn sheep were native to the Black Hills but became extinct by 1916. In 1991 and 1992, thirty-one Rocky Mountain bighorn sheep (*O. c. canadensis*) were transplanted into Spring Creek Canyon in the Black Hills (US Forest Service 2005a). More recent introductions occurred within the Elk Mountain region, north of the project area. In 2001, 20 big horn sheep were introduced to the Elk Mountain area and an additional seven sheep were released in September of 2007 (Benzon 2008). The current population is estimated at approximately 100 animals and is a healthy, viable population (Benzon 2008). Harvest surveys can indicate population trends and the South Dakota Department of Game, Fish, and Parks (SDGFP) harvest reports indicate that big horn sheep population appear to be stable as there has been a 100 percent harvest rate for at least the past seven years (SDDGFP 2007).

Mountain lions are distributed throughout the Black Hills region. The SDDGFP 2007 summary of mountain lion occurrences documented 227 mountain lion sightings within South Dakota and 14 of these sightings occurred within Custer County (SDDGFP 2007). Mountain lions would likely use the Project Area for hunting areas as the Project Area provides excellent habitat for deer, the mountain lion's key prey species.

Small game animals that may be found include: cottontail rabbits (*Sylvilagus floridanus*), blacktail jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), raccoon (*Procyon loter*), and badger (*Taxidra taxus*).

Upland birds common within the region of the Project Area include: gray partridge (*Perdix perdix*), sharp-tailed grouse (*Tympanuchus cupido*), and mourning doves (*Zenaida macroura*). While the gray partridge prefers the grassland areas, sharp-tailed grouse tend to prefer areas with deciduous shrubs or sagebrush.

Sage grouse (*Centrocercus urophasianus*) have been a species of concern due to a long term reduction in their overall habitat. Sage grouse are considered a sagebrush obligate species and rely on sagebrush for all stages within their life cycle. Western South Dakota is considered the most easterly fringe of the sage grouse range in the United States. However, there is one documented lek in Fall River County between Edgemont, SD and the Wyoming border (SDDGFP 2008b).

3.8.2.2 Non-game Species

A wide range of non-game species also utilize the Project Area. Some species likely inhabit the Project Area include: big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasioncyceteris noctivagens*), little brown myotis (*Myotis lucifugai*), masked shrew (*Sorex cinereus*), short-tailed shrew (*Blarina brevicauda*), hispid pocket mouse (*Perognathus hispidus*), plains pocket mouse (*Perognathus flavescens*), deer mouse (*Peromyscus maniculatus*), thirteen-rail lined ground squirrel (*Spermophilus tridecemrail lineatus*), and meadow vole (*Miscrotus pennsylvanicus*).

3.8.2.3 Migratory Birds

A variety of migratory birds utilize the diversity of habitats within the Black Hills Ecosystem. Breeding bird surveys have been conducted annually within the Black Hills since 2001 (RMBO 2008). While the majority of the surveys have been conducted within the core areas of the Black Hills, some of the surveys that occurred along the fringe of the Black Hills may provide insight into the migratory birds utilizing the Project Area. Migratory birds that have been documented within mixed-grass prairie similar to the Project Area include: mourning dove, northern flicker, western

wood-pewee, dusky flycatcher, plumbeous vireo, pinyon jay, mountain bluebird, Townsend's solitaire, yellow-rumped warbler, western tanager, chipping sparrow, vesper sparrow, lark sparrow, grasshopper sparrow, western meadowlark, red crossbill, and American goldfinch.

3.8.2.4 Raptors

Raptors that could potentially use the Project Area include: bald eagles (*Haliaeetus leucocephalus*) for winter range, golden eagle (*Aquila chrysaetos*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), ferruginous hawk (*Buteo regalis*) and great horned owl (*Bubo virginianus*). A query of the South Dakota Natural Heritage Database was conducted to determine if any rare, threatened or endangered species had ever been documented within the Project Area or within a three-mile buffer area. While no rare, threatened or endangered species were identified within the search radius, there were two golden eagle nests identified within the three-mile buffer area around the Project Area. These nests were located within the cliff habitat along Pass Creek.

3.8.2.5 Amphibians and Reptiles

The Project Area represents limited habitat for amphibians due to as the lack of aquatic habitat. Streams that do occur are intermittent and wetland habitat is limited to less than 3 acres. **Table 3-10** presents a brief list of some of the reptile and amphibian species that may occur in the region.

3.8.3 Direct and Indirect Effects

3.8.3.1 Alternative A - Proposed Action

Table 3-10 displays the potential direct impacts associated with the Proposed Action that may occur to wildlife utilizing the Project Area.

The most significant level of impacts to wildlife would occur during the construction phase of the project. This phase is expected to last approximately 8 to 12 months, after which, all areas of temporary disturbance would be reclaimed. While the disturbance associated with construction would displace wildlife species that typically use the Project Area, these animals would be expected to return to the Project Area once construction activities are completed. The noise disturbance associated with the operation of the conveyor belt may initially deter animals from using habitat immediately adjacent to the conveyor belt, but it is expected that most species would become accustomed to the noise and resume utilization of the area.

The conveyor belt would not influence daily or migratory movement patterns for most species utilizing the area. The conveyor belt would have a clearance of at least six feet and wildlife species would be able to fly over or move under the conveyor belt without any restrictions. Movement under the conveyor belt may not occur until animals are accustomed to it, and some species known to be sensitive to disturbance, such as pronghorn, may take longer to become accustomed. Movement patterns of big game would likely be more hindered by the conveyor belt than other species due to their size and their inherent sensitivity to disturbance. Most big game species would eventually become accustomed to the conveyor belt and move under it, and those species that avoid the conveyor belt, could migrate around it as it is relatively short considering the average movement patterns of big game species.

There would be some permanent habitat loss associated with the Proposed Action. **Table 3-11** summarizes the projected habitat loss due to construction activities associated with the Proposed Action. The conveyor belt itself is only six feet wide; however, due to the noise disturbance that would occur during operation of the conveyor belt, the permanent disturbance area was considered to be a 100 foot buffer along the length of the conveyor belt.

The majority of disturbance would occur within grassland habitat as the Proposed Action would permanently remove approximately 11 percent of the grassland habitat. This would reduce important habitats such as big game winter habitat and grassland bird nesting habitat. However, the habitat loss would be minor on a regional level as there is extensive grassland habitat available within the region of the Project Area. Species that utilize grassland habitats would easily utilize adjacent grassland habitat. The approximately 13 acres of Ponderosa pine habitat loss would represent approximately 12 percent of the Ponderosa pine

Table 3-10
Direct Impacts to Wildlife Associated with the Proposed Project

Project Related Activity	Potential Impacts	Duration and Extent of Impact
Impacts Associated with Construction		
Site clearing and grading; construction of conveyor belt; access road and loading areas; vehicle travel	Habitat disturbance; reduction or alteration of on-site habitat	Long-term habitat reduction within conveyor belt and access road footprints
	Invasive vegetation; Reduced habitat quality	Short-term as implementation of the Weed Control Plan would control weeds within the disturbance areas
	Direct injury or mortality associated with equipment or vehicle collisions. Would have greatest impact on wildlife with limited mobility such as amphibians, reptiles, ground dwelling birds, and burrowing mammals	Short-term as impacts would cease upon completion of construction
	Fugitive dust generation; respiratory impairment	Short-term
	Noise; Disturbance of foraging and reproductive behaviors; habitat avoidance	Short-term
	Interference with behavioral activities such as foraging, migration or reproductive behaviors; disturbance and avoidance of migratory movements	Short-term
Accidental spill during equipment refueling; accidental release of stored fuel or hazardous materials	Exposure to contaminants; exposure may affect survival, reproduction, development, or growth.	Short-term and localized to spill area
Impacts Associated with Operation and Maintenance		
Conveyor belt operation, support machinery, and motorized vehicles	Noise; possible disturbance of foraging and reproductive behaviors; habitat avoidance	Short and long-term; greatest effect in highest noise areas
	Collision with maintenance vehicles	Long-term for many species
Accidental spill or release of pesticides, fuel, or hazardous materials	Exposure to contaminants; Exposure may affect survival, reproduction, development, or growth	Short- or long-term, localized to spill locations

habitat available. As with the grassland habitat, this would reduce habitat for those species that utilize this forest area; however, there is habitat available regionally for displaced animals.

While wildlife species that utilize the Project Area would experience direct impacts from the Proposed Action, most of these impacts would be associated with the construction phase of the project and would be short term. Long term impacts such as noise disturbance or an increase in vehicle/wildlife collisions would not negatively impact the populations of species and would not cause the Project Area to be inhabitable by wildlife. Sensitive habitat features such as raptor nests or sage grouse leks have not been identified and would not be impacted.

Table 3-11 Acres of Habitat Disturbance within 100 Feet of the Conveyor Belt			
Habitat Type	**Acres of Total Project Area**	**Acres of BLM w/in Project Area**	**Acres of Forest Service w/in Project Area**
Ponderosa Pine	12.9	1.9	6.6
Sagebrush Shrubland	6.1	0.3	0.2
Mountain Mahogany Shrubland	0.3	0.2	0
Grassland	131.9	20.2	21.1
Agriculture	0	0	0
Barren	4.3	4.0	0.2
Floodplain	2.1	0	1.6

3.8.3.2 Alternative B - No Action

The No Action would not entail the use of a ROW or Special Use Permit; therefore no conveyor belt would be constructed and there would be no impacts habitat or wildlife species.

3.8.3.3 Alternative C – Trucking Existing County Road

Direct impacts to wildlife under Alternative C would be very similar to those types of impacts associated with the Proposed Action (**Table 3-11**); however, the level of impacts would differ. Alternative C would result in less permanent habitat loss in comparison to Alternative D. Alternative C would result in approximately seven mile of existing county roads to be reconstructed. This would cause 17.2 acres of permanent habitat loss. The layout for the road has not been finalized; therefore, it is unknown what type of habitat would be impacted. The permanent habitat loss associated with Alternative C would not be expected to impact wildlife species utilizing the Project Area as this is a relatively small amount of habitat loss given the amount of regional available habitat.

The construction activities associated with Alternative C would cause considerable disturbance to wildlife. The disturbance would be associated with the vehicle traffic, noise and dust and would potentially cause wildlife species to avoid the Project Area during that phase of the project. However, the construction phase would be temporary and wildlife species would likely resume use of most of the Project Area upon completion.

Alternative C would cause more long term disturbance and risk to wildlife species in the area as a result of the increase vehicular traffic along the county roads. It is estimated that there would be approximately 83 truck loads of material transported daily which would result in an additional 166 vehicle trips per day along the county road. The noise and dust associated with this traffic would likely cause disturbance and this may deter many species from using the area adjacent to the road resulting in an increase in habitat fragmentation. In addition, the high level of vehicle traffic could potentially disturb or alter movement patterns of wildlife species in the area. Wildlife, especially those more sensitive to disturbance, may be forced to migrate around the county road. While this would not negatively impact many of the larger species, it may increase the risk and vulnerability to some of the smaller species.

Alternative C would likely increase the rate of mortality and injury associated with vehicle/wildlife collisions. While there would a speed limit enforced along the county road ensuring that drivers would be able to avoid many collisions, there would still be an increase in wildlife mortality due to vehicle/wildlife collisions, especially with the smaller, less mobile species. While increased collisions would impact individual species, the increase would not be expected to reduce the viability of the wildlife population within the region of the Project Area.

While Alternative C may impact wildlife species and may result in less utilization of the Project

Area, Alternative C would not be expected to impact population trends or viability on a regional level.

Indirect impacts under Alternative C would be similar as those detailed within the Alternative A discussion. Accidental spills, potential for erosion and an increase in public travel would all be indirect impacts under Alternative C. The potential for accidental spills and exposure to contaminants would be greater under Alternative C as there would be significantly more vehicular traffic and therefore more opportunity for accidents and spills.

Alternative C would also have an indirect impact to species as a result of the habitat fragmentation and potential alteration of migration routes. The high level of traffic may cause some species to displace or alter their migration routes which would cause these species to expend more energy and possibly make them vulnerable to predators, harsh weather conditions or other risk factors. This would be most significant during seasons of vulnerability such as winter. This indirect impact would be temporary as animals would become familiar with new migration routes and travel corridors and eventually reduce their level of vulnerability.

The increase in public use would be a minor impact under Alternative C as there would be only a mile of new road and public access to the Project Area would not be altered.

3.8.3.4 Alternative D – Trucking ROW Corridor

Alternative D would have similar impacts as Alternative C. As with Alternative C there would be temporary disturbance associated with the construction. The increase in vehicle travel (approximately 166 trips per day) would cause noise and dust disturbance and may deter animals from using the area. This would result in habitat fragmentation and the high level of vehicle traffic may alter movement patterns and migration behavior possibly increasing the vulnerability in some species.

Alternative C and Alternative D would differ in one aspect as Alternative D would result in the construction of an additional six miles of new roads which could result in a permanent habitat loss of approximately 27.8 acres. The road layout has not been finalized; therefore, it is unclear what amount of habitat would be permanently disturbed. The new roads under Alternative D can impact wildlife by not only removing habitat, but by increasing the level of disturbance and habitat fragmentation into an area that was previously undisturbed. Roads can impact different wildlife species differently as some wildlife species are much more vulnerable to habitat loss and fragmentation caused by roads than are other species. Wildlife that are the most vulnerable to habitat loss are large, long-lived species that require large home ranges and occur in low densities and have low reproductive rates such as many large carnivores (US Forest Service 2005b). Alternative D would degrade the habitat by increasing the disturbance and fragmentation; however, there is adjacent habitat available as the region of the Project Area is relatively rural and it would be expected that displaced wildlife species could utilize adjacent areas. Wildlife species would be impacted, but the trend or viability of the regional populations would not be impacted.

Alternative D would have similar indirect impacts as discussed under Alternative C. There would be an increase in opportunity for accidental spills; however, these impacts would be short term and localized to the impacts area. The potential for erosion would be greater under Alternative D as there would be approximately seven miles of new road construction; however, the implementation of BMPs would reduce the potential for erosion. Alternative D would also result in an increase in public use and legal and illegal take of wildlife. While the new roads would closed to the public, there would be an increase in access and increase the level of disturbance to wildlife associated with public access.

As discussed under Alternative C, the high level of vehicle traffic would result in habitat fragmentation and potential for impacting migration corridors and travel routes. This impact would be more significant under Alternative D as the road density in the area would be increased; thus, increasing the disturbance, stress and vulnerability to species in the area.

3.8.4 Connected Action

The connected action would result in additional permanent habitat loss and disturbance within the

region of the Project Area. It is estimated that during any given year during the life of the project, there would be approximately 20 to 30 acres of disturbed ground at the quarry site. These areas will be continuously reclaimed as the material is harvested. The disturbed ground, noise and dust that would be associated with the mining activities would likely displace animals from the area. The disturbance would impact species differently depending on their sensitivity to disturbance and their ability to become accustomed. These activities would result in a reduction in utilization of the Project Area and would displace wildlife species. However, the species would be able to occupy adjacent habitats and the impacts would not likely result in a reduction in the viability of the regional populations.

3.8.5 Cumulative Effects

The Project Area and adjacent areas have mainly been used for livestock grazing. There have been varying degrees of surface disturbance related to the historical construction of utility/transportation corridors and historical uranium and oil and gas exploration drilling. .The proposed action alternatives would increase the level of surface disturbance to the overall area and may displace wildlife species. The reasonable foreseeable actions to occur within the region of the Project Area include activities such as: uranium mining, oil and gas exploration and changes in grazing leases. The mining and exploration activities would increase the level of surface disturbance, noise and vehicle traffic within the region of the Project Area. The exploration and mining activities would result in disturbances over relatively smaller geographic areas and over a shorter time frame than the proposed action alternatives. The cumulative impacts from the selected action alternative and the reasonably foreseeable actions would result in an overall increase in disturbance, habitat loss and mortality due to vehicle collisions to wildlife species within the region of the Project Area. The cumulative impacts would result in impacts to individual species and would result in some species displacement to adjacent habitats. There could potentially be a slight, temporary decrease in local populations as populations adjust to the increase in noise and disturbance. However, these populations would adjust to the adjacent habitats and the overall viability of populations would not be impacted.

3.9 Special Status Species

3.9.1 Study Area Boundaries

When adequate information was available, the analysis area boundary was the Project Area and a surrounding three-mile buffer area.

3.9.2 Affected Environment

Threatened and Endangered Species

Table 3-12 summarizes habitat and occurrence of threatened and endangered species.

Table 3-12
Threatened, Endangered, and Candidate Species of South Dakota

Common Name	Scientific Name	Habitat of Species	Does the Habitat or Species occur within the Project Area
Invertebrate			
American Burying Beetle, Endangered	*Nicrophorus americanus*	Given the broad geographic region of the species historic habitat, it is unlikely that vegetation or soil type were historically limiting. The American burying beetle seems to be largely restricted to areas most undisturbed by human influence. Carrion availability (appropriate in size as well as numbers) may be the more important factor of where beetles occur than the type of vegetation or soil structure.	**No-** Species not known or suspected to occur within the Black Hills region. Species not known to occur.
Mammals			
Black-footed Ferret, Endangered	*Mustela nigripes*	Black-footed ferrets utilize open habitat used by prairie dogs such as: grasslands, steppe, and shrub steppe. The ferrets do not dig their own burrows and rely on abandoned prairie dog burrows for shelter. Only large complexes (several thousand acres of closely spaced colonies) can support and sustain a breeding population of black-footed ferrets.	**Yes, potential future habitat-** Species has been historically tied to prairie dog colonies for food and shelter. The Black Hills National Forest has only 200 acres of black-tailed prairie dog colonies (US Forest Service 2005c). Species known to occur within Custer County (Roddy 2008; USFWS 2007. Black-footed ferrets were recently re-introduced to Custer County as 49 ferrets were released within the Wind Cave National Park in 2007. Fall 2008 surveys documented that reproduction had occurred within the population suggesting that the transplant was a success (Roddy 2008). There are approximately 2,800 acres of prairie dog towns within the Wind Cave National Park and there could potentially be another reintroduction effort in 2009 (Roddy 2008). In addition, there may also be future black-footed ferret reintroductions within the Thunder Basin Grassland (Byer 2008). Prior to the 2007 reintroduction effort, the last sighting of black-footed ferrets within Custer County occurred 1972 and 1977 within the Wind Cave National Park (Roddy 2008). There were also documented sightings in Wind Cave National Park in 1956 (US Forest Service 1996). While there are no documented sightings of black-footed ferrets and there is limited prairie dog activity, there is the potential for the area to provide black-footed ferrets habitat within the future as populations expand.

Source: US Forest Service. 2007a. Rocky Mountain Region: Endangered, Threatened, Proposed and Sensitive Species, August 6, 2007; USFWS. 2007b. Mountain Prairie Region, South Dakota Ecological Services Field Office: Endangered Species List by County. December 18, 2007. http://www.fws.gov/southdakotafieldoffice/endsppbycounty.htm

Sensitive Species

Table 3-13 summarizes the habitat and occurrence of sensitive species.

Table 3-13
Sensitive Species identified to occur within the Black Hills Region

Common Name / Agency Listed	Scientific Name	Habitat of Species	Does the Habitat or Species occur within the Project Area
Mammals			
Rocky Mountain Bighorn Sheep / US Forest Service	*Ovis Canadensis canadensis*	In 1991 and 1992 thirty-one Rocky Mountain bighorn sheep (*O. c. canadensis*) were transplanted into Spring Creek Canyon in the Black Hills. More recent introductions occurred within the Elk Mountain region, north of the project area. In 2001, 20 big horn sheep were introduced to the Elk Mountain area and an additional seven sheep were released in September of 2007 (Benzon 2008). The current population is estimated at approximately 100 animals and is a healthy, viable population (Benzon 2008). They inhabit alpine meadows, foothills, and cliffs (US Forest Service 2005a).	**Yes-** This species is known to occur within the region and Project Area could provide seasonal habitat.
Fringed Myotis / US Forest Service; BLM	*Myotis thysanodes*	Habitat occurs within caves, mines, snags, rock outcrops, and human structures as roost sites, with foraging habitat often occurring within riparian areas. Species is known to hibernate in caves of the Black Hills (US Forest Service 2005a). Open water habitats within the Black Hills are likely provided by stock tanks and other water catchments (US Forest Service 2005a).	**Yes, although limited-** Species currently documented to occur within Black Hills National Forest Lands. While this species occurs within the region, limited roosting and foraging habitat occurs.
Townsend's Big-eared Bat / US Forest Service; BLM	*Corynorhinus townsendii*	Roosting habitat includes: caves, mines, snags, rock outcrops, and human structures. Similar habitat as the fringed myotis but more closely associated with caves and mines for day roosts and hibernation sites. Hibernating sites are documented in the Black Hills. It is common in shrub-steppe, juniper woodlands and dry coniferous forest (US Forest Service 2005a).	**Yes, although limited-** Species currently documented to occur within Black Hills National Forest Lands. While this species occurs within the region, limited roosting and foraging habitat occurs.
Black-tailed Prairie Dog / US Forest Service; BLM	*Cynomys leucurus*	In the State of Wyoming, species currently occurs in scattered populations in the eastern portion of the state. Within the Black Hills National Forest, species currently has approximately 200 acres of prairie dog habitat in 4-5 colonies. The largest colony is approximately 80 acres (US Forest Service 2005a).	**Yes-** Species currently documented to occur within Black Hills National Forest Lands. Prairie dog towns were observed within the region of the Project Area; however, no prairie dog towns are documented to occur.

Table 3-13
Sensitive Species identified to occur within the Black Hills Region

Common Name / Agency Listed	Scientific Name	Habitat of Species	Does the Habitat or Species occur within the Project Area
Swift Fox / US Forest Service; BLM	*Volans velox*	The swift fox has been documented within the southwestern quarter of South Dakota (Ashton and Dowd 1991). Swift fox tend to be associated with short and mixed grass prairie. No known populations have been documented on the Black Hills National Forest with the only suitable habitat surrounding active prairie dog colonies (comprising 200 acres) in the southern portions of the BHNF (US Forest Service 2005a).	**Yes, potentially-** Species not known or suspected to occur within the Black Hills National Forest; however, it may occur in planning vicinity. The grassland habitat utilized by the swift fox does occur.
American Marten / US Forest Service	*Martes americana*	Preferred habitat is moist coniferous forest and to a lesser degree, drier coniferous forest (Buskirk 2002). Uses confer forests with near-ground structure. The marten is present in the Black Hills National Forest usually in habitat dominated by white spruce (US Forest Service 2005a).	**No-** Species currently documented to occur within Black Hills National Forest Lands.; however, the Project Area does not contain marten habitat.
Long-eared Myotis / BLM	*Myotis evotis*	Inhabits coniferous forest and woodland, including juniper, Ponderosa pine, and spruce-fir. It typically forages over rivers, streams, and ponds within the forest-woodland environment. During summer, it roosts in a wide variety of structures, including cavities in snags, under loose bark, stumps, buildings, rock crevices, caves, and abandoned mines. During winter, it probably hibernates primarily in caves and abandoned mines.	**No-** Given the limited forest and aquatic habitat, it is unlikely that the Project Area would be utilized by this species.
Long-legged Myotis / BLM	*Myotis volans*	Roosts are in trees, caves, abandoned mines, and other such sheltered areas. The long-eared myotis emerges after dark to forage, feeding near trees or over water. They are late fliers (around midnight) but have been captured throughout the night.	**Yes-** The Project Area occurs on the eastern fringe of the distribution.
Northern Long-eared Myotis / BLM	*Myotis septentrionalis*	Species primarily inhabits forested regions. In Wyoming, it can be found in wooded riparian zones in badlands and prairies to higher elevation conifer and deciduous woodlands. During summer, it roosts in crevices and cavities of trees, under loose bark, and occasionally in buildings. During winter, it usually hibernates in caves and abandoned mines.	**No-** The Project Area does not represent habitat for this species.

Table 3-13 Sensitive Species identified to occur within the Black Hills Region			
Common Name / Agency Listed	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Spotted Bat / US Forest Service	*Euderma maculatum*	Species occupies a wide variety of habitats, from desert scrub to coniferous forest.. It roosts in cracks and crevices in high cliffs and canyons. Species is typically associated rough, rocky terrain and is considered a high flying bat (US Forest Service 2000). It also may occasionally roost in buildings, caves, or abandoned mines, although cliffs are the only roosting habitat in which reproductive females have been documented.	**No-** There has been no documentation or evidence suggesting that the species occurs within the Black Hills and habitat is marginal (US Forest Service 2000).
Birds			
Northern Goshawk / US Forest Service; BLM	*Accipiter gentilis*	Species is a forest habitat generalist and requires abundant prey base, possibly related to understory shrub development in forested habitat. Confirmed breeding records in Custer, Meade, Lawrence and Pennington Counties within the Black Hills. Breeds in dense mature ponderosa pine in Black Hills. The goshawk is a winter resident in ponderosa pine throughout most of the Black Hills. (US Forest Service 2005a)	**No-** Although, species currently documented to occur on Black Hills, it is unlikely that this species would utilize the Project Area as the forest habitat required by this species does not occur.
Ferruginous Hawk / US Forest Service; BLM	*Buteo regalis*	Mixed-grass prairie species, associated with little bluestem, prairie June grass, green needle-grass, western wheatgrass, and Kentucky bluegrass. Trees are common nest sites, including eastern cottonwoods, peachleaf willow, juniper, box elder maple, green ash, Chinese elm, and American elm. Also uses sagebrush and saltbrush, greasewood shrublands. Nests may be found on riverbed mounds, river cutbanks, low hills, clay buttes, high vegetated hills, and rock piles. Avoids montane forests, aspen, wooded areas, urban areas, and habitat recently altered by cultivation.	**Yes-** The Project Area provided grassland habitat that may be utilized by this species.
American Peregrine Falcon / US Forest Service; BLM	*Falco peregrinus anatum*	Nests near rocky cliffs and often hunts near water. Formerly considered a rare summer resident in the Black Hills (US Forest Service 2005a).	**No-** The habitat required by this species does not occur. Species or habitat is suspected to occur on Black Hills National Forest Lands, but unconfirmed.

Table 3-13
Sensitive Species identified to occur within the Black Hills Region

Common Name / Agency Listed	Scientific Name	Habitat of Species	Does the Habitat or Species occur within the Project Area
Northern Harrier / US Forest Service	*Circus cyaneus*	Found in upland grasslands, marshes, open wetlands, marshy meadows, wet, lightly grazed pastures, old fields, upland prairies, mesic grasslands, drained marshlands, croplands, cold desert shrub-steppe, riparian woodland, and woody draws. Populations associated with large tracts of undisturbed habitats dominated by thick vegetation growth.	**Yes-** The Project Area does provide the grassland used by this species.
Mountain Plover / US Forest Service	*Charadrius montanus*	Inhabits grasslands, short-grass prairie, alkali flats, agricultural lands, and shrub-steppe. Mountain plovers have been observed in the general vicinity of the Wyoming Black Hills. The mountain plover is not listed as a breeding bird in South Dakota, and the Black Hills are not within known winter range (US Forest Service 2005a).	**Yes-** The Project Area provides marginal habitat for mountain plovers. While the species is not known or suspected to occur within the Black Hills National Forest, it may occur in planning vicinity.
Long-billed Curlew / US Forest Service; BLM	*Numenius americanus*	Selects open habitats year around. During the breeding season, they frequent prairies and grasslands, as well as plowed fields, meadows, and pastures. Use developed lands for feeding, but not for nesting. Intensive grazing and fires can be effective management tools when used at proper time, because they prefer short vegetation on nesting areas.	**Yes-** The Project Area provides grassland habitat that may be utilized by this species. Species currently documented to occur within Black Hills National Forest Lands.
Yellow-billed Cuckoo / US Forest Service	*Coccyzus americanus*	Breeds in open woodlands and riparian woodlands throughout much of the US, but not common in the west. Breeding occurrence documented in Crook County Wyoming and observed in Weston County, Wyoming in lower elevations of the Black Hills. Not known to occur in the South Dakota Black Hills (US Forest Service 2005a).	**No-** The Project Area does not provide the riparian and woodland habitat selected by this species.
Burrowing Owl / US Forest Service; BLM	*Athene cunicularia*	Uses vacant rodent burrows, mainly associated with prairie dog habitat. Burrowing owls have been documented in several locations in the Black Hills. Population status is unclear, although Black Hills National Forest only has approximately 200 acres of prairie dog habitat (US Forest Service 2005a).	**Yes-** Species may utilize the Project Area as foraging habitat. Species currently documented to occur within Black Hills National Forest Lands.

Table 3-13 Sensitive Species identified to occur within the Black Hills Region			
Common Name / Agency Listed	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Flammulated Owl / US Forest Service	*Otus flammeolus*	Nests in woodpecker holes made in mature aspen or ponderosa pine habitat. Flammulated owls were sighted near the Hanna/Spearfish Canyon area in the spring of 2002. A second likely occurrence was recorded in 1992 near Woodcock Spring in the southern Black Hills (US Forest Service 2005a).	**No-** The Project Area does not provide the mature forest this species selects.
Lewis's Woodpecker / US Forest Service	*Melanerpes lewis*	Favors open forests, ranging in altitude from low elevation riparian areas to high-elevation burns and pine forests. Three principal habitats are open ponderosa pine forest, open riparian woodland dominated by cottonwood, and logged or burned pine forest. May prefer ponderosa pine forest at medium to high elevations and open riparian forests at low elevations. Often classified as a specialist in burned pine forest habitat although suitability of burned areas may vary with post-fire age, size, and intensity of burn.	**Yes-** The Project Area offers limited marginal habitat for this species, but there is the potential that this species may utilize the habitat present. Species currently documented to occur within Black Hills National Forest Lands.
Black-backed Woodpecker / US Forest Service; BLM	*Picoides arcticus*	Uncommon year-round resident of various coniferous forest types Ponderosa pine in the Black Hills. Prefers dense coniferous forests, burns, or beetle-killed forests with greater than 15- inch diameter at breast height (dbh) snags needed for nesting cavities (DeGraaf et al. 1991). Species is rare and local on the Black Hills National Forest with no available trend data (US Forest Service 2005a).	**No**- Although the species is currently documented to occur within Black Hills National Forest Lands, only a small percent of the Project Area is forest (approximately eight percent Ponderosa pine), and these forested areas have not been recently burned and are not late successional.
American Three-toed Woodpecker / US Forest Service; BLM	*Picoides dorsalis*	Similar habitat to black-backed woodpecker. Prefers burns, spruce, and denser coniferous forests and needs greater than 16 inches DBH snags for nesting. This species is resident but rare in the Black Hills, usually at higher elevations. No available population trend data, but preferred habitat may be in decline (US Forest Service 2005a).	**No**- Although the species is currently documented to occur within Black Hills National Forest Lands, only a small percent of the Project Area is forest (approximately eight percent Ponderosa pine), and these forested areas have not been recently burned and are not late successional.

Table 3-13
Sensitive Species identified to occur within the Black Hills Region

Common Name / Agency Listed	Scientific Name	Habitat of Species	Does the Habitat or Species occur within the Project Area
Loggerhead Shrike / US Forest Service; BLM	*Lanis ludovicianus*	Prefers open habitat including shrub-steppe, deserts and grasslands with access to elevated perches and impaling stations. Feeds mostly on large insects such as grasshoppers and beetles but some small birds and rodents are also taken. This species has declined in North America in recent decades, but South Dakota populations have increased, although trend data for the Black Hills is not available (US Forest Service 2005a).	**Yes-** The Project Area provides the grassland and shrub habitat utilized by this species. Species currently documented to occur within Black Hills National Forest Lands.
Grasshopper Sparrow / US Forest Service	*Ammodramus savannarum*	Ground-nester that breeds in open grassland habitat with less than 35 percent shrubs. Confirmed breeding records and numerous probable and possible breeding records within the Black Hills. Within grasslands of suitable size, prefer grassland habitat of intermediate height and avoid grasslands where vegetation less than 10 cm in height. Suspected downward population trend (US Forest Service 2005a).	**Yes-** The Project Area provides grassland habitat that this species utilizes. Species currently documented to occur within Black Hills National Forest Lands.
American Dipper / BLM	*Cinclus mexicanus*	Resident of fast-flowing mountain streams, where it lives its entire life along fast moving, clear, unpolluted mountain streams with cascades, riffles, and waterfalls, especially waters that travel through canyons. Streams selected for breeding rarely exceed 15 m in width or 2 m in depth. Prefers bottom with rocks, sand, and rubble. In South Dakota, habitat is limited to swift, high quality mountain streams with suitable nest sites in the Black Hills.	**No-** The stream habitat required by this species odes not occur.
Baird's Sparrow / BLM	*Ammodramus bairdii*	Less than 1 hectare minimum habitat area in grasslands that are ungrazed or lightly grazed and tame-grass (planted non native) prairie with typic borolls (cool or cold soils of the organically rich, fertile Mollisol order). Shrub cover must be less than 25 percent. Associated with spikemoss selaginella, fringed sagebrush, June grass, and needle-and-thread. Also may be found in hayfields, weedy stubble fields, retired croplands, wheat fields, and dry wetlands basins. May use local pockets of tall-grass prairie along the periphery of ponds and lakes or along intermittent streams.	**No-** It is highly unlikely that this species would utilize the Project Area. The majority of the grasslands have received at least moderate grazing. In addition, the South Dakota GAP distribution data does not document the distribution within the region of the Project Area.

Table 3-13 Sensitive Species identified to occur within the Black Hills Region			
Common Name / Agency Listed	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Bald Eagle / BLM; US Forest Service	*Haliaeetus leucocephalus*	Dwell in large forested areas close to open water, including major rivers, lakes, and reservoirs. Found in areas with little urban habitat, and, within South Dakota, most frequently on plots near prairie dog towns. Generally occupy riparian or lacustrine habitat as breeders but occasionally exploit upland areas for food. Dominant vegetation may be eastern plains cottonwood, box elder, green ash, hackberry, red cedar, American elm, willow, or false indigo. On rivers, they concentrate on runs and pools, riffles are important seasonally as prey fishes are spawning; lakes and reservoirs are used in shallow areas with gentle sloped shorelines and wetlands.	**Yes-** May use the Project Area as winter foraging habitat.
Blue-gray Gnatcatcher / BLM	*Polioptils caerulea*	Broad range of wooded habitats from shrublands to mature forest. Generally use broad-leaved trees and shrubs, riparian and swamp forest, upland deciduous woodlands, and pine flatwoods. Rare or absent from needle-leaved conifer forests. Largely confined to riparian or lakeside habitats at northern edge of range. Uses floodplain forest dominated by green ash and silver maple.	**No-** Species is rare within South Dakota and only known to occur within the south eastern corner of the state.
Dickcissel / BLM	*Spiza americana*	Tall grasslands, including prairie, hayfields, lightly grazed pastures, and roadsides.	**Yes-** The Project Area does provide habitat for this species and the species is know to occur within South Dakota.
Franklin's Gull / BLM	*Laris pipixcan*	Nests in small to large colonies in extensive prairie marshes, and entire colonies may shift sites from year to year depending on water levels. Large flocks forage in fields, following the plow or disk harrow.	**No-** The Project Area does provide habitat for this species.

Table 3-13
Sensitive Species identified to occur within the Black Hills Region

Common Name / Agency Listed	Scientific Name	Habitat of Species	Does the Habitat or Species occur within the Project Area
Golden Eagle BLM	*Aquila chrysaetos*	Found in shrub-steppe community with big sagebrush, shadscale, and winterfat vegetation associations. Major drainages may include deciduous trees and shrubs, riparian grassland, and irrigated hayfields. Common tree species in riparian areas include plains cottonwood, green ash, and boxelder. Use stands of ponderosa pine, Rocky Mountain juniper, and quaking aspen. Nests typically found in large trees in the bottom of isolated drainages, and associated with Ponderosa pine, cottonwood stands, open sagebrush-grassland, and cliffs or rock ledges. Avoids agriculture.	**Yes-** The Project Area does provide habitat for this species and golden eagles are known to occur in the area. The South Dakota Natural Heritage database documented two golden eagle nests identified within the 3-mile buffer area around the Project Area. These nests were located within the cliff habitat along Pass Creek.
Greater Sage Grouse / BLM; US Forest Service	*Centrocercus urophasianus*	Western South Dakota is considered the most easterly fringe of the sage grouse range in the United States. Sage grouse are only found in areas where adequate sagebrush is available to meet habitat and biological needs. As a sagebrush obligate species, sage grouse rely upon this specific plant species to meet most of its habitat needs to complete all aspects of its annual life cycles. Adequate stands of sagebrush are essential as sage grouse rely on the leaves for food and plant structure for cover.	**Yes-** While there are no documented leks and limited habitat, there is approximately 57 acres of sagebrush shrubland that has connectivity to larger tracts of sage grouse habitat. Sage grouse are known to occur in the region as there is a known lek south of the Project Area in Fall River County.
Le Conte's Sparrow / BLM	*Ammodramus leconteii*	Prefers wet grasslands, marshes and bogs, open habitat and wet meadows, fine grasses and sedge meadows, drier border of rush marshes, and dominant plants, such as softstem bulrush, prairie cordgrass, gay-feather, foxtail barley, wheatgrass, and goldenrod. Also found in low, damp parts of hayfields (alfalfa-wheatgrass).	**No-** The Project Area does not provide habitat for this species. Species in known to occur in eastern South Dakota, but has not been documented in western South Dakota.
Marbled Godwit / BLM	*Limosa fedoa*	Breeds in short, sparsely to moderately vegetated landscapes that include native grassland and wetland complexes with a variety of wetland classes (ephemeral, temporary, alkali, and semipermanent). Tall dense vegetative cover is avoided. Selected idle grassland and pastures, agricultural land avoided, but use hayfields, mulched stubble, standing stubble, and growing grain. Migrates through wetland habitats with bulrush, spike-rushes, wire rush, whitetop grass, and cattail.	**No-** the grassland characteristics and wetland habitats do not occur.

Table 3-13 Sensitive Species identified to occur within the Black Hills Region			
Common Name / Agency Listed	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Osprey / BLM	*Pandion haliaetus*	Nesting requirements include trees surrounding bodies of water (or nesting platforms where trees are not available) and minimal human acitvity. Loss of cottonwood snags in one area led to temporary decrease in population. Several nests may be grouped, with individual nests occasionally as close together as 20 m. Foraging occurs over open areas, including water, seen hunting while walking on dirt road.	**No-** Habitat for this species does not occur.
Red-headed Woodpecker / BLM	*Melanerpes erythrocephalus*	Found in bottomland vegetation from 500 to 1000 m wide with surrounding uplands of sand sagebrush-mixed prairie and agricultural lands. Overstory was dominated by plains cottonwood and peachleaf willow, but also included boxelder maple, Siberian elm, Russian-olive, and red ash. Nesting habitat consists of open bottomland along rivers, trees along roads or buildings in open farmland.	**No-** Habitat for this species does not occur.
Sage Sparrow / US Forest Service; BLM	*Amphispiza belli*	Species is closely associated with sagebrush-steppe plant communities. Sagebrush-steppe describes a plant community consisting of one or more layers of grasses and forbs with a discontinuous overstory of sagebrush shrub cover. Species is known to be sensitive to fragmentation of sage cover and is found more frequently in extensive areas of continuous sage.	**No-** Distribution for this species within the region of the Project Area has not been documented. In addition, while some sagebrush habitat occurs, it is marginal and lacks the contiguous habitat required by this species.
Sprague's Pipit / BLM	*Anthus spragueii*	Prefers well-drained areas in open grassland. Grasslands with even a few shrubs are avoided. Common in grasses of intermediate height and thickness with moderate litter depths, lightly to moderately grazed. Native grass is preferred over alfalfa, smooth brome, and crested wheatgrass.	**No-** Distribution for this species does not occur and GAP data indicates that habitat does not occur.
Swainson's Hawk / BLM	*Buteo swainsoni*	Forages in open to semi-open grasslands, sparse shrublands, prairies, deserts, and small, open woodlands; presence correlated to percent of lowland grassland, including blue grama, sideoats grama, western wheatgrass, galleta, and needle-and-thread. Typically nests in scattered live trees within grassland, shrubland, or agricultural landscapes. Large majority of nest trees found in planted shelterbelts, wetland borders, and abandoned farmsteads.	**Yes-** Grassland habitat for this species does occur.

Table 3-13
Sensitive Species identified to occur within the Black Hills Region

Common Name / Agency Listed	Scientific Name	Habitat of Species	Does the Habitat or Species occur within the Project Area
Trumpeter Swan / BLM	*Cygnus buccinator*	Species inhabit lakes, ponds, large rivers, and coastal bays. Their most important habitat requirements are open water, access to food, and protection from disturbance. Usually placed on slightly elevated sites surrounded by water, such as a muskrat mound, beaver lodge, or small island.	**No-** Distribution not documented within Project Area and wetland open water habitat within Project Area is minor and marginal.
White-faced Ibis / BLM	*Plegadis chihi*	Inland, mainly shallow marshes with "islands" of emergent vegetation. Frequently feeds in shallowly flooded wetlands of short, emergent plants, such as sedges, spikerushes, glassworts, inland saltgrass, and black greasewood. Nearby irrigated crops, particularly alfalfa, barley, and native hay meadows are important feeding sites. Water appears to be a requirement for a suitable feeding site. Usually nests in emergent vegetation or low trees and shrubs over shallow water, use hardstem bulrush, alkali bulrush, cattails, or build a stick nest in small willows.	**Yes-** The Project Area provides marginal habitat for this species with only 1.3 acres of open water and 1.3 acres of emergent wetlands; however, documented distribution for this species does occur within the region of the Project Area.
Willet / BLM	*Cataptrophorus semipalmatus*	Nest in uplands near brackish or saline wetlands, wet meadows, and vegetated shorelines. Used ephemeral, temporary, seasonal, and alkali wetlands greater than available. Semipermanent and permanent lakes were least preferred; only used when other wetlands were not available. Prefers native prairie versus exotic plants, such as CRP. Adapted to exploit short, sparse cover in wetlands and upland habitats. Forage near edges of grasslands and marshes and on mud flats near vegetated areas.	**Yes-** The Project Area provides marginal habitat for this species with only 1.3 acres of open water and 1.3 acres of emergent wetlands; however, documented distribution for this species does occur within the region of the Project Area
Wilson's Phalarope / BLM	*Phalaropus tricolor*	A common species of marshes and alkaline wetlands. Nest in low, grassy areas or sedges along the edge of wetlands, over the water in emergent vegetation, or nearby uplands, road rights-of-way, small tracts of idle grasslands, and standing grain stubble. Grasslands with shrub cover also were inhabited, such as wolfberry, silverberry, and chokecherry.	**Yes-** The Project Area provides marginal habitat for this species with only 1.3 acres of open water and 1.3 acres of emergent wetlands; however, documented distribution for this species does occur within the region of the Project Area
Yellow Rail / BLM	*Coturnicops noveboracensis*	Prefers large very shallow marshes and wet meadows during summer breeding, especially those with thick vegetation of grasses and sedges. Primarily found in coastal salt marsh during the winter.	**No-** The Project Area does not contain the level of wetland habitat for this species.
Amphibian and Reptiles			

Table 3-13 Sensitive Species identified to occur within the Black Hills Region			
Common Name / Agency Listed	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Northern Leopard Frog / US Forest Service	*Rana pipiens*	Variety of habitats; small creeks, lakes, temporary wetlands, stock ponds and habitat provided by irrigated back yards.	**Yes-** Habitat occurs within Project Area. Species currently documented to occur within Black Hills National Forest Lands.
Black Hills Redbelly Snake / US Forest Service	*Storeria occipitomaculata pahasapae*	In the Black Hills, species have been found understones and woody debris. Redbelly snakes are known to occur in wet meadows, woodlands, and forest-meadow edge habitats within the Black Hills. Most Black Hills records are from the northern hills or in the granitic/schist formations such as the Harney Peak area, where surface water is more abundant due to higher precipitation or less permeable bedrock. The high limestone plateau of the western Black Hills has few records.	**No-** Species has not been documented within the region of the Project Area and the moist, forested habitat that is believed to be a habitat component of this species is limited.
Plains Spadefoot / BLM	*Sea bombifrons*	Sandy, loose swails and large temporary wetlands easily flooded.	**No-** The distribution of this species does not occur and habitat is limited.
Snapping Turle / BLM	*Cheldy serpentine*	Species found throughout South Dakota where there is adequate habitat of quiet or slow-moving water with a muddy bottom and vegetation.	**Yes-** Habitat is limited for this species; however, there is approximately 1.3 acres of open water that may be suitable. Distribution for this species has been documented throughout South Dakota.
Spiny Softshell Turtle / BLM	*Apalone spinifera*	Prefers small marshy creeks and farm ponds as well as large, fast-flowing rivers, lakes, streams, and impoundments east of the Missouri River. Mud or sand bottoms with gravel, or sandbars and beaches are important habitat requirements. Avoids aquatic conditions with rocky bottoms or abundant emergent vegetation.	**No-** Distribution is not known to occur within Project Area and a only small amount of marginal habitat occurs.
Greater Short-horned Lizard / BLM	*Phrynosoma hernandesi*	The species prefers grassland and sagebrush habitats. In Wyoming, its range encompasses the entire state below 6,500 feet in elevation. It can also be found in Montana east of the Rocky Mountains south through western South Dakota, western Nebraska and Colorado.	**Yes-** The grassland and sagebrush habitats required by this species occurs and they are known to be distributed within the region.
Western Hognose Snake / BLM	*Heterodon nasicus*	Found on short- or mixed grass, and sand prairies with sand or gravel and sandy floodplains of the Missouri River and in the sandhills south of the White River and in the Badlands. Well-drained, loose loam or sand is needed for burrowing activities.	**No-** Habitat and known distribution for this species does not occur.

Table 3-13 Sensitive Species identified to occur within the Black Hills Region			
Common Name / Agency Listed	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**

Source: US Forest Service. 2007. Rocky Mountain Region: Endangered, Threatened, Proposed and Sensitive Species, June 8, 2007;
BLM. 2004. Montana/Dakota Sensitive Species List;
BLM. ND. Special Status Species that May Occur within the South Dakota Planning Area.
South Dakota GAP. 2001b. SD GAP: Mammals of South Dakota. http://wfs.sdstate.edu/sdgap/mammal.html

Management Indicator Species – Forest Service

Table 3-14 Management Indicator Species within the Black Hills National Forest			
Common Name	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Mammals			
White-tailed Deer	*Odocoileus virginianus*	Associated with forested areas and adjacent open area. Aspen, shrubs and forest understory are important winter habitat features.	**Yes**- the Project Area does provide habitat and is likely utilized by white-tailed deer.
Beaver	*Castor canadensis*	Dependent on riparian and aquatic habitats.	**No**- aquatic habitats to support beaver do not occur.
Birds			
Ruffed Grouse	*Bonasa umbellus*	Dependence on aspen forest. Ruffed grouse may require a variety of aspen structural stages, including late successional aspen for drumming logs and most other stages for buds and catkins.	**No**- aspen or similar deciduous habitats do not occur.
Brown Creeper	*Certhia americana*	Strongly associated with large trees and late successional coniferous forest.	**No**- Only a small percent of the Project Area is forest (approximately eight percent Ponderosa pine), and these forested areas are not late successional.
Black-backed Woodpeckers	*Picoides arcticus*	Species is frequently associated with recently burned coniferous forests. They also occur in lower densities within other forest types, including late-successional pine forest.	**No**- Only a small percent of the Project Area is forest (approximately eight percent Ponderosa pine), and these forested areas have not been recently burned and are not late successional
Golden-crowned Kinglet	*Regulus satrapa*	Closely associated with white spruce forests. This species is considered a permanent residence of the Black Hills.	**No**- The Project Area does not contain any spruce forest habitat.

Table 3-14 Management Indicator Species within the Black Hills National Forest			
Common Name	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Song Sparrow	*Melospiza melodia*	Dependent on riparian areas and wetland habitats. They are uncommon winter residents in the Black Hills and likely winter on adjacent prairie habitat.	**No-** The Project Area does not support the riparian vegetation and wetlands to provide habitat for song sparrows.
Grasshopper Sparrow	*Ammodramus savannarum*	Selects large patches of open grassland types, prefers grassland types of intermediate heights, avoids grasslands where vegetation is less than 10 cm.	**Yes-** The Project Area is 85 percent grassland habitat and provides habitat for grasshopper sparrows.

Source: US Forest Service. 2005c. Selection of Management Indicator Species Black Hills National Forest Phase II Plan Amendment. May 4, 2005.

Species of Local Concern

Species of Local Concern on the Black Hills National Forest are identified by the Forest Supervisor through a Forest Supplement to the Forest Service Manual. The list is periodically updated by the Forest Supervisor.

Table 3-15 Species of Local Concern within the Black Hills National Forest			
Common Name	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Mammals			
Long-eared Myotis	*Myotis evotis*	Inhabits coniferous forest and woodland, including juniper, Ponderosa pine, and spruce-fir. It typically forages over rivers, streams, and ponds within the forest-woodland environment. During summer, it roosts in a wide variety of structures, including cavities in snags, under loose bark, stumps, buildings, rock crevices, caves, and abandoned mines. During winter, it probably hibernates primarily in caves and abandoned mines.	**No-** Given the limited forest and aquatic habitat, it is unlikely that the Project Area would be utilized by this species.
Long-legged Myotis	*Myotis volans*	Roosts are in trees, caves, abandoned mines, and other such sheltered areas. The long-eared myotis emerges after dark to forage, feeding near trees or over water. They are late fliers (around midnight) but have been captured throughout the night.	**Yes-** The Project Area occurs on the eastern fringe of the distribution.
Northern Flying Squirrel	*Glaucomys sabrinus*	The northern flying squirrel ranges throughout the mountainous western US and boreal forests of North America (US Forest Service 1996). In the Black Hills the highest densities are found in white spruce forests in moist canyons of the Northern Black Hills. They use hollow trees and cavities for nest sites (USDAForest Service 1996).	**No-** The Project Area does not have the vegetation communities required by this species.

Table 3-15 Species of Local Concern within the Black Hills National Forest			
Common Name	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
Northern Long-eared Myotis	*Myotis septentrionalis*	Species primarily inhabits forested regions. In Wyoming, it can be found in wooded riparian zones in badlands and prairies to higher elevation conifer and deciduous woodlands. During summer, it roosts in crevices and cavities of trees, under loose bark, and occasionally in buildings. During winter, it usually hibernates in caves and abandoned mines.	**No-** The Project Area does not represent habitat for this species.
Meadow Jumping Mouse	*Zapus hudsonius campestris*	Meadow jumping mouse is associated with riparian areas along small streams in meadows or beneath forests usually with an understory of deciduous shrubs, grasses, forbs, and fallen logs. Species burrows and hibernates in dry ground from October to May. Maintenance of dense understory vegetation is an important management consideration for this species.	**No-** The Project Area provides very limited riparian habitat and is not suitable for this species.
Mountain Goat	*Oreamnos americanus*	Introduced into the Black Hills in 1924. Primary range and habitat of the mountain goat in the Black Hills covers about 2,000 acres and is centered around Harney Peak and the Needles area (US Forest Service 2005a). Mountain goat habitat is typically high, Rocky Mountains.	**No-** The Project Area does not provide habitat for this species.
Small-footed Myotis	*Myotis ciliolabrum*	Forages over riparian habitat, but limiting factor is likely cave habitat. Species is a year-round resident of the Black Hills. Both cave and mine hibernacula are known in the Black Hills (US Forest Service 2005a). Summer roost sites are typically buildings, caves, and mines. This species usually forages near water including creeks, ponds, and reservoirs where it feeds on flying insects, particularly beetles (US Forest Service 2005a).	**Yes-** While the Project Area provides limited habitat for this species, there is the potential for the species to utilize portions of the Project Area as foraging habitat, especially in the spring and early summer months when the creeks are flowing.
Birds			
American Dipper	*Cinclus mexicanus*	Resident of fast-flowing mountain streams, where it lives its entire life along fast moving, clear, unpolluted mountain streams with cascades, riffles, and waterfalls, especially waters that travel through canyons. Streams selected for breeding rarely exceed 15 m in width or 2 m in depth. Prefers bottom with rocks, sand, and rubble. In South Dakota, habitat is limited to swift, high quality mountain streams with suitable nest sites in the Black Hills.	**No-** The stream habitat required by this species odes not occur.
Black and White Warbler	*Mniotilta varia*	Species nests in deciduous woodlands on or near the ground and feeds primarily on insects. This	**No-** The Project Area does not contain

Table 3-15 Species of Local Concern within the Black Hills National Forest			
Common Name	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
		species has been observed in Wyoming counties of the Black Hills but breeding has not been confirmed (US Forest Service 2005a). Both Peterson (1995) and SDOU (1991) reflect confirmed breeding records in the South Dakota Black Hills. Panjabi (2001) did not detect *M. varia* during breeding surveys of the BHNF. (US Forest Service 2005a)	deciduous forest habitat that this species utilizes.
Broad-winged Hawk	*Buteo platypterus*	Common species within the Wyoming and South Dakota Black Hills (US Forest Service 2005a). Species typically nests in pine stands with a deciduous component, often in large diameter ponderosa pine. This species is also known to inhabit agricultural and suburban areas (US Forest Service 2005a). Its prey base is varied and includes small mammals, birds, reptiles and insects (US Forest Service 2005a).	**Yes-** While the Project Area provides limited habitat for this species, there is the potential for the Project Area to be used during foraging.
Cooper's Hawk	*Accipiter cooperi*	A forest habitat generalist that forages near the ground taking avian and mammalian prey. Preferred nest sites are located in tall, large-diameter trees in dense stands, often with a significant sapling component. Dense forest may also be important for foraging (US Forest Service 2005a).	**No-** Habitat for this species does not occur.
Northern Saw-Whet Owl	*Aegolius acadicus*	Species is a forest habitat generalist found at lower to middle elevations in forested habitat, particularly in riparian areas. Nest sites are cavities excavated by flickers (*Collaptes auratus*) and other large woodpeckers (US Forest Service 2005a). Nests tend to be in mature forest, while dense sapling-polesized stands are preferred for roosting . This species often forages along forest edges preying upon small mammals. In the Black Hills seasonal migration is likely between high- and low-elevation habitat (US Forest Service 2005a).	**No-** The Project Area does not provide habitat for this species.
Pygmy Nuthatch	*Sitta pygmaea*	Found primarily in mature ponderosa pine forests throughout the Western US although may also utilize other coniferous forest habitat. .Prefers old-growth, mature, undisturbed forests (US Forest Service 2005a). Diet is mainly insects, although some pine seeds are eaten. This species is an uncommon resident of the Black Hills (US Forest Service 2005a).	**No-** The Project Area does not provide habitat for this species.
Sharp-shinned Hawk	*Accipiter striatus*	Found in forests, woodlots and brushy draws. Black Hills habitat is riparian forests and conifers (US Forest Service 2005a). Listed as an uncommon	**No-** The Project Area does not provide habitat for this species.

Table 3-15 Species of Local Concern within the Black Hills National Forest			
Common Name	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
		permanent resident in the Black Hills (US Forest Service 2005a). Diet is almost exclusively small passerine birds. Nest sites are typically in dense conifer stands often adjacent to deciduous trees (US Forest Service 2005a).	
Invertebrates			
Atlantis Fritillary	*Speyeria atlantis pahasapae*	Forest openings, upland pastures, bogs, meadows, and moist canyons. Species regularly visits flowers. It is most common in boreal habitats, but in the Prairies and aspen parkland it becomes less common and highly localized (US Forest Service 2005a). Endemic to the Black Hills it is known from three counties, Pennington, Custer and Lawrence Marrone 2006). Habitat is higher elevation moist boreal forests and riparian areas with adjacent meadows (US Forest Service 2005a).	**Yes –** The Project Area provides marginal habitat for this species.
Callused Vertigo	*Vertigo arthuri*	The callused vertigo is the most widely distributed Black Hills vertigo species and is found in wet, relatively undisturbed forest on limestone or schist substrate. Most common at sites with a varied understory, diverse flora, and deep litter, on shaded north-facing slopes (US Forest Service 2005a). This species is cryptic and feeds on the surface of half decayed leaves (US Forest Service 2005a)	**No-** Habitat for this species does not occur.
Frigid Ambersnail	*Catinella gelida*	Found in the Black Hills at low to medium elevations, in somewhat dry forests on limestone talus, near the slope base. The most frequent vegetation at known colonies was open *Pinus ponderosa* forest with a mixture of deciduous trees and shrubs. Since this species has sparse populations it may be more vulnerable to management activities, such as logging and grazing, than other land snails. Some of the colonies on the Black Hills are located near highways and roads (US Forest Service 2005a).	**Yes-** While the Project Area provides limited habitat for this species, there is the potential for the species to utilize the dry forest areas.
Mystery Vertigo	*Vertigo paradoxa*	Only found in the Northern Black Hills where it is restricted to rich lowland wooded sites often with *Picea glauca* communities, on limestone or schist derived soils (US Forest Service 2005a). Important habitat components include closed canopy forest, deep litter, and rich floral understory. This species feeds on partially decayed leaves and the organic coating on rock surfaces (US Forest Service 2005a).	**No-** Project Area does not occur within the know distribution area for this species.
Striate Disc	*Discus shimekii*	Found in moist habitat such as riparian areas, north-facing slopes on calcareous soils, mesic	**No-** The Project Area does not provide habitat

Table 3-15 Species of Local Concern within the Black Hills National Forest			
Common Name	**Scientific Name**	**Habitat of Species**	**Does the Habitat or Species occur within the Project Area**
		forest floors. This species requires moist habitats (US Forest Service 2001). (US Forest Service 2005a).	for this species.
Tawny Crescent	*Phycoides batesii*	Habitat is typically moist aspen stands and riparian forest near the transition between deciduous and coniferous forests. This species' habitat has declined in the BHNF due to pine encroachment into wet meadows and decreases in water flows, and the resulting degradation of riparian areas (US Forest Service 2001a). (US Forest Service 2005a.)	**No-** The Project Area does not provide adequate aspen and riparian stands for this species.

Source: US Forest Service.

3.9.3 Direct and Indirect Effects

3.9.3.1 Alternative A - Proposed Action

Direct impacts to special status species would include those impacts discussed within the Wildlife Section above. The following discussion focuses on direct impacts to those habitat components critical or unique to the special status species identified to potentially occur.

Threatened, Endangered, and Candidate Species

Only the black-footed ferret was identified to have potential habitat. While there are no black-footed ferrets or prairie dog towns currently documented, there is the potential that future expanding populations may utilize the area. The Proposed Action would not impact prairie dog towns or black-footed ferret habitat. There would be approximately 132 acres of grassland permanently disturbed, but given the available grassland habitat within the region, this would not impact future expansion of black-footed ferret populations. The operation of the proposed conveyor belt would cause minimal disturbance to future expanding populations and would not hinder their distribution. While the Proposed Action may affect black-footed ferrets by impacting future habitat, there would be no adverse effect on black-footed ferrets.

Sensitive and Management Indicator Species

The Proposed Action would result in a total of 156 acres of habitat to be permanently disturbed. The conveyor belt itself is only six feet wide; however, due to the noise disturbance that would occur during operation of the conveyor belt, the permanent disturbance area for wildlife was considered to be a 100 foot buffer along the length of the conveyor belt. The majority of this habitat would be grassland habitat. This loss in habitat may displace many of the sensitive species that utilize the area; however, given the small amount of habitat loss relative to the regional habitat available, it is unlikely that this loss would negatively impact populations.

Special status big game species such as big horn sheep (sensitive) or white-tailed deer (MIS) may experience a loss in year-round or winter range, but this loss would not be expected to reduce the viability of populations. As discussed within the Wildlife Section above, animals utilizing the Project Area may be temporarily displaced by the construction and operation of the conveyor belt, but they would eventually become accustomed to the noise and resume use of the area.

Sensitive or SOLC bat species such as fringe myotis, Townsend's big-eared bat, and the long-legged myotis would experience very minor impacts under the Proposed Action. Construction activities would not disturb bat species as the activities would occur during the day while bats are

active at night. Under the Proposed Action, foraging habitat for these sensitive species would experience minimal disturbance as wetland habitats would not be disturbed; however, there would be approximately 2,244 feet of stream habitat disturbed by the installation of the conveyor belt. These streams are intermittent and provide only seasonal foraging habitat. Relative to the amount of foraging habitat available regionally, the loss of habitat would be minor. Some roosting habitat may be lost as the Proposed Project would impact approximately 13 acres of Ponderosa pine habitat. The level of potential roosting habitat lost is relatively small given the amount of Ponderosa pine habitat available within the Black Hills ecosystem. In addition, rock outcrop roosting habitat would be protected as all disturbance activities (including the connected action of the mine) would not occur within 200 feet of the steep relief cliffs. While the Proposed Action may disturb some sensitive bat species, it would not reduce the viability of populations.

The Proposed Action has been identified as bald eagle winter foraging habitat and year-round golden eagle habitat. Given the amount of grasslands available, the primary use of the Project Area by eagles is foraging. As previously discussed, the Proposed Action would result in a loss of approximately 132 acres of grassland habitat within the 100-foot buffer of the conveyor belt. While the Proposed Action would impact 11 percent of the foraging (grassland) habitat available, it would not negatively impact eagles as the Project Area and adjacent areas provide additional foraging habitat. Eagles may be temporarily displaced as they become accustomed to the disturbance; however, given the amount of available habitat regionally, the impacts would not adversely impact eagles or reduce the viability of their populations.

Most of the sensitive and SOLC species that rely on habitat are species reliant on grassland habitat. These species include: black-tailed prairie dogs, swift fox, ferruginous hawks, northern harriers, mountain plovers, long-billed curlews, burrowing owls, loggerhead shrikes, grasshopper sparrows, dickcissels, Swainson's hawk and greater short-horned lizard. As previously discussed, these sensitive species would have approximately 132 acres of habitat disturbed from within the 100-foot buffer as a result of the proposed action. While this may displace some species, the Project Area is located within in an area of high density, undisturbed grassland, and it is expected that these displaced animals would utilize the adjacent grassland habitat.

Sensitive and SOLC species that utilize sagebrush habitat include: sage grouse and the greater short-horned lizard. These species would experience minimal habitat loss as approximately six acres of sagebrush habitat would be permanently disturbed as a result of the Proposed Action. There are no known sage grouse leks or adjacent areas; therefore, sage grouse would not be impacted.

Sensitive and SOLC species that may utilize the wetland and adjacent grassland habitats include: willet, white faced ibis, Wilson's phalarope, northern leopard frog, and the snapping turtle. The Project Area contains small amounts of wetland habitat for these species and these wetlands would not be impacted. As previously discussed, there would be some permanent disturbance to the adjacent grassland habitat; however, there are large, contiguous areas of grassland habitat for these species to utilize if displaced.

There was only one species identified that may utilize the relatively small amount of Ponderosa pine habitat available and that was Lewis' woodpecker. The Project Area provides a small amount of marginal habitat for this species. The Proposed Action would permanently disturb approximately 13 acres of Ponderosa pine habitat. Given the amount of Ponderosa pine habitat available within the Black Hills ecosystem, the habitat loss would not be expected to negatively impact this species.

3.9.3.2 Alternative B - No Action

Threatened, Endangered, and Candidate Species

The No Action would have no direct impacts on threatened, endangered or candidate species or their habitat.

Sensitive and Management Indicator Species

The No Action would not entail the use of a ROW or Special Use Permit; therefore no conveyor belt

or road construction would occur and there would be no direct impacts on special status species or their habitat.

3.9.3.3 Alternative C – Trucking Existing County Road

Threatened, Endangered, and Candidate Species

The direct impacts to black-footed ferrets and their habitat would be the same as under Alternative A.

Sensitive and Management Indicator Species

As previously discussed, the significant difference between Alternative A and Alternative C in regards to wildlife is that Alternative C would result in less habitat loss and more disturbance due to vehicle traffic. The difference in impacts between the alternatives does not apply to any of the sensitive species specifically, but impacts animals in the area similarly. Refer to the Wildlife Section above, for a detailed discussion of the impacts to all wildlife species.

3.9.3.4 Alternative D – Trucking ROW Corridor

Threatened, Endangered, and Candidate Species

The direct impacts to black-footed ferrets and their habitat would be the same as under Alternative A.

Sensitive and Management Indicator Species

The impacts to sensitive and SOLC species under Alternative D would be very similar as those impacts discussed for Alternative A. Refer to Alternative A for an overall discussion of impacts to sensitive and SOLC species as a result of activities within the proposed ROW. Alternative D has an additional impact to wildlife species due to the increased vehicle traffic. As discussed, the increased vehicle traffic increases the disturbance, habitat fragmentation and potential for mortality or injury to species. Many of the sensitive species identified to occur are birds or bats; therefore, the risk would be reduced for these species as they can fly over the disturbance. Species such as big horn sheep, white-tailed deer, swift fox or the reptiles and amphibian are more susceptible to the habitat fragmentation and vehicle/wildlife collisions. While these disturbances would impact these species, they would not reduce the viability of the local populations as the impacts to the habitat is relatively small given the habitat on a regional level. Refer to the discussion within the Wildlife Section above, for a detailed discussion of these impacts on species.

3.9.4 Connected Action

Impacts to special status species associated to the connected action would not differ from those impacts discussed in the Wildlife Section.

3.9.5 Cumulative Effects

Cumulative impacts to special status species associated to the action alternatives would not differ from those impacts discussed in the Wildlife Section above.

Table 3-16
Determination of Effects for Action Alternatives on Special Status Species

Common Name	Scientific Name	Determination
Black-footed Ferret, (Endangered)	*Mustela nigripes*	May effect, not likely to adversely effect.
Rocky Mountain Bighorn Sheep (Sensitive) / US Forest Service	*Ovis Canadensis canadensis*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Fringed Myotis (Sensitive) / US Forest Service; BLM	*Myotis thysanodes*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

Table 3-16
Determination of Effects for Action Alternatives on Special Status Species

Common Name	Scientific Name	Determination
Townsend's Big-eared Bat (Sensitive) / US Forest Service; BLM	*Corynorhinus townsendii*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Black-tailed Prairie Dog (Sensitive) / US Forest Service; BLM	*Cynomys leucurus*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Swift Fox (Sensitive) / US Forest Service; BLM	*Volans velox*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Long-legged Myotis (Sensitive) / BLM	*Myotis volans*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Ferruginous Hawk (Sensitive) / US Forest Service; BLM	*Buteo regalis*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Northern Harrier (Sensitive) / US Forest Service	*Circus cyaneus*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Mountain Plover (Sensitive) / US Forest Service	*Charadrius montanus*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Long-billed Curlew (Sensitive) / US Forest Service; BLM	*Numenius americanus*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Burrowing Owl (Sensitive) / US Forest Service; BLM	*Athene cunicularia*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Lewis's Woodpecker (Sensitive) / US Forest Service	*Melanerpes lewis*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Loggerhead Shrike (Sensitive) / US Forest Service; BLM	*Lanis ludovicianus*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Grasshopper Sparrow (Sensitive; MIS) / US Forest Service	*Ammodramus savannarum*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Bald Eagle (Sensitive) / BLM; US Forest Service	*Haliaeetus leucocephalus*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Dickcissel (Sensitive) / BLM	*Spiza americana*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Golden Eagle (Sensitive) / BLM	*Aquila chrysaetos*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

Table 3-16 Determination of Effects for Action Alternatives on Special Status Species		
Common Name	**Scientific Name**	**Determination**
Greater Sage Grouse (Sensitive) / BLM; US Forest Service	*Centrocercus urophasianus*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Swainson's Hawk (Sensitive) / BLM	*Buteo swainsoni*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
White-faced Ibis (Sensitive) / BLM	*Plegadis chihi*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Willet (Sensitive) / BLM	*Cataptrophorus semipalmatus*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Wilson's Phalarope (Sensitive) / BLM	*Phalaropus tricolor*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Northern Leopard Frog (Sensitive) / US Forest Service	*Rana pipiens*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Snapping Turle (Sensitive) / BLM	*Cheldy serpentine*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
Greater Short-horned Lizard (Sensitive) / BLM	*Phrynosoma hernandesi*	May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

3.10 Grazing Management

3.10.1 Study Area Boundaries

The analysis area for grazing management is the Project Area. Grazing allotments are areas of public land used for livestock grazing.

3.10.2 Affected Environment

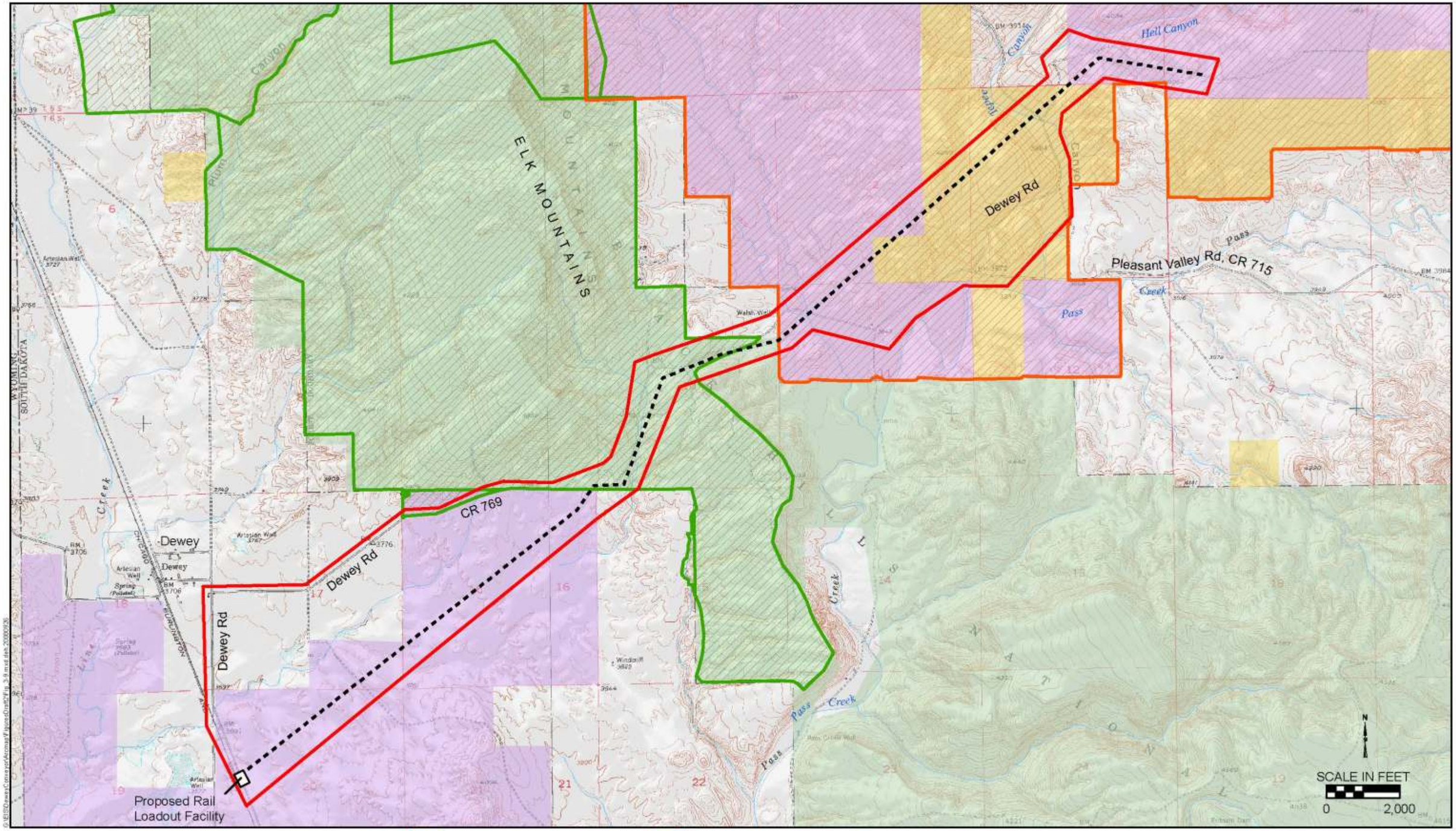
The Project Area includes 161 acres of the Forest Service's Elk Mountain Allotment (**Figure 3-9**). The allotment is grazed by four permittees as part of a five pasture system where three herds use a two pasture deferred rotation schedule. **Table 3-17** presents the allotment vegetation communities. Mixed grass prairie and ponderosa pine woodland are the dominant communities portion of the Elk Mountain Allotment. These vegetation communities have high grazing value with ample herbaceous feed and ponderosa pine forests offer late-season feed and shade.

The project area encompasses 358 acres of BLM administered lands. It is assumed all of this area is managed to some extent as grazing allotments.

Table 3-18 presents the BLM vegetation types. Similar to National Forest, BLM land are dominated by mixed grass prairie and ponderosa

Table 3-17 Project area vegetation types in the Forest Service Elk Mountain Allotment	
Community	**Acres**
Grassland	115
Ponderosa Pine	36
Sagebrush Shrubland	1
Floodplain/Riparian/Aquatic	8

Note: Table current as of September 15, 2008 pending update project boundary and buffer changes.



Conveyor Project Area
Proposed Conveyor Right-of-Way
Allotment 07227
Elk Mountain Allotment
GCC Property
Public Land Ownership
BLM
State
USFS

September 2008

Figure 3-9

Grazing Allotments within the Project Area

Custer County, South Dakota

Dewey Conveyor Belt Project

pine woodlands. In addition, GCC Dacotah has most of it under private lease agreements for grazing.

Table 3-18
Project area vegetation types on BLM administered lands

Community	Acres
Grassland	296
Ponderosa Pine	35
Sagebrush Shrubland	5
Mountain Mahogany Shrubland	2
Barren	20

Note: Table current as of September 15, 2008 pending update project boundary and buffer changes.

3.10.3 Direct and Indirect Effects

3.10.3.1 Alternative A- Proposed Action

The Proposed Action would create approximately 8.5 and 6.7 acres of new disturbance on Forest Service and BLM lands, respectively, during the one year construction phase. This would result in a temporary loss of available forage in the short-term, while areas surrounding conveyor footings and maintenance road disturbance are reseeded and excluded from grazing for seedling establishment.

Long-term losses in available forage would include 3.4 acres of National Forests and 2.7 acres of BLM land and confined to the conveyor and access road footprints proper. Along the entire proposed conveyor route as many as 40 acres of new disturbance would be created during construction and about 16 acres of disturbance would remain principally along the conveyor and maintenance road footprints. However, the service road could improve livestock travel, which would result in better utilization of forage through improved access to previously inaccessible vegetation.

Vegetation community condition could deteriorate around conveyor structure resulting from increased livestock use and loitering. Seeded herbaceous species are often preferred by livestock and could initially receive higher grazing pressure than surrounding areas. In addition, livestock are often drawn to structures and fencelines. Conveyor structures would offer limited shade and a surface to rub against which could result in animals loitering around structures. Increased grazing pressure and animal loitering would result in soil disturbance, an increase in bare ground and a higher probability of weedy species establishment.

3.10.3.2 Alternative B- No Action

The No Action Alternative would not impact current grazing practices in the area. No ground disturbance associated with construction of the conveyor belt would occur and stocking rates would continue at present levels.

3.10.3.3 Alternative C- Trucking Existing County Road

Approximately 0.8 lineal miles of new road would be developed. When the area of disturbance of this new road is combined with re-engineering and reconstruction of the existing county road it would result in a total permanent disturbance of 17.2 acres and result roughly 5.6 acres of new disturbance on US Forest Service and BLM land. Short-term losses of available forage would occur as areas are seeded for revegetation. Long-term forage losses would occur as available forage would be converted to the modified county and new road segments. Livestock travel would improve and could result in better utilization of forage through improved access to previously inaccessible vegetation.

There could be an increased risk of livestock vehicle collisions as service vehicles and other mine related traffic increases. Vegetation community condition could deteriorate around conveyor structure resulting from increased livestock use and loitering. Seeded herbaceous species are often preferred by livestock and could initially receive higher grazing pressure than surrounding areas. In addition, livestock are often drawn to structures and fencelines. Conveyor structures would offer limited shade and a surface to rub against which could result in animals loitering around structures. Increased grazing pressure and animal loitering would result in soil disturbance, an increase in bare ground and a higher probability of weedy species establishment.

3.10.3.4 Alternative D- Trucking ROW Corridor

A new 7.2 mile long haul road would be constructed that uses a 1.5 mile segment of existing county road over the pass and would create 27.8 acres of permanent new disturbance. Establishment of a new ROW corridor would result in loss of approximately 9 acres of available forage on US Forest Service and BLM land. Short-term losses of available forage would occur as disturbed areas are seeded for revegetation. Long-term forage losses would occur as available forage would be converted to a new haul road. Livestock travel would improve and could result in better utilization of forage through improved access to previously inaccessible vegetation.

There could be an increased risk of livestock vehicle collisions as haul trucks, service vehicles and other mine related traffic increases. Vegetation community condition could deteriorate around conveyor structure resulting from increased livestock use and loitering. Seeded herbaceous species are often preferred by livestock and could initially receive higher grazing pressure than surrounding areas. In addition, livestock are often drawn to structures and fencelines. Conveyor structures would offer limited shade and a surface to rub against which could result in animals loitering around structures. Increased grazing pressure and animal loitering would result in soil disturbance, an increase in bare ground and a higher probability of weedy species establishment.

3.10.3.5 Connected Action

Mining of the limestone resource to be produced and transported to a proposed rail load-out facility near Dewey, either by the proposed conveyor belt or one of the trucking action alternative haul routes is considered to be a Connected Action. Both the mine and rail load out area fall within property owned by GCC and therefore would not affect third-party grazing leases on federal property in any way. GCC may have private grazing lease agreements in place would potentially be affected; however it is unlikely that GCC would continue those leases in areas directly associated with active mining, or transport and rail load-out operations.

3.10.3.6 Cumulative Effects

Wildland fire, recreation, the spread of invasive plants, and land use changes will continue to impact livestock grazing. In addition, soil disturbance and impacts to vegetation resulting from surface disturbance activities related to past and reasonably foreseeable mining, exploration, or transportation and utility corridors has and would change vegetation communities and increase the likelihood of weed establishment and spread, all of which result in a decrease in available forage for wildlife and livestock. Land use change could dramatically alter grazing in the area depending on the nature of the disturbance and aerial extent of proposed changes.

3.11 Water Resources

3.11.1 Study Area Boundaries

This water resources section includes both surface water and groundwater resources within the Dewey project area. The effects analysis for the action alternatives focuses on direct, indirect, and cumulative effects on water quantity and water quality. Water quantity issues include the amount of water needed for construction and operational water demands. The assessment of the project's water supply demands is based on whether the water supply is permitable through the South Dakota DENR water rights application process. The water quality issues focus on identifying applicable water quality standards, and whether the action alternatives would by there effects exceed these standards, and if so, could these effects be mitigated.

The Dewey Conveyor project is located in the Black Hills Plateau physiographic province; an area characterized by unglaciated, plateau topography exhibiting broad ridges and entrenched canyons. Elevations range from 3,500 to 5,500 feet.

The climate of the Dewey area is semiarid with average annual precipitation of 13.22 inches, average winter low temperatures in January are 5˚F and average summer high temperatures in July are 90˚F (WRCC 2008).

3.11.2 Affected Environment

3.11.2.1 Surface Water

The Cheyenne River is the principal surface water drainage in the Dewey area (**Figure 3-10**). The Cheyenne is an approximately 295 mi (475 km) long tributary of the Missouri River that flows through the states of Wyoming and South Dakota. The Cheyenne River is formed by the confluence of Antelope and Dry Fork creeks, in northeastern Wyoming. It flows east into South Dakota, passes the town of Edgemont, and skirts the southern end of the Black Hills, passing through Angostura Reservoir. Eventually it flows into the Missouri River in Lake Oahe, approximately 32 mi (50 km) NNW of Pierre, South Dakota, with the lower 35 mi (56 km) of the river forming an arm of Lake Oahe. GCC Dacotah's possible quarry site and trace of the proposed conveyor are located in the Pass Creek drainage, a tributary to the Cheyenne River and in the Lime Creek drainage, a tributary to Pass Creek.

The upper Cheyenne River and its tributaries exhibit late spring snow melt runoff flow characteristics, with peak flows measured at Edgemont (located approximately 15 miles downstream of the mouth of Beaver Creek) averaging 230 cubic feet per sec (cfs) in late May/June, and low flows averaging approximately 9 cfs in January (USGS 2008). Its annual mean flow is about 75 cfs. A smaller low elevation snow melt event creates a short duration peak in the hydrograph in early spring with mean peak flows in March of 117 cfs (NWIS 2008). The project area is located principally within the Pass Creek Drainage. Pass Creek and Hell Canyon merge near the northeast portion of the project area and "flow" southwest to the confluence of Beaver Creek (south of Dewey). The proposed project ROW crosses two ephemeral tributaries within the Pass Creek Drainage (Hell Canyon in T41N R1E Sec 1) and an unnamed tributary near Walsh Well (in T41N R1E Sec11), before crossing the Elk Mountain divide and passing into the Beaver Creek drainage. The ROW also crosses one other unnamed tributary drainage on the west slope of the Elk Mountain range (T41N R1E Sec 16). It is assumed that Beaver Creek and Pass Creek runoff characteristics in their lower reaches would be similar to the Cheyenne River near Edgemont under high flow conditions as they drain the same physiographic region. However, the Hell Creek and other unnamed drainages that drain the project area are ephemeral streams with dry streambeds over much of the year.

There are several nearby springs (Cedar Spring, Issue Wood Spring, Roger's Shack Spring) shown on the USGS Jewel Southwest topographic quadrangle map (**Figure 3-11**).

Surface Water- Floodplains

The Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Star. 975), mandates the avoidance to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Specifically, each federal agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

Based on a review of the FEMA Class A flood designation (100 year floodplain) there are approximately 124 acres of floodplain with the project area boundary (**Figure 3-12**). The proposed ROW incorporates or crosses 100-year floodplains in three locations; Hell Canyon, the unnamed tributary near Walsh Well, and a portion of the eastside of Beaver Creek Valley.

Surface Water Development and Water Rights

In South Dakota, all water (surface and groundwater) is the property of the state and therefore, its use may require a water right. The only type of water use which does not require a water right permit is domestic use. However, even domestic use of water requires a permit if water use exceeds either 25,920 gallons per day or a peak pump rate of 25 gallons per minute (DENR 2008a).

The South Dakota DENR was contacted to provide an inventory of all surface water and groundwater rights for the project area. Results are shown on **Figure 3-13**.

Surface water developments and water rights are limited within the Pass Creek drainage basin that bisects the project area, particularly in the upper reaches and bedrock outcrop areas where spring discharges are minimal and stream flow is intermittent. Only one surface water diversion was shown from the DENR database review for the Pass Creek drainage area that falls within the legal descriptions of the proposed conveyor ROW and action alternative haul roads.

Location notice summary reports for small stock ponds were also provided in the DENR database (DENR 2008b) review and are also shown on **Figure 3-13**. These water rights are for stock water purposes and amount to small annual appropriations (less than 10 acre-feet). There are four stock water locations within the Pass Creek drainage on or near the proposed conveyor right-of-way.

Water Quality

The 2006 and 2008 South Dakota Integrated Report for Surface Water Quality (DENR 2006, 2008b) were reviewed for content relative to water quality with the Cheyenne River basin and the area surrounding the Dewey project. DENR has assessed 16 lakes and maintains 26 water quality monitoring sites within the Cheyenne basin. Six monitoring sites are located on the Cheyenne River, three are located on French Creek, and five are located on Rapid Creek. The other sites are located on various other streams in the basin. The USGS also maintains a number of water quality monitoring sites on the Cheyenne River and other sites located on 18 different streams have also been sampled, one of which is located on Pass Creek approximately 1-mile south of the proposed quarry location along Pleasant Valley Road. The USGS data is limited, as for most sites the only parameters reported were conductivity and water temperature.

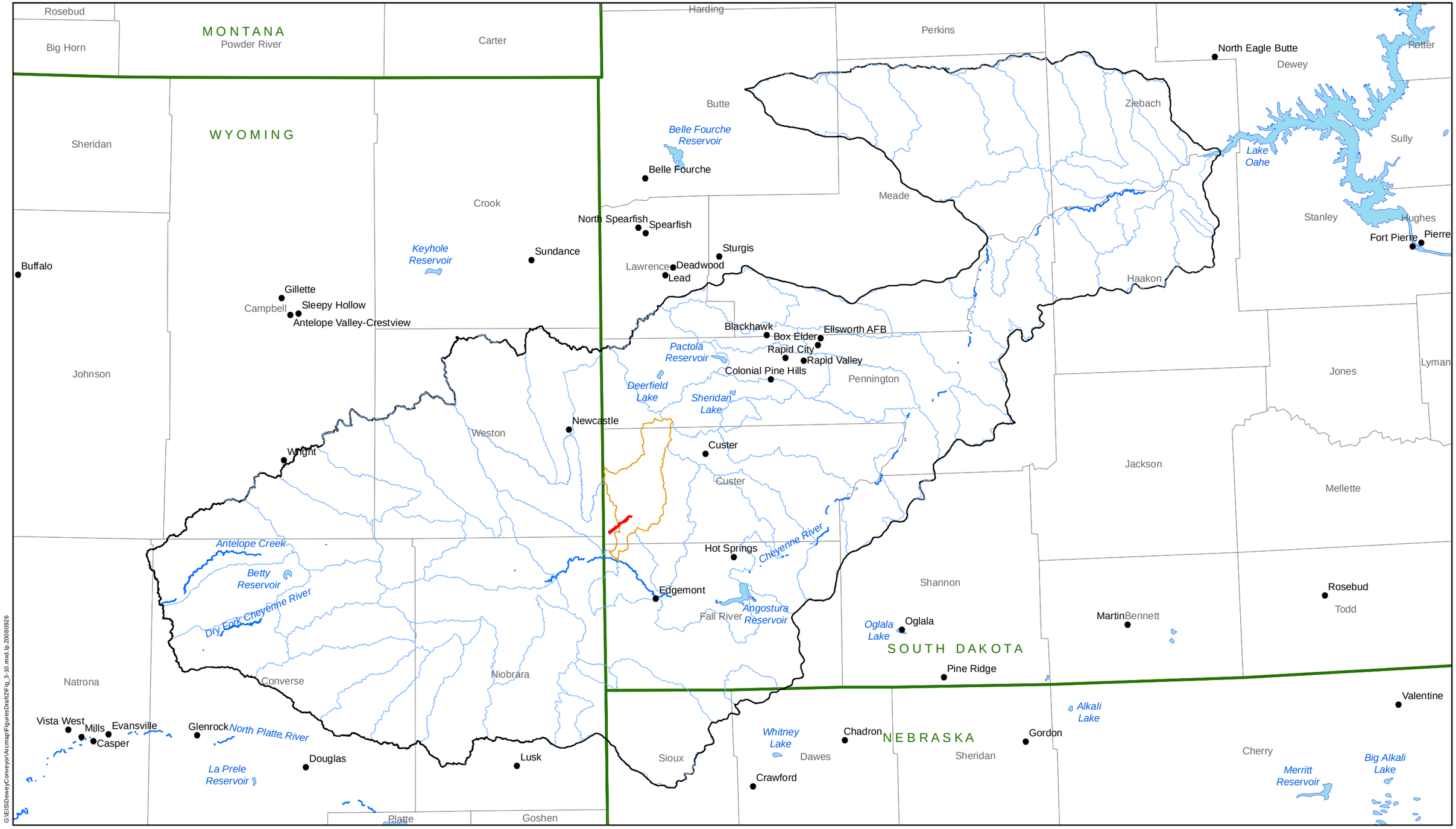
The water quality of the lower Cheyenne River in west central South Dakota is generally poor, as the area, contains a high percentage of erodible cropland and rangeland. This cropland may contribute significant amounts of eroded sediment during heavy rainfall events. Irrigation return flows also contribute to water quality issues. The Black Hills region, however, has traditionally had some of the best surface water quality in the state. This is due in a large part to a cooler climate and higher rainfall than the surrounding plains areas and as a result of higher elevation forest cover. Also contributing to the water quality in this region is the nature of local bedrock formations which are much more resistant to erosion than the highly erosive and leachable marine shales and badlands of the surrounding plains. However, the Black Hills streams are vulnerable to losses of flow to groundwater, exacerbated by periodic droughts. Grazing of stream side vegetation, which increases stream bank erosion, water temperature and nutrient loading, also impact water quality in some streams in this area.

Applicable Water Quality Standards

Surface water quality standards have been established by the South Dakota DENR under the Total Maximum Daily Loads (TMDLs) as authorized by Section 303(d) of the federal Clean Water Act which requires that states develop TMDLs for water bodies (DENR 2008d) .

Based on South Dakota TMDL regulations for the receiving surface waters of the area envisioned for limestone mining (Cheyenne River Basin, **Figure 3-10**), the constituents to be monitored that are pertinent to this project include ammonia, dissolved solids, conductivity, pH, suspended solids, and trophic state index (TSI) (DENR 2008d). The Cheyenne River is located approximately 10 miles south of the Project Area.

South Dakota numeric water quality standards have been established for various beneficial uses as defined in the South Dakota Administrative Rules (ARSD Article 74:51:03). Relevant to the Cheyenne River Basin, beneficial uses include warm-water semi-permanent fish life propagation, limited contact recreation, fish and wildlife propagation, recreation and stock watering, and irrigation (**Table 3-19**). These numeric surface water quality standards are applicable to the surface water bodies within the Cheyenne River basin. These constituents can arise from Non-Point Sources (NPS) and are typically included in the TMDL monitoring program.



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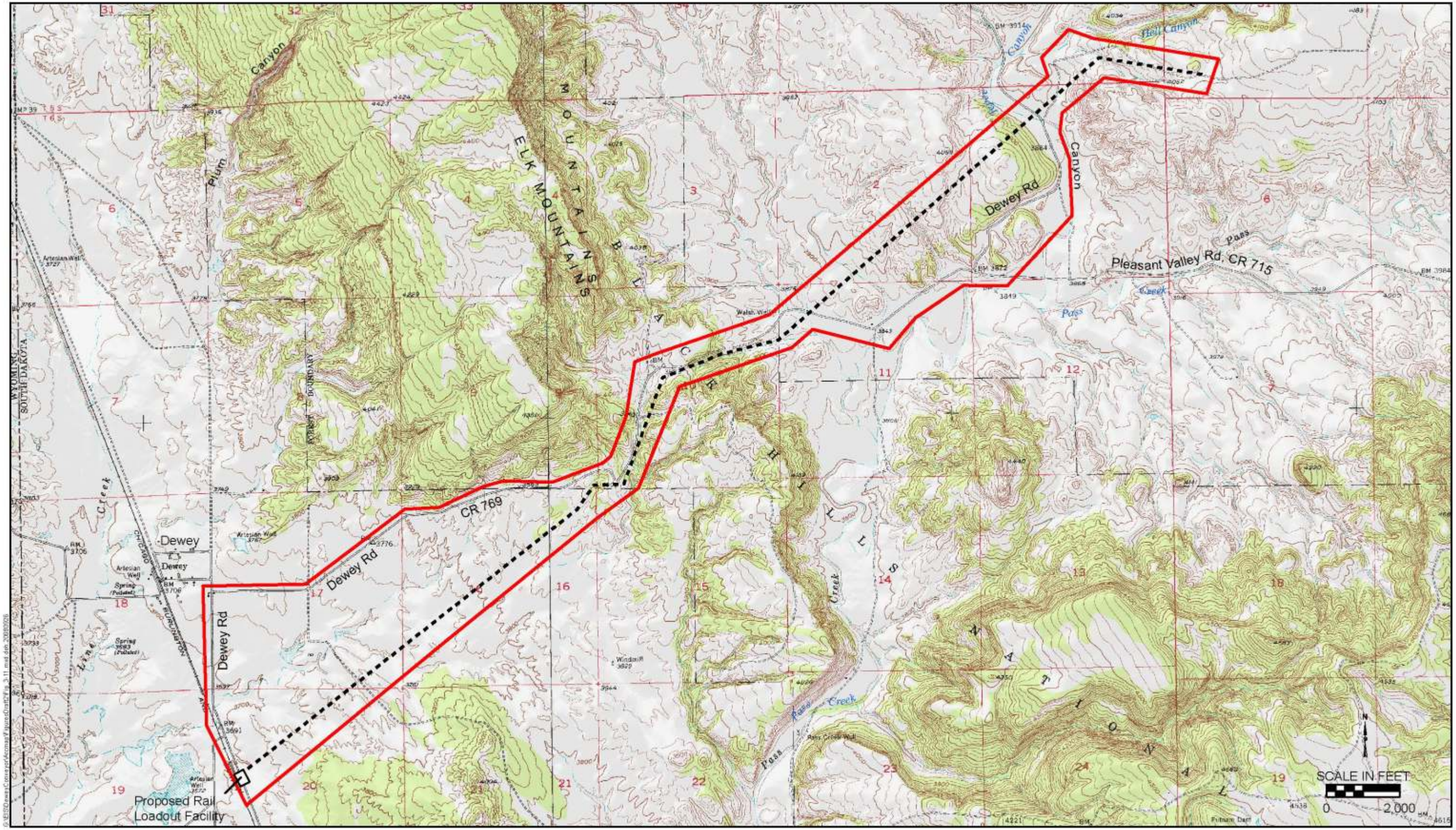
City
Conveyor Project Area
Cheyenne River Basin
Pass Creek Drainage
Watershed Boundary
River
Lake/Reservoir
State Boundary
County Boundary

September 2008

Figure 3-10
Watershed Boundaries
Custer County, South Dakota
Dewey Conveyor Belt Project



USGS 1:24,000 Quadragles Dewey and Jewel Cave SW

September 2008

Conveyor Project Area

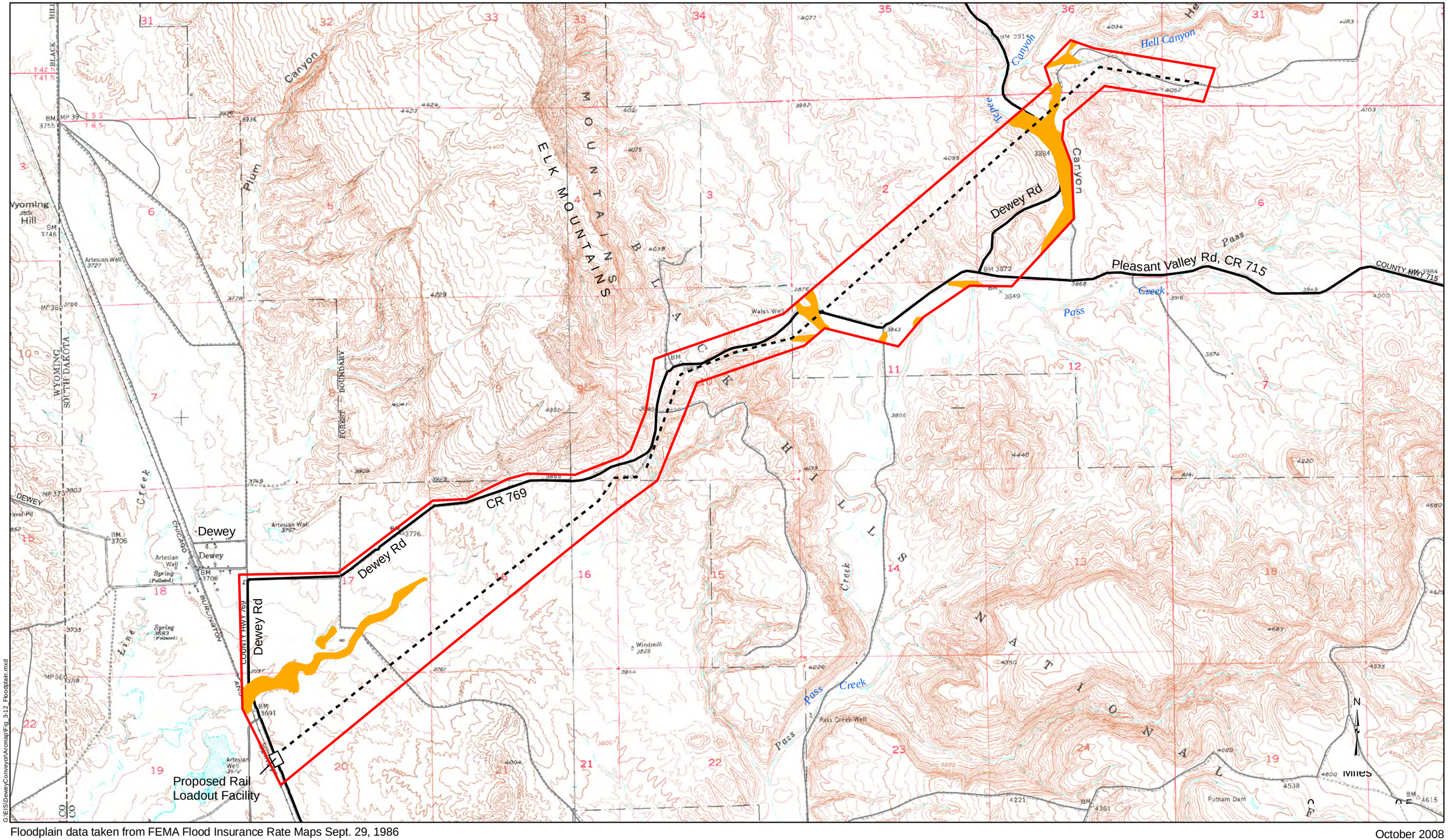
Proposed Conveyor Right-of-Way

Figure 3-11

USGS Topographic Quadrangle Map, Jewel Cave Southwest

Custer County, South Dakota

Dewey Conveyor Belt Project



Floodplain data taken from FEMA Flood Insurance Rate Maps Sept. 29, 1986

October 2008

Figure 3-12

Project Area Floodplains

Custer County, South Dakota

Dewey Conveyor Belt Project

Conveyor Project Area

Proposed Conveyor Right-of-Way

Floodplain

Other Roads

County Roads

US Highway

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149-2 FRANK WALSH
Dugout/Stock Pond

148-2 FRANK WALSH
Dugout/Stock Pond

150-2 KATHERINE WALSH
Dugout/Stock Pond

3163-2 J.W. CORNELISON
Dugout/Stock Pond

US151-2 USDA
DOM,FWP

US506-2 USDA
DOM, FWP

383-2 JEROME A. ZEHRING
Dugout/Stock Pond

5669-2 DARRELL HAWTHORNE - GOLDEN CLIFF CATTLE CO.
Dugout/Stock Pond

380-2 HENRY C. HOLLENBECK
IRR

LN383-2 VIVIAN COOK
IRR

0181-2 GRAND ISLAND & WYOMING CENTRAL RAILROAD
IRR

0182-2 GRAND ISLAND & WYOMING CENTRAL RAILROAD
IRR

0183-2 GRAND ISLAND & WYOMING CENTRAL RAILROAD
IRR

54-2 GCC DACOTAH, INC
IRR

293-2 GCC DACOTAH, INC
IRR

294-2 GCC DACOTAH, INC
IRR

SILVER KING MINES
MW

Powertech
Satelite
Plant Site

TENNESSEE VALLEY AUTHORITY
MW

TENNESSEE VALLEY AUTHORITY
MW

DON SPENCER
MW

TENNESSEE VALLEY AUTHORITY
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LOUIE GOKEL
OIL

Teepe Canyon Watershed

Middle Pass Creek Watershed

Pass Creek-East Pass Creek Watershed

Line Creek-Beaver Creek Watershed

Lower Pass Creek Watershed

Beaver Creek-Hay Creek Watershed

DEWEY

COUNTY HWY 273

COUNTY HWY 715

OLD US HWY 85

SCALE IN FEET
0 2,000

Watershed Boundaries
- Beaver Creek-Hay Creek
- Middle Pass Creek
- Line Creek-Beaver Creek
- Pass Creek-East Pass Creek
- Lower Pass Creek
- Teepe Canyon

Water Rights
- Surface Water (Permit, Owner, Type)
- Groundwater (Owner,Type)

- Conveyor
- Project Area
- 1 Mile Buffer
- River/Stream
- County Road
- Local Road
- Haul Road (Alternative 1)
- BLM Land
- USFS Land
- State Land

September 2008

Figure 3-13

Surface Water and Groundwater Rights within 1-Mile of Project Area

Custer County, South Dakota

Dewey Conveyor Belt Project

NPS pollution originates from diverse and diffuse sources. South Dakota primarily uses voluntary measures for the implementation of Best Management Practices (BMPs) to control NPS pollution. The Clean Water Act section 319 program is the focal point for most of the existing NPS control programs. However, the technical and financial assistance currently available is not sufficient to resolve all of the NPS pollution problems in the state, and as a result the DENR has implemented voluntary control measures such as land management changes that benefit the landowner by making their lands more productive and sustainable.

A total of 86 stream segments and 61 lakes require nonpoint source TMDLs to address impairments. Fifty-nine percent of the the TMDLs sites are for streams and 41 percent are for lakes. The **Table 3-19** lists NPS sampling requirements for the upper Cheyenne River basin.

The Pass Creek USGS surface water quality sampling stations (6394450) is cited in the DENR Integrated Report for Surface Water Quality 2006

Table 3-19
Applicable South Dakota Numeric Water Quality Standards

Parameter (mg/L) except where noted	Warm-water semi-permanent fish life propagation	Limited contact recreation	Fish and wildlife propagation, recreation, and stock watering	Irrigation
Chlorine, total residual	0.019 acute/ 0.011 chronic			
Coliform, fecal (per 100 mL) May 1-Sept. 30		1,000 (mean)/ 2,000 (single)		
Conductivity (µohms/cm @ 25° C			4,000[1]/7,000[2]	2,500[1]/4,375[2]
Hydrogen Sulfide undisassociated		0.002		
Nitrogen, unionized ammonia as N	0.041/1.75X the criterion			
Nitrogen, nitrate as N			50[1]/88[2]	
Oxygen, dissolved	≥5.0	≥5.0		
pH (units)	6.5-9.0		6.0-9.5	
Sodium adsorption ratio				10
Solids, suspended	90[1]/158[2]			
Solids, total dissolved			2,500[1]/4,375[2]	
Temperature (° F)	90			
Total Petroleum Hydrocarbons			≤10	
Oil and Grease			≤10	

[1] 30 day average
[2] daily maximum
[3] water quality standards for toxic pollutants are not included in this summary

(DENR 2006). Based on results of this sampling it appears that Pass Creek water quality meets all its proposed use criterion established by the DENR (Fish/Wildlife Propagation, Recreation, Stock Waters, Irrigation Waters) (DENR 2006). Pass Creek is not listed on the 303(d) list as a priority water body requiring priority status under the TMDL program.

3.11.2.2 Groundwater

In preparation of this groundwater resources section of the EIS the USGS's *Ground-Water Resources in the Black Hills Area, South Dakota* report was reviewed in detail (USGS, Water-Resources Investigation Report 03-4049, 2003). Other resources reviewed included water quality information available from the South Dakota DENR webpage, correspondence with a Water Rights Program specialist at the DENR, and correspondence with the environmental manager at GCC Dacotah. The topographic uplift and bedrock core of the Black Hills is the principal recharge zone for the Paleozoic aquifers across much of western South Dakota. In general, groundwater flows radially away from the central uplift of the Black Hills. The availability of groundwater along the proposed Dewey Conveyor ROW and the in envisioned quarry area is influenced primarily by subsurface geology and structure as well as by local recharge and groundwater flow conditions. These factors combine to form an extremely variable groundwater resource with both spatial and temporal limitations. Even where, groundwater is present it may not be of sufficient quality to meet all its intended uses.

The principal bedrock aquifers in the Black Hills are the Deadwood, Madison (Pahasapa), Minnelusa, Minnekahta, and the Inyan Kara Formations. Minor bedrock aquifers may also exist locally within aquitards due to secondary permeability features such as fractures and jointing, or the local presence of a more permeable bedrock unit. The primary source of recharge for these confined aquifers is from direct precipitation of rain and snow melt on bedrock outcrops. Progressing down-dip from the core uplift, these aquifers are collectively confined at their base by the presence of Precambrian-age rocks and at their surface by the overlying low permeability Spearfish Formation red-beds. Individually the major aquifers are confined by minor confining layers or by low-permeability sediments within the individual units. Overlying the Spearfish Formation are Mesozoic age units composed primarily of shale, siltstone, and sandstone and include the Cretaceous age Inyan Kara group. The Inyan Kara group is in turn overlain and confined by a thick sequence of Cretaceous marine shale. Confined or artesian conditions generally exist in these major bedrock aquifers except in the absence of a confining surface proximal to areas of bedrock outcrop. **Figure 3-3** shows the surficial geology across the project area.

In the envisioned quarry location, the Minnekahta Limestone Formation is exposed at surface and is less than 50 feet thick. It is the proposed source of the limestone to be mined. The Minnekahta is not saturated at the quarry site and is therefore not considered an aquifer in this location. According to the USGS report, the bedrock aquifers in the southwest portion of the study area (Black Hills) are not fully saturated until approximately six miles downgradient of their respectively outcrops. Progressing downdip, in the proposed Dewey rail load-out area the Minnekahta is present approximately 1,500 feet below the ground surface (bgs) (USGS 2003). The other older Paleozoic age aquifers mentioned in the USGS study are found progressively deeper than the Minnekahta, with the top of the basal Deadwood Formation aquifer approximately 3,500 feet bgs. The depth to the top of the Minnelusa Formation ranges from an estimated 200 feet bgs at the envisioned quarry location to 1,250 feet bgs at Dewey. The Minnelusa ranges from 800 to 1,000 feet thick. The Madison Limestone aquifer is present from 1,500 to 3,500 feet bgs and ranges between 200 to 600 feet thick across the project area. The Mesozoic aged Inyan Kara group outcrops between the proposed quarry area and the railroad loadout area. In the railroad loadout area the Inyan Kara Formation is present approximately 400 feet bgs and is approximately 300 feet thick. Younger Cretaceous aged deposits confine the Inyan Kara.

Near surface potential alluvial aquifers can be found in prominent drainages through the project area. These alluvial deposits are limited in extent to the valley bottoms and may or may not be present in a particular drainage. As discussed previously,

many of the surface water features are temporal in nature, with saturated conditions existing only in the wetter months. The degree of saturation in these alluvial deposits is expected to be highly variable dependant upon seasonal runoff and long-term climatic conditions.

3.11.2.3 Groundwater Flow Direction and Gradient

At the envisioned quarry location the depth to the first of three major aquifers, the Minnelusa is approximately 200 feet bgs (USGS 2003). The potentiometric surface (hydrostatic pressure head in the aquifer) in the Minnelusa Formation beneath the quarry site is estimated to be 3,750 feet mean sea level. Ground surface is approximately 4,750 feet. Static water level is therefore approximately 1,000 feet bgs. Groundwater flow direction is to the southwest under a hydraulic gradient of 0.0047 ft/ft (USGS, 2003). Beneath the Minnelusa, the Madison Formation aquifer is present at a depth of 1,500 feet bgs. The potentiometric surface in the Madison aquifer is estimated to be 3,700 feet mean sea level, the groundwater flow direction is to the southwest under a gradient of 0.0076 feet per foot.

At the proposed railroad loadout area, the depth to the first of five major aquifers, the Inyan Kara, is approximately 400 feet bgs. The potentiometric surface in the Inyan Kara aquifer is estimated to be 3,770 feet mean sea level. Ground surface in this area is approximately 3,690 feet mean sea level; therefore the hydrostatic water level is approximately 80 feet above ground surface. This approximation is supported by the presence of an artesian well shown on the USGS topographic quadrangle map 600 feet west of the proposed rail load-out area. Groundwater flow direction is the south under a hydraulic gradient of 0.011 feet per foot.

3.11.2.4 Groundwater Development and Water Rights

In South Dakota, all water (surface and groundwater) is the property of the state and therefore, dependant upon its intended usage, may require a water right. The only type of water use which does not require a water right permit is domestic use. The DENR provided a list of all groundwater completions within the legal description of the proposed ROW. Because domestic water use (includes stock watering and water of noncommercial trees, shrubs, gardens) is typically exempt from water right permitting, the database return of all groundwater developments is therefore likely incomplete. Small groundwater usage (less than 25 gpm peak flow or 25,920 gallons per day) would be excluded. The list provided also includes wells for non-consumptive groundwater use such as oil wells and monitoring wells. **Figure 3-13** shows the location of groundwater developments relative to the project area. Numerous groundwater wells exist near the proposed rail load-out area, ranging in depth from 580 to 835 feet bgs. These wells are listed as monitoring wells under the name of Tennessee Valley Authority (a utility company) and are associated with historical uranium exploration in the 1980s. Only one domestic well was included in DENR list; Don Spencer's well is located in SW¼SW¼ Section 15, T6S, R1E. Other monitoring wells listed, are registered under the name of Powertech USA Inc. (Powertech Uranium Corporation), and plot in Section 11, T6S, R1E. However, the registration indicates that the Powertech wells are in Fall River County not Custer County and therefore may be mislocated in the DENR database. It is much more likely that these wells are located in T7S, R1E, Section 11 where Powertech has identified inferred uranium resources that it proposes to mine. All five of these Power Tech wells are completed to a depth of 745 feet.

3.11.2.5 Groundwater Quality

Water quality of the aforementioned major aquifers is generally very good in areas proximal to the recharge zones and deteriorates progressively with distance downgradient from the outcrop areas. In the Minnelusa aquifer for example, an abrupt increase in concentration of dissolved sulfate occurs downgradient from the recharge area where a zone of anhydrite (gypsum) dissolution occurs and is primarily due to a redox change in groundwater chemistry (USGS 2003). This in turn limits the downgradient water quality sources developed in the Minnelusa formation.

Most the use limitations for groundwater are a function of aesthetic quality due to hardness, and high ionic concentrations of chloride, sulfate, sodium, manganese, and iron. Very few health

related limitations exists for groundwater other than those located in specific areas which contain elevated levels of radionuclides such as radon and uranium, or in a few samples collected from the Minnelusa for arsenic concentrations (USGS 2003).

Numeric water quality standards have been established by the South Dakota DENR under the Drinking Water Program (DWP) as part of South Dakota's responsibilities under the Federal Safe Drinking Water Act (SDWA). Suppliers of public drinking water have important responsibilities for testing water qualities under the DWP program. Public Water Supplies (PWS) systems are defined as any water system that serves 15 connections or 25 people per day for 60 days per year (DENR 2000). The most important section of the standards concerns sampling and reporting requirements for each type of PWS. The DWP sampling requirements are listed in **Table 3-20** and are applicable to all public water supply systems (PWS). The maximum allowable contaminant levels for these sampling parameters are provided in Appendix W, (DENR 2008e).

Table 3-20
Public Groundwater Supply System Standards and Sampling Frequency

Parameter	Sample Frequency
Total Coliform	monthly
Inorganic Chemicals (antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, mercury, nickel, selenium ,thallium, and fluoride	every three years
Asbestos	every nine years
Nitrite	every three years
Nitrate	annually
Radiological Chemicals	varies
Synthetic Organic Chemicals (SOC)	every three years
Trihalomethanes (THMs)	annually
Turbidity/Disinfection Residuals	annually
Volatile Organic Chemicals (VOC)	every three years
Lead and Copper	as necessary

3.11.3 Direct and Indirect Effects

3.11.3.1 Alternative A - Proposed Action

Surface Water

Some sediment runoff from road and general construction activities associated with the 6.6 mile long proposed conveyor which could impact surface water bodies is expected. This predictable type of direct impact is similar to what is outlined in GCC Dacotah's Storm Water Pollution Prevention (SWPP) Plan. Expected runoff contaminants would predominately be in the form of suspended or dissolved solids and increases in turbidity.

These impacts will be partially mitigated by the fact that many area streams beds in the vicinity of the project area are dry for much of the year. Runoff potential would also be mitigated by the implementation of Best Management Practices (BMPs) for runoff control. Based on GCC Dacotah's existing SWPP Plan these are:

- Water trucks for dust suppression would be available for use principally during construction and mining operations, but may not be required on the conveyor access road.
- Drainage ditches along constructed roads would be used to control runoff and minimize erosion potential. Sediments ponds would be utilized where necessary.
- Riprap would be installed where necessary to prevent severe erosion (i.e., culvert areas).
- Active and reclamation areas will be sloped and revegetated to prevent serious erosion

Floodplains

As previously stated in the Affected Environment section above, the project area crosses or incorporates three Class A Floodplains, encompassing approximately 124 acres within the ROW. The proposed conveyor trace would cross two of the three mapped floodplains. During construction all appropriate federal, state, and county floodplain rules and regulations would be applied to the conveyor crossings in order to

minimize any floodplain disturbance. Constructed crossings would utilize supports that are in accordance with the standards and criteria promulgated under the Nation Flood Insurance Program. To further achieve flood protection, GCC Dacotah would, wherever practicable, elevate structures above the base flood level rather than filling in land. These mandated construction practices should effectively mitigate any direct effects on floodplains; the beneficial use of the floodplains in the proposed ROW crossing would be preserved, and no additional flood threat would be expected.

Groundwater

Groundwater would likely be used to suppress dust during road building and use activities, and for the construction of concrete foundation supports for the conveyor along its 6.6 mile course. In addition groundwater would be used for dust control/mitigation once the envisioned quarry and proposed conveyor are operational.

Groundwater use rates for dust suppression, utilizing a spray truck as needed, are estimated to be 30,000 gallons per day during the construction period. This estimate was provided by a construction company specializing in road construction; however this rate of water usage is highly dependant upon the type of road, its locations, and the type of earth materials used in construction (LS Jensen 2008). The 30,000 gallons per day is based on a single water sprayer (3,000 gallon tanker) applying 10 loads per day. The need for dust suppression would be seasonally regulated based on ground moisture and is not expected over the entire operational/construction season. For the purposes of estimating water consumption, Tetra Tech has assumed that a water truck will be needed 100 days per year. This equates to approximately 3 million gallons of water or 9.2 acre-feet per year (for the first several years during construction) Once construction is complete the one-lane access road used to inspect and maintain the conveyor would likely see very limited use (one or two trucks per day) and may not require dust suppression.

Based on estimates of groundwater usage at aggregate plants and quarry locations, groundwater use for dust suppression on the conveyor will consume approximately 2 gallons of water per ton of material (Eng-Tips Forum, 2008). This assumes that water-based dust suppression systems would be installed at the conveyor loading and unloading areas. In other locations, mechanical dust traps would be used along the conveyor and would not require water. The dust suppression rates suggested by industry peers were for dust suppression systems utilizing water foggers (agglomeration systems) at key locations. The estimated production rate of 4,000 tons/day over a period of 250 days per year results to about 1,000,000 tons of limestone to be mined/moved per year. This equates to 2,000,000 gallons of water per year (6.1 acre-feet). The conveyor is expected to transport 1,500 tons per hour and operate 2.5 to 3 hours per day. This equates to 3,000 gallons per hour of water or 50 gpm; however it is likely that a storage tank would be used in conjunction with a groundwater supply well so that the pumping rate required for the well could be reduced to 20-25 gpm, assuming a 4,000 gallon storage tank would be used. The railroad loading facility would also likely have a water based dust suppression system. Assuming an agglomerate system, the amount of water consumed would equal to the proposed quarry consumption, 8,000 gallons per day.

The total amount of water estimated to be used by quarry and conveyor operations after the access road construction period would be approximately 12 acre-feet per year. This water demand could be supplied by one or more production wells (one at the quarry site and one at rail load-out facility). The Madison Limestone aquifer is present from approximately 1,500 feet bgs at the quarry location and would likely yield sufficient water quantity and quality to develop into a PWS system (to serve quarry workers). The supply well would require permitting for PWS through the South Dakota DENR. Based on the predicted demands for operations, dust suppression, and public supply, the well would likely be configured with a storage tank to meet peak demands of approximately 25 gpm. At the proposed railroad loading location, the Inyan Kara aquifer is present approximately 400 feet bgs and is approximately 300 feet thick. Numerous groundwater wells exist near the proposed Dewey railroad loading area, ranging in depth from 580 to 835 feet bgs. The railroad loading facility well could be developed solely for dust suppression

supply and could be designed with a storage tank thereby limiting well demand to 25 gpm or less.

The direct effects on groundwater resources resulting from use requirements for the proposed quarry/conveyor are potential impacts to other permitted and unpermitted[1] groundwater users in project area. Indirect effects on groundwater can also occur as diminished flows to springs and surface water bodies down basin of the developed groundwater. Direct effects can be evaluated based on whether the proposed source wells would be permitable for water rights; since permitting a groundwater right is contingent upon no adverse effects. South Dakota water rights are administered by the doctrine of prior appropriation. This means that senior priority water users have first right to the water, except for individual domestic use. Priority is established by the date of the filing. Uses of water prior to 1955 may qualify for a vested water right depending on the type of historical usage. Criteria for granting a water right permit set for in SDCL 46-2A-9 are as follows:

Water must be available for the proposed use. In the case of groundwater usage, the annual volume from the water source may not exceed the average estimated annual recharge.

The source aquifer for a proposed PWS well at the quarry location would likely be the Madison Formation. Well yields in the Madison Formation range from several gallons per minute (gpm) up to 2,000 gpm or more, with the mean yield of 200 gpm (USGS 2003). The estimated recoverable water in storage for the Madison Limestone aquifer in the Black Hill area is 62.7 million acre-feet. The amount of recoverable water in storage can be estimated by the outcrop area of the aquifer upgradient from the supply well; in this case it is about ~150+ square miles (**Figure 3-13**) in comparison to 4,113 square miles for the total aquifer area provided in the Black Hills USGS study (USGS 2003). The resultant fraction of the 62.7 million acre-feet of available water is 2.3 million acre-feet; therefore the water from the Madison is likely physically available for use.

The source aquifer for the supply well at the rail load-out facility would likely be developed in the Inyan Kara formation. The mean well yield in the Inyan Kara formation is 30 gpm (USGS 2003). This supply well would likely be used solely for dust suppression at the rail load-out area therefore the well demand is quite low, in the neighborhood of 25 gpm or less. The estimated recoverable water in storage for the Inyan Kara in the Black Hills area is 84.7 million acre-feet (USGS 2003). Considering that the local recharge area is much smaller than the 2,500 square miles of aquifer recharge area in the USGS study; the amount of recoverable water in storage can be estimated by the outcrop area of the aquifer. In this case, it is about 6 square miles. The resultant fraction of the 85 million available acre-feet of water in the USGS study is 200,000 acre-feet; therefore the water is likely physically available for use.

The proposed diversion can be developed without unlawful impairment of existing rights.

Well draw-down (well interference) from development of a groundwater supply well pumping at 25 gpm at the quarry location on nearby water user can be estimated by use of the Theis analytical equation (Theis 1935). The nearest well, Louie Gokel-Oil, is approximately 6,000 feet from the quarry site. Using a transmissivity of the Madison aquifer of 17,000 feet squared per day, and the storage coefficient of 2×10^{-3} (USGS 1993) drawdown at a radial distance of 6,000 feet after one year of continuous pumping at 25 gpm is projected to be 0.12 feet. In terms of impairment to surface water rights in the quarry well location the nearest water rights are for Frank Walsh's stockponds/dugouts located approximately 7,000 feet from the quarry (**Figure 3-13**). These surface water rights are not connected either directly or indirectly to the Madison Formation and would not be impaired in any way. Based on this analysis it appears that the supply well at the quarry location can be developed without unlawful impairment of either surface or groundwater rights.

[1] Liability for damage to domestic and municipal wells. The failure of a well to meet standards established pursuant to §46-6-6.1 is not a defense in any action or proceedings regarding damage, loss of water production or quality, replacement cost, or increased operating expenses incurred by a municipal or domestic use well located in a formation older than or stratigraphically lower than the Greenhorn Formation caused by any person using or withdrawing groundwater for mine dewater in a formation older than or stratigraphically lower than the Greenhorn Formation. Source: SL 1980, ch 304, §1; SL 1982, ch 311

Well draw-down from development of a groundwater supply well at the rail load-out facility on the nearest groundwater wells was calculated based on continuous pumping at 25 gpm for a period of one year. The nearest neighboring well, Silver Kings Mine-MW is located about 1,750 feet from the proposed railroad loadout facility **Figure 3-13**). Using a transmissivity of Inyan Kara aquifer of 1,500 feet squared per day and a storage coefficient of 4 x 10^{-4}(PCO_2R 2005), the drawdown is estimated to be 1.77 feet at a radial distance of 1,750 feet. Based on this analysis it appears that the supply well at the quarry location can be developed without unlawful impairment of either groundwater rights.

The use of water must be beneficial.

Beneficial use is defined as the use of water that is reasonable and useful and beneficial to the owner and consistent with the best utilization of water supplies. Tetra Tech considers a supply well for dust suppression, public supply, and road construction as a direct beneficial use to GCC Dacotah.

The use of water must be in the public interest.

Public interest is not specifically defined in the water rights law and its determination made by the Board based on testimony at the time of hearing. At this time, Tetra Tech sees no reason that the supply well would not be analyzed as in the public's best interest.

As with construction related disturbances, some sediment runoff from dust emanating from the conveyor could indirectly impact surface water bodies within the immediate vicinity of the proposed conveyor route. This generation of dust pollution from operation of the conveyor and subsequent potential sediment runoff during precipitation events would be mitigated by dust suppression control features such as agglomerative and mechanical dust suppression systems.

Agglomerative dust suppression is a cross between ventilation / filtration systems and the garden hose technology. It works on the principal that small particles of water will "come together" with small particles of solid matter (dust), forming larger and heavier particles that will settle by gravity. Like a garden hose spray because it uses water and no chemicals; similar to the ventilation system because it doesn't saturate the material; and it separates dust by the filtration process created from the fog.

Water application dust suppression along roadways and dust suppression systems at key transfer locations would be used, as needed, and will substantially cut down on fugitive dust emissions from the conveyor mitigating any indirect threat of sediment runoff to nearby surface water bodies.

Surface water impairment from the indirect effects of nearby groundwater supply well withdrawals was assessed based on a review of the hydrogeologic conditions at the proposed well locations. In terms of impairment to surface water rights from groundwater withdrawals at the proposed quarry supply well, the nearest water rights are for Frank Walsh's stockponds/dugouts, located approximately 7,000 feet from the quarry location (**Figure 3-13**). Groundwater resources in the quarry location are located at great depth and are separated by from surface water resources by many hundreds of feet of low permeability sediments (aquitards). Based on the degree of isolation, Tetra Tech does not believe that surface water rights are connected either directly or indirectly to the Madison Formation and would not be impaired in any way.

At the proposed rail load-out supply well location, the nearest surface water rights are the GCC Dacotah-Irr. water right, located on Stockade Beaver Creek, approximately 3,000 feet to the west of the railroad (**Figure 3-13**). Groundwater withdrawals from the Inyan Kara formation should be isolated from the nearby surface water bodies by several hundred feet of confining beds such that any minor reduction in the hydrostatic pressure on the aquifer due to aquifer pumping would not indirectly influence recharge to surface water. Based on groundwater flow direction and surface elevation, the discharge point for the Inyan Kara Formation is many miles to the south within the Cheyenne River valley (USGS 2003). Based on this analysis it appears that the supply well at the quarry and railroad loadout locations can be developed without unlawful impairment of nearby surface water rights.

3.11.3.2 Alternative B - No Action

Under the No Action Alternative the proposed action to provide a ROW grant along which to

construct a conveyor system would not be approved and the quarry would not be constructed or operated; therefore no direct effects of surface water or groundwater resources would occur.

3.11.3.3 Alternative C – Trucking on existing county road

Surface Water

Some sediment runoff from road construction activities which could impact surface water bodies is expected. This predictable type of direct impact is similar to what is outlined in GCC's SWPP Plan (GCC Dacotah 2008). Expected runoff contaminants would predominately be in the form of suspended or dissolved solids, oil and grease and increased turbidity.

As with the proposed action, the potential for runoff or spill related impacts will be partially mitigated by the fact that many area streams beds in the vicinity of the proposed are dry for much of the year. The nearest perennial stream is the lower reach of Pass Creek (based on vegetation evidence from aerial photography the distance is approximately 2-miles south of the nearest project area boundary). Runoff potential would also be mitigated by the use of BMPs for runoff control, including:

- Water trucks for dust suppression would be available for use during construction and hauling operations.
- Drainage ditches along constructed roads would be used to control runoff and minimize erosion. Sediments ponds will be used where necessary.
- Riprap would be installed where necessary to prevent severe erosion (culverts).
- Active and reclamation areas would be sloped and revegetated to prevent serious erosion.

Monitoring of surface water runoff during the construction and operations phases downstream of proposed ROW crossings would be a means to assess direct and indirect effects of the hauling alternatives. The closest surface water monitoring station is located on Pass Creek (approximately 1-mile south, but upstream of the Hell Canyon tributary confluence). This USGS monitoring station monitors for flow, temperature and specific conductance. Since this location is upstream of most of the potential water quality impairments from disturbances within project area it would not be suitable for monitoring. Other locations further downstream of the confluence of Hell Canyon or the other unnamed tributary ROW crossing would need to be established. Additional suitable surface water monitoring locations within the ROW on the Beaver Creek drainage would also be established. Based on South Dakota TMDL regulations for the receiving surface waters of the Dewey mining area (Cheyenne River, ~10-miles south of the project area); constituents to be monitored that are pertinent to this project include ammonia, dissolved solids, conductivity, pH, suspended solids, and trophic state index (TSI) (DENR 2008d).

Another direct effect of permitting a ROW haul road would be a slight increase in the potential for a traffic accidents resulting in the release of diesel fuel or motor oil onto the unpaved county road surface; thereby creating the potential for impacts of diesel or oil constituents into nearby surface water bodies. Best management practices and development of a traffic plan would only alleviate this increased risk to some extent; due to inherent risks associated with moving large volumes of rock on unpaved rural county roads with variable grade, blind corners, adverse weather conditions, and other environmental factors. The SPCC Plan would minimize any potential risk to surface water. Appropriate controls and clean up procedures would be identified in the site specific SPCC Plan put forth by GCC Dacotah upon commencement of mining and hauling operations. The SPCC plan would be reviewed by the State kept on file in GCC Dacotah's Environmental Specialist's office.

As with construction related disturbances, some sediment runoff from dust emanating from the haul route could indirectly impact surface water bodies within the immediate vicinity the ROW. Additionally, with the development groundwater supply wells for use of dust suppression by water trucks along the haul road, the potential exists for indirect effects such as diminished flows to area springs and surface water bodies due to groundwater withdrawals.

Because of the mitigating circumstances in described in the proposed action section analysis,

such as the use of best management practices for fugitive dust and the degree of separation of deep groundwater sources with surface water, the indirect effects on surface water resources would be expected to be minimal.

Floodplains

Under this alternative action, road construction may be necessary to enhance existing stream crossings design for haul trucks. Construction practices would follow federal mandates established by the Flood Disaster Protection Act of 1973, and would provide effective mitigation of any direct effects resulting from floodplain encroachment. The beneficial use of the floodplains in the proposed ROW crossings would be preserved, and no additional flood threat would be expected.

Groundwater

Dust suppression rates using a spray truck, as needed, are estimated to be 60,000 gallons per day (LS Jensen 2008). This is double the volume estimated for the proposed action and has been adjusted to reflect an increase in the unpaved surface area associated with this alternative. In addition, the use of this water for dust suppression via water trucks has a degree of permanency not associated with the proposed action road construction activities. The 60,000 gallons per day is based on a two water sprayers (3,000 gallon tanker) applying 10 loads per day. This equates to approximately 6 million gallons of water applied over 100 days or 18.4 acre-feet per year. The need for dust suppression would be seasonally regulated based on ground moisture and is not expected over the entire operational season.

This water demand could be supplied by one or more production wells (one at quarry site and one at railroad loading location). Direct effects from groundwater production wells are discussed in detail the proposed action section. The source aquifer for a supply well at the quarry location would likely be the Madison Formation and at the railroad loading area likely the Inyan Kara Formation. Permitting and operation of the supply wells would follow DENR regulations. The direct effects for groundwater development for water supply are potential impacts to other groundwater users in project area; however based on the minor amount of water needed and hydrogeologic conditions, the supply wells would likely be permitable through the South Dakota DENR because:

- the proposed source water is physically available without unlawful impairment to existing rights;
- its serves a beneficial purpose (dust suppression); and
- it is likely in the public's best interest (considered a best management practice).

3.11.3.4 Alternative D – Trucking along ROW corridor

Alternative D would involve hauling the limestone by truck from the envisioned mine quarry to the proposed rail load-out facility (7.2 miles) on a new road, where feasible, to decrease the effects on the existing county road and minimize the impacts to public safety. Part of the new road constructed for this alternative would follow the proposed conveyor ROW. This alternative would still require upgrading the county road segment (1.6 miles) to make it suitable and safe for use by the haul trucks and public traffic.

Surface Water

Some sediment runoff from road construction activities which could impact surface water bodies is expected. The direct effects of Alternative D would be very similar to Alternative C, albeit with a slightly greater potential for runoff due to a increase in construction related activities associated with new haul road construction and a increase of net disturbance area required by the new road construction. Once constructed, the cumulative effects of this alternative on surface water would be a slight increase in runoff potential due to a net increase in unpaved surface area relative to Alternative C which uses the existing county road. Direct effects on surface water from this alternative would be at least partially mitigated by BMPs and runoff controls as previously discussed.

Monitoring of surface water runoff during the construction and operations phase downstream of proposed ROW crossings would be a means to assess direct and indirect effects of the hauling alternatives.

One direct effect of the use of a new haul road (minimizing the use of county road segments) for hauling the limestone to the rail load-out facility, in comparison to using the county road for the entire length of hauling (Alternative C), would be an decrease in the potential for traffic accidents especially those involving the public. The risk of accidents involving spills of diesel fuel and motor oil is however, likely similar to that of Alternative C. As described previously (Alternative C), the development of a traffic plan, and SPCC would help minimize the potential effects of a spill on the environment.

As with disturbances associated with Alternative C, some sediment runoff from dust emanating from the haul route construction could indirectly impact surface water bodies within the immediate vicinity the ROW. Additionally, with the development groundwater supply wells for use of dust suppression by water trucks along the haul road, the potential exists for indirect effects such as diminished flows to area springs and surface water bodies due to groundwater withdrawals.

Because of the mitigating circumstances in described in the proposed action section analysis, such as the use of best management practices for fugitive dust and the degree of separation of deep groundwater sources with surface water, the indirect effects on surface water resources would be expected to be minimal.

Floodplains

Under this alternative action, road construction of stream crossings for the new haul road would be necessary in at least two locations. Construction practices would follow federal mandates established by the Flood Disaster Protection Act of 1973, and would provide effective mitigation of any direct effects resulting from floodplain encroachment. The beneficial use of the floodplains in the proposed ROW crossings would be preserved, and no additional flood threat would be expected.

Groundwater

Direct effects on groundwater for Alternative D would be very similar to Alternative C. Groundwater supply for dust suppression would still be developed under guidelines established by the South Dakota DENR; however the amount of water required for dust suppression may increase due to an increase of road construction activities and a net increase in new unpaved surface area.

Any surface spills or impacts from this alternative would not likely impact any groundwater resources due to extreme depth of groundwater and confining hydrogeologic conditions.

3.11.4 Connected Action

Raw material inventory areas at the limestone quarry would include exposed stock piles of limestone prior to and following crushing. Active mining results in the exposure of natural deposits of limestone, and creates limestone muck/waste piles in the quarry (GCC Dacotah 2008). Additionally, it is reasonable to expect that limestone fines from the crusher and dust from the dust collectors on the conveyor and at the rail load-out facility would be backfilled into the quarry area. Prior to soil cover and final reclamation, all of the above mentions sources of limestone would be subjected to precipitation and runoff that would generate suspended or dissolved solids that may direct impacts to surface water resources if not confined to the quarry. As mentioned previously, these impacts will be partially mitigated by the fact the area streams beds in the vicinity of the proposed quarry are dry for much of the year and by the use of management/runoff controls. Run-off controls specific to quarry areas have been developed at other quarry sites by GCC Dacotah (GCC Dacotah 2008):

- Stock piles are not placed in areas that are subject to flooding.
- Drainage ditches are used to divert runoff around stock piles.
- Drainage ditches are used to divert runoff around active mining areas.
- Berms are constructed to divert runoff around stock piles and active mining areas.
- Sediments ponds are used where necessary.
- Riprap is installed where necessary to prevent severe erosion.
- Inactive mine areas and reclamation areas are sloped to prevent serious erosion.

- Mined areas are revegetated.

Another direct effect concerns for the proposed quarry site is the potential for water quality impacts resulting from hazardous chemical usage. Ammonium nitrate fertilizer and fuel oil (ANFO) is used by GCC Dacotah for blasting at quarry sites. The oil used most often is No. 2 fuel oil, or diesel fuel. At a mine site in Rapid City with a similar production rate to that proposed for the Dewey quarry, GCC uses about 700,000 lbs of ammonium nitrate and 3,800 gallons of diesel for its ANFO explosive mixture on an annual basis (Nelson 2008). The potential for runoff of residual ANFO from blasting activities has been expressed by comment at a scoping meeting; however, based on information provided by GCC Dacotah's environmental manager, the likelihood of any residual explosive ingredients remaining after blasting is minimal (Gene Nelson, GCC Dacotah 2008). This is supported by the chemical characteristics of an ANFO explosion and experiences at numerous other open pit and quarry sites. The byproduct of the explosion product is carbon dioxide, water and gaseous oxides of nitrogen (NOx).

Spills and leaks contributing contaminants into surface water and groundwater resources from stormwater runoff or direct infiltration from of materials used in the mining process; including ammonium nitrate and diesel fuel, are expected to be minimal. According to GCC Dacotah, no significant spills or leaks have occurred at the other quarry sites operated by GCC Dacotah (GCC Dacotah 2008). The SPCC Plan as outlined in Dacotah facilities' SPCC Plan would minimize any potential risk to water resources.

The potential for surface spills or mining runoff to impact groundwater resources would further mitigated by the extreme thickness of the vadose zone and shallowness of the proposed quarry (50 feet or less); with an estimated 1,000 feet to groundwater in the Minnelusa aquifer, any impacts to groundwater resources from surface spills or runoff infiltration are expected to be minimal.

The proposed quarry site proposes to mine the Minnekahta Limestone Formation, which outcrops at the surface and is no more than 50 feet thick. The Minnekahta Limestone is well above the water table and dry in this location (USGS 2003) and dewatering operations are not expected. Some water would be utilized to build roads and access points at the quarry site but the majority of the water used would be for fugitive dust control once the quarry is operational. Dust suppression usage at the quarry operations is expected to be at a rate similar to those discussed in the Proposed Action and Alternatives C and D and the total amount used would be proportional to its total surface area or the number of transfer points that require wet dust mitigation. For the purposes of this analysis, Tetra Tech assumes that the limestone loading area will utilize the same amount of water in each of the three development scenarios (dust suppression will occur at the cone crusher/loading area and dust suppression will occur as needed on quarry area roads). Based on estimate of water usage at aggregate plants and quarry locations, dust suppression of a conveyor system consumes approximately 2 gallons of water per ton of material. The estimated production rate of 4,000 tons of limestone per day would result in water usage for agglomerative dust suppression in the neighborhood of 8,000 gallons per day.

As discussed previously, the railroad loading facility would also likely have some sort of water based dust suppression system. Assuming an agglomerate system, the amount of water consumed would equal to the quarry consumption rate of 8,000 gallons per day.

Dust suppression using a spray truck, would be 30,000 gallons per day. This estimate is the same for each alternative and is a rough estimate. Actual use for dust suppression would vary depending on the alternative and weather.

As with construction related disturbances, some sediment runoff from dust emanating from the limestone quarry or railroad loadout facility could indirectly impact surface water bodies within their immediate vicinity. Additionally, with the development groundwater supply wells for use of dust suppression, the potential exists for indirect effects such as diminished flows to area springs and surface water bodies due to groundwater withdrawals.

Because of mitigating circumstances in described in the proposed action analysis, such as the use of best management practices for fugitive dust and the degree of separation of deep groundwater supply

sources, the indirect effects on surface water resources are expected to be minimal.

3.11.5 Cumulative Effects

Water is a precious commodity in the Northern Great Plains region. The Cheyenne River basin is the principal watershed draining southern South Dakota and is vitality important for the many different uses of water. Some of the headwaters country of the Cheyenne River resides, as such, cumulative effects on water resource development in the headwaters country could compound effects on limited water supply and poor water quality. Groundwater originating in the Black Hills area is used for municipal, industrial, agricultural, and recreational purposes. The Black Hills area is an important recharge area for aquifers in the Northern Great Plains. Adequate water supplies can be difficult to obtain at some locations in the Black Hills area (USGS 2003).

3.11.5.1 Alternative A - Proposed Action

The cumulative effects of the Proposed Action on surface water and groundwater resources in this region are largely dependant on other development trends in the Black Hills region and water management policy. Trends influencing water resource management include rural population growth and natural resource developments, such as, raw materials for aggregate (limestone, shale, and gypsum), oil and gas leasing, and *in-situ* leaching uranium mining. These activities contribute to additional surface disturbances and are being assessed through programs like the TMDL and the Black Hills Water Management Study. The Black Hills Water Management Study was conducted by the Bureau of Reclamation during 1992-2002, evaluating alternatives for management of water resources in the area. This study coupled with the aforementioned USGS Ground-Water Resources study are being used by federal, state and local government agencies to set water development policy and to protect this valuable resource.

About 45 percent of the recent population growth in the Black Hills area has occurred in unincorporated areas where water supply systems are not provided by municipalities (USGS 2003). This population trend has mainly developed around Rapid City area on the eastern flank of the Black Hills; however it is reasonable to expect this trend to continue and spread to more rural areas.

In-situ leach mining of roll-front deposits of uranium is a noninvasive process with minimal surface disturbance which extracts uranium from porous sandstone aquifers by reversing the natural processes which deposited the uranium.

The mining process introduces additional oxygen to the water in the deposit itself to cause the uranium to go back into solution. Then, it can be pumped up to the surface. The well field can be up to several thousand wells. During mining, slightly more water is produced from the formation than is reinjected. This water is disposed of by land application of large volumes of waste water. Eventually, the same injection and production wells and surface facilities are used for restoration of the affected ground water. Ground water restoration is continued until the affected water is suitable for its pre-mining use (WMA 2008).

Because the in-situ leach process only alters the aquifer aqueous chemistry for a short time until the aquifer is reconditioned to its original redox state after cessation of mining, long-term effects resulting from groundwater extraction are not expected. One of the longer term indirect effects associated with the in-situ leach process is the build up of minerals in the land application area and subsequent increases in sulfate, chloride, and TDS discharges to nearby surface water bodies. These environmental consequences are similar to those from the methane extraction well industry and the associated surface discharge of hard water.

The cumulative effects of the proposed action (development of a 6.6 mile conveyor) is expected to be minimal on existing water users. Other potential concerns of cumulative impacts in the area including rural residential growth and other mining developments could exacerbate water shortages and increase runoff potential; however water rights law in South Dakota provides a safeguard against unlawful impairment of existing rights- both water quality and water quantity.

Past and reasonably foreseeable actions such as uranium mining and exploration, oil and gas exploration, and transportation and utility corridor construction create surface disturbances that would increase the potential transport of sediment to

surface waters. General or site specific storm water permits required by the DENR would significantly mitigate potential impacts to surface water sediment load and turbidity.

3.11.5.2 Alternative B - No Action

There would be no cumulative effects on surface or ground water from the No Action Alternative.

3.11.5.3 Alternative C – Trucking Existing County Road

No adverse cumulative effects from the use of the County road system for haul the limestone ore is expected; however future oil and gas or uranium mining could benefit from the reengineering and reconstruction of the county road.

The cumulative effects of sediment-loading to surface waters as a result of surface disturbances related to mining, exploration and the construction of transportation and utility corridors would be similar to those described for Alternative A.

3.11.5.4 Alternative D - Trucking ROW Corridor

Future oil and gas or uranium mining could benefit from the reconstruction of the county road segment over the pass, and it is possible that these other mining activities could use the GCC Dacotah haul road as a means of accessing and supplying any development sites and therefore might benefit from implementation of this alternative.

Future oil and gas or uranium mining could benefit from the reengineering and reconstruction of the county road portions of Alternative D.

The cumulative effects of sediment-loading to surface waters as a result of surface disturbances related to mining, exploration and the construction of transportation and utility corridors would be similar to those described for Alternative A.

3.11.6 Connected Action

Other potential concerns for cumulative impacts in the area included rural residential growth and natural resource development, which could exacerbate water shortages and increase runoff potential; however water rights law in South Dakota provides a safeguard against unlawful impairment of existing rights- both from a water quality and a water quantity perspective.

The effects of the Connected Action (development of the limestone quarry) is expected to be minimal on existing water users.

3.11.7 Cumulative Effects

The cumulative effects of the limestone quarry and rail load-out facility development would be similar as the proposed action; and would therefore be largely dependant upon other future developments in the Pass Creek-Hell Canyon watershed.

3.12 Social and Economic Conditions

3.12.1 Study Area Boundaries

The region of influence (ROI) is Custer, Fall River, and Pennington Counties, all located in South Dakota. The major city in the ROI is Rapid City, located in Pennington County. Other ROI communities near the proposed project are Hot Springs, Custer, and Edgemont.

3.12.2 Affected Environment

Population

Between 1900 and 1970, the ROI's annual average population growth rate (2.6 percent) outpaced that of South Dakota (0.7 percent). This pattern continued during the 1970s and 1980s, with the ROI increasing by 1.4 percent to South Dakota's 0.2 percent. During the 1990s, however, the average annual growth rates were similar: 0.9 percent for the ROI and 0.8 percent for South Dakota. **Table 3-21** shows that by 2000, the ROI's 103,293 residents constituted 13.7 percent of the state's population.

Rapid City is the second-largest city in South Dakota and has 58 percent of the ROI's population and 67 percent of Pennington County's population. Fall River County is similar in that 55 percent of its residents live in Hot Springs, the largest town near the proposed project site. In Custer County, the residents are somewhat more dispersed, with 26 percent living in the town of Custer and 35 percent living in the small communities of Hermosa, Buffalo Gap, Pringle, and Fairburn. The town of Dewey, the closest town to the proposed project, is not listed as a Census-designated Place, and no comparable population data are available.

The two rural counties are very sparsely populated, with population densities of 4.3 people per square mile in Fall River County and 4.7 in Custer County; both counties are less densely populated than South Dakota (9.9). Pennington County's density is 31.6, and that of the total ROI is 17.0. By comparison, the United States as a whole has 79.6 persons per square mile.

Employment and Income

Pennington County, along with Meade County, comprise the Rapid City, SD Metropolitan Statistical Area. Custer and Fall River Counties are not part of any Metropolitan Statistical Area (OMB 2007).

Employment trends within the ROI have also varied, as shown in **Table 3-22**. Growth, as measured by increases in the number of people employed between 1980 and 2000 in Custer and Pennington Counties, averaged annual growth rates of 2.8 percent and 2.1 percent, respectively; these counties led the US and South Dakota, which both grew at an average rate of 1.9 percent annually. However, Fall River County's employment actually declined slightly, with an average annual change of -0.2 percent during the 1980s and 1990s. From 2001 to 2006, growth slowed somewhat for Pennington County, South Dakota, and the US, and increased slightly for Custer County. Fall River County, however, saw its average annual growth rate in employment rise to equal that of the US, 1.3 percent.

Table 3-21
Population of ROI Counties and Comparison Areas, 1950-2000

	Comparison Areas		ROI				
	United States	**South Dakota**	**Custer Co.**	**Fall River Co.**	**Pennington Co.**	**Total ROI**	**ROI as % of SD**
1950	151,325,798	652,740	5,517	10,439	34,053	50,009	7.7
1960	179,323,175	680,514	4,906	10,688	58,195	73,789	10.8
1970	203,211,926	665,507	4,698	7,505	59,349	71,552	10.8
1980	226,545,805	690,768	6,000	8,439	70,361	84,800	12.3
1990	248,709,873	696,004	6,179	7,353	81,343	94,875	13.6
2000	281,421,906	754,844	7,275	7,453	88,565	103,293	13.7
Average annual percent change:							
1900-1970	1.4	0.7	0.8	1.1	3.4	2.6	
1970-1990	1.0	0.2	1.4	-0.1	1.6	1.4	
1990-2000	1.2	0.8	1.6	0.1	0.9	0.9	

Source: USCB 1995, 2000a

Table 3-22
Employment, ROI and Comparison Areas, 2001-2006

	Comparison Areas		ROI				
	United States	**South Dakota**	**Custer Co.**	**Fall River Co.**	**Pennington Co.**	**Total ROI**	**Pennington as % of ROI**
1980	114,231,200	353,587	2,606	4,131	43,784	50,521	86.7
1990	139,380,900	412,013	3,510	3,721	54,955	62,186	88.4
2000	166,758,800	519,228	4,568	3,964	66,997	75,529	88.7
2001	167,014,700	517,285	4,856	3,357	60,095	68,308	88.0
2002	166,633,100	519,394	5,020	3,423	60,799	69,242	87.8
2003	167,553,500	518,248	5,019	3,466	61,172	69,657	87.8
2004	170,512,700	529,965	5,268	3,548	62,234	71,050	87.6
2005	174,176,400	542,401	5,470	3,625	62,664	71,759	87.3%
2006[1]	178,332,900	555,921	5,618	3,584	63,428	72,630	87.3%
Employment Change,1980 to 2000:							
Total % change	46.0	46.8	75.3	-4.0	53.0	49.5	
Average annual % change	1.9	1.9	2.8	-0.2	2.1	2.0	
Employment Change, 2001 to 2006:							
Total % change	6.8	7.5	15.7	6.8	5.5	6.3	
Average annual % change	1.3	1.5	3.0	1.3	1.1	1.2	

Source: BEA 2008a
[1]The latest year for which the BEA was reporting data at the time of this analysis was 2006.

The US Bureau of Labor Statistics (BLS), in cooperation with state labor departments, collects employment and unemployment data for states, counties, and other areas. Regions in the Great Plains tend to have low unemployment rates, and such is the case for the ROI.

In 2007 the ROI's unemployment rate was 2.9 percent, compared to 3.0 percent for South Dakota—the same as Custer County—and 4.6 percent for the US. Within the ROI, Pennington County had the lowest rate, 2.8 percent, and Fall River County, the highest, at 3.4 percent. **Table 3-23** shows these rate comparisons.

The US Bureau of Economic Analysis (BEA) reports employment by industrial sector as collected by the BLS and state departments of labor or employment. County or other small area data may not be disclosed when data do not meet BLS or state agency disclosure standards regarding confidentiality or data quality (BLS 2006). For example, if there are few firms in an area, data users could determine or approximate a firm's information that a firm may not want its competitors to know. This analysis also examined employment by industrial sector for the ROI. However, because of the small employment base in Custer and Fall River Counties, much of their employment data by sector are not disclosed. Because Pennington County accounted for 87.3 percent of the ROI's employment in 2006, and all data were disclosed.

In 2006, retail trade was the second largest sector, which is not surprising given that Rapid City is the central shopping location for the surrounding region, and the Black Hills is a major tourist destination. Federal and state government was the next largest sector, supported by the presence of Ellsworth AFB east of Rapid City. The area was also home to strong construction and manufacturing sectors.

Table 3-23
Employment and Unemployment Characteristics in 2007, ROI and Comparison Areas

	Comparison Areas		ROI			
	United States	South Dakota	Custer Co.	Fall River Co.	Pennington Co.	Total ROI
Labor Force			4,669	3,765	54,050	62,484
Employment	146,047,000	429,495	4,529	3,636	52,520	60,685
Unemployment	7,078,000	13,060	140	129	1,530	1,799
Unemployment Rate	4.6%	3.0%	3.0%	3.4%	2.8%	2.9%

Source: BLS 2008.

Changes in employment sectors between 2001 and 2006 were also examined to identify growth and decline in individual sectors, although missing data make a complete analysis difficult. In Custer and Fall River Counties, there were large percentage increases in construction, manufacturing, real estate (includes rentals and leasing), administrative and waste services, and the arts, entertainment, and recreation sector. (Note that because of the small employment base in these rural counties, small absolute changes can represent a large percentage change.) Pennington County, on the other hand, lost jobs in mining and manufacturing, but gained jobs in the real estate and management sectors, as well as construction, utilities, educational services, health care, accommodation and food services, and the arts, entertainment, and recreation sector. Some of the changes in Pennington County reflect the national shift from "primary" and "secondary" activity (mining and manufacturing, respectively, in this case) to a service sector orientation.

These changes suggest that the tourism industry may have strengthened in all three counties, and growth in construction and real estate may indicate that those approaching retirement age, and others are moving into the area either permanently or on a part-time basis. For example, those approaching retirement may purchase a second home with the goal of relocating there full-time after retiring. This is more likely the case for Custer and Pennington Counties. Fall River County contains only one town of any size, Hot Springs, which has a large mammoth (fossil) excavation site that draws tourists, and the Angostura Reservoir, with its many surrounding campgrounds. However, large portion of the county consists of the Buffalo Gap National Grasslands and the Black Hills National Forest, and the county lacks the network of towns and services found in Pennington and Custer Counties, and the numerous tourist attractions such as Wind Cave National Park, Custer State Park, Mount Rushmore, and others.

In 2006 the ROI had a per capita income (PCI) of $32,799, which was slightly higher than South Dakota's PCI but represented 89 percent of the US PCI (see **Table 3-24**). Within the ROI, Pennington County's PCI was the highest, followed by Custer County and Fall River County.

Local Government Services and Taxes

In South Dakota (as in many states), property taxes are the main source of revenues for county and local governments, and school systems. State law limits the amount of property taxes that local governments can collect from their property owners. Increases in the assessed value of properties within the taxing district, automatically reduces the district's property tax rates, to ensure that the cap is not exceeded (SDDORR 2008). The Dewey Conveyor project is located in Custer County, and Custer County is the only county within the ROI that would receive property taxes from the owners of the proposed project. In 2007, Custer County's total real property valuation was $597.1 million. The county levied property taxes of $1,758,990 in 2007, and also received $202,496 in federal payment in lieu of taxes (SDDLA 2008).

Table 3-24
Per Capita Income, ROI and Comparison Areas, 2006

	Comparison Areas		ROI			
	United States	South Dakota	Custer Co.	Fall River Co.	Pennington Co.	Total ROI
Per Capita Income[1]	$36,714	$32,030	$29,032	$28,002	$33,478	$32,799
as % of US		87	79	76	91	89
as % of SD			91	87	105	102

Source: BEA 2008b.
[1]Per Capita Income is derived by dividing total personal income for an area by the area's population.

South Dakota collects a state sales tax of 4.0 percent. Municipalities may add up to 2 percent above the state's sales tax rate, and may impose a 1 percent municipal gross receipts tax on alcoholic beverages, eating establishments, lodging accommodations, and similar entertainment-related items. Municipalities near the proposed project that impose the local sales tax, all at a rate of 2 percent, include Custer (city), Edgemont, Hill City, Hot Springs, and Pringle (SDDORR 2008).

The state also imposes a year-round tourism tax on lodging, campgrounds, rentals of motor vehicles and recreational equipment, and similar activities. The tourism tax on visitor-intensive businesses applies only between June and August.

Several school districts serve the ROI. Those nearest the proposed project include Elk Mountain, Edgemont, Hot Springs, Hill City, Custer, and Rapid City. **Table 3-25** summarizes key characteristics for these districts.

The Dewey Conveyor project lies within the boundaries of the Elk Mountain School District, which encompasses the western portion of Custer County, and the project owners would therefore pay property taxes to this school district. In 2006, the Elk Mountain School District's taxable valuations totaled $23.2 million (**Table 3-26**).

Table 3-26
Elk Mountain School District Taxable Valuations, 2006-07

Category	Taxable Valuation
Agricultural	$7,476,946
Owner Occupied	$5,420,089
Non-Ag Z	$72,100
Other Non-Ag/Utilities	$10,271,225
Total	$23,240,360

Source: SDDOE 2008a

Table 3-25
Selected ROI School Districts, 2006-07 School Year

2006-07	Total Revenues	Grades Offered	Fall Enrollment, PK-12	# Certified Instructional Staff
Custer	$5,960,897	PK-12	949	80.6
Edgemont	$1,448,198	PK-12	153	15
Elk Mountain	$356,697	PK-8	13	1
Hill City	$3,427,146	PK-12	481	41.7
Hot Springs	$4,911,118	PK-12	857	61.1
Rapid City	$71,745,807	PK-12	13,063	809.9

Source: SDDOE 2008a

The South Dakota Department of Education's *Issue Brief: State Aid to K-12 General Education Funding Formula* (SDDOE 2008b) states that:

"The amount of state aid provided to local school districts for general K-12 education is based on an equitable formula that starts with the same amount of funding per student. However, small school districts (such as the Elk Mountain District) receive more money per student. The total amount of per-student funding for a school district is paid for by a combination of money raised by the school district through local property taxes and money raised by the state through statewide taxes. School districts also have other sources of revenue for general education beyond state aid."

3.12.3 Direct and Indirect Effects

3.12.3.1 Alternative A - Proposed Action

Details have not yet been finalized regarding the size of the construction labor force, the length of the construction period, the amount of construction expenditures, and the assessed valuation of the finished project. For this reason, it is not possible to identify precise and specific quantitative impacts. However, a qualitative assessment of potential impacts is provided, based on the following assumptions. Construction of the conveyor would involve approximately 50 workers and take one construction season and cost approximately $7 million in 2007 dollars. The conveyor is composed of modular components and would likely involve a specialized crew for construction, with some support construction workers hired locally and most brought in from outside the ROI. Additional regionally available (within the ROI) construction workers could be required for road construction. It is assumed that construction workers from outside the ROI would not bring their families, due to the relatively short duration of the construction phase. Following construction, approximately 12 workers would oversee quarrying, transport and load-out operations related to the project. Some of these workers would already live in the ROI, and others would relocate from outside the ROI.

Population

Only small impacts to human population would be anticipated. This is due to the short duration of the construction project, little or no requirement for construction worker relocation, and the small size of the operational workforce anticipated. It is estimated that about 25 people (principally operations workers and their families) could migrate into the ROI. No predictions can be made about where they would choose to reside. Population increases are generally considered to be beneficial, especially in areas of static or declining population such as the two rural counties.

Employment and Income

A small number of jobs would be created during construction (temporary) and operations (permanent). There would be short-term beneficial impacts to local retailers, restaurants, lodging providers, and other establishments during construction as a result of spending by construction workers. It is possible that new firms could arise to serve the project, and perhaps more likely that existing firms would see an increase in their business. No information is yet available regarding operations worker wage levels relative to prevailing wages in the ROI, but it is safe to predict that long-term impacts to the ROI's economy and income would be slightly beneficial.

Local Government Services

During construction, there could be very small and short-duration impacts on law enforcement, health care, and other services. Impacts to government services during project operations would likely be even smaller due to the small number of workers. A small number of children would be enrolled in local schools, but as they would likely be dispersed among several local school districts, impacts would likely be very small. Increased property tax revenues generated by the taxes on real property related to the Dewey Conveyor project should be available to the county for its use.

Taxes

The major impact from the proposed project would be increased property tax revenues to Custer County and the Elk Mountain School District. The amount of property taxes on the proposed project cannot be estimated at this time, but its valuation would increase the tax base for both jurisdictions, and would result in a lower tax rate for each jurisdiction's other taxpayers, a beneficial impact.

Increased tax revenues could also allow Custer County to provide additional services to its residents, an additional benefit. Some of the property tax payments to the Elk Mountain School District would flow to the State of South Dakota and be redistributed to other districts, a beneficial impact. Workers who purchase homes in the ROI would also improve the local tax base, but these impacts would be very small. Sales tax collections by the state and local jurisdictions would increase as a result of local expenditures for construction and operations, and from purchases by workers and their families. This would be a beneficial impact, but would likely be dispersed among taxing entities throughout the ROI, and would therefore be small for any one jurisdiction.

3.12.3.2 Alternative B - No Action

The No Action Alternative would have no impacts on socioeconomic resources.

3.12.3.3 Alternative C – Trucking Existing County Road

Impacts would be essentially the same as under the Proposed Alternative. A workforce similar in sized to that required by Alternative A (50 worker) would be involved for the haul road construction, which would provide a similar beneficial impact to employment in the ROI. However, Alternative C trucking alternative would likely require a slightly larger operational work force, as 4 to 5 truck drivers and 2 additional loader operators would likely be required in addition to the 12 operational staff anticipated by Alternative A. This would bring the total number of permanent employees to approximately 20 workers. The impacts / benefits identified for alternative A would be similar, and only very slightly increased by the larger permanent workforce.

3.12.3.4 Alternative D – Trucking ROW Corridor

Impacts would be essentially the same as those of Alternative C.

3.12.4 Connected Action

The limestone quarrying operation is considered a connected action with respect to the Dewey Conveyor EIS. However, socioeconomic impacts and benefits of the permanent employees required to operate the quarry, transport, and load the limestone are already considered under action alternatives discussed and analyzed above. This is because the operational workforce can not be reasonably separated into quarry employee and transport and load-out employees.

3.12.5 Cumulative Effects

The effects of Alternatives A, C and D could have cumulative effects when considered with other economic activities. Mining or construction activities could compete for labor resources. If these activities brought large numbers of new residents, there could be pressure on local schools and other community services.

Because Alternative B would not have any effect, there would be no cumulative effects.

Cumulative effects resulting from oil and gas leasing and drilling and uranium exploration drilling are likely to be seasonal in nature and involve only a few workers who would not likely reside near the project area. Therefore, the socio-economic effects should be similar to those described for the seasonal construction workers in Alternative A, but generate only incrementally minor cumulative impacts and benefits as a function of the number of worker involved.

3.13 Environmental Justice

3.13.1 Study Area Boundaries

The region of influence (ROI) is Custer, Fall River, and Pennington Counties, all located in South Dakota. The major city in the ROI is Rapid City, located in Pennington County.

3.13.2 Affected Environment

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was signed by the President in 1994. It requires that each federal agency address the potential for disproportionately high and adverse health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. An environmental justice area is defined as an area where the community's minority population is equal to or greater than 50 percent of the community population and/or a community in

which the percentage of persons living below the poverty level is higher than the county average, based on poverty statistics published by the USCB. If the proposed action would result in significant adverse effects on minority or low-income populations or Native American tribes, the NEPA analysis should address those impacts as part of the alternatives analysis and identify appropriate mitigation measures to address the effects.

Each federal agency must also ensure that public documents, notices, and hearings are readily available and accessible to the public. The NEPA review process must provide opportunities for effective community participation and involve consultation with affected communities.

This section evaluates the construction and operation of the proposed project to determine if it would have a disproportionately adverse impact on minority or low-income populations. The assessment follows the methodology in EPA's *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses*, issued in April 1998 (USEPA 1998).

Table 3-27 provides data on minority and low-income populations for all communities affected by the proposed project, along with data on comparison areas. As the table shows, South Dakota's only minority of substantial size is American Indians (or Native Americans), who comprise 8.3 percent of the state's total population (compared to 0.9 percent of the US population). In the ROI, Native Americans comprise 7.6 percent of the population, concentrated mostly in Pennington County. Custer County, where the proposed project would be built, is 94.2 percent white (Caucasian) with only 3.1 percent Native Americans.

There are limited Census data for the very rural area surrounding the proposed project. As discussed earlier, for example, the town of Dewey is not recognized as a CDP. However, data were available for Zip Code 57735, which covers a large geographical area near the proposed project site and includes the nearby towns of Dewey, Edgemont, and Burdock within Custer and Fall River Counties. To evaluate the Dewey Project area, census data for Zip Code 57735 were examined (see **Table 3-28**, Note 1). This zip code, which is within the ROI (Custer and Fall River Counties) and includes the vicinity of the project area and the nearby towns of Dewey, Edgemont, and Burdock, had a total population in 2000 of 1,345, of which 93.9 percent were white and 3.2 percent were Native American.

Based on these findings, no environmental justice area for minority populations is identified within the larger ROI, or within the vicinity.

In South Dakota in 2000, the "poverty rate" (the percentage of individuals below poverty) was 13.2 percent, a little higher than the US rate of 12.4 percent. Fall River County's rate was slightly higher than the state, but the rate in the ROI overall was lower, at 11.5 percent (see **Table 3-28**, Note 4). In Zip Code 57735, 15.2 percent of the population was below the poverty threshold in 2000, a higher proportion than was found in the state or in the ROI as a whole.

Because the percentage of low-income individuals in Zip Code 57735 exceeded the poverty rates for the ROI and state, census data were examined more closely to determine if low-income populations were located near the proposed project. The USCB divides counties into census tracts, which are subdivided into block groups. These divisions are based on population rather than the size of a geographic area. The proposed project is located in Custer County, which is made up of only two census tracts (9951 and 9952). Census Tract 9951 covers most of the county, while Census Tract 9952 is a narrow wedge-shaped area that includes Custer and several nearby small communities. Census Tract 9951 contains three block groups. Block Group 3 comprises the western third of the county, including the Project Area (**Figure 3-14**). **Table 3-28** presents sub-county data.

As shown in **Figure 3-15**, Census Tract 9951 contains most of the rural portion of Custer County. In 2000, the poverty rate was 10 percent among the population for whom poverty status was identified in Census Tract 9951, compared to 8.4 percent in the more densely populated areas around the town of Custer. However, when Census Tract 9951 data are scrutinized, the poverty rate of 5.4 percent in the western-most Block Group 3 is substantially lower than in Block Groups 1 and 2 (the eastern-most and central group, respectively). Based on this analysis of poverty data, no environmental justice area for low-income populations is identified

within the ROI, especially within the vicinity of the proposed project area.

Table 3-27
Ethnic/Demographic and Poverty Characteristics in 2000, ROI and Comparison Areas

	Comparison Areas		ROI				Zip Code 57735 [1]
	United States	South Dakota	Custer Co.	Fall River Co.	Pennington Co.	Total ROI	
Numbers of People:							
White / Caucasian	211,460,626	669,404	6,851	6,746	76,789	90,386	1,345
Black / African American	34,658,190	4,685	20	24	755	799	0
Amer. Indian / AK Native	2,475,956	62,283	227	451	7,162	7,840	46
Other Minorities[2]	32,827,134	18,472	177	232	3,859	4,268	41
Total Population	281,421,906	754,844	7,275	7,453	88,565	103,293	1,432
Hispanic or Latino[3]	35,305,818	10,903	110	130	2,341	2,581	26
Individuals below Poverty	33,899,812	95,900	659	951	9,967	11,577	208
Percentage of Total Population							
White / Caucasian	75.1	88.7	94.2	90.5	86.7	87.5	93.9
Black / African American	12.3	0.6	0.3	0.3	0.9	0.8	0.0
Amer. Indian / AK Native	0.9	8.3	3.1	6.1	8.1	7.6	3.2
Other Minorities[1]	11.7	2.4	2.4	3.1	4.4	4.1	2.9
Total Population	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Hispanic or Latino[3]	12.5	1.4	1.5	1.7	2.6	2.5	1.8
Individuals below Poverty[4]	12.4	13.2	9.4	13.6	11.5	11.5	15.2

Source: USCB 2000a, 2000b, 2000c, 2000d, 2000e, 2000f, 2000g.

[1] Census data were not available for the town of Dewey, but were available for Zip Code 57735, which covers a large geographical area near the proposed project site and includes the nearby towns of Dewey, Edgemont, and Burdock.

[2] Includes USCB categories of Asian; Native Hawaiian and Other Pacific Islander; “Some other race;” and “Two or more races.”

[3] Hispanic / Latino can be of any race.

[4] The USCB bases percentages below poverty on a sample population, not on the total population. Therefore, the percentages shown for the US, South Dakota, and the three counties (taken from the USCB Demographic Profiles for the respective areas) do not equal the number of persons below poverty (shown above) divided by the total population (also shown above). The percentage below poverty for the ROI was calculated by extrapolating the basis population for the three counties, and dividing the number of persons below poverty by the sum of the extrapolated county totals.

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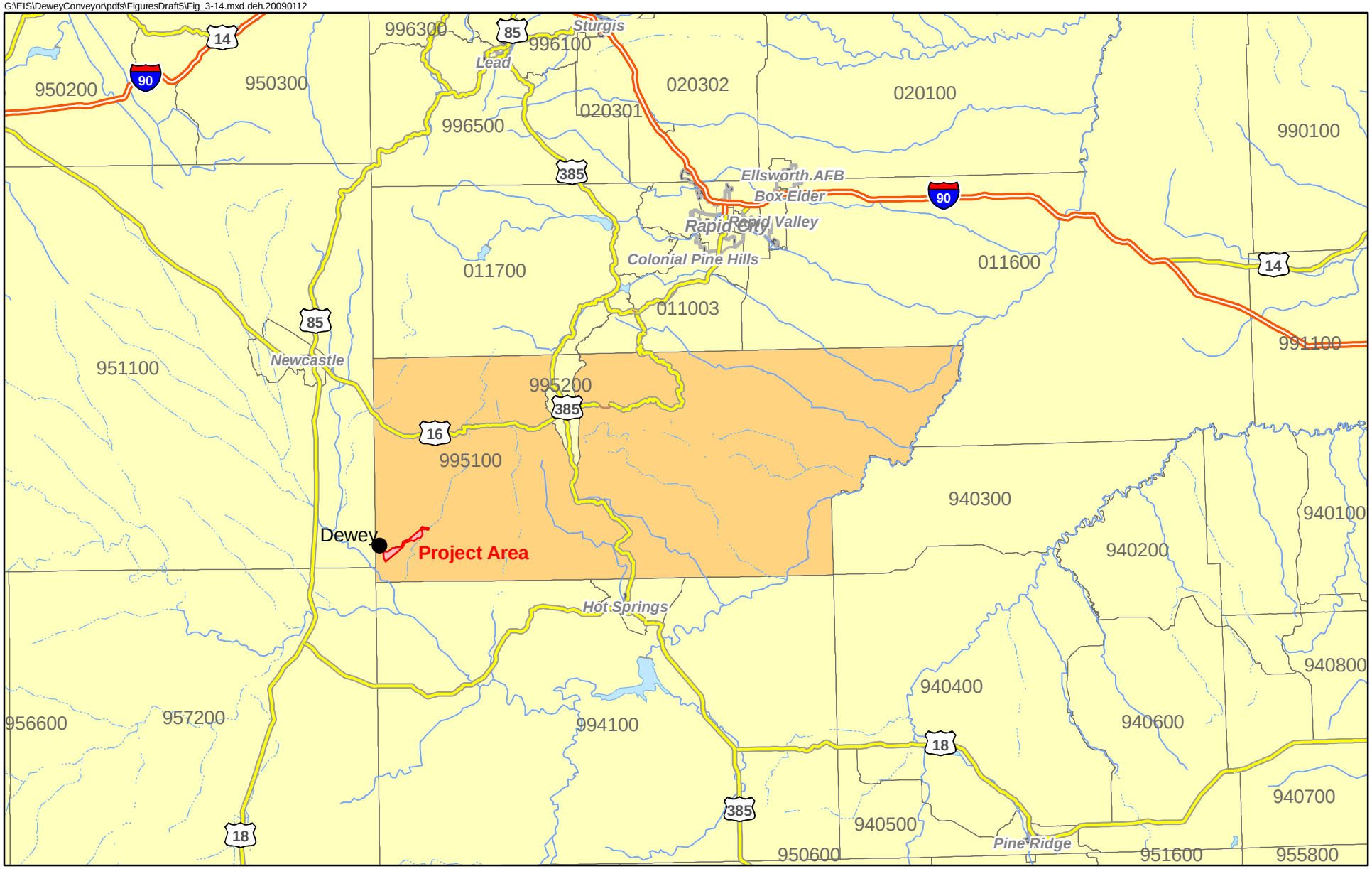

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Figure 3-14

Custer County, Showing Census Tracts

Custer County, South Dakota

Dewey Conveyor Belt Project

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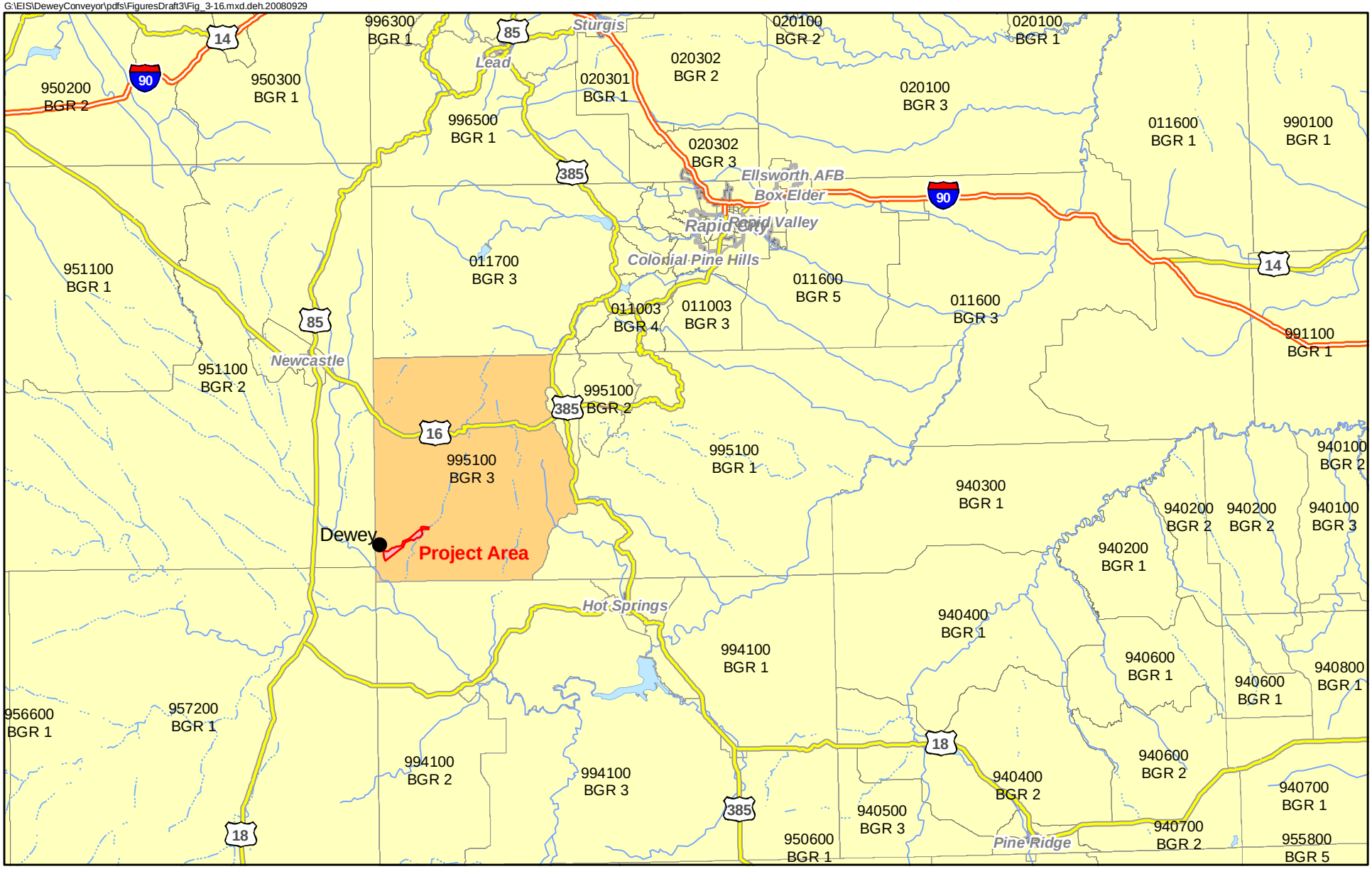

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Figure 3-15

Custer County, Showing Census Tract 9951, Block Group 3

Custer County, South Dakota

Dewey Conveyor Belt Project

Table 3-28
Income Characteristics, Custer County and Project Area [1]

	Custer County			Custer County, Census Tract 9951		
	County Total	**Census Tract 9951**	**Census Tract 9952**	**Block Group 1**	**Block Group 2**	**Block Group 3**
Total for whom poverty status was identified [2]:	6,985	4,460	2,525	2,006	1,107	1,347
Income in 1999 below poverty level:	659	448	211	290	85	73
Percent of Total	9.4	10.0	8.4	14.5	7.7	5.4
Income in 1999 at or above poverty level:	6,326	4,012	2,314	1,716	1,022	1,274
Percent of Total	90.6	90.0	91.6	85.5	92.3	94.6

Source for data: USCB 2000
[1] Highlighted columns contain the project area.
[2] The USCB determines the percentages below poverty based on a sample population, not on the total population. Therefore, the county population shown here does not equal the total population shown in previous tables.

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (April 21, 1997), recognizes a growing body of scientific knowledge that demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because (1) children's bodily systems are not fully developed, (2) children eat, drink, and breathe more in proportion to their body weight, (3) their size and weight may diminish protection from standard safety features or guidelines, and (4) their behavior patterns may make them more susceptible to accidents. Based on these factors, the President directed each federal agency to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. The President also directed each federal agency to ensure that its policies, programs, activities, and standards, address disproportionate risks to children that result from environmental health risks or safety risks.

3.13.3 Direct and Indirect Effects

No environmental justice minority populations or low-income populations were identified in the vicinity of the project, and no impacts would be expected from any of the alternatives. Due to the rural nature of the project area and the somewhat remote project location, impacts to children would be highly unlikely.

3.13.4 Connected Action

As no populations were identified, there would be no effects from the connected action.

3.13.5 Cumulative Effects

There would be no direct or indirect effects from any of the alternatives, and therefore, there would be no cumulative effects.

3.14 Noise

3.14.1 Study Area Boundaries

Noise was evaluated within 1-mile of the noise sources for each alternative. Residents, as well as livestock and wildlife that live, forage, and pass through the project area, are the primary noise-sensitive receptors.

3.14.1.1 Affected Environment

The ambient noise at a receptor location in a given environment is the all-encompassing sound associated with that environment, and is due to the combination of noise sources from many directions, near and far, including the noise source of interest. Traveling from a noise source to a receptor in an outdoor environment, noise levels decrease as the distance increases between the source and receptor. Noise levels typically decrease by approximately 6 dBA every time the distance

between the source and receptor is doubled, depending on the characteristics of the source and the conditions over the path that the noise travels. The reduction in noise levels can be increased if a solid barrier, such as a man-made wall or natural topography, is located between the source and receptor.

Noise is generally defined as unwanted sound, and can be intermittent or continuous, steady or impulsive, stationary or transient. Noise levels heard by humans and animals are dependent on several variables, including distance between the source and receiver, altitude, temperature, humidity, wind speed, terrain, and vegetation. Human and animal perception of noise is affected by intensity, frequency, pitch and duration, as well as the auditory system and physiology of the animal. Noise can influence humans or wildlife by interfering with normal activities or diminishing the quality of the environment. Response to noise is subjective, and therefore, the perception of noise can vary from person to person or among animals.

Noise levels are quantified using units of decibels (dB). Humans typically have reduced hearing sensitivity at low frequencies compared with their response at high frequencies. The "A-weighting" of noise levels, or A-weighted decibels (dBA), closely correlates to the frequency response of normal human hearing (250 to 4,000 hertz). By utilizing A-weighted noise levels in an environmental study, a person's response to noise can typically be assessed. Because decibels are logarithmic values, the combined noise level of two 50 dBA noise sources would be 53 dBA, not 100 dBA.

Many different A-weighted metrics can be used to describe and quantify noise levels. The equivalent noise levels, L_{eq}, during a certain time period uses a single number to describe the constantly fluctuating instantaneous ambient noise levels at a receptor location during a period of time, and accounts for all of the noises and quiet periods that occur during that time period.

The day-night average noise level, L_{dn}, is a single number descriptor that represents the constantly varying sound level during a continuous 24-hour period. The L_{dn} can be determined using 24 consecutive one–hour L_{eq} noise levels, or estimated using measured L_{eq} noise levels during shorter time periods. The L_{dn} includes a 10 decibel penalty that is added to noises that occur during the nighttime hours between 10:00 p.m. and 7:00 a.m., to account for people's higher sensitivity to noise at night when the background noise level is typically low. Because it represents the average noise level during a 24-hour period, the L_{dn} is not effective for describing individual noise events, such as a single blast.

Large amplitude impulsive sounds, such as blasting, are commonly defined using the un-weighted instantaneous peak noise level, L_{pk}. L_{pk} represents the highest instantaneous noise level during a certain time period, and the units of L_{pk} are unweighted peak decibels (dBP).

Noise Guidelines

No state or county noise regulations exist to govern environmental noise levels or noise that generated by the Proposed Action, however, federal noise guidelines apply. As a result of the Noise Control Act of 1972, the EPA developed acceptable noise levels under various conditions that would protect public health and welfare with an adequate margin of safety. The EPA identified outdoor L_{dn} noise levels less than or equal to 55 dBA are sufficient to protect public health and welfare in residential areas and other places where quiet is a basis for use (EPA 1979). Although the EPA guideline is not an enforceable regulation, it is a commonly accepted target noise level for environmental noise studies. In addition, the National Environmental Policy Act (1969) and the Endangered Species Act (1973) define noise-related disturbances on wildlife as "harassment", but no guidelines or regulations have been developed to quantify animal annoyance noise levels.

In addition to the EPA's L_{dn} 55 dBA limit, an increase in ambient noise levels can also be used to gage community response to a new noise. If a project-related noise does not significantly increase the community's existing L_{dn}, then little or no community reaction is expected. If a project causes an increase in the L_{dn} of 5 to 10 dBA, sporadic to widespread complaints should be anticipated. An increase of more than 10 dBA may result in strong negative community reaction (FTA 1995).

No regulations exist to limit the blasting noise produced by the Connected Action, but the US Army has determined an approximate level

associated with human annoyance to blast noise. In general, L_{pk} 115 dBP at a listener location represents the threshold of annoyance for people, and below this level, there is a low risk of noise complaints (USACHPPM 2005).

3.14.2 Direct and Indirect Effects

To determine the direct effects of the project, noise levels were predicted at various distances from the anticipated noise sources for general information. Noise level calculations included the estimated effects of distance, ground attenuation and attenuation resulting from air absorption per international standards (ISO 1996). Although the calculations conservatively assumed that atmospheric conditions were favorable for noise propagation, the estimated noise levels can vary significantly due to atmospheric conditions, and should be considered average noise levels, since temporary significant positive and negative deviations from the averages can occur (Harris 1998). Favorable atmospheric conditions for noise propagation means that the wind is blowing from a source to a receiver at approximately 2 to 10 miles-per-hour, and a well-developed temperature inversion is in place, which typically occurs between approximately 2 hours after sundown to 2 hours after sunrise. The estimated noise levels assume that a direct line of sight is present between the receiver and the noise source(s), but if the line of sight is blocked due to topography, the estimated noise levels will be reduced by 6 dBA or more due to shielding.

The existing ambient noise levels were estimated to be L_{dn} 40 dBA, which is typical for sparsely-populated, rural locations (Harris 1998), but will be higher in the town of Dewey due to the active rail line through town. The existing L_{dn} values will vary with the railroad activity on any particular day. Existing noise sources include wind-generated noise through grass and trees, livestock, wildlife, birds, insects, aircraft flying overhead, trains, and vehicles traveling on roads.

3.14.2.1 Alternative A – Proposed Action

The Proposed Action (an above ground conveyor) would traverse approximately 7 miles through a rural area. Noise sources associated with the enclosed, above-ground conveyor and train activities would include the conveyor, conveyor drive motors, locomotives and diesel-powered loaders, and were assumed to operate during the daytime hours.

Noise produced by an enclosed conveyor system is typically L_{eq} 76 dBA at 33 feet from the drive motor and typically L_{eq} 53 dBA at 33 feet from the rollers (DEFRA 2006). Five drive motors are anticipated along the route, primarily at the initial take off and where the conveyor changes direction (**Figure 1-2**). The train cars at the load-out facility may be loaded directly by conveyor or with a conveyor fed by front-end loader from the storage dome. Noise produced by loaders is typically L_{eq} 85 dBA at a distance of 50 feet from the equipment, and noise produced by an idling or slow moving locomotive is typically L_{eq} 88 dBA at 50 feet away from the train (FTA 1995). However, equipment noise can vary considerably depending on age, condition, manufacturer, use during a time period, changing distance and whether a direct line of sight is available between the equipment to a listener location.

The rail load-out noise was calculated separately from the conveyor noise since the load-out may not occur during the same time the conveyor is operating. Since the locomotive will move rail cars along the load-out spur, the noise at a fixed listener location, like a residence in the town of Dewey, due to the locomotive will vary.

The estimated noise levels for the Proposed Action are summarized in **Table 3-29**. The anticipated noise sources are listed in the table with predicted noise levels at varying distances from the sources.

The noise levels due to the conveyor system are predicted to be below the EPA guideline of L_{dn} 55 dBA within 70 feet from the drive motors, and the estimated existing L_{dn} 40 dBA within 365 feet from the drive motors. The noise levels due to the rail load-out are predicted to meet the EPA guideline of L_{dn} 55 dBA within 1050 feet from equipment, and the existing ambient L_{dn} 40 dBA within 4,225 feet from the equipment. The town of Dewey is located approximately 6,340 feet to the North-northwest from the proposed rail load-out facility. Predominant wind direction is from the west.

In an effort to limit the Proposed Action noise and the effects on humans and animals within a 1-mile

Table 3-29
Proposed Action Predicted Distances (Feet) to Achieve Various Noise Levels

Noise Sources	EPA Guideline L_{dn} 55 dBA	L_{dn} 50 dBA	L_{dn} 45 dBA	Rural Ambient L_{dn} 40 dBA
Conveyor (3 hours/day) Rollers, belt, etc.	15	40	100	215
Conveyor (3 hours/day) Drive motor	70	115	215	365
Rail load-out (4 hours/day): Locomotive and Loader	1,050	1,580	2,640	4,225

Notes:
L_{dn} 55 dBA = EPA noise guideline
L_{dn} 50 dBA = 10 dBA increase over existing conditions – strong negative community reaction possible (FTA 1995).
L_{dn} 45 dBA = 5 dBA increase over existing conditions – sporadic community complaints possible (FTA 1995).
L_{dn} 40 dBA = Estimated rural ambient existing noise level.

(5,280 feet) radius, the following mitigation measures could be considered:

- Place storage dome between rail load-out and the town of Dewey.
- Construct a noise barrier (wall or earthen berm) taller than the locomotive on northwest side of rail load-out facility.
- Install high-grade mufflers on the diesel-powered equipment.
- Combine noisy operations to occur for short durations during the same periods.
- Replace standard back-up alarms with manually adjustable, ambient-sensitive, directional sound technology, or strobe light alarms. Adjustable and ambient-sensitive alarms typically limit the alarm noise to 5 to 10 dBA above the background noise, which would still typically be audible behind the equipment.
- Implement a regular maintenance schedule to ensure proper equipment operation.
- Use new equipment rather than older equipment.
- Limit rail loading to daytime hours as much as feasible.
- Ensure that the conveyor idlers (i.e., rollers) are balanced and machined to a smooth surface.
- Ensure that the conveyor belt is smooth and without defects.

The primary human indirect effect due to noise is annoyance. The degree of annoyance due to a noise is subjective and can vary dramatically from person to person based on the type and level of the noise, and other non-acoustic factors, such as prior exposure to similar noises, the age and health of a listener, attitude toward the noise source, etc. Other indirect effects on humans may include speech interference, stress reactions, sleep interference, lower morale, efficiency reduction, and fatigue (Harris 1998).

3.14.2.2 Alternative B – No Action

No increase in noise levels is anticipated. Existing noise sources will remain, including wind-generated noise through grass and trees, flowing water in area creeks, livestock, wildlife, birds, insects, aircraft flying overhead, and vehicles traveling on roads.

3.14.2.3 Alternative C – Trucking Existing County Road

For Alternative C, limestone would be truck-hauled on existing rural county roads to the train load-out facility. Noise sources associated with the haul and train activities would include haul trucks, locomotives, and a diesel-powered loader. Noise produced by a haul truck moving on a haul road is typically 88 dBA at a distance of 50 feet from the road (FTA 1995). Noise sources associated with the rail load-out are the same as described for the Proposed Action. The estimated noise levels for Alternative C are summarized in **Table 3-30**. The anticipated noise sources are listed with predicted noise levels at varying distances from the sources.

The noise levels due to the haul trucks are predicted to meet the EPA guideline of L_{dn} 55 dBA within 430 feet from the road, and the estimated existing ambient L_{dn} 40 dBA within 4,750 feet. The noise levels due to the rail load-out are predicted to meet the EPA guideline of L_{dn} 55 dBA within 1,050 feet from equipment, and the existing ambient L_{dn} 40 dBA within 4,225 feet of equipment.

L_{dn} 50 dBA is predicted to be met within approximately 1,330 feet from the haul road and 1,580 feet from the load-out. Because the predicted L_{dn} 50 dBA noise level will exceed the estimated existing L_{dn} 40 dBA by 10 dBA, the project operations will become the dominant ambient noise source during the day on Monday through Friday when operating. Therefore, even though L_{dn} 50 dBA is less than the EPA guideline of L_{dn} 55 dBA, the increase of up to 10 dBA will likely cause a strong negative reaction unless the noise is mitigated. The town of Dewey is located less than 1,050 feet from the County Road along which truck hauling is proposed by Alternative C. Moving the haul road to a location further from the Town of Dewey is considered in Alternative D.

To limit the noise due to Alternative C and the effects on humans and animals within one mile (5280 feet), the following mitigation measures could be implemented:

- Place storage dome between rail load-out and the town of Dewey.
- Construct a noise barrier (wall or earthen berm) taller than the locomotive on northwest side of rail load-out facility.
- Install high-grade mufflers on the diesel-powered equipment.
- Replace standard back-up alarms with manually adjustable, ambient-sensitive, directional sound technology, or strobe light alarms. Adjustable and ambient-sensitive alarms typically limit the alarm noise to 5 to 10 dBA above the background noise, which would still typically be audible behind the equipment.
- Implement a regular maintenance schedule to ensure that equipment is operating properly.
- Use new equipment rather than older equipment.
- Limit rail loading to daytime hours as much as feasible.
- Limit the haul truck speed.

Potential indirect effects from noise on humans and animals due to Alternative C would be comparable to the Proposed Action (Alternative A). However, since the haul trucks are louder than the conveyor of the Proposed Action, the effects of noise associated with the haul truck route would extend further (**Table 3-30**).

3.14.2.4 Alternative D – Trucking ROW Corridor

Noise sources associated with the haul and train activities are the same described for Alternative C.

The estimated noise levels for Alternative D are the same as those for Alternative C and are summarized in **Table 3-30**. The anticipated noise sources are listed in the table with predicted noise levels at varying distances from the sources. The

Table 3-30
Alternative C Predicted Distances to Achieve Various Noise Levels

Noise Sources	EPA Guideline L_{dn} 55 dBA	L_{dn} 50 dBA	L_{dn} 45 dBA	Rural Ambient L_{dn} 40 dBA
Haul trucks, 20 trucks/hour for 8 hours/day at 35 mph	430 ft.	1,320	3,170 ft.	4,750 ft.
Rail load-out (4 hours/day), Locomotive and Loader	1,050 ft.	1,580 ft.	2,640 ft.	4,225 ft.

Notes:
L_{dn} 55 dBA = EPA noise guideline
L_{dn} 50 dBA = 10 dBA increase over existing conditions – strong negative community reaction possible (FTA 1995).
L_{dn} 45 dBA = 5 dBA increase over existing conditions – sporadic community complaints possible (FTA 1995).
L_{dn} 40 dBA = Estimated rural ambient existing noise level.

Table 3-31
Connected Action Predicted Distances to Achieve Various Noise Levels

Connected Action	Equipment / Noise Source(s)	Noise Level at Receiver		
		¼ mile (1,320 feet)	½ mile (2,640 feet)	1 mile (5,280 feet)
Quarry operations	Four pieces of earth moving equipment operating simultaneously 10 hours during the daytime.	L_{dn} 49 dBA	L_{dn} 43 dBA	L_{dn} 36 dBA
Cone crusher	Crusher operating continuously 10 hours during the daytime.	L_{dn} 47 dBA	L_{dn} 31 dBA	L_{dn} 6 dBA
Quarry blasting	Blasting	L_{pk} 117 dBP	L_{pk} 112 dBP	L_{pk} 107 dBP[1]

Note: [1] Blast noise may be audible for several miles.

same mitigation measures described for Alternative C could be implemented.

Potential indirect effects from noise on humans and animals due to Alternative D would be comparable to the Proposed Action (Alternative A). However, since the haul trucks are louder than the conveyor of the Proposed Action, the effects of noise from the haul truck route would extend further.

3.14.3 Connected Action

The Connected Action is expected to use standard quarry mining practices. Noise sources associated with the limestone quarry may include drilling, blasting, crushing, loading, and hauling. Noise is primarily generated by heavy equipment (i.e., blast-hole drills, bulldozers, front-end loaders, haul trucks, etc.), the cone crusher, and intermittent blasting. Other noise sources in the quarry area include wind-generated noise through grass and trees, livestock, wildlife, birds, insects, aircraft flying overhead, and vehicles traveling on roads.

Noise produced by diesel-powered equipment used at a quarry is typically 85 dBA at a distance of 50 feet from the equipment (FTA 1995). Mobile crushers have been measured at L_{eq} 66 dBA at 1,050 feet away from the equipment with a direct line of site from the listener to the equipment. Therefore, the typical dominant noise source that determines the L_{dn} is the cone crusher, with loaders or a conveyor operating with the crusher. However, equipment noise can vary considerably depending on age, condition, manufacturer, use during a time period, changing distance and whether a direct line of sight is available between the equipment to a listener location.

Impulsive noises from quarry blasting will probably be audible within several miles of the mine, and can vary significantly due to atmospheric conditions at the time of the blast, such as wind speed and direction, temperature, and relative humidity. The L_{pk} noise level due to blasting at the quarry was estimated based on the weight of explosive per delay and the distance to the listener (Fidell 1983).

The estimated noise levels for the Connected Action are summarized in **Table 3-31**. The anticipated quarry noise sources are listed in the table with predicted noise levels at varying distances from the sources. The estimated noise levels assume that a direct line of sight is present between the receiver and the noise source(s), but if the line of sight is blocked due to topography, depth of the pit, or constructed berms, the estimated noise levels will be reduced by 6 dBA or more due to shielding.

The noise levels due to heavy equipment operation are predicted to be L_{dn} 49 dBA at 1,320 feet from the quarry, which is less than the EPA guideline of L_{dn} 55 dBA, and the predicted L_{dn} 36 dBA at 1-mile (5,280 feet) from heavy equipment is less than the estimated existing ambient L_{dn} 40 dBA. The predicted L_{dn} 31 dBA at 2,640 feet from the crusher is less than the estimated existing ambient L_{dn} 40 dBA. The predicted peak blasting noise level for the mine is predicted to be less than the US Army guideline for human annoyance of L_{pk} 115 dBP

between 1,320 and 2,640 feet of the blast (USACHPPM 2005).

In an effort to limit the noise due to the Connected Action and the effects on humans and animals within a 1-mile (5280 feet) radius, the following mitigation measures could be implemented:

- Install high-grade mufflers on the diesel-powered equipment.
- Replace standard back-up alarms with manually adjustable, ambient-sensitive, directional sound technology, or strobe light alarms. Adjustable and ambient-sensitive alarms typically limit the alarm noise to 5 to 10 dBA above the background noise, which would still typically be audible behind the equipment.
- Implement a regular maintenance schedule to ensure that equipment is operating properly.
- Use new equipment rather than older equipment.
- Add earthen berms around the quarry to block the direct line of site to a listener location.

Table 3-32 summarizes the predicted L_{dn} values at various distances from the equipment and operations. Since the haul trucks of Alternatives C and D are louder than the conveyor of the Proposed Action, the effects of noise associated with the haul truck routes would extend further than the conveyor. In addition the noise generated from haul trucks will occur as close as 0.2 miles to the town of Dewey with Alternative C.

3.14.4 Cumulative Effects

Cumulative effects from the construction and operation of the action alternatives include the combination of noise sources from the project and other noise sources. In addition to the conveyor, rail load-out and haul road operations, other noises, such as natural sources, traffic noise from nearby roads, trains, and noise from recreational and residential activities, are also present in the vicinity of the project area, and will remain into the future.

Cumulative effects of noise related to oil and gas, and uranium exploration drilling are likely to be dispersed activities that may take place at unknown sites within or at some unknown distance as much as several miles from the project site. However, noise from access road and drill pad construction equipment and from drilling equipment may be expected to be similar to that of the loader and truck equipment in the Action Alternatives described above.

However, the noise due to the Proposed Action and Alternatives C and D will become the dominant

Table 3-32
Summary of Predicted Distances to Achieve Various Noise Levels

Noise Sources	EPA Guideline L_{dn} 55 dBA	L_{dn} 50 dBA	L_{dn} 45 dBA	Rural Ambient L_{dn} 40 dBA
Alternative A				
Conveyor (3 hours/day) Rollers, belt, etc.	15 ft.	40 ft.	100 ft.	215 ft.
Conveyor (3 hours/day) Drive motor	70 ft.	115 ft.	215 ft.	365 ft.
Alternatives A, C, and D				
Rail load-out (4 hours/day)	1,050 ft.	1,580 ft.	2,640 ft.	4,225 ft.
Alternative C				
Haul trucks on County Roads	430 ft.	1,370 ft.	3,170 ft.	4,750 ft.
Alternative D				
Haul trucks in ROW Corridor and on County Roads	430 ft.	1,370 ft.	3,170 ft.	4,750 ft.

Notes:
L_{dn} 55 dBA = EPA noise guideline
L_{dn} 50 dBA = 10 dBA increase over existing conditions – strong negative community reaction possible (FTA 1995).
L_{dn} 45 dBA = 5 dBA increase over existing conditions – sporadic community complaints possible (FTA 1995).
L_{dn} 40 dBA = Estimated rural ambient existing noise level.

noise sources at the distances associated with L_{dn} 50 dBA, which is 10 dBA greater than the estimated existing ambient L_{dn} 40 dBA, during the day on Monday through Friday when operating.

The cumulative effect from past actions is not relevant with respect to noise.

3.15 Visual Resources

3.15.1 Study Area Boundary

The study area for visual resources includes all land areas from which the visual impacts of the Proposed Action or Alternatives that occur would be visible (**Figure 3-1**).

3.15.2 Affected Environment

Visual resources include landscapes that are typically seen during on- or off-road vehicle and other ranching and recreation travel activities. The objectives of this visual resource investigation are to identify and describe important visual resources that could be affected by the construction of the proposed action (Alternative A) or one of the haul road Action Alternatives (C or D).

The affected environment for visual resources extends beyond the Project Area study boundaries to include all lands within a one mile sight line from any proposed activity. One mile is generally the distance to which man-made features are visible. Man-made features throughout the study area consist of roads, power lines, ranch buildings, fence lines, and occasional water troughs for grazing livestock. Man-made features at greater distances are discernable only as forms and outlines and therefore, visual impacts are negligible. Night lighting is pole mounted lights in ranch yards.

The landforms of the study area are characterized by rolling hills and broad grassland flats with incised drainages, locally in canyons.

The vegetation of the study area provides a coarse visual texture comprised of grass, sagebrush and sparse trees over the rolling landscape. The canyons and distant hills are more densely tree covered and therefore exhibit a less coarse visual texture. Vegetation colors range from tans and light brown to sage green and dark green. The rock and earth colors range from tan and brown to reddish brown.

Three locations have been identified along Dewey Road to be used as View Points (VP) for analysis and simulations (**Figure 3-16**). VP 1 is located at the town site of Dewey (**Figure 3-17)** and VP 2 is located along Dewey Road close to the Elk Mountain pass (**Figure 3-18**), and VP 3 is in close proximity to the conveyor to the road (**Figure 3-19**). Most of the viewing locations occur along lightly traveled roads throughout the area. The Dewey Road is the primary route through the study area and the Custer County Highway Department believes that vehicular traffic may be as light as 25 cars or less per day (John Culbertson, Superintendent, Custer County Highway Department). In addition to travelers along the road other potential viewers from off-road locations would be local residents, ranchers, recreationalists and hunters.

The proposed construction activities on BLM and National Forest lands require an analysis and decision process consistent with agency specific land management plans.

The BLM's South Dakota Resource Management Plan established the scenic integrity objectives (SIO). Scenic integrity is defined as state of naturalness or conversely the state of disturbance or alteration created by human activities. Integrity is measured in degrees of deviation from the existing landscape character within the specific National Forest area. Scenic integrity can be used to describe an existing condition, a standard for management, or desired future conditions. The highest scenic integrity ratings are given to those landscapes for which little or no deviation from the character valued by constituents, generally for aesthetic appeal, is allowed. There are six levels of scenic integrity; very high, high, moderate, low, very low, and unacceptably low. The SIO for the Dewey Conveyor Project Study Area (Black Hills National Forest Plan, as amended, 2004) are defined as:

Low – A scenic integrity referring to the landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, effect, and pattern of natural opening, vegetative type changes, or architectural styles within or outside the landscape being viewed.

- They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.
- Moderate – A scenic integrity level that refers to landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.

The Bureau of Land Management has developed a Visual Resource Management (VRM) system to classify visual resource management objectives based on scenic quality, visual sensitivity, and visual distance zones (BLM, 1986). Management classes are broken down into four levels (I through IV) that define permissible levels of landscape alteration under the VRM system. VRM classes and their associated visual quality objectives (VQO) apply only to BLM lands. These objectives have not been established for the proposed Dewey Conveyor Project.

Visual guidelines and specific objectives for management of the National Forest's visual resources are presented in the 1997 Land and Resource Management Plan (LRMP), as amended for the Black Hills National Forest (Black Hills National Forest Plan, as amended, 2004).

The Forest Service uses the Visual Management System (VMS) to evaluate visual impacts on the environment. Visual Quality Objectives (VQO) are divided into five management goals; preservation, retention, partial retention, modification, and maximum modification. VQO apply only to National Forest lands.

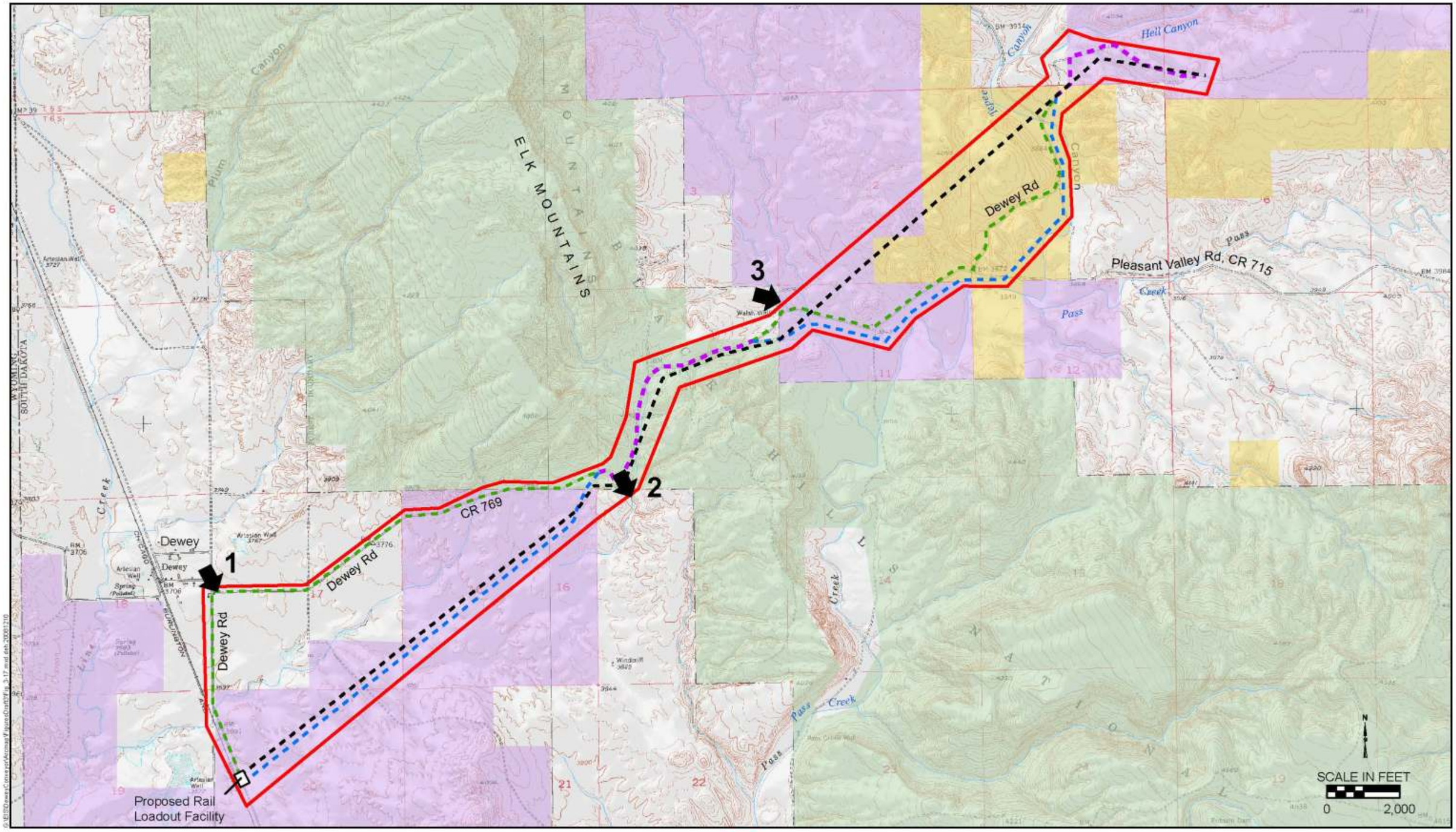
3.15.3 Direct and Indirect Effects

3.15.3.1 Alternative A - Proposed Action

The proposed 6.6 mile long conveyor would have a visual impact on the viewshed over much of its entire length. The conveyor alignment is proposed to begin at Dewey Road approximately 1.1 miles south of the town of Dewey. The alignment heads east-northeast for approximately 2.4 miles across GCC-owned property prior to paralleling Dewey Road. The viewing distance along this section is approximately one half mile (**Figure 3-17**). The conveyor begins to parallel Dewey Road, the conveyor would be constructed approximately parallel to the road for 1.5 miles as it makes its way over a topographic pass through the Elk Mountains. The visual impact over this section would be greater due to the close proximity of the conveyor to the road (**Figure 3-17**). The conveyor crosses Dewey Road on the east side of the Elk Mountains prior to leaving the roadway alignment and crosses Dewey Road yet again approximately 1.8 miles east of the base of the Elk Mountains (**Figure 3-18**). The final 1.0 mile of the conveyor is located outside the Dewey Road corridor (**Figure 3-19**).

The proposed conveyor would be supported by structures spaced 25 to 40 feet apart on concrete piers or foundations to support the conveyor, the elevated (5 feet by 8 feet by 40 feet) conveyor segments attached to the structures. A one lane construction/maintenance access road within the conveyor right-of-way to allow for visual inspection and maintenance of the conveyor. The piers or foundations would be at grade or up to several feet above depending on terrain. The height of the conveyor is expected to average about 16 feet (with approximately 9 feet of clearance beneath the conveyor segments) however, higher and lower sections will occur as the conveyor crosses existing topography at a constant grade. Due to the narrow existing county road, and steep topography along the proposed alignment through the Elk Mountains, an access road is likely not possible along this section of conveyor. Some of the conveyor supports may need to be placed within the right-of-way for Dewey Road along this 1.5 mile section of National Forest through the Elk Mountains.

Visual resources would be affected most during the one-year construction phase. Dust-generating construction equipment (trucks, dozers, track hoes, cranes, etc.), worker's vehicles, and equipment and materials deliveries, would all be expected to be occurring at the same time. The visual congestion of equipment and dust-generating activity would be a temporary effect until the construction was completed.



Alternatives
- Proposed Conveyor Right-of-Way
- Alternative C Haul Road
- Alternative D Haul Road
- Alternative C and D Common Segments

Conveyor Project Area

GCC Property

Public Land Ownership
- BLM
- State
- USFS

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Figure 3-16

Viewpoints in the Project Area

Custer County, South Dakota

Dewey Conveyor Belt Project

Figure 3-17A
View Point 1 - existing southeast view from Dewey town site.

Figure 3-17B
View Point 1 - southeast simulation of proposed conveyor from Dewey town site.

Figure 3-17
Visual Simulation 1
Custer County, South Dakota
Dewey Conveyor Project

Figure 3-18A
View Point 2 - existing southeast view from Dewey Road.

Figure 3-18B
View Point 2 - southeast simulation of proposed conveyor from Dewey Road.

Figure 3-18
Visual Simulation 2
Custer County, South Dakota
Dewey Conveyor Project

Figure 3-19A
View Point 3 - existing northwest view from Dewey Road.

Figure 3-19B
View Point 3 - simulation of proposed conveyor crossing Dewey Road.

Figure 3-19
Visual Simulation 3
Custer County, South Dakota
Dewey Conveyor Project

The long-term visual effect of the Proposed Action would impact each of the visual elements that make up the characteristic landscape; including size, shape, effect, and pattern. The most obvious visual impact of the conveyor would be on the elements of shape and pattern as the conveyor crosses the landscape as seen from Dewey Road (**Figure 3-17**). From this middle ground viewing distance the conveyor and the associated service road would appear as horizontal shapes and lines superimposed on a landscape composed of horizontal elements. The color and reflectivity of the material used to construct the conveyor would be an important defining factor on the level of impact upon the viewer.

The conveyor would generally be operated during daytime hours thus eliminating the need for extensive lighting. Security, safety, and maintenance lighting will be used as needed at transfer and loadout locations. Shielded or directional night lighting will be used at the rail loadout facility on Dewey Road. There would be no impacts on the night sky.

The highest level of visual impact would result from the elements of size and shape of the conveyor, when placed in a foreground setting where the conveyor is close to or crossing Dewey Road (**Figure 3-18**). As the conveyor converges with the roadway, the size and height of the structure, in addition to its color, would be the most dominant visual components to the viewer.

The conveyor will follow existing topography, and therefore, should not have any major effects on the shape of adjacent landforms except on a very localized scale. The color and texture of reclaimed areas would likely provide only a moderate contrast with the existing landscape and vegetation. The disturbed soils used for reclamation are not expected to contrast with undisturbed soil colors.

3.15.3.2 Alternative B - No Action

The No Action Alternative would not have any effects on the existing visual resources.

3.15.4 Alternative C – Trucking Existing County Road

The haul road features would be flat and low-lying with respect to adjacent topography and consist largely of horizontal elements. The haul roads should conform approximately to existing landforms and follow existing topography with no new areas of significant relief. Alternative C visual impacts would largely result from the potential for reduced visibility due to dust, however the generation of dust will be controlled at the source by various water and chemical application abatement techniques. At the proposed production rates, truck traffic would increase to approximately 83 round-trips per day (166 one-way trips) resulting in a loaded or unloaded truck trip being initiated on average every 2.9 minutes for an eight hour haul day. The substantial increase in the number of large/long trucks on the road during the day time hours would also have both distant and close-up visual impacts on other users of Dewey County road.

The short-term road reconstruction visual impacts of this alternative would be similar to the conveyor construction impacts involving heavy equipment and dust generation. However, the potential for generation of dust plumes associated with truck hauling even if mitigated would continue over the proposed 200 year mine life. Impacts from dust under this alternative would have a greater visual impact than dust under Alternative A.

Shielded or directional night lighting will be used at the rail loadout facility on Dewey Road. There would be no impacts on the night sky.

3.15.4.1 Alternative D – Trucking ROW Corridor

The haul road features would be flat and low-lying with respect to adjacent topography and consist largely of horizontal elements. The haul roads should conform approximately to existing landforms and follow existing topography with no new areas of significant relief.

This alternative would have similar visual resource impacts to those described for Alternative C across National Forest. However, the principal differences would be that of the new road construction, would occur at a distance of approximately one half mile from the Dewey Road on GCC lands, and at a distance of less than ¼ mile from the Dewey Road on BLM lands.

The short-term road reconstruction visual impacts related to dust for this alternative would be similar

to Alternative C. However, the potential for generation of dust plumes associated with truck hauling even if mitigated would continue over the proposed 200 year mine life. This alternative would have a greater visual impact than Alternative A or C.

Shielded or directional night lighting will be used at the rail loadout facility on Dewey Road. There would be no impacts on the night sky.

3.15.5 Connected Action

Widespread, steep-sided, and flat bottomed areas would be produced by quarrying the relatively thin (40-50 feet) but extensive limestone unit. Rock faces would present moderate to strong contrasts with existing landforms consisting of steep canyons and gentle slopes in the area to be quarried. Moderate to strong form contrasts would affect visual resources in these localized areas. Much of the quarry area would be hidden from view by higher elevation surrounding landforms and set-backs from canyon walls. The color and texture of reclaimed quarry areas would likely provide only a moderate contrast with the existing landscape. The disturbed soils used for reclamation are not expected to contrast with undisturbed soil colors, unless limestone fines are used for reclamation rather than back-fill of the quarry. Reclamation would include shaping the edges of disturbances to blend-in as well as possible with adjacent areas landforms and vegetation.

3.15.6 Cumulative Effects

Transportation and utility corridors constructed in the past significantly contribute to the cumulative effects of man-made linear visual features superimposed on the project area landscape (**Figure 3-19**).

Cumulative effects from surface disturbances associated with access road and drill pad construction developed for uranium or oil and gas exploration should have only a minor cumulative increased impact on the visual resources of the area. Access road segments would be considerably shorter than either the Dewey Road or an alternative haul road. Truck and equipment traffic for both construction and drilling activities would be relatively minor, consisting of one or two pieces of equipment per day for construction and two to four pick-up truck trips per day during drilling activities. All surface disturbances associated with exploration drilling should remain open for only a short period and be fully reclaimed after use.

3.16 Native American and Cultural Resources

Cultural resources are sites of past human activity defined by artifacts, features (the non-portable remains of human activity) or architectural structures. The study of these sites can provide a better understanding of the lifeways and behaviors of early societies. Some sites may contain information important for research, public interpretation and use by future generations.

The principal study area and Area of Potential Effects (APE) for cultural resources is the Dewey Conveyor Project area boundary (Project Area) as depicted on **Figure 1-2** This area contains all anticipated surface disturbances associated with the Proposed Action (Alternative A) and the Action Alternatives (Alternative C and D). The cultural resource record search of the Dewey Conveyor Belt project area identified 72 sites. Three of these sites are recommended eligible to the National Register of Historic Places (NRHP), 40 sites are not recommended eligible. The 30 remaining previously recorded cultural sites have not been evaluated for NRHP eligibility. However, of these 30 sites, two sites are isolated finds which do not meet the definition of a site, and therefore, would not be considered for NRHP eligibility and 14 sites have been recommended not eligible by Augustana College (Linda Palmer, personal communication 2008). This recommendation has not been concurred with by the BLM or the South Dakota State Historical Society to date. A second APE is defined for the area envisioned for limestone quarrying and this area is discussed under the Connected Action subsection of cultural resources below.

The cultural history and a discussion of the activities that occurred during the historic period are presented below to place the likely artifact assemblages and other cultural resources that have been encountered or might be anticipated to occur into context with respect to their antiquity and potential significance.

Cultural History

The Project Area is located within the prehistoric cultural subarea known as the Northwestern Plains, a region that includes western Minnesota, North and South Dakota, Wyoming, and portions of eastern Idaho and southern Montana. The prehistoric inhabitants of the Northwestern Plains existed for 12,000 years as semi-nomadic hunters and gatherers. The archaeological record suggests minor changes in tool technologies and subsistence strategies over time. A primary focus on bison for food, clothing and shelter is evident during the last 4000 years (Frison 1971).

The prehistory of the Northwestern Plains has been classified into four periods based on similarities of artifact assemblages and apparent overall adaptive strategies. The time periods are known as Paleoindian (12,000-8000 BP), Plains Archaic (7700-1500 BP), Late Prehistoric (1400-500 BP) and Protohistoric (A.D. 1600-1874). Within each period, cultural entities with a smaller defined temporal and spatial extent are discussed. These entities are called traditions or complexes.

Paleoindian sites have been classified into four traditions: Fluted Point, Lanceolate Straight or Rounded Base, Lanceolate Stemmed and Late Paleoindian. These traditions occurred during the Late Glacial, Pre-Boreal and Boreal climatic episodes. During these episodes, the climate experienced a warming trend and the grasslands and sagebrush steppe expanded at the expense of the boreal forests and tundra (Noisat 1996). Paleoindian sites suggest a subsistence strategy that focused on big game animals such as mammoth, bison, mountain sheep and deer. Sites are found in environmentally diverse settings including those of protected mountains, foothills areas and major river valleys. Paleoindians sites are rarely found on the more homogeneous upland prairie lands. Paleoindian sites have been found in the mountainous interior of the Black Hills, typically near springs (Tratebas 1986).

The Early Plains Archaic period (7700-4700 BP) began during a dry climatic episode known as the Altithermal. Only a few Early Plains Archaic sites have been found in plains/foothill and montane life zones of the Black Hills. These sites suggest that Early Plains Archaic groups abandoned big game hunting in favor of a generalized foraging strategy that included a seasonal migration pattern and the exploitation of small and medium-sized game.

The Middle Plains Archaic (4700-2500 BP) coincides with the end of the Altithermal and a gradual return to moister, cooler conditions. Prehistoric use of the Black Hills was high during this period. In fact, radiocarbon dates from the Black Hills indicate a peak in prehistoric use between 4000 and 3500 BP (Sundstrom 1996a). Subsidence strategies in the Black Hills incorporated communal bison hunting, individuals hunting deer and other big game, and broad spectrum foraging. The ground stone industry of the Middle Plains Archaic suggests extensive use of plant foods. Habitation features include prepared pit houses, stone rings and rockshelters. Complexes of the Middle Plains Archaic include Oxbow and McKean.

The climate of the Late Plains Archaic (2500-1500 BP) gradually became moister and the grasslands expanded, increasing the carrying capacity of bison herds. With this increase, the subsistence strategies of Late Plains Archaic groups shifted from a broad spectrum, scheduled subsistence strategy toward a more nomadic hunting economy focused on bison. Toolkit composition underwent a related shift as more hunting and butchering tools appeared and the number of composite and groundstone tool types decreased (Sundstrom 1996b). The Late Plains Archaic toolkit is further distinguished by the appearance of corner-notched projectile points. Data on habitation types in the Black Hills is sketchy for the Late Plains Archaic but the identification of several stone rings indicates tipi use. Sundstrom (1996b:2d-20) notes pithouses might be expected but no evidence of this structure type has been found in the Black Hills. Late Plains Archaic complexes include Pelican Lake and Besant. Besant is associated with the Plains Woodland Period, a cultural entity that developed in the eastern Northern Plains and is generally identified by the presence of ceramic assemblages. In the Black Hills, Late Plains Archaic and Plains Woodland sites appear to overlap spatially and temporally to a limited extent (Buechler 1999).

The transition to the Late Prehistoric is distinguished by the appearance of the Avonlea complex which dates from 1400-1000 BP. Avonlea

groups are characterized as extremely proficient bison hunters who used ritualized communal bison procurement strategies and introduced the bow and arrow to the area. Avonlea projectile points are finely made thin, triangular points with narrow side notches placed very close to the base. There is a paucity of Avonlea sites in the Black Hills and Tratebas (1986:363) suggests the area wasn't well used by Avonlea groups because their subsistence strategy focused on large-scale bison drives. Subsistence data from at least one site suggests Avonlea groups had a more diversified food base in the Black Hills (Noisat and Sundstrom 1996). Plains Village sites have also been identified along the periphery of the Black Hills (Buechler 1999). Plains Village is another eastern Northern Plains culture and it is estimated that the Plains Village culture supplanted Plains Woodland culture in the Missouri River Valley about 1100 BP (Noisat and Sundstrom 1996:2e-8). Plains Villagers were horticulturalists who lived in semi-permanent villages near the Missouri River floodplain. Populations grew corn, beans, squash and sunflowers (Lovick and Ahler 1982:55) and produced distinctive simple incised or cord-impressed ceramics.

The Protohistoric refers to the time period after European goods and species had entered Native American culture and before permanent European settlement, ca. A.D. 1600-1874. The two European items that literally transformed the lifeways of the Plains Indians were the horse and the gun. Horses were brought to the continent by the Spanish in the early 1500s and were introduced in the Black Hills by the Kiowa sometime between 1730 and 1750. Guns were acquired about the same time but originated from the northeast via the Mandan, Hidatsa and Arikara groups. With the acquisition of horses and guns, warfare patterns changed, territories and military alliances rapidly shifted, group mobility increased, and fierce competition developed for access to trade goods and trade centers. Many Plains Indian tribes abandoned a semi-horticultural lifeway for a nomadic existence as hunter foragers and trappers. Communal bison hunts were abandoned as mounted hunters rode into bison herds shooting individual animals. Various tribes occupied the Black Hills country during the Protohistoric period. The Kiowa and the Kiowa-Apache were probably the first ethnic group to inhabit the Black Hills followed by the Crow, Comanche, Suhtai and possibly the Arapaho and Ponca groups (Sundstrom 1989). These groups eventually migrated west and south as the Arapaho, Cheyenne and Lakotas groups moved in from the north and east.

Historic Period

Traders and missionaries were the first non-Indian people to arrive in the Black Hills; however, their numbers were few and the area remained under Native American control until the last half of the 1800s. From 1700 to 1750, the Lakota migrated westward from Minnesota and transitioned from being hunters-gatherers and part-time farmers to nomadic hunters who primarily relied on bison. The Lakota crossed the Missouri River around 1775 and with the acquisition of the horse, the Sioux became the dominant culture between the Missouri River and the Rocky Mountains.

Settlers, miners and merchants were the next wave of people to arrive in the Northern Plains. The settlers were traveling west to the Oregon Territory while the miners and merchants were headed to the goldfields in California, Colorado and Montana. Thousands of people passed through the Northern Plains and as the demand grew for supply lines and government protection from the Indians, forts and supply routes were established within Lakota territory. These actions enraged the Lakota and hostilities between the two cultures ensued.

The Fort Laramie Treaty of 1868 was ratified to end conflict on the Northern Plains. This treaty granted the Sioux all of western South Dakota and closed military forts and the Bozeman Trail in Lakota territory. Tensions did not ease for long as gold was discovered in the Black Hills in 1874. Word of the discovery hit the newspapers and soon miners began pouring into the area. At first the US government tried to stop the prospectors, a task which proved impossible. Treaty obligations were abandoned by 1875 and racial conflicts intensified. Battles, from small skirmishes to larger scale encounters that resulted in high casualties, were not uncommon. The climax of the Sioux War occurred in June 1876 when the Lakota and Cheyenne defeated Custer's troops at the Battle of Little Bighorn in southeast Montana.

Ultimately, the Sioux could not hold off the U. S. government and a new treaty was signed in October 1876. In this treaty, the Lakota gave up all claim to the Black Hills, lost hunting rights in Montana and Wyoming, and agreed to a reservation set at the 103rd meridian, excepting land between the two branches of the Cheyenne River. By 1888, the Black Hills were opened to homesteaders and an economy developed that focused on mining, logging and ranching. This pattern persists to present day with the addition of tourism as a major contributor to the regional economy of the Black Hills (Buechler 1999).

Cultural Resource Surveys and Results

In compliance with regulations established in the 1966 National Historic Preservation Act (NHPA), 36 CFR Part 800, 12 cultural resource surveys have been conducted in the vicinity of the study area (**Table 3-33**). These surveys were initiated by proposals for transmission line corridors, buried cable routes, land exchanges, grazing allotments and drill holes on uranium exploration properties.

Three of these surveys are directly related to the current Dewey Conveyor Project EIS study. In1999, Buechler examined 1360 acres of federal land, within the Custer-Elk Mountain Ranger District of the Black Hills National Forest (BHNF), slated for a land exchange between Dacotah Cement (now GCC Dacotah) and the BHNF. In 2001, Winham et al. examined additional acres designated for the land exchange between Dacotah Cement and the BHNF. And finally, in 2002, Buechler examined a 100-foot wide strip along the entire route of the proposed conveyor belt route.

Figure 3-20 depicts the areas inventoried by the cultural resource surveys listed in Table 3-33. In total, these surveys recorded 72 sites in the project area boundary. Sixty-two of these sites are prehistoric and include 49 artifacts scatters, eight isolated finds, four stone ring sites, and one hearth site. Six sites are multi-component (prehistoric and historic) and include four artifact scatters or farmsteads and two artifact scatters/historic trash scatters. Four sites are historic and include one earthwork site, one road, one trash scatter and one isolated find. Of these 72 sites, 34 are located within the construction corridors of the conveyor belt or one of the two proposed haul roads.

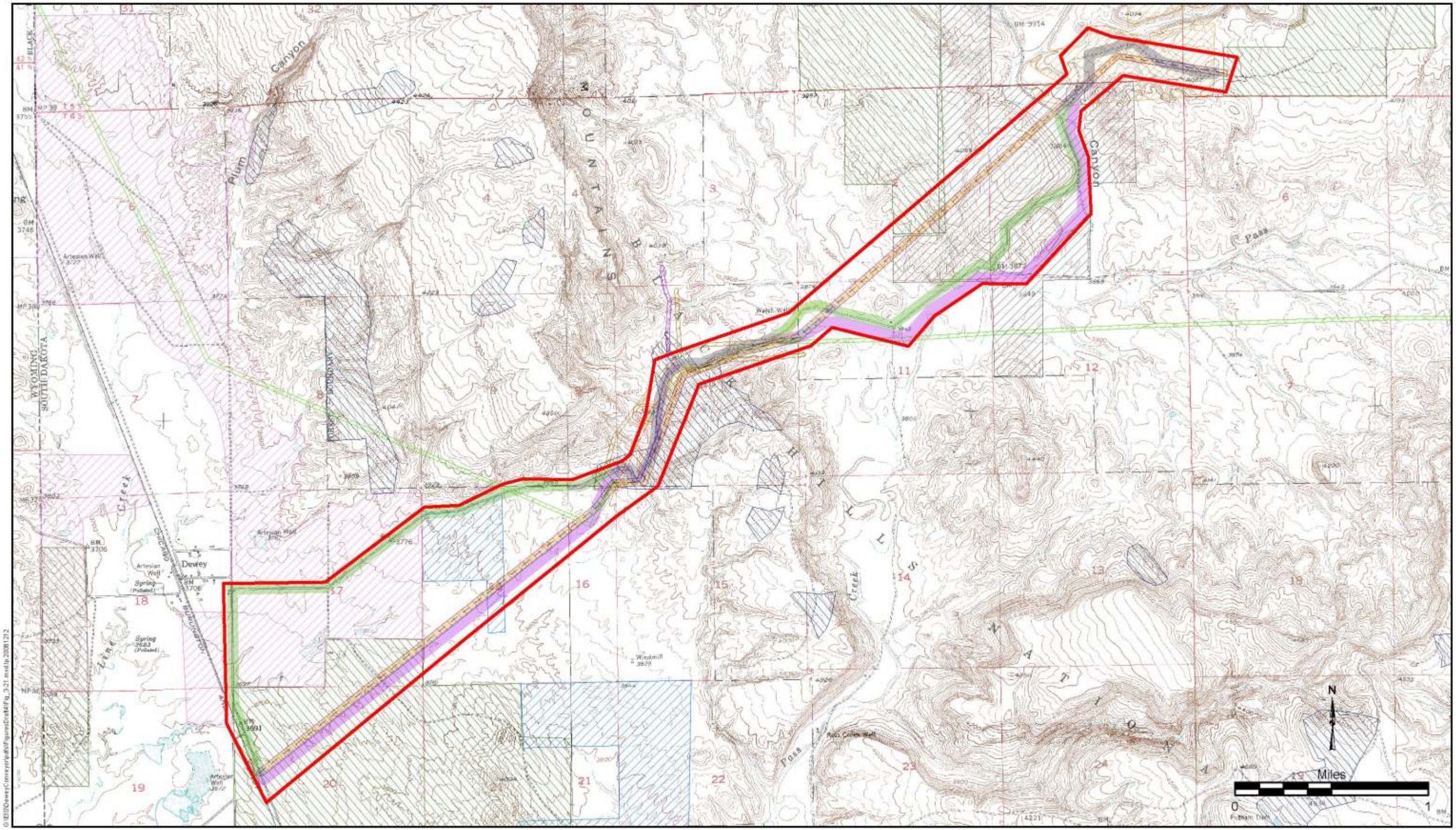
In 2001, Augustana College (Winham et al. 2005) tested potentially eligible sites, identified by the Buechler (1999) and the Winham et al. (2001) inventories, to determine if these sites contained cultural deposits that would make them eligible for nomination to the NRHP. The Augustana College project determined that, one artifact scatter (39CU2711) and one artifact scatter/historic trash scatter (39CU2696) are eligible to the NRHP. Additionally, one artifact scatter (39CU1921) was recommended eligible by the Noisat (1999) inventory. The college also recommended that 14 previously unevaluated sites did not have the potential to be eligible to the NRHP. The BLM and South Dakota State Historical Society still need to concur or not concur with this recommendation. Of the remaining sites, 39 are recommended as not eligible to the NRHP and 16 sites have not been evaluated for NRHP eligibility. This number of unevaluated sites decreases to 14 when two isolated finds, which were recorded as sites, are removed from NRHP consideration.

Ethnographic Study

The Bureau of Land Management (BLM) contracted with Mr. Donovin Sprague, a member of

Table 3-33
Regulatory Responsibilities For Historic Resources

Reference	Legal Location in Project Area
Jolley and Sigstad 1975	T6S, R1E, Sec. 17 and 19.
West and Tratebas 1976	T6S, R1E, Sec. 9, 10 and 16.
Lippincott 1983	T6S, R1E, Sec. 16.
Bambrey 1985	T6S, R1E, Sec. 9, 10, 11, and 16.
Buechler 1985	T6S, R1E, Sec. 10.
Buechler 1988	T6S, R1E, Sec. 10 and 11.
Miller 1995	T6S, R1E, Sec. 9, 10, 11, and 16.
Buechler 1999	T5S, R2E, Sec. 31; T5S, R1E, Sec. 36; T6S, R1E, Sec. 1, 2, 9 and 11.
Noisat 1999	T6S, R1E, Sec. 9, 10, 15, 16 and 17.
Sundstrom 1999	T5S, R2E, Sec. 31; T5S, R1E, Sec. 36; T6S, R1E, Sec. 1.
Winham et al. 2001	T5S, R2E, Sec. 31; T6S, R1E, Sec. 2, 17 and 20.
Buechler 2002	T6S, R1E, Sec. 9, 10, 11, 16, 17 and 20.



Legend

- Conveyor (Alternative A)
- Conveyor Corridor (Alternative A)
- Co. Rd. Corridor (Alternative C)
- New Haul Road Corridor (Alternative D)
- Alternatives Overlap
- Conveyor Belt Project Area

Cultural Resource Survey

- Jolley 1975
- West 1976
- Lippincott 1983
- Bambrey 1985
- Buechler 1985
- Buechler 1988
- Miller 1995
- Buechler 1999
- Noisat 1999
- Sundstrom 1999
- Winham 2001
- Buechler 2002

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Figure 3-20
Cultural Resource Surveys
Custer County, South Dakota
Dewey Conveyor Project

the federally recognized tribe Minnicoujou Lakota, to conduct interviews with tribal members on their interest and concerns in the proposed Dewey Conveyor Project. Information received on traditional use of the area would then aid in compiling an ethnographic study of the intended project area. Presented below is a summary of the interviews that was prepared based on a draft report submitted to the BLM (Sprague 2008).

The report is titled *Area Of Potential Effects (APE) and Interviews With Tribal Members* (Sprague 2008). It is a compilation of interviews conducted with Lakota tribal members in North and South Dakota. The focus of this report was to concentrate on the Dewey area and within the project area of potential effect (APE) for the conveyor and limestone mine. This area comprises approximately 20,000 acres of conveyor route, mining claims, and adjacent areas. A 25 question survey of information was presented to tribal members from Pine Ridge, Rosebud, Cheyenne River, Standing Rock, and Lower Brule along with Lakota members located in the large urban population in Rapid City.

This study included contact with many people who are directly involved in the tribal governments, elected tribal administrators and council members, as well as Traditional and Elder Tribal members. An elder is defined in the report as "someone 55 years of age or older" (Sprague 2008: 16).

During project consultation, tribal members stated that the entire Black Hills has a sacred meaning asa whole to the tribes. According to the draft report, the Lakota people have been removed for several generations of from the Black Hills with the five reservations starting in the late 1880's. Tribal recollection of this area comes from tribal oral histories and storytelling. Most of the members interviewed knew their people had regular ceremonial, cultural, and religious activity in the Black Hills prior to the reservations; however, no one could outline this use inside the project (APE).

In summary the report states: "Hardly anyone had heard of Dewey, S.D. and the proposed project. There was also no one who could pinpoint present cultural, ceremonial or religious use in the proposed area. A few people outlined this type of use within the Black Hills but not in this exact area. (Sprague 2008:14). The majority of the respondents who had recommendations were that the environment and nature be protected, and that no archaeological or human remains be disturbed (15)." A few of the interviewers thought the area should be left alone and three members reported that they oppose the project. The remaining tribal members interviewed typically did not know about the project, the project area location; and had no opinion on the project.

3.16.1 Direct and Indirect Effects

Area of Potential Effect

Section 106 of the National Historic Preservation Act, requires that an APE be defined that is specific to the proposed undertaking. For the Dewey Conveyor Project Proposed action and other Action Alternatives, direct effects on cultural resources would result in physical damage to sites from surface disturbances associated with construction activities. Areas of direct effect would be associated with conveyor belt, service road and access point construction (Alternative A – Proposed Action), county road re-engineering and reconstruction (Alternative C), and new road construction (Alternative D).

The APE for the Dewey EIS is the Project Area boundary. The project area varies from 500 feet to 4,500 feet in width from the conveyor belt centerline (**Figure 3-21**). The APE includes more limited construction zones (or areas of potential surface disturbance) defined for the conveyor alternative (A) and haul road alternatives (C and D) that include a buffer zone that is 300 feet wide (150 feet on each side of the road centerlines). This would allow for a 100-foot wide corridor for actual construction and a 100-foot buffer on each side of the construction corridor to maintain the required set-back from eligible and unevaluated sites.

Three National Register eligible properties (39CU1921, 39CU2696, and 39CU2711) are present in the Project Area APE (**Table 3-34**). These sites are recommended eligible based on Criterion D which means these sites contain information which is considered important to our understanding of history. Site 29CU1921 is located within the county road corridor (Alternative C) and Site 39CU2696 is located within the new road corridor (Alternative D). Site 39CU2711 is not located within the area proposed for surface disturbance or within the required 100-foot buffer

zone of any of the three Action Alternatives (A, C, or D). Measures should be taken to ensure sites 39CU1921 and 39CU2696 are avoided and protected during construction of the Dewey Conveyor Project. If these sites cannot be avoided and protected from construction activities, mitigation should occur prior to project construction.

Fourteen sites located within the Project Area have been recommended as not eligible to the NRHP by Augustana College. The BLM and South Dakota State Historical Society need to concur or not concur with this recommendation. Five of these sites are located within the conveyor construction corridor, and one each occurs within each of the haul road alternatives (**Table 3-34**). Seven other sites recommended as "not eligible" occur but are not proposed for disturbance by any of the action alternatives.

The Project Area encompasses 1877 acres. The 12 cultural resource inventories conducted to date have examined 1416 acres, including a 100-foot wide corridor along the entire route of the proposed conveyor route. A total of 461 other acres within the APE have not been inventoried for cultural resources. A portion of these unsurveyed acres associated with proposed surface disturbances along the existing county road (Alternative C) and the proposed new haul route (Alternative D) would need to be surveyed for the presence of cultural resources. If cultural resources are present, eligibility for the National Register needs to be determined prior to project construction activities.

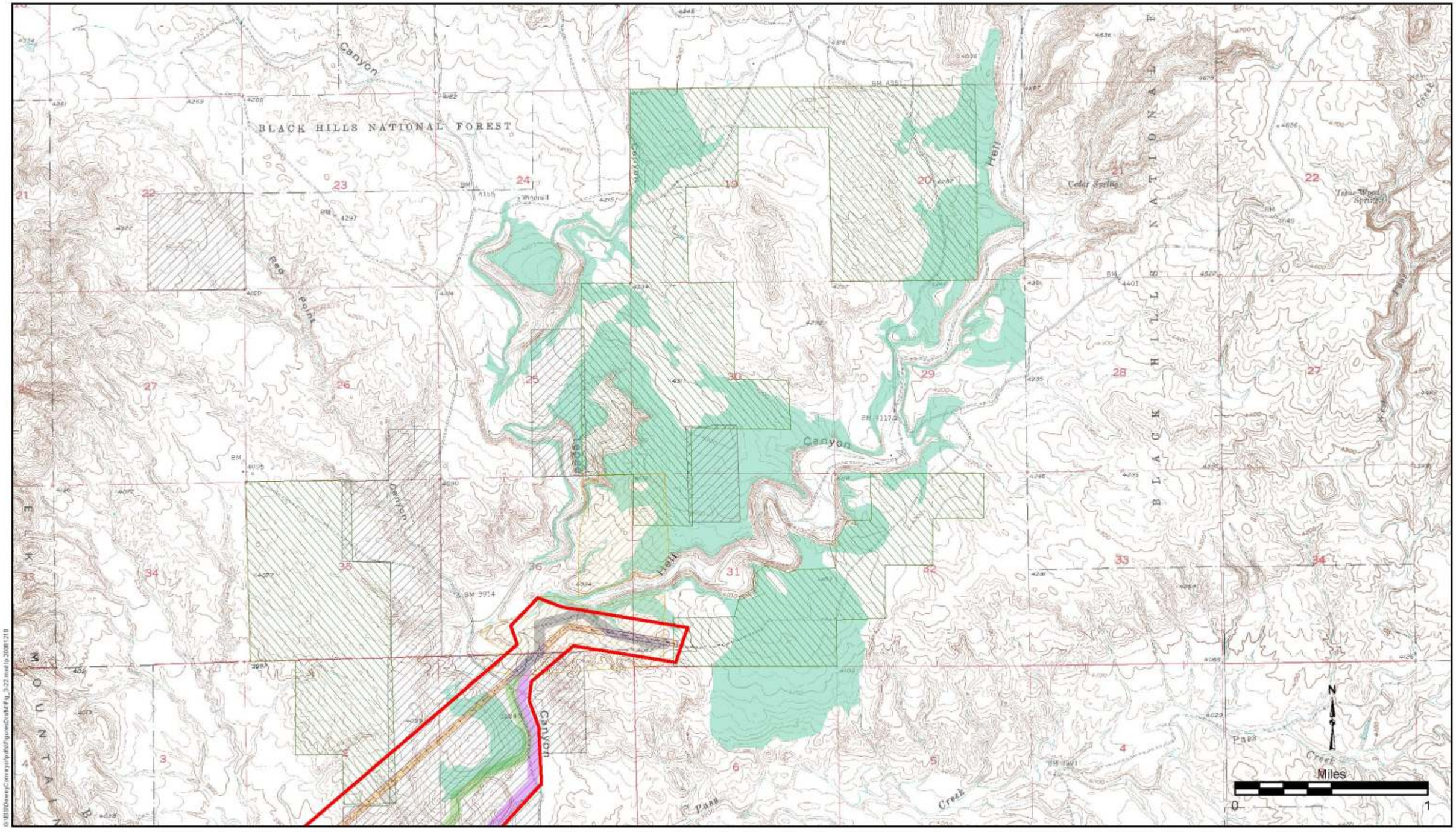
The Proposed Action and Action Alternatives (C and D) would likely result in loss of cultural resources that are not eligible to the National Register. Loss of these sites would constitute an irreversible and irretrievable commitment of a resource. These sites have been recorded and information concerning these sites has been integrated into a database managed by the South Dakota State Historical Society.

Potential impacts to National Register eligible properties along the proposed haul routes with the implementation of Alternatives C and D would be mitigated through preparation and implementation

Table 3-34
Cultural Resource Sites that May Affect Alternatives

Construction Corridor Potentially Affected	Site No.	Type	NRHP Eligibility
Conveyor corridor (A)	39CU2602	Artifact Scatter	Not eligible*
Conveyor corridor (A)	39CU2693	Historic Trash Scatter	Not eligible*
Conveyor corridor (A)	39CU2706	Artifact Scatter	Not eligible*
Conveyor corridor (A)	39CU2707	Artifact Scatter	Not eligible*
Conveyor corridor (A)	39CU2710	Artifact Scatter	Not eligible*
Conveyor corridor (A)	39CU1635	Artifact Scatter	Not evaluated
Conveyor corridor (A)	39CU1637	Artifact Scatter	Not evaluated
County Rd corridor (C)	39CU1921	Artifact Scatter	Eligible
County Rd corridor (C)	39CU2702	Artifact Scatter/Historic Trash Dump	Not eligible*
County Rd corridor (C)	39CU0245	Artifact Scatter	Not evaluated
New Road corridor (D)	39CU2696	Artifact Scatter and Hearth/ Historic Trash Scatter	Eligible
New Road corridor (D)	39CU2709	Artifact Scatter	Not eligible*
New Road corridor (D)	39CU0580	Artifact Scatter/Occupation	Not evaluated
New Road corridor (D)	39CU2705	Artifact Scatter	Not evaluated
Project Area	39CU2711	Artifact Scatter	Eligible

*Recommended not eligible by Augustana College, BLM and South Dakota State Historical Society have not yet concurred with this recommendation.



Legend

- Conveyor (Alternative A)
- Conveyor Corridor (Alternative A)
- Co. Rd. Corridor (Alternative C)
- New Haul Road Corridor (Alternative D)
- Alternatives Overlap
- Conveyor Belt Project Area
- Minekahta Limestone

Cultural Resource Survey

- Buechler 1999
- Buechler 2002
- Sundstrom 1999
- Winham 2001

September 2008

Figure 3-21

Cultural Resource Surveys - Federal Mineral Lands

Custer County, South Dakota

Dewey Conveyor Project

of data recovery plans. However, the information potential of impacted National Register properties cannot be fully retrieved. As a result, post-treatment impacts to these properties as a result of the Action Alternatives (C and D) would result in an irreversible and irretrievable commitment of a resource.

3.16.1.1 Alternative A – Proposed Action

The proposed conveyor route has been surveyed over a 100-foot wide path over the entire length. No NRHP eligible cultural resource sites have been identified along the proposed conveyor route or within a 100-foot wide buffer zone on either side of the proposed construction zone. GCC Dacotah has indicated that eligible sites would be avoided during construction of the proposed conveyor and that measures would be taken to ensure that other identified cultural resource sites are avoided and protected, wherever possible. However, a number of non-eligible sites cannot be avoided or protected during conveyor construction activities. As these sites have been determined to be not eligible to the NRHP, no further work is recommended.

3.16.1.2 Alternative B – No Action

There would be no direct effect on National Register eligible sites or unevaluated sites under the No Action Alternative.

3.16.1.3 Alternative C – Trucking Existing County Road

Re-engineering of the existing Dewey (County) Road to make it suitable and safe for haul traffic would require additional surface disturbance over much of its length (7.1 miles). Most portions of the existing Dewey road have been surveyed for cultural resources (**Figure 3-21**), and one NRHP eligible site (39CU1921) has been identified in the zone proposed for construction. However, some portions of the existing Dewey Road corridor have not been surveyed for cultural resources including segments in the north half of Sections 11 and 16 of T6S, R1E. If a 300 foot wide corridor is assumed (150 feet on either side of the centerline that includes a 100-foot wide construction zone and 100–foot wide buffer zone on either side of the construction zone) some 78.34 acres would need to be surveyed for cultural resources. If cultural resources are present, eligibility for the National Register needs to be determined prior to project construction activities. It is possible that NRHP eligible sites exist in the unsurveyed segment of the existing Dewey County Road. If eligible sites are found appropriate levels of evaluation and mitigation would be required prior to road reconstruction. In addition, a number of non-eligible sites likely cannot be avoided or protected during construction activities. These sites have been determined to be not eligible to the NRHP, therefore, no further work is recommended.

3.16.1.4 Alternative D – Trucking ROW Corridor

Construction of a new road for haul traffic would require new surface disturbance over most of its entire length (7.2 miles) including reconstruction of a segment of the Dewey County Road over the Elk Mountain pass (1.5 miles). Portions of this proposed route have been surveyed, and one NRHP eligible site (39CU2696) has been identified in the zone proposed for construction. Presumably, if a new road were constructed, the southern portion of this road in Sections 15, 16, 17, and 20 in T6S, R 1E. would follow the proposed conveyor route that has been previously surveyed for cultural resources. However, one portion of the proposed construction corridor located in the north half of Section 11 T6S, R1E has not been surveyed for cultural resources. If a 300 foot wide corridor is assumed (150 feet on either side of the centerline that includes a100 foot wide construction zone and 100–foot wide buffer zone on either side of the construction zone) an additional 92.31 acres would need to be surveyed for cultural resources. If cultural resources are present, eligibility for the National Register needs to be determined prior to project construction activities. It is possible that NRHP eligible sites exist in the unsurveyed segment (Section 11) of the existing Dewey County Road. If eligible sites are found appropriate levels of evaluation and mitigation would be required prior to road reconstruction. In addition, a number of non-eligible sites likely cannot be avoided or protected during construction activities. These sites have been determined to be not eligible to the NRHP, therefore, no further work is recommended.

3.16.2 Connected Action

For purposes of this EIS limestone quarrying operations by GCC Dacotah are considered a connected action associated with construction of the proposed conveyor or implementation of one of the truck-hauling alternatives of the Dewey Conveyor Project. No specific area for limestone quarrying has been proposed to the State of South Dakota to date, however, areas likely to be mined were identified by GCC Dacotah for purposes of this EIS (**Figure 2-1**). All Federal mineral lands have been previously surveyed for cultural resources and over 60 sites were identified (Buechler 1999; Sundstrom 1999 and Windham et al. 2001) (**Figure 3-21**). GCC Dacotah has indicated that measures would be taken to ensure that identified cultural resource sites would be avoided and protected wherever possible during quarrying operations. However, it is envisioned that many sites cannot be avoided or protected during quarrying activities, therefore, appropriate levels of evaluation and mitigation would be required prior to mining.

3.16.3 Cumulative Effects

Cultural resources have the potential to be impacted by surface disturbances associated with past and reasonably foreseeable future actions related to exploration activities for oil/ gas, and uranium within and in the vicinity of the Dewey Conveyor Project Area. Levels of activity in the near future are expected to involve access road and drill pad construction. In the case of oil and gas exploration, areas have only been proposed for lease sales; and no actual drill holes have been proposed to date. It is unlikely that more than a few holes would be drilled for oil and gas exploration in the future even if the lease-sales are authorized. Uranium exploration drilling is currently underway within and in the vicinity of Project Area and additional future drilling is also proposed. One hundred and fifty drill holes have been proposed by Powertech, Inc. (about half of which have been drilled to date) and more are expected in the future (Powertech 2008). All access roads and sites proposed for any type of exploration drilling would need to be surveyed for cultural resources. If cultural resources are present, eligibility for the National Register would need to be determined prior to project construction activities. If eligible sites are found appropriate levels of evaluation and mitigation would be required prior to reconstruction.

3.16.4 Monitoring and Mitigation Measures

Measures Common to All Action Alternatives

Direct impacts could occur to National Register eligible properties with the implementation of Alternatives A, C or D. The following mitigation measures are proposed to address impact to the APE common to Alternatives A, C and D:

- **Encourage avoidance:** GCC Dacotah, Inc. shall make a reasonable effort to design the Project in such a manner as to avoid National Register eligible properties.
- **Address impacts to National Register properties located inside the APE:** Unless authorized by the BLM/US Forest Service, no surface disturbance shall occur within 100 feet of the boundary of National Register eligible properties 39CU1921, 39CU2696 and 39CU2711 prior to completion of the field phase of a data recovery plan that has been reviewed and approved by the BLM/US Forest Service and the South Dakota State Historical Society.
- **Address the eligibility of unevaluated sites inside the APE:** Unless otherwise authorized by the BLM/US Forest Service, no surface disturbance shall occur within 100 feet of the boundary of the 14 unevaluated sites until their National Register eligibility has been determined. Additionally, no surface disturbance shall occur within 100 feet of the 14 sites recommended not eligible by Augustana College until the BLM and South Dakota State Historical Society have concurred with this recommendation. If one of more of these sites is determined to be National Register eligible, no surface disturbance shall occur within 100 feet to the boundary of sites prior to completion of the field phase of a data recovery plan that has been reviewed and approved by the BLM/US

Forest Service in consultation with the South Dakota State Historical Society.

3.16.5 Residual Effects

Effects Common to Alternatives C and D

Data recovery activities could occur at National Register eligible properties with implementation of Alternatives C or D. Even after implementation of data recovery activities, non-renewable resources would have been expended and is a residual effect of the Proposed Actions and Alternatives.

3.17 Hazardous Materials

3.17.1 Study Area Boundaries

The study area for hazardous materials includes air, water, soil, and biological resources that could potentially be affected by an accidental release of hazardous materials during transportation to and from the project site and during storage and use at the project site.

3.17.2 Affected Environment

Hazardous materials may affect air, water, soil, and biological resources that could potentially be affected by an accidental release of these materials during transportation to and from the project site and during storage and use at the project site.

The following hazardous substances would likely be present during construction or operation of the proposed conveyor or during road construction activities;

- Diesel fuel, gasoline, hydraulic fluids, and various viscosities of motor oil/grease for equipment that would be delivered to the site either by truck or tanker and transferred to on-site storage vessels.
- Compressed gasses used for welding that would be delivered to the site by truck and transferred to storage containers (e.g. sheds) or other areas.

Hazardous materials that are likely to be used during construction activities are reported in **Table 3-35** along with the maximum amount likely to be stored on site, and the rate of use. This is not an all inclusive list and the types, volumes, and weights of each substance have been estimated and are subject to change based on final construction requirements and plans.

A, SPCC Plan was prepared by GCC Dacotah (2004) to specify sound engineering practices and spill prevention and response plans to be employed during manufacturing and drill coring operations. This plan would be used as a model to guide preparation of a SPCC plan for safe handling, use, storage, and clean-up procedures during construction and maintenance activities under the Proposed Action or implementation of one of the action Alternatives.

Hazardous substances would be transported to the Dewey area by US Department of Transportation regulated transporters (49 CFR Part 172) and stored in approved containers. In the event of an accident involving hazardous substances, Title 49 of the CFR requires that the carrier notify local emergency response personnel, the National

Table 3-35
Hazardous Substances at Likely to be Present at Dewey Conveyor Project

Substance	Operational Use	Annual Rate of Use	Maximum On-site Storage Gallons	On-site Storage Method
Ethylene Glycol	Antifreeze	1,000 gal	250 gal	Bulk Tank / Drums
Grease	Equipment	8,000 lbs	1,000 lbs	Totes and Drums
Hydraulic Fluid	Equipment	250 gal	1,500 gal	Bulk Tank / Drums
Motor Oil	Equipment	250 gal	700 gal	Bulk Tank / Drums
Petroleum Hydrocarbon (Diesel)	Equipment Fuel	80,000 gal	10,000 gal	Bulk Tank
Petroleum Hydrocarbon (Gasoline)	Equipment Fuel	8,000 gal	2,000 gal	Bulk Tank
Compressed Gasses (acetylene, propane)	Various	40,000 gal	10,000 gal	Bulk Tanks

Response Center (for discharge of reportable quantities of hazardous substances to navigable waters), and the US Department of Transportation.

The commercial transportation company is responsible for first response and cleanup in the event of a release during transport. Each transportation company is required to develop a SPCC Plan to address the materials they transport. Local and regional law enforcement and fire protection agencies also may be involved initially to secure the site and protect public safety.

3.17.3 Direct and Indirect Effects

3.17.3.1 Alternative A - Proposed Action

Potential direct impacts related to hazardous materials may result from an accidental release of hazardous materials during transportation, or during use and storage at the site. These impacts are typically considered significant if they result in:

- One or more accidents during transport, resulting in the release of a reportable quantity of a hazardous material;
- Release of a hazardous material on the site exceeding the storage volume of the containment structure; or
- Release of any quantity of hazardous material into surface or ground water.

Over the life of the project, the probability of minor spills of materials such as oils and lubricants is relatively high. These releases can occur during operations as a result of a bad connection on an oil supply line, or from an equipment failure. Spills of this nature are likely to be localized, contained, and their effects removed. Other accidents involving greater volumes or flammable or explosive materials also could occur during construction. GCC Dacotah has prepared an SPCC plan establishing procedures for responding to accidental spills or releases of hazardous materials to minimize health risk and environmental effects at its mine and kiln facilities in Rapid City. The plan includes procedures for evacuating personnel, maintaining safety, cleanup and neutralization activities, emergency contacts, internal and external notifications to regulatory authorities, and incident documentation. A site specific SPCC Plan will be required for the Dewey Mine and related transportation facilities prior to the site becoming operational in the future. Proper implementation of the SPCC Plan is expected to minimize the potential for significant impacts associated with potential releases of hazardous materials.

As identified in **Table 3-35**, trucks would be used to transport a variety of hazardous substances to the project site. Shipments of hazardous substances would originate from cities such as Rapid City and be transported to the town of Dewey via State Highways 79 and 16, US 18, and County Road 769.

Based on the quantity of the deliveries, the material of greatest concern is diesel fuel which could be delivered in 11,000 to 14,000 gallon tanker trucks. Under this assumption, the project would receive a delivery frequency of about 8 diesel fuel trucks each year during construction of the conveyor and access/maintenance road. Gasoline and diesel fuel are shipped from Rapid City. Rapid City is located approximately 80 road miles northeast of the project. Diesel shipments travel south from Rapid City on SD-79 for approximately 20 miles, west on US-16 for approximately 45 miles, then south into Dewey on County Roads 270 and 769 for about 15 miles. This route passes through the towns of Hot Springs and Edgemont.

The risk of a spill during transport was evaluated for diesel fuel based on accident statistics for liquid tankers carrying hazardous materials (Rhyne 1994) as presented in **Table 3-36**. According to these statistics, the average rate of truck accidents for transport along a rural interstate freeway is 0.64 per million miles traveled. For rural two-lane roads, the average truck accident rate is 2.19 accidents per million miles traveled. On the average, 18.8 percent of accidents involving liquid tankers carrying hazardous materials resulted in a spill or release.

Using the accident and liquid tanker spill statistics, the probability analysis indicates that the potential for an accidental release of liquids using truck transport during construction of the conveyor and the associated access roads is for less than one accident involving a spill of diesel fuel. The total number of truck deliveries of diesel fuel could increase by a factor greater than 100 before an accidental spill would be expected. Adding the

Table 3-36
Estimated Number of Spills from Truck Accidents During Construction

Truck Shipment Type	Rural Two-lane Road					
	Total Truck Deliveries[1]	Two-lane Haul Distance	Accident Rate per Million Miles Traveled[2]	Calculated Number of Accidents	Probability of Release Given an Accident (%)[2]	Calculated Number of Spills
Diesel Fuel	40	80	2.19	0.01	18.8	0.002

Source: Rhyne 1994.

1 Total truck deliveries = estimated number of truck deliveries over the life of construction; assumed to be 5 years.

2 Accident rates are based on the average number of truck accidents occurring per million miles traveled by road type. Spill probabilities are based on the statistics from accident reports that indicate the percentage of truck accidents involving liquid tankers that resulted in a spill.

other shipments listed in **Table 3-36** would incrementally increase the odds of a release of a

hazardous substance during a transport accident. One spill resulting from a truck accident would be considered a significant impact.

The environmental effects of a release would depend on the substance, quantity, timing, and location of the release. The event could range from a minor oil spill on the project site where cleanup equipment would be readily available, to a severe spill during transport involving a large release of diesel fuel or another hazardous substance. Some of the chemicals could have immediate adverse effects on water quality and aquatic resources if a spill were to enter a flowing stream. With rapid cleanup actions, diesel contamination would not result in a long-term increase in hydrocarbons in soils, surface water, or ground water.

A large-scale release of diesel fuel or several of the other substances delivered to the site could have implications for public health and safety. The location of the release would be the primary factor in determining its importance. However, the probability of a release anywhere along a proposed transportation route was calculated to be extremely low; the probability of a release within a populated area would be even lower; and the probability of a release involving an injury or fatality would be still lower. Therefore, it is not anticipated that a release involving a severe effect on human health or safety will occur during the life of the project.

3.17.3.2 Alternative B - No Action

Under the No Action alternative, there would be no hazardous materials transported to or used for the purpose of conveyor or access or maintenance road construction. Small spills of hazardous materials such oil, gas, and diesel may occur during recreational, farm, or ranch vehicle use or via illegal refuse dumping.

3.17.3.3 Alternative C – Trucking Existing County Road

Effects from hazardous materials under Alternative C would be the same as described for Alternative A for the period of reconstruction of the County road. However, due to the reduced amount of construction activities under this alternative compared to Alternative A, proportionally less diesels, gas, oil, and other hazardous materials would be transported and stored resulting in an even smaller potential for accidental spills.

However, Alternative C during operations would require considerably more diesel fuel to be transported for use under the limestone truck hauling scenario. In addition, the higher risks associated with the transport of greater volumes of fuel would persist over the entire proposed 200 year mine-life.

3.17.3.4 Alternative D – Trucking ROW Corridor

Effects from hazardous materials under Alternative D would be similar to those of the proposed action and slightly greater than those of Alternative C during the construction period. This is because of the greater length of new road construction

required under alternative D. The effects from hazardous material under Alternative D would be similar to those of Alternative C during operations.

3.17.4 Connected Action

Mine operations would result in increased use and transport of hazardous materials (including explosives). Storage and safety concerns related to use of these materials is addressed in the existing SPCC. The oil used most often at limestone quarries is No. 2 fuel oil, or diesel fuel. At a mine site in Rapid City with a similar production rate to that proposed for the Dewey quarry, GCC Dacotah uses about 700,000 lbs of ammonium nitrate and 3,800 gallons of diesel for its ANFO explosive mixture on an annual basis (Nelson 2008).

3.17.5 Cumulative Effects

There are no cumulative effects that result from past activities related to the construction of utility and transportation corridors, or in association with past uranium or oil and gas exploration activities. However, reasonably foreseeable activities of these types would add incrementally to the cumulative effects of risks from hazardous material spills as a function of levels of activity and duration of the exploration or construction actions.

Alternatives A, C, and D would result in an incremental increase in the amount of hazardous materials shipped along identified transportation routes. This would increase the risk of release of hazardous substances resulting from truck accidents during the life of the project, as described previously. With proper implementation of the SPCC, cumulative impacts associated with storage and use of hazardous substances would not be anticipated.

No cumulative effects would result from Alternative B.

CHAPTER 4
CONSULTATION, COORDINATION, AND PREPARATION PUBLIC PARTICIPATION

4.1 Summary

Public participation specific to the Dewey Conveyor Project is summarized in this chapter. The summary indicates how the public has been involved, identifies persons and organizations to be contacted for feedback, and specifies time frames for accomplishing goals in accordance with 40 CFR 1506.6.

Public involvement in the EIS process includes the necessary steps to identify and address public concerns and needs. The public involvement process assists the agencies in: (1) broadening the information base for decision making; (2) informing the public about the Proposed Actions and the potential long-term impacts that could result from the projects; and (3) ensuring that public needs are understood by the agencies.

Public participation in the EIS process is required by NEPA at four specific points: the scoping period, review of Draft EIS, review of Final EIS, and receipt of the Records of Decision.

- **Scoping:** The public is provided a 30-day scoping period to disclose potential issues and concerns associated with the Proposed Action. Information obtained by the agencies during public scoping is combined with issues identified by the agencies and this forms the scope of the EIS.
- **Draft EIS Review:** A 45-day Draft EIS review period is initiated by publication of the Notice of Availability for the Draft EIS in the Federal Register. A public meeting will be held during the comment period.
- **Final EIS Review:** A 30-day Final EIS review period is initiated by publication of the Notice of Availability for the Final EIS in the Federal Register.
- **Record of Decision:** Subsequent to the 30-day review period for the Final EIS, a Record of Decision would be prepared.

4.1.1.1 Tribal Communication and Coordination

Communication and coordination with local tribes is addressed in the *Native American Interests* section of Chapter 3.

4.1.2 Public Participation

The public participation process for the Project EIS is comprised of the following five components:

4.1.2.1 Public Scoping Period and Meetings

To allow an early and open process for determining the scope of issues and concerns related to the Proposed Action (40 CFR 1510.7), a public scoping period was provided by BLM. A Notice of Intent to prepare the EIS was published in the Federal Register (Volume 72, Number 190 pp. 56083-56084) on October 2, 2007, (MT-040-5101-EO42). Publication of this notice in the Federal Register initiated a 60-day public scoping period for the Proposed Action that was later extended to January 11, 2008.

BLM provided a website with project information that described the various methods of providing public comment on the proposed action including email address where comments could be sent electronically. Concurrent with these actions, BLM issued a news release to news organizations with coverage in the surrounding geographical regions in South Dakota and Wyoming providing scoping meeting locations and dates and reiterating the various methods of submitting public comments. A combined BLM and US Foreset Service mailing list was compiled.

Four public scoping meetings were held by BLM and US Forest Service in November and December of 2007. The location and times of four public scoping meetings were published in five local and regional newspapers: including the Custer County Chronicle; Hot Springs Star; Rapid City Journal; Newcastle News Letter Journal; and the Edgemont Herald Tribune. Meetings were held in Edgemont,

SD on November 5th, Custer, SD on November 6th, Newcastle, WY on November 7th, and Dewey, SD on December 3rd, 2007. The public meetings used an "open house" format. Project information was provided on poster boards. Representatives from BLM, Forest Service, and GCC Dacotah were on hand to provide additional information and discuss the project with attendees. Fifty-one members of the public documented attendance by signing a voluntary sign in sheet at the respective meetings attended. Agency personnel prepared annotated lists of verbal comments presented during the meetings. Comment forms were provided at the meetings, along with information on other ways to provide comments during the scoping process. Written letter responses or comment forms were received from ten individuals during the public scoping period.

4.1.2.2 Distribution of the Draft EIS

The Draft EIS will be distributed as follows:

- A Notice of Availability will again be published in the Federal Register specifying dates for the comment period and the date, time, and location of a public meeting.
- A news release provided to all area media by BLM at the beginning of the 60-day comment period on the Draft EIS.
- The Draft EIS will be distributed to interested parties identified on an updated EIS mailing list.
- The Draft EIS will be posted on the BLM South Dakota Field Office website.
- A public open-house meeting will be held to obtain comments on the accuracy and adequacy of the Draft EIS and answer questions that the public has regarding the Project or the EIS process.
- Comments on the draft EIS will be received and written responses to the comments prepared.

4.1.2.3 Final EIS Distribution

The Final EIS will be distributed as follows:

- Notice of Availability will be published in the Federal Register.
- Copies of the Full Text Final EIS or Abbreviated Final EIS will be sent to addresses on an updated EIS mailing list.
- The Final EIS will be posted on the BLM South Dakota Field Office website.
- A news release issued to the same news outlets used for previous Project announcements will be sent at the beginning of the 30 day comment period.

4.1.2.4 Record of Decision

A Record of Decision will be distributed by BLM to individuals and organizations identified on the updated Project mailing list. A notice of availability (NOA) will be published in the Federal Register. A news release will be provided to the news media at the beginning of an additional 30-day comment period.

4.2 Criteria and Methods By Which Public Input is Evaluated

Letters and oral comments received by BLM on the Draft EIS will be reviewed and evaluated by the agency to determine if information provided in the comments would require a formal response or contains new data that may identify deficiencies in the EIS. Steps will then be initiated to correct such deficiencies and to incorporate information into the Final EIS.

4.3 List of Preparers and Reviewers

4.3.1 Lead Agency – Bureau of Land Management

4.3.1.1 Core Interdisciplinary Team and Technical Specialty

Responsible Official -South Dakota Field Office Manager – Marian Atkins

EIS Project Team Leader – Marian Atkins

NEPA Compliance Coordinator – Russell Pigors

Geology and Minerals/Paleontology – Dan Benoit

Soil – Mitch Iverson

Vegetation – Mitch Iverson

Fisheries and Aquatic Resources – Chuck Berdan

Terrestrial Wildlife – Chuck Berdan

Grazing Management – Mitch Iverson

Noxious Weeds – Gerald Moller

Access and Land Use – Chuck Berdan

Cultural Resources – Brenda Shierts

Native American Interests – Brenda Shierts

Hazardous Materials – Russell Pigors

GIS/CADD- Corinne Walter

Cooperating Agency - US Forest Service, Black Hills National Forest

Responsible Official -Forest Supervisor- Craig Bobzien

EIS Project Team Leader – Laura Burns

NEPA Compliance Coordinator – Kelly Honors

Geology and Minerals – Laura Burns

Water Resources – Les Gonyer

Vegetation – Cissie Englebert, Michael Reichenberg

Fisheries and Aquatic Resources – Brad Phillips

Terrestrial Wildlife – Brad Phillips

Noxious Weeds – Jason Brengle

Access and Land Use – Megan Buehler

Visual Resources – Steve Keegan

Cultural Resources – Tony King

Native American Interests –Tony King

Hazardous Materials – Rusty Wilder

GIS/CADD- Margaret Farrell

4.3.2 GCC Dacotah, Inc.

Gene Nelson – Director Environmental Services

Tim Rauert– Senior Engineer

Paul Seby – Consulting Attorney

4.3.3 Third Party EIS Contractors

Tetra Tech, Inc.

EIS Project Manager – Daryl Longwell, BS Civil Engineering, 22 years

EIS IDT Leader – Allan Kirk, BA Geological Sciences, MS Geological Sciences, 35 years

NEPA Compliance Coordinator – Cameo Flood, BS Forest Management, 23 years

Geology and Minerals/Paleontology – Allan Kirk, BA Geological Sciences, MS Geological Sciences, 35 years

Air Quality – Robert Hammer, BS Meteorology, MS Meteorology, 26 years and Bill Cote, BS Chemical Engineering, MS Chemical Engineering, MBA, 43 years

Water Resources – Bill Craig, BS Geology, MS Hydrogeology, 16 years

Soil – Shane Matolyak, M.S. Land Rehabilitation, 8 years experience

Vegetation – Stacy Pease, BS Wildlife and Fisheries Science, MS Watershed Mgmt., 11 years and Vicki Regula, BS Natural Resources, MS Rangeland Ecology and Watershed Mgmt, 9 years.

Fisheries and Aquatic Resources – Stacy Pease, BS Wildlife and Fisheries Science, MS Watershed Mgmt., 11 years

Terrestrial Wildlife – Stacy Pease, BS Wildlife and Fisheries Science, MS Watershed Mgmt., 11 years

Grazing Management – Vicki Regula, BS Natural Resources, MS Rangeland Ecology and Watershed Mgmt, 9 years

Noxious Weeds – Vicki Regula, BS Natural Resources, MS Rangeland Ecology and Watershed Mgmt, 9 years

Access and Land Use – Cameo Flood, BS Forest Management, 21 years experience

Transportation –Matt Culpo, BS Civil Engineering, 14 years

Jim Kienholz, BS Civil Engineering, 11 years

Visual Resources – Mitch Paulson, A.D. Commercial Art, 28 years experience

Cultural Resources – Lynn Peterson, BS Anthropology, MS Anthropology, 18 years

Native American Interests – Lynn Peterson, BS Anthropology, MS Anthropology, 18 years

Social and Economic Resources – Kristin Sutherlin, BA Economics, 25 years

Environmental Justice – Kristin Sutherlin, BA Economics, 25 years

Hazardous Materials – Shane Matolyak, M.S. Land Rehabilitation, 8 years experience

GIS/CADD- Patricia Williams, BS Wildlife Biology, MA Geography, 5 years

Dave Highness, BA Anthropology, MA Geography, 14 years

Big Sky Acoustics

Noise- Sean Connelly- B.S. Mechanical Engineering, M.S. Mechanical Engineering, 14 years experience.

4.3.4 Mailing List

A hard copy of the DEIS was mailed to all those who commented during scoping, Tribal leaders, and required state and federal agencies. Individuals and agencies who received a hard copy are listed below. Others whose names were on the mailing list but did not comment during scoping were send an electronic copy of the DEIS on compact disk with an opportunity to request a hard copy. Other agencies were notified through the Federal Register Notice of Availability that the DEIS is available on the BLM and Forest Service websites.

4.3.4.1 List to Whom this DEIS was Sent

BLM Library, National Science and Technology Center

BLM Planning Office (WO 210)

USDA National Agricultural Library

US Environmental Protection Agency, Office of Federal Activities, EIS Filling Section

US Environmental Protection Agency, Region 8, EPR-N

US Department of the Interior, Director, Office of Environmental Policy and Compliance

Chairman, Crow Creek Sioux Tribe

Chairman, Cheyenne/Arapaho Tribes Of Oklahoma

President, Rosebud Sioux Tribe

President, Northern Cheyenne Tribe

President, Oglala Sioux Tribe

Tribal Chairman, Yankton Sioux Tribe

Tribal Chairman, Sisseton-Wahpeton Sioux Tribe

Tribal Chairman, Flandreau Santee Sioux Tribe

Tribal Chairman, Cheyenne River Sioux Tribe

Tribal Chairman, Mandan Hidatsa and Arikara Tribes

Tribal Chairman, Eastern Shoshone Tribe

Tribal Chairman, Northern Arapaho Business Council

Tribal Chairman, Lower Brule Sioux Tribe

Tribal Chairman, Standing Rock Sioux Tribe

Tribal Chairman, Santee Sioux Nation

Tribal Chairwoman, Spirit Lake Sioux Tribe

Spirit Lake Sioux Tribe

Grey Eagle Society

Northern Cheyenne Tribe

THPO Oglala Sioux Tribe

Cultural Resource Office, Lower Brule Sioux Tribe

THPO Standing Rock Sious Tribe

Cultural and Heritage Program, Cyeyenne-Arapaho Tribes of Oklahoma

THPO, Rosebud Sious Tribe

THPO, Northern Cheyenne Tribe

Cultural Preservation Ovvice, Three Affiliated Tribes

Northern Arapaho Business Council

Kiowa Ethonographic Endeavor for Preservation

Sicangu Lakota Treaty Council

Weston County Library

Edgemont Public Library

Custer County Library

Bill and Susan Paulton

C. Beckner

Don Emch

Henry and Mary Hollenbeck

Homer W. Dejmek

John and Marjory Holmes

Ms. Nancy Kile

Mr. Travis Paulton

Mr. William M. Smith

REFERENCES

Anderson, T. (2004, September 16). Callused Vertigo (*Vertigo authuri*): a technical conservation assessment. [Online]. US Forest Service, Rocky Mountain Region. Available online at: http://www.fs.fed.us/r2/projects/scp/assessments/callusedvertigo.pdf accessed [11.2008].

Ashton, D. E., and E. M. Dowd. 1991. Fragile legacy: endangered, threatened, and rare animals of South Dakota. South Dakota Game, Fish, and Parks, Report Number 91-04, Pierre, South Dakota, USA.

Bandas, S.J. and K.F. Higgins. 2004. A field guide to South Dakota turtles. SDCES EC 919. Brookings: South Dakota State University.

BEA 2008a. U.S. Department of Commerce Bureau of Economic Analysis, Regional Economic Accounts, Local Area Personal Income: "Table CA04 – Personal income and employment summary." Available at http://www.bea.gov/bea/regional/reis/default.cfm#step2.

BEA 2008b. U.S. Department of Commerce Bureau of Economic Analysis, Regional Economic Accounts, Local Area Personal Income: "Table CA30 – Regional Economic Profiles." Available at http://www.bea.gov/bea/regional/reis/.

Benzon, Ted. 2008. Conversation between Stacy Pease, Tetra Tech, and Ted Benzon, SD Department of Game, Fish and Parks, Big Game Biologist, November 24, 2008.

BLM. 2004. Montana/Dakota Sensitive Species List.

BLM. ND. Special Status Species that May Occur within the South Dakota Planning Area.

BLS 2006. U.S. Department of Labor Bureau of Labor Statistics, Bureau of Labor Statistics Report to the Office of Management and Budget On Implementation of The Confidential Information Protection and Statistical Efficiency Act of 2002, December 2002 – December 2006. Available at http://www.bls.gov/bls/cipseareport.pdf

BLS 2008. U.S. Department of Labor Bureau of Labor Statistics, Local Area Unemployment Statistics. Labor Force, Employment, and Unemployment Data. Available at http://data.bls.gov/.

Bowen, C.K., G.E. Schuman, R.A. Olson and L.J. Ingram. 2005. Influence of topsoil depth on plant and soil attributes of 24-year old reclaimed mined lands. Arid Land Research and Management 19: 267-284.

Braddock, W.A., 1961, Geology of the Jewel Cave SW Quadrangle, Custer County, South Dakota, US Geological Survey Bulletin 1063-G. pp. 217-268, and plate.

Brobst, D.A., 1961. Geology of the Dewey Quadrangle, Wyoming-South Dakota. US Geological Survey Bulletin 1063 B, pp. 16-60 and plate.

Buechler, J. V., 1999. Intensive (Level III) Heritage Resources Inventory Survey of the Dacotah Cement Land Exchange Proposal in Southwestern Custer County, South Dakota, Volumes I and II. Prepared for Dacotah Cement, Rapid City, South Dakota by Dakota Research Services.

Buechler, J. V., 1999. Intensive (Level III) Heritage Resources Inventory Survey of the Dacotah Cement Land Exchange Proposal in Southwestern Custer County, South Dakota, Volumes I and II. Prepared for Dacotah Cement, Rapid City, South Dakota by Dakota Research Services.

Buskirk. 2002. Conservation Assessment for the American Marten in the Black Hills National Forest, South Dakota and Wyoming. U.S. Forest Service, Rocky Mountain Region, Black Hills National Forest, Custer, South Dakota. http://www.fs.fed.us/r2/blackhills/projects/planning/assessments/marten.pdf

Byer, Tim. 2008. Conversation between Stacy Pease, Tetra Tech, and Tim Byer, Biologist for the Thunder Basin National Grasslands, November 5, 2008.

DeGraaf, R. M., Scott, V.E., Hamre, R.H., Ernst, L., and Anderson, S.H. 1991. Forests and Rangeland Birds of the United States, Natural History and Habitat Use. USDA, Forest Service, Agriculture Handbook. 688 pp.

DENR. 2000. South Dakota Drinking Water Regulations Summary, Drinking Water Program, South Dakota Department of Environment and Natural Resources, February

DENR. 2006. "The 2006 South Dakota Integrated Report for Surface Water Quality Assessment", South Dakota Department of Environment and Natural Resources, March 31.

DENR. 2008a. Using Water in South Dakota, South Dakota Department of Environment and Natural Resources, Water Rights, Water Rights Links http://www.state.sd.us/DENR/des/waterrights/wr_permit.htm

DENR. 2008b. Water Rights in Project Area (portions of Sections 1, 2, 10, 11, 15, 16, 17, 20 of T6S R1E and Section 36, T5S, R1E and Section 31, T5S, R2E.), review and tabular results of South Dakota Department of Environment and Natural Resources water rights database, provided by Eric Gronlund, Water Rights Program, July 1, eric.gronlund@state.sd.us

DENR. 2008c. The 2008 South Dakota Integrated Report for Surface Water Quality Assessment, South Dakota Department of Environment and Natural Resources, March 31.

DENR. 2008d. Total Maximum Daily Loads (TMDL), Surface Water Quality Program, South Dakota Department of Environment and Natural Resources, http://www.state.sd.us/denr/DES/Surfacewater/TMDL.htm

DENR. 2008e. South Dakota Drinking Water Standards, Drinking Water Program, South Dakota Department of Environment and Natural Resources, http://www.state.sd.us/DENR/des/drinking/standard.htm

Department for Environment, Food and Rural Affairs (DEFRA). 2006. Update of noise database for prediction of noise on construction and open sites. Phase 3: Noise measurement data for construction plant used on quarries. July 2006.

Eng-Tips Forum, 2008. Wet dust suppression-air/water or just water, thread 454-197931, provides estimates of water use for air/water dust suppression systems, http://www.eng-tips.com/viewthread.cfm?qid=197931&page=1

Executive Order 12898. 1994. "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations." Signed February 11, 1994. 3 Code of Federal Regulations (CFR) 298 (1995 Comp.) Available at http://www.archives.gov/federal-register/executive-orders/1994.html.

Executive Order 13045. 1997. "Protection of Children From Environmental Health Risks and Safety Risks." Signed April 21, 1997. 3 Code of Federal Regulations (CFR) 298 (1998 Comp.)Available at http://www.archives.gov/federal-register/executive-orders/1997.html.

Federal Transit Administration (FTA). 1995. Transit Noise and Vibration Impact Assessment, Final Report, April 1995. U.S. Department of Transportation. DOT-T-95-16.

Fidell, S. et al. 1983. Community Response to Blasting. Journal of the Acoustical Society of America 74(3), September 1983.

Fischer, T.D., D.C. Backlund, K.F. Higgins, and D.E. Naugle. 1999. A field guide to South Dakota Amphibians. SDAES Bulletin 733. Brookings: South Dakota State University.

Fragile Legacy: Endangered, Threatened and Rare Animals of South Dakota. Report Number 91-04. Pierre, SD: South Dakota Department of Game Fish and Parks. Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/distr/others/sdrare/sdrare.htm (Version 08DEC97).

Frison, G. C., 1971. The Buffalo Pound in Northwestern Plains Prehistory: Site 48CA302, Wyoming. American Antiquity 36(1):77-91.

Gries, J. P. 1996. Roadside Geology of South Dakota. Mountain Press Publishing Company, Missoula (MT), 356 p.

Harris, C., ed. 1998. Handbook of Acoustical Measurements and Noise Control. Acoustical Society of America, Woodbury, New York.

Holl, K.D. 2002. Long-term revegetation recovery on reclaimed coal surface mines in the eastern USA. Journal of Applied Ecology 39(6): 960-970.

Holl, K.D. and J.Cairns, Jr. 1994. Vegetational community development on reclaimed coal surface mines in Virginia. Bulletin of the Torrey Botanical Club 121: 327-337.

Holm, E.H., T. Cline Jr., and R. Fivecoate, 2007, South Dakota – 2007 Mineral Summary Production, Exploration and Environmental Issues, South Dakota Department of Environment & Natural Resources Minerals and Mining Program.

International Organization for Standardization (ISO). 1996. Standard 9613-2, Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation.

Jenney, Walter Proctor, and Newton, Henry.1877. Bird's eye view of the Black Hills to illustrate the geological structure. In Geographical and Geological Survey of the Rocky Mountain Region (U.S.). Geographical and Geological Survey of the Rocky Mountain Region (U.S.).

Lovick, S. E. and S. A. Ahler, 1982. Cultural Resource Reconnaissance in the Knife River Indian Villages National Historic Site. Contribution 159, University of North Dakota, Dept. of Anthropology and Archeology, Grand Forks. Taken from Noisat and Sundstrum 1996.

LS Jensen, Inc. 2008. Water use estimate for road construction. Verbal communication between Louis Miller, LS Jensen, Inc. and Michael Connolly, Tetra Tech, July 25.

Marrone, G.M. 2006. A butterfly survey of the southern Black Hills and adjacent areas with emphasis on species monitored by the South Dakota Natural Heritage Program. Submitted to: South Dakota Department of Game, Fish and Parks, September 2006.

Natural Resource Conservation Service (NRCS). 2008. Soil Survey Staff, United States Department of Agriculture. Soil survey of Custer and Pennington Counties, Black Hills Parts, South Dakota [Online WWW]. Available URL: “http://soildatamart.nrcs.usda.gov/Survey.aspx?State=SD” [Accessed 06 February 2008].

Nelson, Gene, 2008. Email communication to Bill Craig. July 18, 2008. Gene Nelson, GCC Dacotah, Environmental Specialist.

Noisat, B. 1996. The PaleoIndians in Black Hills National Forest, Cultural Resources Overview, Volume 1 – Synthetic Summary. Pgs.2a1-2a5, Lance Rom, Tim Church and Michele Church, editors, U.S. Forest Service, Black Hills National Forest, Custer, South Dakota.

Noisat, B. and L. Sundstrom, 1996. Late Prehistoric in Black Hills National Forest, Cultural Resources Overview, Volume 1 – Synthetic Summary. Pgs. 2e1-2e15, Lance Rom, Tim Church and Michele Church, editors, U. S. Forest Service, Black Hills National Forest, Custer, South Dakota.

Noisat, B., 1999. Level III Heritage Resources Inventory of the Range South Grazing Allotments in the Black Hills National Forest, Custer/Elk Mountain Ranger District, Custer and Fall River Counties, South Dakota and Weston County, Wyoming. Project No. Ce-96-99. Prepared by Niwot Archeological Consultants, Sterling, Colorado.

NWIS, 2008. USGS 06395000 Cheyenne River at Edgemont, South Dakota, National Water Information System, USGS Surface-Water Monthly Statistics for South Dakota, United Stated Geological Survey, http://nwis.waterdata.usgs.gov/sd/nwis/monthly/?referred_module=sw&site_no=06395000&por_06395000_3=1412820,00060,3,1903-07,2007-10&format=html_table&date_format=YYYY-MM-DD&rdb_compression=file&submitted_form=p

OMB 2007. Office of Management and Budget. OMB BULLETIN NO. 08-01: Update of Statistical Area Definitions and Guidance on Their Uses. November 20, 2007, available online at http://www.whitehouse.gov/omb/bulletins/fy2008/b08-01.pdf.

Palmer, Linda, 2008. Personal communication from Linda Palmer, Augustana College, to Lynn M. Peterson, Tetra Tech, on Sept. 23, 2008.

Panjabi, A. 2001. Monitoring the birds of the Black Hills: Year 1 final report. Rocky Mountain Bird Observatory. Fort Collins, Colorado. http://www.fs.fed.us/r2/blackhills/projects/wildlife/index.shtml

Paris, C. A., F. S. Wagner, and W. H. Wagner. 1989. Cryptic species, species delimitation, and taxonomic practice in the homosporous ferns. American Fern Journal 79: 46-54.

PCO$_2$R, 2005. “Inyan Kara Formation Outline”, Plains CO$_2$ Reduction Partnership, Practical, Environmentally Sound CO$_2$ Sequestration, prepared by David W. Fischer, Fischer Oil and Gas, Inc., James A. Sorensen, Energy & Environmental Research Center, Steven A. Smith, Energy & Environmental Research Center, Edward N. Steadman, Energy & Environmental Research Center, John A. Harju, Energy & Environmental Research Center, September 2005.

Powertech Uranium Corporation., 2008, corporate website. http://www.powertechuranium.com/s/Home.asp

Rhyne, W.R. 1994. Hazardous Materials Transport Risk Analysis: Quantitative Approaches for Truck and Train. Van Nostrand Reinhold. New York, New York.

Rocky Mountain Bird Observatory (RMBO). 2008. Population densities and trend detection of avian species on the Black Hills National Forest. Tech. Rep. M-MBBH07-02

Roddy, Dan. 2008. Conversation between Stacy Pease, Tetra Tech, and Dan Roddy, Natural Resource Specialist, Wind Cave National Park, November 5, 2008.

SD Department of Environment and Natural Resources, 2008, Summary of the Mining Industry in South Dakota 2007, Prepared by The Minerals and Mining Program, May 2008, 29p. http://www.state.sd.us/denr/DES/mining/mineprg.htm

SD Department of Game, Fish and Parks (SDDGFP). 2007. Annual Harvest Report: Mountain Goats and Big Horn Sheep.

SD Department of Game, Fish and Parks. (SDDGFP). 2007. Statewide Cougar Summary 2007. www.sdgfdinfo/wildlife/mountainlions

SD Department of Game, Fish and Parks. (SDDGFP). 2008a. Black Hills Deer Management Plan 2008-2017.

SD Department of Game, Fish and Parks. (SDDGFP). 2008b. Greater Sage Grouse Management Plan South Dakota.

SD Department of Game, Fish and Parks. (SDDGFP). 2008c. Query of the South Dakota Natural Heritage Database: August 2008.

SD Department of Legislative Audit. (SDDLA) 2008. Annual Financial Report, Custer County, 2007. Available at http://apps.sd.gov/applications/DLASearches/countymenu.aspx.

SD Department of Revenue and Regulation. (SDDORR) 2008. "2007 Annual Report." Available at http://www.state.sd.us/drr2/publicat.htm .

SD GAP. 2001a. Reptiles and Amphibians of South Dakota. http://wfs.sdstate.edu/sdgap/herps.html

SD GAP. 2001b. SD GAP: Mammals of South Dakota. http://wfs.sdstate.edu/sdgap/mammal.html

SD Ornithologists' Union. (SDOU). 1991. The Birds of South Dakota, First revised edition and second edition. The South Dakota Ornithologists' Union. Northern State University Press. Aberdeen, South Dakota. 411pp.Sibert, John W. (Venice, CA), 1982. United States Patent 4473255, Application Number:06/447356, Publication Date: 09/25/1984, Filing Date:12/06/1982 Assignee: Atlantic Richfield Company (Los Angeles, CA)

SDDOE 2008a. South Dakota Department of Education. School District Profiles for 2006-2007. Available at http://doe.sd.gov/ofm/statdigest/07digest/profiles.asp.

SDDOE 2008b. South Dakota Department of Education. Issue Brief: State Aid to K-12 General Education Funding Formula. Available at http://doe.sd.gov/stateaid/docs/StateAid.pdf.

Sprague, Donovin. 2008. Area of Potential Effects (Ape) and Interviews with Tribal Members (Draft). On file, Bureau of Land Management South Dakota Field Office, 310 Roundup Street, Belle Fourche, South Dakota 57717.

Sundstrum, L., 1989. Cultural History of the Black Hills with Reference to Adjacent Areas of the Northern Great Plains. Reprints of Anthropology, Volume 40. J&L Reprints, Lincoln, NE. Taken from Buechler 1999.

Sundstrom, L., 1996a. Middle Plains Archaic in Black Hills National Forest, Cultural Resources Overview, Volume 1 – Synthetic Summary. Pgs. 2c1-2c22, Lance Rom, Tim Church and Michele Church, editors, U. S. Forest Service, Black Hills National Forest, Custer, South Dakota.

Sundstrom, L., 1996b. Late Plains Archaic in Black Hills National Forest, Cultural Resources Overview, Volume 1 – Synthetic Summary. Pgs. 2d1-2d23, Lance Rom, Tim Church and Michele Church, editors, U. S. Forest Service, Black Hills National Forest, Custer, South Dakota.

Sundstrom, L., 1999. Living on the Edge: Archaeological and Geomorphological Investigations in the Vicinity of Tepee and Hell Canyons, Western Custer County, South Dakota. Day Star Research, Shorewood, WI.

Theis, Charles V., 1935. "The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground-water storage". Transactions, American Geophysical Union 16: 519–524.C. V., 1935.

Tratebas, A. M., 1986. Black Hills Settlement Patterns: Based on a Functional Approach. Ph.D. dissertation, Indiana University, Dept. of Anthropology. Taken from Noisat 1996.

U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM). 2005. Operational Noise Manual, An Orientation for Department of Defense Facilities, November 2005.

U.S. Census Bureau. (USCB). 1995. Population Division. South Dakota Population of Counties by Decennial Census: 1900 to 1990. Available at http://www.census.gov/population/cencounts/sd190090.txt.

U.S. Environmental Protection Agency (EPA) 1971. Effects of Noise on Wildlife and Other Animals. NTID300.5 (N-96-01 II-A-233).

U.S. Environmental Protection Agency (EPA). 1979. Protective Noise Levels, Condensed Version of EPA Levels Document. EPA 550/9-79-100 (N-96-01 II-A-86).

U.S. Environmental Protection Agency. (USEPA) 1998. Final Guidance For Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. April, 1998. Available at <www.epa.gov/compliance/resources/policies/ej/ej_guidance_nepa_epa0498.pdf>.

US Census Bureau. (USCB) 2000a. Census of Population and Housing, 2000a. Summary File 1 (SF 1) – 100-Percent Data. Available at http://factfinder.census.gov/.

US Census Bureau. (USCB) 2000b. Demographic Profile, United States. Table DP-1. Profile of General Demographic Characteristics: 2000. Available at http://censtats.census.gov/pub/Profiles.shtml.

US Census Bureau. (USCB) 2000c. Demographic Profile, South Dakota. Table DP-1. Profile of General Demographic Characteristics: 2000. Available at http://censtats.census.gov/pub/Profiles.shtml.

US Census Bureau. (USCB) 2000d. Demographic Profile, Custer County, South Dakota. Table DP-1. Profile of General Demographic Characteristics: 2000. Available at http://censtats.census.gov/pub/Profiles.shtml.

US Census Bureau. (USCB) 2000e. Demographic Profile, Falls River County, South Dakota. Table DP-1. Profile of General Demographic Characteristics: 2000. Available at http://censtats.census.gov/pub/Profiles.shtml.

US Census Bureau. (USCB) 2000f. Demographic Profile, Pennington County, South Dakota. Table DP-1. Profile of General Demographic Characteristics: 2000. Available at http://censtats.census.gov/pub/Profiles.shtml.

US Census Bureau. (USCB) 2000g. Census of Population and Housing, 2000. Summary File 3 (SF 3) – Sample Data. Available at http://factfinder.census.gov/.

US Fish and Wildlife Service. (USFWS). 2007. Mountain Prairie Region, South Dakota Ecological Services Field Office: Endangered Species List by County. December 18, 2007. http://www.fws.gov/southdakotafieldoffice/endsppbycounty.htm

US Fish and Wildlife Service. (USFWS). 2008. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. August 8, 2008. http://www.nwi.fws.gov.

US Forest Service. 1996. Revised Land and Resource Management Plan Final EIS. Black Hills National Forest.

US Forest Service. 2000. Expert interview summary for the Black Hills National Forest Land and Resource Management Plan amendment. Black Hills National Forest, October 2000.

US Forest Service. 2001. Black Hills National Forest monitoring and evaluation report for fiscal year 2000 (October 1999 through September 2000). Black Hills National Forest, Custer, South Dakota

US Forest Service. 2005a. Black Hills Species of Local Concern. September 22, 2008. http://www.fs.fed.us/r2/blackhills/projects/planning/assessments/phase_II/solc/solc_report_2005_0321.pdf.

US Forest Service. 2005b. Black Hills National Forest 4-11 Forest-Wide Roads Analysis Report.

US Forest Service. 2005c. Selection of Management Indicator Species Black Hills National Forest Phase II Plan Amendment. May 4, 2005.

US Forest Service. 2007. Rocky Mountain Region: Endangered, Threatened, Proposed and Sensitive Species, August 6, 2007.

US Forest Service. 2007a. Rocky Mountain Region: Endangered, Threatened, Proposed and Sensitive Species, August 6, 2007

US Forest Service. 2007b. Rocky Mountain Region: Endangered, Threatened, Proposed and Sensitive Species, June 8, 2007

US Forest Service. 2008. Regional Forester's Sensitive Species Plant List. May 8, 2008. http://www.fs.fed.us/r2/projects/scp/sensitivespecies/index.shtml.

US Geological Survey. (USGS) 2008a, Earthquake Search Results, Http://Neic.Usgs.Gov/Cgi-Bin/Epic/Epic.Cgi?SEARCHMETHOD=3&SLAT2=0.0&SLAT1=0.0&SLON2=0.0&SLON1=0.0&FILEFORMAT=1&SEARCHRANGE=HH&CLAT=43.3230&CLON=-104.023&CRAD=100&SUBMIT=Submit+Search&SYEAR=&SMONTH=&SDAY=&EYEAR=&EMONTH=&EDAY=&LMAG=&UMAG=&NDEP1=&NDEP2=&IO1=&IO2=

US Geological Survey. (USGS) 2008b, South Dakota Earthquakes. Available online at http://earthquake.usgs.gov/regional/states.php?region=South%20Dakota.

US Geological Survey. 2003. "Ground-Water Resources in the Black Hills Area, South Dakota", by Janet M. Carter and Daniel G. Driscoll, U.S. Geological Survey, and J. Foster Sawyer, South Dakota Department of Environment and Natural Resources, Water-Resources Investigations Report 03-4049.

Wick, A.F., P.D. Stahl, S. Rana and L.J. Ingram. 2007. Recovery of reclaimed soil structure and function in relation to plant community composition. Presented at the ASMR National Meeting, Gillette WY, June, 2-7, 2007. R.I. Barnhisel (Ed.) Published by ASMR, 3134 Montavesta Rd., Lexington, KY 40502.

Winham, R. P., L. A. Hannus, Ed. J. Lueck, L. Palmer and L. Rossum. 2005. National Register of Historic Places Evaluations for the Proposed GCC Dacotah Limestone Mining Project with the Bureau of Land Management in Southwestern Custer County, South Dakota, Parts I and II. Prepared by the Archeology Laboratory, Augustana College, Sioux Falls, South Dakota for GCC Dacotah, Rapid City, South Dakota.

Winham, R. P., L. Palmer, F. Sellet and E. J. Lueck, 2001. Intensive (Class III) Cultural Resources Inventory Survey of the Dacotah Cement Land Exchange Proposal with the Bureau of Land Management in Southwestern Custer County, South Dakota. Volumes 1-6. Prepared by Archeology Laboratory, Augustana College, Sioux Falls, SD.

WMA, 2008. A Description of the Uranium In-Situ Mining Process, Uranium In-Situ Mining, Wyoming Mining Association, http://www.wma-minelife.com/uranium/insitu/insitufr.htm.