

**Table 4.5-1
Comparison of Emission Increases to EPA Thresholds for the 20 million net tons/year
for Spring Creek Segment**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Pennington/ Custer	43.29	100	2.70	100	7.26	100	1.83	100	4.55	100	0.00015	0.6

Gross Ton Increase: 28,967,000.00
 Fuel Efficiency Factor (ton miles per gallon): 993.80
 Total length of Segments (miles): 8.5

**Table 4.5-2
Comparison of Emission Increases to EPA
Thresholds for the 20 million net tons/year for Phiney Flat Alternative**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Pennington/ Custer	52.45	100	3.28	100	8.80	100	2.22	100	5.51	100	0.00018	0.6

Gross Ton Increase: 28,967,000.00
 Fuel Efficiency Factor (ton miles per gallon): 993.80
 Total length of Segments (miles): 10.3

**Table 4.5-3
Comparison of Emission Increases to EPA Thresholds
for the 50 million net tons/year for Spring Creek Segment**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Pennington/ Custer	102.98	100	6.43	100	17.28	100	4.35	100	10.82	100	0.0004	0.6
Gross Ton Increase: 68,915,700.00 Fuel Efficiency Factor (ton miles per gallon): 993.80 Total length of Segments (miles): 8.5												

**Table 4.5-4
Comparison of Emission Increases to EPA Thresholds
for the 50 million net tons/year for Phiney Flat Alternative**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Pennington/ Custer	124.79	100	7.79	100	20.94	100	5.28	100	13.11	100	0.0004	0.6
Gross Ton Increase: 68,915,700.00 Fuel Efficiency Factor (ton miles per gallon): 993.80 Total length of Segments (miles): 10.3												

**Table 4.5-5
Comparison of Emission Increases to EPA Thresholds
for the 100 million net tons/year for Spring Creek Segment**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Pennington/ Custer	201.05	100	12.56	100	33.74	100	8.50	100	21.12	100	0.0007	0.6
Gross Ton Increase: 134,539,615.00 Fuel Efficiency Factor (ton miles per gallon): 993.80 Total length of Segments (miles): 8.5												

**Table 4.5-6
Comparison of Emission Increases to EPA Thresholds
for the 100 million net tons/year for Phiney Flat Alternative**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Pennington/ Custer	243.63	100	15.22	100	40.89	100	10.30	100	25.59	100	0.0008	0.6
Gross Ton Increase: 134,539,615.00 Fuel Efficiency Factor (ton miles per gallon): 993.80 Total length of Segments (miles): 10.3												

Based on SEA’s analysis, NO_x emissions are predicted to exceed EPA thresholds at the 50 MNT and 100 MNT levels of operation for both the Spring Creek and Phiney Flat alignments. Therefore, the results of the CALPUFF air dispersion modeling were reviewed to determine if the impacts from the new rail traffic would be expected to exceed the NAAQS or PSD Class II increments. These increments are presented in Section 4.4.8. The results of the CALPUFF analysis indicated there would be no exceedence of either the NAAQS or PSD Class II increments (Appendix E).

Additionally, SEA used the CALPUFF model to determine the potential impacts of the Extension Alternatives to the visibility at Class I airsheds. This analysis included emissions over these alternatives. The results of SEA’s visibility analysis are presented in Section 4.4.21.

4.5.5 NOISE

The construction and operation of the Spring Creek Segment and Phiney Flat Alternative would increase noise levels along the rail line, as discussed in Section 4.4.9. Operation of construction equipment and train traffic meeting the Board’s environmental analysis threshold for noise evaluation would occur along the entire alignment of these alternatives. Tables 4.5-7 through 4.4-12 show the number of noise sensitive receptors expected to experience noise levels exceeding 65 dBA L_{dn} and the county within which each receptor occurs. County totals are in bold and include both the sensitive receptors within and outside the communities. Noise sensitive receptors within the 65 dBA L_{dn} noise level due to wayside noise, wayside and horn noise, and horn noise only are provided. Tables 4.4-13 through 4.4-18 show the same information but for the number of noise sensitive receptors exceeding 70 dBA L_{dn}. No communities would be affected by either alternative.

Table 4.5-7 Spring Creek Segment Number of Noise Sensitive Receptors - 65 dBA L_{dn} for 8 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
1	0	0	1

Table 4.5-8 Phiney Flat Alternative Number of Noise Sensitive Receptors - 65 dBA L_{dn} for 8 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	1	1

Table 4.5-9 Spring Creek Segment Number of Noise Sensitive Receptors - 65 dBA L_{dn} for 18 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
1	0	1	2

Table 4.5-10 Phiney Flat Alternative Number of Noise Sensitive Receptors - 65 dBA L_{dn} for 18 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	1	1

Table 4.5-11 Spring Creek Segment Number of Noise Sensitive Receptors - 65 dBA L_{dn} for 34 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
1	0	1	2

Table 4.5-12 Phiney Flat Alternative Number of Noise Sensitive Receptors - 65 dBA L_{dn} for 34 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	3	3

Table 4.5-13 Spring Creek Segment Number of Noise Sensitive Receptors - 70 dBA L_{dn} for 8 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	0	0

Table 4.5-14 Phiney Flat Alternative Number of Noise Sensitive Receptors - 70 dBA L_{dn} for 8 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	0	0

Table 4.5-15 Spring Creek Segment Number of Noise Sensitive Receptors - 70 dBA L_{dn} for 18 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	0	0

Table 4.5-16 Phiney Flat Alternative Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 18 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	0	0

Table 4.5-17 Spring Creek Segment Number of Noise Sensitive Receptors - 70 dBA L_{dn} for 34 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	1	1

Table 4.5-18			
Phiney Flat Alternative			
Number of Noise Sensitive Receptors - 70 dBA L_{dn} for 34 Trains Per Day			
Wayside	Wayside/Horn	Horn	Total
0	0	1	1

The scattered, rural nature of the project area for these alternatives results in few noise-sensitive receptors being exposed to noise levels of concern. Even at the 100 MNT level of operation, only two and three noise sensitive receptors would experience noise levels of 65 dBA L_{dn} or greater for the Spring Creek Segment and Phiney Flat Alternative, respectively. Only one of these receptors would be exposed to noise levels of 70 dBA L_{dn} or greater for each of these alternatives, and only under the 100 MNT level of operation. One house located along the Spring Creek Alternative would be within 100 feet of the proposed alignment. No houses along the Phiney Flat Alternative would be located within 100 feet of the proposed alignment. Neither of these alternatives is considered by SEA to have a significant impact on noise sensitive receptors.

4.5.6 BIOLOGICAL RESOURCES

4.5.6.1 Vegetation

Impacts to vegetation from the Spring Creek Alternatives would be similar to those discussed in Section 4.4.10. They would primarily include the loss of vegetative cover due to construction activities converting the area to rail line right-of-way.

Spring Creek - Alternative B

This alternative would cross 8.3 miles (approximately 402.4 acres) of grasslands and 0.2 mile (9.7 acres) of forested wetlands.

Spring Creek - Alternative C

This alternative would cross 7.7 miles (approximately 373.3 acres) of grasslands, 0.6 mile (approximately 29.1 acres) of cropland and pasture, and 0.2 mile (approximately 9.7 acres) of forested wetlands.

Phiney Flat

The Phiney Flat Alternative would cross 4.6 miles (approximately 223.0 acres) of grasslands, 5.7 miles (approximately 276.4 acres) of croplands and pastures, and 1.0 acre of emergent wetlands.

4.5.6.2 Wildlife

4.5.6.2.1 Big Game

Impacts to big game would be similar to those mentioned previously in Section 4.4.11.1. The only quantifiable impact to big game is the amount of habitat in the species' seasonal ranges converted to rail line right-of-way. Table 4.5-19 lists the number of miles of seasonal ranges crossed by each alternative and the acres converted to rail line right-of-way.

Big Game Species and Seasonal Range Category	Spring Creek - Alternative B		Spring Creek - Alternative C		Phiney Flat	
	miles	acres	miles	acres	miles	acres
Pronghorn						
Winter Range	8.5	412.1	8.5	412.1	1.3	63.0
Yearlong Range	<0.1	<4.8	1.5	72.7	9.4	455.8
Mule Deer/White-tailed Deer						
Winter Range	8.3	402.4	8.1	392.7	1.6	77.6
Yearlong Range	8.5	412.1	8.5	412.1	10.3	499.4
* In South Dakota, lands may be classified as more than one type of seasonal range, therefore the totals for ranges may be greater than the length of the Alternative.						

4.5.6.2.2 Game Species

Upland Game Birds

Construction and operation impacts resulting from new rail line to upland game birds are discussed in detail in Section 4.4.11.2. Impacts would include habitat fragmentation and loss and noise disturbance, particularly to mating rituals performed by male sage grouse during the spring mating season. However, impacts to sage grouse are not anticipated as no sagebrush habitat is

crossed by these alternatives. Leks identified along the alternatives are therefore likely sharp-tailed grouse leks to which some disturbance may occur. Upland game birds could also be subject to direct mortality during construction and operation of any alternative.

Spring Creek - Alternative B

This alternative would have 1 grouse lek within 0.25 mile and 3 leks within 1.0 mile. No sagebrush habitat suitable for sagegrouse, but approximately 0.2 mile (9.7 acres) of woodland habitat suitable for wild turkey roosting and cover would be converted to rail line right-of-way by this alternative.

Spring Creek - Alternative C

This alternative would have 1 grouse lek within 0.25 mile and 2 leks within 1.0 mile. No sagebrush habitat suitable for sagegrouse and no woodland habitat suitable for wild turkey roosting and cover would be crossed by this alternative.

Phiney Flat

This alternative would have 2 grouse leks within 0.25 mile and 3 leks within 1.0 mile. No sagebrush habitat suitable for sagegrouse and no woodland habitat suitable for wild turkey roosting and cover would be crossed by this alternative.

Waterfowl

Potential impacts to waterfowl from construction and operation of new rail line are discussed in detail in Section 4.4.11.2. Impacts from these alternatives would generally include loss of nests and nesting habitat in grassland areas, loss of wetland habitat for adults and brood rearing, and disturbance.

Spring Creek - Alternative B

This alternative would convert 8.3 miles (approximately 402.4 acres) of grassland habitat to rail line right-of-way. It would cross 16 perennial and 23 intermittent streams and would convert approximately 9.7 acres of forested wetlands to rail line right-of-way.

Spring Creek - Alternative C

This alternative would convert 7.7 miles (approximately 373.3 acres) of grassland habitat and 0.6 mile (29.1 acres) of cropland and pasture that could provide nesting habitat for waterfowl to rail line right-of-way. It would cross 26 perennial and 44 intermittent streams and would convert approximately 9.7 acres of forested wetlands to rail line right-of-way.

Phiney Flat Alternative

The Phiney Flat Alternative would convert approximately 4.6 miles (223.0 acres) of grasslands and 5.7 miles (276.4 acres) of croplands and pasture that could provide nesting habitat for waterfowl to rail line right-of-way. This alternative would not result in any significant loss of wetlands but would require new crossings for 1 perennial and 13 intermittent streams.

Small Game and Furbearers

Potential impacts from new rail line construction and operation to small game animals and furbearers are discussed in Section 4.4.11.2. Those impacts would be similar to the types of impacts expected from either the Spring Creek Segment or Phiney Flat Alternative. As these species are found in nearly all habitats and are wide ranging, construction of either alignment would have the potential to disturb them and reduce their habitat. Both alternatives would also likely result in some mortality to these species during operation. However, because the Spring Creek Segment generally follows the riparian areas of the drainage and includes numerous crossing of Spring Creek, it would likely affect a larger amount of habitat for furbearers, as these species would tend to utilize the riparian areas along the creek much more than the grasslands and croplands along Phiney Flat. This would be especially true for species such as beaver, mink, and muskrat.

4.5.6.2.3 Non-Game Species

Amphibians and Reptiles

The construction and operation impacts to amphibians and reptiles discussed in Section 4.4.11.3 would be similar to those expected for the Spring Creek Segment and Phiney Flat Alternative. Reptiles and amphibians could occur anywhere along the alternatives and their lack of mobility makes them susceptible to mortality during construction and operation of a rail line. However, the Spring Creek Segment would likely have a greater impact to these species due to its location along Spring Creek, which provides a reliable source of water for amphibian habitat and

breeding and foraging areas for reptiles, as well as potential habitat for such species as aquatic turtles and water snakes.

Songbirds

The primary impact to songbirds from construction and operation of the proposed alignment alternatives would be the loss of nesting habitat. Songbirds within the project area include both ground and tree nesters. However, the limited amount of woody vegetation in the area make loss of this type of habitat more important to the species that utilize it. The Spring Creek Segment would convert approximately 9.7 acres of woodlands to rail line right-of-way while the Phiney Flat Alternative would result in no loss of woodland. Additionally, the Spring Creek Segment would also convert between approximately 378.2 and 402.4 acres of grassland to rail line right-of-way compared to 223.0 acres of grassland for Phiney Flat Alternative, a better habitat for ground nesting birds than the remaining 276.4 acres of cropland and pasture found along the Phiney Flat Alternative.

Shorebirds

Impacts to shorebirds would be similar to those discussed for waterfowl. The Spring Creek Segment would likely have a greater impact on shorebirds than Phiney Flat Alternative because the Spring Creek Segment would have numerous crossings of Spring Creek and cross more riparian areas.

Small Mammals

Small mammals would be impacted during construction and operation by loss of habitat and mortality, as discussed in Section 4.4.11.3. Small mammals are expected to occur throughout the project area and along both alternatives. Differences in habitat (grassland and woodland for Spring Creek and grassland, pasture, and cropland for Phiney Flat) may result in different species or numbers of individuals of a species along the alternative alignments. Loss of habitat and any mortality are expected to be similar for both alternatives due to the similar habitats affected. Overall, the Spring Creek Segment would likely be of greater impact than the Phiney Flat Alternative due to the loss of approximately 9.7 acres of woodland. Because this habitat is uncommon in southwestern South Dakota, those species relying on it have fewer adjacent areas to move into. However, because of the high reproductive potential of small mammal species and the limited amount of woodland lost, both the alternatives would have similar and generally minimal impacts to small mammal populations.

Raptors

The potential impacts to raptors from the Spring Creek Segment and Phiney Flat Alternative would be similar to those discussed in Section 4.4.11.3. However, no raptor nests would be impacted by either of these alternatives. Woodland habitat (9.7 acres plus adjacent areas that would be disturbed by construction and operation activities) potentially providing nesting trees for raptors would be lost along the Spring Creek Segment. Both alternatives would convert foraging lands and potential ground-nesting habitat to rail line right-of-way. Raptors could be struck by trains if feeding on carrion along the rail line during the winter.

Aquatic and Fisheries

Potential impacts to aquatic and fishery resources include loss of habitat and reduced water quality as discussed in Section 4.4.11.4. No trout streams are crossed by either of the alternatives. Impacts to aquatic and fishery resources would be most likely to occur in areas where the alternatives are in close proximity to streams or drainages or at stream crossings.

Spring Creek - Alternative B

This alternative would cross 16 perennial and 23 intermittent streams. Approximately 7.5 miles of the Spring Creek Segment would be within the Spring Creek drainage valley.

Spring Creek - Alternative C

The Spring Creek Segment for Alternative C would cross 26 perennial and 44 intermittent streams. Approximately 7.5 miles of the Spring Creek Segment would be within the Spring Creek drainage valley.

Phiney Flat

This alternative would cross 1 perennial and 13 intermittent streams. Except for one crossing of Spring Creek, this alternative would not be within any perennial drainageway. Rather, it would be located across the relatively flat area (Phiney Flat) located between Spring Creek and the Cheyenne River. The Phiney Flat Alternative would generally be approximately one mile or more from these drainages.

4.5.6.3 Endangered, Threatened, and Sensitive Species

The following section discusses the potential impacts to those Federally listed threatened or endangered species known to occur or potentially occur along the Spring Creek Alternatives.

4.5.6.3.1 Piping Plover

Spring Creek

Impacts to piping plovers would generally include disturbance to nesting pairs, loss of habitat (particularly nesting), and reductions in water quality that could affect the plovers food supply or ability to forage (Section 4.4.12.2). The only suitable nesting habitat for plovers in the project area is the Cheyenne River as other drainages are of insufficient size for sandbars suitable for nesting. The Spring Creek Segment would have no affect on plover nesting habitat or nesting plovers along the Cheyenne River as it does not cross it and would be a mile or more away. However, because approximately 7.5 miles of this segment would be in the Spring Creek drainage, it could impact water quality in the Cheyenne River downstream of the confluence between the two waterways. Soil disturbance during construction adjacent to Spring Creek and the numerous crossings could increase erosion and sedimentation into the creek, resulting in increased water turbidity. This turbidity would continue for some distance downstream of where Spring Creek enters the Cheyenne River. Plovers using this area for foraging could experience a reduction in invertebrates due to increased sedimentation. These impacts would only be expected during construction of the rail line and would only affect a small portion of the Cheyenne River.

Additionally, spills of petroleum products during construction and operation could affect aquatic invertebrates upon which piping plover feed. However, this impact would only occur if sufficient material is spilled and flows downstream in Spring Creek to the Cheyenne River, reaching it in sufficient concentrations to harm aquatic invertebrates. This impact is not anticipated due to the limited amounts of petroleum products potentially spilled and the distance (approximately two miles at its nearest point) such material would have to travel before entering the Cheyenne River.

Phiney Flat

The Phiney Flat Alternative would not cross the Cheyenne River and only cross Spring Creek once. Because it would generally be located a mile or more from the Cheyenne River, across relatively flat terrain, it would not result in a loss of plover nesting habitat, disturb nesting plovers, or likely contribute to erosion into the river that could affect the plover's food source. Additionally, the terrain makes it unlikely any hazardous materials such as diesel fuel, would reach

the Cheyenne River in the unlikely event of a spill or derailment. Only in the unexpected event of a spill or derailment at the single location where this alternative crosses Spring Creek, approximately one mile from the Cheyenne River, would a spill be a concern for piping plovers.

4.5.6.3.2 Interior Least Tern

Interior least terns utilize similar habitats as piping plovers (Section 4.1.8.4 and Appendix K), including in the project area for the Spring Creek Alternatives. Therefore, the potential impacts of the alternatives upon interior least terns would be similar to those discussed in Sections 4.4.12.3 and 4.5.8.1.

4.5.6.3.3 American Burying Beetle

The American burying beetle has not been documented in the vicinity of the Spring Creek Alternatives. However, they could occur in areas of suitable soils. Compaction of soil and earthmoving activities could make soils unsuitable for use by burying beetle or kill beetles already buried, as discussed in Section 4.4.12.5.

Spring Creek - Alternative B

No suitable soils for American burying beetle would be crossed by this alternative.

Spring Creek - Alternative C

Approximately 0.30 mile (approximately 14.5 acres) of suitable soils would be converted to rail line right-of-way by this alternative.

Phiney Flat

The Phiney Flat Alternative would cross approximately 3.6 miles (approximately 174.5 acres) of soils suitable for use by American burying beetles.

4.5.6.3.4 Bald Eagle

Areas along the corridor of the Cheyenne River could be potential bald eagle winter habitat. Impacts to wintering bald eagles would occur from human activity associated with project construction, operation and maintenance, as well as loss of habitat for nesting, perching and roosting (Section 4.4.12.7).

Spring Creek - Alternative B

Approximately 9.7 acres of woodland would be lost from construction of the Spring Creek Segment for Alternative B. Currently, most of this woodland is unsuitable for bald eagle use for roosting, nesting, or perching due to the size of the trees being too small. However, over time, some of the trees in this area could grow to a sufficient size to provide nesting and perching trees. Woodlands are not extensive enough in this area to provide suitable roosting areas as they would not provide shelter from severe winter weather. No bald eagle nests occur along the proposed Spring Creek Segment.

Spring Creek - Alternative C

No woodland would be lost from Alternative C. There is no bald eagle habitat or nests along this alternative.

Phiney Flat

No bald eagle nests exist along the alignment for the Phiney Flat Alternative. Except for a few scattered trees, no potential bald eagle habitat would be crossed by this alternative.

4.5.6.3.5 Mountain Plover

The potential impacts from the Spring Creek Alternatives to mountain plovers would be similar to those types of impacts discussed in Section 4.4.12.8. They would generally include destruction of nests during construction and disturbance to nesting birds leading to nest failure during both rail line construction and operation. Mountain plover nests and chicks would be particularly susceptible to mortality from vehicles and construction equipment, especially along two-track roads and where construction activities would cross prairie dog towns.

Spring Creek - Alternative B

The Spring Creek Segment of Alternative B would convert 8.3 miles (approximately 402.4 acres) of grasslands that are considered potential mountain plover nesting habitat to railroad right-of-way. Additionally, mountain plover appear to prefer prairie dog colonies for nesting because of the short-grass. There are 0.2 mile (approximately 9.7 acres) of prairie dog colonies along this alignment that would be converted to railroad right-of-way. Additional areas of these habitats adjacent to the right-of-way may be unsuitable for nesting due to human activity and noise during construction and operation.

Spring Creek - Alternative C

This alternative would convert approximately 7.7 miles of grasslands (approximately 373.3 acres) that are considered potential nesting habitat to railroad right-of-way. There are 0.4 mile (approximately 19.4 acres) of prairie dog colonies that would be converted to railroad right-of-way. Additional habitat adjacent to the right-of-way may be unsuitable for nesting due to human activity and noise during construction and operation.

Phiney Flat

The Phiney Flat Alternative would convert 4.6 miles of grasslands (approximately 223.0 acres) that are considered potential nesting habitat to railroad right-of-way. There are 0.3 mile (approximately 14.5 acres) of prairie dog colony that would be converted to railroad right-of-way. Additional habitat adjacent to the right-of-way may be unsuitable for nesting due to human activity and noise during construction and operation.

4.5.6.3.6 Swift Fox

Swift fox may occur in a variety of habitats throughout the project area (Section 4.4.12.9 and Appendix K). Swift fox are known to utilize prairie dog colonies, primarily for prey. Therefore the amount of prairie dog colony converted to rail line serves as a means to compare the potential impacts of each alternative.

Spring Creek - Alternative B

This alternative would convert approximately 0.2 mile (approximately 9.7 acres) of prairie dog colonies to rail line right-of-way.

Spring Creek - Alternative C

The Alternative C alignment for the Spring Creek Segment would result in the conversion of approximately 0.4 mile (approximately 19.4 acres) of prairie dog colonies to rail line right-of-way.

Phiney Flat

The Phiney Flat Alternative would convert 0.3 mile (approximately 14.5 acres) of prairie dog colony to rail line right-of-way.

4.5.6.3.7 Sturgeon Chub

Increased sedimentation in the Cheyenne River during construction could impact sturgeon chub. Increased silt in the water from erosion can reduce water quality and be harmful to chubs as well as increasing sedimentation that could reduce chub habitat (Section 4.4.12.10).

Spring Creek

The Spring Creek Segment does not cross the Cheyenne River. However, as discussed for the piping plover in Section 4.5.8.1, erosion into Spring Creek could increase sedimentation and dissolved solids in the Cheyenne River downstream of the confluence of the two streams. Any such impacts would likely be minimal due to the distance from the Cheyenne River (over one mile).

Phiney Flat

The Phiney Flat Alternative only crosses Spring Creek once and is generally more than a mile from either Spring Creek or the Cheyenne River. This distance, combined with the relatively flat terrain of the alignment make it unlikely that any erosion of disturbed areas in the right-of-way would impact nearby surface waters.

4.5.6.3.8 Black-tailed Prairie Dog

Direct impacts to black-tailed prairie dogs are most likely to occur during construction if the animals occur in the right-of-way. Burrows and dens of inhabited colonies and within the construction right-of-way would be destroyed. Some mortality to prairie dogs would also be expected during excavation and other earthmoving activities. During rail line operation, fragmentation of colonies could reduce their ability to sustain themselves as well as result in mortality to individuals crossing the rail line from one area of the colony to the other.

Spring Creek - Alternative B

This alternative would convert approximately 0.2 mile (approximately 9.7 acres) of prairie dog colonies to rail line right-of-way.

Spring Creek - Alternative C

The Alternative C alignment for the Spring Creek Segment would result in the conversion of approximately 0.4 mile (approximately 19.4 acres) of prairie dog colonies to rail line right-of-way.

Phiney Flat

The Phiney Flat Alternative would convert 0.3 mile (approximately 14.5 acres) of prairie dog colony to rail line right-of-way.

4.5.7 TRANSPORTATION

Transportation impacts would be similar to those described in Section 4.4.13. They would include increased vehicle traffic and delays at new grade crossings during construction and vehicle delays due to passing trains during operation. SEA concluded that the potential effect of increased train traffic for highways with ADT volumes below 5,000 would be experienced by very few drivers and the additional vehicular delay would be minimal. None of the Spring Creek Alternatives have any public highway/railroad grade crossings where ADT volumes are 5,000 or greater. Therefore, SEA did not calculate potential vehicle delay or queue at these new crossings.

Spring Creek

The Spring Creek Segment would have one new grade crossing of a public road. The new crossing would be of County Highway 121 in Custer County.

Phiney Flat

The Phiney Flat Alternative would have six new crossings of public roadways. These crossings would include Creston Folsom Road (C486) in Pennington County and four crossings of Creston Folsom Road (C220) and an unnamed county road in Custer County.

4.5.8 SAFETY

Construction and operation of a rail line has the potential to result in injury or loss of human life, particularly at locations where the rail line would cross an active roadway grade crossing. Vehicles operating across the rail line would be at risk of accidents during construction as well as being struck by a train during rail line operation. Section 4.4.14 provides a detailed discussion of the potential affects of construction and operation of new rail line on safety.

To further address potential accidents resulting from new grade crossings, SEA calculated accident frequency rates at all proposed public grade crossings. SEA's analysis procedure considered the type of warning devices at the highway/rail grade crossing, including passive devices (signs or crossbucks), flashing lights, or gates. The following presents the results of SEA's analysis for each county, at the various levels of proposed operation.

Spring Creek

Custer County

20 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Spring Creek Alternative at County Highway 121 (Milepost 625.50), the predicted accident frequency at the 20 MNT level of operation is 0.008. This frequency corresponds to 1 accident every 125 years. The proposed crossing in Custer County is classified as Category B (see Section 4.4.14 for a description of categories).

50 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Spring Creek Alternative at County Highway 121 (Milepost 625.50), the predicted accident frequency at the 50 MNT level of operation is 0.011. This frequency corresponds to 1 accident every 91 years. The proposed crossing in Custer County is classified as Category B.

100 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Spring Creek Alternative at County Highway 121 (Milepost 625.50), the predicted accident frequency at the 100 MNT level of operation is 0.015. This frequency corresponds to 1 accident every 67 years. The proposed crossing in Custer County is classified as Category B.

Phiney Flat

Pennington County

20 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Phiney Flat Alternative at County Highway Creston Road/C486 (Milepost 625.20), the predicted accident frequency at the 20 MNT level of operation is 0.015. This frequency corresponds to one accident every 67 years. The proposed crossing in Pennington County is classified as Category B.

50 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Phiney Flat Alternative at County Highway Creston Road/C486 (Milepost 625.20), the predicted accident frequency at the 50 MNT level of operation is 0.021. This frequency corresponds to 1 accident every 48 years. The proposed crossing in Pennington County is classified as Category B.

100 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Phiney Flat Alternative at County Highway Creston Road/C486 (Milepost 625.20), the predicted accident frequency at the 100 MNT level of operation is 0.027, which corresponds to 1 accident every 37 years. The proposed crossing in Pennington County is classified as Category B.

Custer County

20 MNT

SEA's safety analysis showed that for the 5 proposed public highway/railroad grade crossing along the Phiney Flat Alternative, the highest predicted accident frequency at the 20 MNT level of operation is 0.015. This corresponds to 1 accident every 67 years. The predicted rate was calculated for the crossings of Creston Folsom Road/C220 (Milepost 629.10, 630.10, 630.60, and 631.67). The proposed crossings in Custer County are all classified as Category B.

50 MNT

SEA's safety analysis showed that for the 5 proposed public highway/railroad grade crossing along the Phiney Flat Alternative, the highest predicted accident frequency at the 50 MNT level of operation is 0.021. This corresponds to 1 accident every 48 years. The predicted rate was calculated for each crossings of Creston Folsom Road/C220 (Milepost 629.10, 630.10, 630.60, and 631.67). The proposed crossings in Custer County are all classified as Category B.

100 MNT

SEA's safety analysis showed that for the 5 proposed public highway/railroad grade crossing along the Phiney Flat Alternative, the highest predicted accident frequency at the 100 MNT level of operation is 0.027. This corresponds to 1 accident every 37 years. The predicted rate was calculated for crossings of Creston Folsom Road/C220 (Milepost 629.10, 630.10, 630.60, and 631.67). The proposed crossings in Custer County are all classified as Category B.

4.5.9 HAZARDOUS MATERIALS

Section 4.4.15 provides a detailed discussion of the potential project related impacts to hazardous materials transportation and sites. Because no hazardous materials are anticipated to be transported over Alternatives B or C, neither of the Spring Creek Alternatives would have any impact on their transportation. No hazardous waste sites have been identified along either of the alternatives. However, construction of either rail line could impact them if unknown sites are located within the rail line right-of-way. DM&E should coordinate with the EPA and South Dakota Department of Environment and Natural Resources to obtain specific information on the location of know hazardous materials sites. However, due to the undeveloped and remote location of these alignments, no such sites are anticipated to occur along either the Spring Creek Segment or the Phiney Flat Alternative.

4.5.10 ENERGY RESOURCES

Section 4.4.16 provides a detailed discussion of the potential impacts of the new rail line extension on energy resources, both their transportation and utilization, and on recyclable commodities. The Spring Creek Alternatives would contribute to the impacts discussed in this section. The Phiney Flat Alternative would potentially be less fuel efficient due to it being 1.8 miles longer than the Spring Creek Segment. However, grade considerations with both alternatives, resulting in trains operating up- and downhill along these alternatives, would likely make them similar in overall fuel consumption. No recyclable commodities would be transported by either alternative.

4.5.11 CULTURAL RESOURCES

Cultural resources occur throughout the project area and could be affected if important archaeological or historic sites are damaged or destroyed, particularly if they could add to the understanding of the area's human occupation. The potential types of impacts that could occur to cultural resources as a result of new rail line construction and operation are discussed in Section 4.4.17.

Construction and operation of the Spring Creek Alternatives have the potential to affect cultural resources by damaging or destroying them or altering the setting in which they occur. However, during construction, cultural materials encountered could be recovered and preserved for future study and research. Only two cultural resource sites are known along the Spring Creek Alternatives. However, each of the alternatives is considered to have a high potential for encountering archaeological sites, including sites of significance and eligible for the NRHP. The lack of known sites along the alternatives is most probably due to the lack of archaeological survey and study in the area due to its remoteness and undeveloped character.

Spring Creek

No known cultural resource sites are located along the Spring Creek Segment of Alternative B. However, this segment is considered to have a high potential for such resources due to its proximity to both the Cheyenne River and Spring Creek. It would have provided a reliable source of water and sheltered valleys that would have been attractive for campsites and hunting areas in prehistoric times.

Phiney Flat

Two known archaeological sites are located outside the proposed rail line right-of-way but within 1.0 mile of the Phiney Flat Alternative. These sites include a Euro-American depression and a Native American stone circle. This segment is considered to have a high potential for such resources due to its proximity to the Cheyenne River. It would have provided a reliable source of water and sheltered valley that would have been attractive for campsites and hunting areas in prehistoric times.

4.5.12 SOCIOECONOMICS

The Spring Creek Alternatives comprise a portion of the construction and operation of new rail line that would occur throughout Pennington and Custer Counties. Because they comprise only a small portion and are only 1.8 miles different in length, the overall difference in

their anticipated socioeconomic impacts to the counties in which they are located should be minimal. Therefore, the socioeconomic impacts of the Spring Creek Alternatives are included as part of the total socioeconomic impacts anticipated for the project. These impacts are discussed in detail in Section 4.4.16.

4.5.13 ENVIRONMENTAL JUSTICE

None of the Spring Creek Alternatives would potentially impact any environmental justice communities.

4.5.14 RECREATION

Impacts to recreation from the Spring Creek Alternatives would be similar in nature for each of the proposed alignments. The type of potential impacts would be similar to those discussed in Section 4.4.20. Generally, these impacts would include disturbance to individuals participating in a variety of recreational activities such as hunting, camping, horseback riding, and hiking. Additional lands adjacent to the right-of-way may also be considered by the public or landowners as undesirable due to trains disturbing horses during riding, game during hunting, and campers trying to sleep. During construction and operation, big game hunting (an important recreational activity in the area) may be particularly affected by noise and human presence. Noise and human activities would both cause game to seek areas undisturbed by these activities and, for safety reasons, require hunters to avoid areas near the rail line. This would further reduce the lands available for recreation.

In addition to noise disturbance, rail line construction and operation may also reduce the attractiveness of an area for recreation due to the alteration of the visual setting of the area. Construction and operation of a rail line would create an intrusion into the landscape considered by some to be unattractive, resulting in individuals changing their recreational patterns to avoid areas within site of the rail line.

Because these alternatives cross mainly private lands, as discussed for each alternative below, and the alternatives pass through remote areas, impacts to recreation would generally occur to a small number of individuals, including landowners, their families, and guests.

Spring Creek - Alternative B

This alternative would cross 2.1 miles of lands that are part of BGNG. For safety reasons, the lands within the right-of-way, approximately 101.8 acres, would be fenced and removed from

public use. The remaining 6.1 miles of this alternative would directly remove approximately 310.3 acres of private land from use for recreation.

Spring Creek - Alternative C

This alternative would cross 0.2 mile of BGNG, removing approximately 9.7 acres of public land from recreational use. Approximately 402.4 acres of private land would be directly converted to rail line right-of-way for the remaining 8.3 miles and removed from potential recreational use.

Phiney Flat

No public lands would be crossed by this alternative. Construction of the 10.3-mile Phiney Flat Alternative would directly remove approximately 499.4 acres from recreational use.

4.5.15 AESTHETICS

Section 4.4.21 provides a detailed discussion of the potential project related impacts to the aesthetics of the project area. As noted in Section 4.4.21, no designated scenic areas or overlooks occur along the project alternatives, although many areas are considered by landowners and visitors as scenic. The same is true for the Spring Creek Alternatives. Additionally, the USFS has developed VQOs for lands under its management in an attempt to quantify the scenic value of its areas (Section 4.4.21). Each of these alternatives would create a visual intrusion into the current landscape, altering the visual quality.

There is also concern that emissions from operating locomotives could contribute to regional haze and impact visibility of nearby Class I airsheds (Badlands National Park/Sage Creek Wilderness Area and Wind Cave). The minimal emissions that would result along the Spring Creek Alternatives due to their short length would not result in any reduction in air quality for these areas. However, as part of the total project, emissions along these alternatives could affect air quality for these areas. Section 4.4.21 discusses the potential air quality impacts to Class I areas and includes the emissions that would result from the Spring Creek Alternatives.

Spring Creek - Alternative B

This alternative would cross 2.1 miles of BGNG that has a VQO of modification. The Spring Creek Segment would be constructed largely within the Spring Creek drainage, a winding drainage between two higher, flat areas that provide a vantage point for the viewer. The creek is a mixture of wooded vegetation and grassland which would require clearing and numerous cuts,

fills, and bridges or culverts for the stream crossing. This segment would create an obvious visual intrusion into this area. Although the remoteness of the area would limit the individuals affected by the change, it would likely be considered an undesirable view compared to that currently present by those that would see it.

Spring Creek - Alternative C

This alternative would cross 0.2 mile of BGNG that has a VQO of modification. Because of the proximity of the Spring Creek alignments for Alternatives B and C, other impacts from this alternative on aesthetics would be similar to those discussed for Alternative B.

Phiney Flat

No USFS lands would be crossed by this alternative. The Phiney Flat Alternative would be located across generally flatter terrain, as compared to within a valley for the Spring Creek Segment. While the terrain may allow the rail line to be visible for a greater distance, it would be less noticeable due to the lack of higher vantage points along the alignment. Additionally, the Phiney Flat Alternative has six road crossings (compared to one for Spring Creek Segment) and crosses 5.7 miles of cropland (compared to less than 1.0 mile for Spring Creek Segment). While these uses of the area may increase the individuals that see the rail line, ground disturbance related to agricultural activities and the presence of roadways, linear transportation facilities like a rail line, may cause the rail line to present less of an intrusion into the landscape.

* * * * *

[THIS PAGE INTENTIONALLY LEFT BLANK]

4.6 HAY CANYON ALTERNATIVES

Three alternative alignments are proposed for the Hay Canyon area. As discussed in Chapter 2, these alternatives were developed due to environmental concerns raised by the USFWS and Reclamation. The original alignments through this area included the Hay Canyon Segment, originally the proposed alignment for use with Alternative C, and the Oral Segment, originally proposed for use with Alternative B. Because of concerns for riparian areas and wetlands by the USFWS, COE, and others along the Hay Canyon Alternative, DM&E developed the WG Divide Alternative alignment. However, this alternative raised concerns with Reclamation because it would cross irrigated lands that are part of the Angostura Irrigation District and could affect operation and maintenance of the Angostura Dam and Reservoir. SEA therefore evaluated the proposed alignments in the Hay Canyon area and determined that use of the Oral Alternative alignment would minimize the amount of irrigated lands impacted and also avoid the Hay Canyon area. SEA determined three feasible alternatives existed in the Hay Canyon area, and that any of the alternatives could be used in conjunction with either Alternative B or C.

The following discussion provides a comparison of the potential impacts of the Hay Canyon Alternatives. Information on the existing conditions along these alternatives is provided in Section 4.1. More detailed discussion of the types, nature, and significance of impacts to the various resources discussed below is included under each resource topic in Section 4.4.

4.6.1 GEOLOGY AND SOILS

Section 4.4.5 discusses the potential impacts to geology and soils that could result from new rail line construction and operation. Impacts would generally be expected to occur during the construction of new rail line and would include creation of unstable areas leading to slope slumps or landslides, clearing and soil disturbance resulting in increased erosion, and loss or damage to paleontological resources.

4.6.1.1 Geologic Hazards

Hay Canyon

This alternative would cross 0.9 mile (approximately 43.6 acres) of soils that have a high slump/landslide potential. The clay-mineral content of these rocks is moderate to high, so that they are susceptible to slumps and earth flows. The potential for slumps or landslides would also be high along the 2.7 miles where this alternative would cross steep slopes.

WG Divide

This alternative would cross 1.2 miles (approximately 58.2 acres) of soils that have a high slump/landslide potential. The potential for slumps or landslides would also be high along 2.8 miles where this alternative would cross steep slopes. Cutting or loading of slopes or unusually high precipitation could also cause landsliding in these formations.

Oral

This alternative would cross 4.3 miles (approximately 208.5 acres) of soils that have a high slump/landslide potential. Approximately 6.9 miles of the Oral Segment would be along steep slopes susceptible to slumps and landslides.

4.6.1.2 Soil Impacts

Hay Canyon

The impacts to soils would be similar to those discussed in Section 4.4.5.3. They include the loss of topsoil, sedimentation, erosion and the possible introduction and establishment of noxious weeds. The Hay Canyon Segment would disturb approximately 897.0 acres of soil over its 18.5-mile length, approximately 4.0 miles (193.9 acres) of which would cross soils with an erosion hazard. This alternative would cross 7.7 miles (approximately 373.3 acres) of prime farmland.

WG Divide

The types of impacts to soil would be similar to the Hay Canyon Segment. Construction of the WG Divide Alternative would disturb approximately 714.4 acres of soil along its 14.7-mile length. Of this length, approximately 7.3 miles (353.9 acres) would include soils with an erosion hazard. This alternative would cross 4.5 miles (approximately 218.2 acres) of prime farmland.

Oral

The 20.5-mile Oral Segment would include 13.3 miles of construction along new rail line right-of-way and 7.2 miles of reconstruction of existing rail line. However, the existing rail line reconstruction would likely involve extensive earthwork to optimize the existing rail line, which is currently unsuitable for movement of unit coal trains. Therefore, lands within the existing right-of-way, as well as additional lands outside the right-of-way would likely be disturbed by construction. Approximately 993.9 acres of soil would be disturbed from construction of the Oral

Segment. It would cross approximately 13.9 miles (673.9 acres) of soils with an erosion hazard. This alternative would cross 7.8 miles (approximately 378.2 acres) of soils classified as prime farmland.

4.6.1.3 Paleontological Resources

Hay Canyon

The Hay Canyon Segment would cross a total of 15.0 miles (approximately 727.3 acres) of formations with a PFYC of 5. Impacts to these areas would be similar to those discussed in Section 4.4.5.4. These include the chance of destruction of important fossils, particularly vertebrate fossils such as dinosaurs and prehistoric mammals.

WG Divide

The WG Divide Alternative would cross 14.5 miles (approximately 703.0 acres) of formations with a PFYC of 5. Impacts would be similar to those discussed in Section 4.4.5.4.

Oral

This alternative would cross 18.3 miles (approximately 887.3 acres) of formations with a PFYC of 5.

4.6.2 LAND USE

Potential project impacts to land use would include conversion of current land use to rail line right-of-way, preclusion of existing land uses within the right-of-way, and incompatibility with adjacent land uses. These impacts and others are discussed in more detail in Section 4.4.6. The following provides an overview of the land use types affected by each of the Hay Canyon Alternatives.

4.6.2.1 Agriculture

4.6.2.1.1 Rangeland/Grazing

Hay Canyon

This segment would cross 14.6 miles (approximately 707.9 acres) of rangeland. Impacts to this resource would be similar to those discussed in Section 4.4.6.1, including the direct loss of

forage during construction, fragmentation of allotments, isolation of water sources and disruption of operations. No grazing allotments on Federal lands would be crossed by this alternative.

WG Divide

This alternative would cross approximately 9.0 miles (approximately 436.4 acres) of rangeland. No grazing allotments on Federal lands would be affected by this alternative.

Oral

This alternative would cross 13.9 miles (approximately 673.9 acres) of rangeland. One BLM grazing allotment would be crossed by this alternative resulting in a disturbance of approximately 6.5 acres, equivalent to the loss of 0.8 AUMs.

4.6.2.1.2 Cropland

Hay Canyon

The Hay Canyon Segment would cross 1.8 miles (87.3 acres) of cropland. Portions of this cropland are likely to be irrigated as this segment also crosses 2.6 miles of the Angostura Irrigation District and 7.7 miles of prime farmland soils. Potential impacts to cropland are discussed in Section 4.4.2.

WG Divide

The WG Divide Alternative would cross 6.3 miles (305.5 acres) of cropland. Portions of this cropland are likely to be irrigated as this segment also crosses 5.8 miles of the Angostura Irrigation District and 4.5 miles of prime farmland soils. Potential impacts to cropland are discussed in Section 4.4.2.

Oral

The Oral Segment would cross 4.5 miles (218.2 acres) of cropland. Portions of this cropland are likely to be irrigated as this segment also crosses 1.5 miles of the Angostura Irrigation District and 7.8 miles of prime farmland soils. Potential impacts to cropland are discussed in Section 4.4.2.

4.6.2.2 Residential

No impacts to residential areas are expected for any of these alternatives.

4.6.2.3 Business and Industrial

No impacts to business and industrial areas are expected for any of the alternatives.

4.6.2.4 Mineral and Mining

No impacts to mineral resources are expected for any of these alternatives.

4.6.2.5 Federal Lands

4.6.2.5.1 Forest Service Lands

No impacts to USFS lands are expected for any of these alternatives.

4.6.2.5.2 Bureau of Land Management Lands

Hay Canyon

No BLM lands would be crossed by this alternative.

WG Divide

No BLM lands would be crossed by this alternative.

Oral

This alternative would cross one BLM allotment for approximately 0.3 mile. Approximately 6.5 acres of this allotment would be disturbed.

4.6.2.5.3 Bureau of Reclamation Lands

All three alternatives would impact the Angostura Irrigation District. The area covered by this district is considered to be the Cheyenne River drainage from just above the Angostura Reservoir to the joining of the Cheyenne River with the Missouri River, about 275 miles downstream of the Angostura Dam in central South Dakota. Angostura Reservoir is about 17

miles long, with another 7.6 miles extending along Horsehead Creek, and averages about 0.5-mile wide in the main body and 0.3-mile wide on Horsehead Creek. Total surface area of the reservoir is 4,612 acres at an elevation of 3,187.2 feet (Reclamation 2000).

The Angostura Dam and Reservoir Project was first authorized in 1939, then re-authorized by the Flood Control Act of 1944. The project consists of Angostura Dam, Angostura Reservoir, a main canal and irrigation distribution system, and public lands surrounding the reservoir. Angostura Irrigation District is responsible for the costs associated with project payback, operation and maintenance. Irrigators are assessed a fee for water based on these projected costs and the amount of acres they irrigate. Currently, Angostura Reservoir provides water to the District to irrigate 12,218 acres below the dam on both sides of the Cheyenne River (Reclamation 2000). Water fees for project costs are based on this 12,218 acres of irrigated land.

Impacts from the Hay Canyon Alternatives to Reclamation lands could occur if water distribution structures are crossed by new rail facilities and if irrigated lands are taken out of production, causing the District to reassess the fees paid by irrigators for water. Water fees would likely be increased on a per irrigated acre basis as less lands would be irrigated and repayment, operation, and maintenance costs would not be expected to change significantly. Impacts to water distribution structures would not likely be significant as appropriate design and construction methods could be used to protect them. Thus, the primary impact would be the loss of irrigated lands. Such impacts are discussed in more detail in Section 4.4.6.2 and would include conversion of lands to rail line right-of-way and loss of the ability to irrigate lands adjacent to the rail line.

Hay Canyon

The Hay Canyon Segment would cross 8 irrigated farm units, converting approximately 134.8 acres to rail line right-of-way. Of these, 6 farm units would lose over 5 percent of the land in the unit.

WG Divide

The WG Divide Alternative would cross 14 farm units, converting approximately 232.5 acres to rail line right-of-way. Of these, 10 farm units would lose over 5 percent of the land in the unit.

Oral

The Oral Alternative would cross 2 new farm units, converting approximately 30.0 acres to rail line right-of-way. Both of these farm units would lose over 5 percent of the land in the unit. Additionally, the existing DM&E rail line portion of the Oral Segment passes through six other farm units. These units were established following construction of the existing rail line. It is unlikely they would be affected by reconstruction of the existing DM&E rail line. However, if in order to optimize this section of existing rail line additional right-of-way or realignment of the existing rail line becomes necessary, portions of these farm units could be incorporated into the rail line right-of-way.

4.6.2.5.4 Fish and Wildlife Service Lands

No impacts to USFWS lands are expected for any of the alternatives.

4.6.2.6 Reservation and Treaty Lands

No impacts to Reservations or Treaty Lands are expected for any of the Hay Canyon Alternatives.

4.6.3 WATER RESOURCES

Potential types of impacts to water resources are discussed in detail in Section 4.4.7. Construction and operation of a new rail line could affect water resources by increasing erosion into the water and subsequently reducing water quality, disturbing or altering the stream causing changes in stream hydrology, contaminating water in the event of a spill, and damage to or loss of wetlands.

4.6.3.1 Surface Water Impacts

Hay Canyon

This alternative would cross 7 perennial, including 1 crossing of the Cheyenne River, and 73 intermittent streams. Construction impacts would be limited to the period of construction and reclamation and would occur primarily at the crossing locations. Impacts could likely include increased erosion and sedimentation, increased water temperature and loss of habitat for aquatic and terrestrial species. Section 4.4.7.1 provides a detailed discussion of the potential impacts to surface waters from construction and operation of new rail facilities.

WG Divide

The WG Divide Alternative would cross 2 perennial, including 1 crossing of the Cheyenne River, and 19 intermittent streams. Impacts would be similar to those discussed for Hay Canyon.

Oral

This alternative would cross 7 perennial and 25 intermittent streams (13 new crossings and 12 existing crossings). Of the 7 perennial stream crossings, 6 would be existing crossings along the DM&E rail line. Existing crossings of perennial streams would include 1 crossing of the Cheyenne River and 5 crossings of Sand Creek. Impacts to these streams would be similar to those discussed in Section 4.4.7.1.

4.6.3.2 Wetlands

Hay Canyon

The Hay Canyon Segment would impact 0.4 mile of wetlands, including approximately 8.9 acres of emergent wetlands, 5.4 acres of aquatic bed wetlands, and 3.6 acres of unconsolidated bottom. These wetlands would be lost through conversion to rail line right-of-way. More detailed discussion of the potential impacts to wetlands is provided in Section 4.4.7.2.

WG Divide

The WG Divide Alternative would cross less than 0.1 mile of wetlands, including approximately 3.0 acres of emergent and 0.2 acres of shrub/scrub wetlands. The impacts would be similar to those mentioned above.

Oral

The Oral Alternative would cross less than 0.1 mile (approximately 2.4 acres) of emergent wetlands. The impacts would be similar to those of the Hay Canyon and WG Divide Alternatives.

4.6.4 AIR QUALITY

Construction of any of the Hay Canyon Alternatives has the potential to impact local air quality, as discussed in Section 4.4.8. Impacts would generally result from fugitive dust during earthmoving activities and emissions from construction vehicles and equipment.

SEA calculated the increase in air pollutant emissions that would result from increased rail operations for these alternatives. The air pollutant emission sources from trains include emissions from the locomotives operating along the new rail line. A summary of the potential emission increases are shown in Tables 4.6-1 through 4.6-9. These emissions are in addition to those presented in Tables 4.4-2 to 4.4-10 for the other portions of the Extension Alternatives.

**Table 4.6-1
Comparison of Emission Increases to EPA Thresholds for the 20 million net tons/year
for Hay Canyon Segment in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/Fall River	94.21	100	5.88	100	15.81	100	3.98	100	9.89	100	0.0003	0.6

Gross Ton Increase: 28,967,000.00
 Fuel Efficiency Factor (ton miles per gallon): 993.80
 Total length of Segments (miles): 18.5

**Table 4.6-2
Comparison of Emission Increases to EPA Thresholds for the 20 million net tons/year
for WG Divide Alternative in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/Fall River	74.86	100	4.68	100	12.56	100	3.16	100	7.86	100	0.0003	0.6

Gross Ton Increase: 28,967,000.00
 Fuel Efficiency Factor (ton miles per gallon): 993.80
 Total length of Segments (miles): 14.7

**Table 4.6-3
Comparison of Emission Increases to EPA Thresholds for the 20 million net tons/year
for Oral Segment in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/Fall River	104.40	100	6.52	100	17.52	100	4.41	100	10.96	100	0.0004	0.6
Gross Ton Increase: 28,967,000.00 Fuel Efficiency Factor (ton miles per gallon): 993.80 Total length of Segments (miles): 20.5												

**Table 4.6-4
Comparison of Emission Increases to EPA Thresholds for the 50 million net tons/year
for Hay Canyon Segment in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/Fall River	224.14	100	14.00	100	37.62	100	9.47	100	23.54	100	0.0008	0.6
Gross Ton Increase: 68,915,700.00 Fuel Efficiency Factor (ton miles per gallon): 993.80 Total length of Segments (miles): 18.5												

**Table 4.6-5
Comparison of Emission Increases to EPA Thresholds for the 50 million net tons/year
for WG Divide Alternative in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/Fall River	178.10	100	11.12	100	29.89	100	7.53	100	18.71	100	0.0006	0.6

Gross Ton Increase: 68,915,700.00
 Fuel Efficiency Factor (ton miles per gallon): 993.80
 Total length of Segments (miles): 14.7

**Table 4.6-6
Comparison of Emission Increases to EPA Thresholds for the 50 million net tons/year
for Oral Segment in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/Fall River	248.38	100	15.51	100	41.68	100	10.50	100	26.09	100	0.0009	0.6

Gross Ton Increase: 68,915,700.00
 Fuel Efficiency Factor (ton miles per gallon): 993.80
 Total length of Segments (miles): 20.5

**Table 4.6-7
Comparison of Emission Increases to EPA Thresholds for the 100 million net tons/year
for Hay Canyon Segment in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/Fall River	437.58	100	27.33	100	73.44	100	18.50	100	45.96	100	0.002	0.6
Gross Ton Increase: 134,539,615.00 Fuel Efficiency Factor (ton miles per gallon): 993.80 Total length of Segments (miles): 18.5												

**Table 4.6-8
Comparison of Emission Increases to EPA Thresholds for the 100 million net tons/year
for WG Divide Alternative in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/Fall River	347.70	100	21.72	100	58.35	100	14.70	100	36.52	100	0.0011	0.6
Gross Ton Increase: 134,539,615.00 Fuel Efficiency Factor (ton miles per gallon): 993.80 Total length of Segments (miles): 14.7												

**Table 4.6-9
Comparison of Emission Increases to EPA Thresholds for the 100 million net tons/year
for Oral Segment in South Dakota**

County	NO _x		HC		CO		PM ₁₀		SO ₂		Pb	
	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold
Custer/ Fall River	484.89	100	30.29	100	81.38	100	20.50	100	50.93	100	0.0002	0.6

Gross Ton Increase: 134,539,615.00
 Fuel Efficiency Factor (ton miles per gallon): 993.80
 Total length of Segments (miles): 20.5

SEA’s calculations predicted that NO_x emissions would exceed EPA thresholds at the 20 MNT level for the Oral Segment and for all the alternatives at the 50 and 100 MNT levels of operation. Therefore, SEA reviewed the results of the CALPUFF air dispersion modeling to determine if the new rail traffic would cause emission levels to exceed the NAAQS or PSD Class II increments. These increments are presented in Section 4.4.8. The results of the CALPUFF analysis indicated there would be no exceedence of either the NAAQS or PSD Class II increments (Appendix E).

Additionally, SEA used the CALPUFF model to determine the potential impacts of the Extension Alternatives to the visibility at Class I airsheds. This analysis included emissions that would result from these alternatives. The results of SEA’s visibility analysis are presented in Section 4.4.21.

4.6.5 NOISE

The construction and operation of any of the Hay Canyon Alternatives would increase noise levels along the rail line, as discussed in Section 4.4.9. Operation of construction equipment and train traffic meeting the Board’s environmental analysis threshold for noise evaluation would occur along the entire alignment. Tables 4.6-10 through 4.6-18 show the communities, within their respective counties, with the number of noise sensitive receptors expected to experience noise levels exceeding 65 dBA L_{dn}. County totals are in bold and include noise sensitive receptors within communities and in rural areas of the county. Noise sensitive receptors within the 65 dBA L_{dn} noise level due to wayside noise, wayside and horn noise, and horn noise only are provided. Tables 4.6-19 through 4.6-27 show the same information but for the number of noise sensitive receptors exceeding 70 dBA L_{dn}.

Table 4.6-10 Hay Canyon Segment Number of Noise Sensitive Receptors Exceeding 65 dBA L_{dn} for 8 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Hay Canyon	1	0	4	5
Smithwick	0	0	3	3

Table 4.6-11 WG Divide Alternative Number of Noise Sensitive Receptors Exceeding 65 dBA L_{dn} for 8 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
WG Divide	0	1	2	3

Table 4.6-12 Oral Segment Number of Noise Sensitive Receptors Exceeding 65 dBA L_{dn} for 8 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Oral	0	3	20	23
Oral	0	3	17	20
Smithwick	0	0	3	3

Table 4.6-13 Hay Canyon Segment Number of Noise Sensitive Receptors Exceeding 65 dBA for 18 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Hay Canyon	1	2	4	7
Smithwick	0	2	1	3

Table 4.6-14 WG Divide Alternative Number of Noise Sensitive Receptors Exceeding 65 dBA L_{dn} for 18 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
WG Divide	0	1	3	4

Table 4.6-15 Oral Segment Number of Noise Sensitive Receptors Exceeding 65 dBA L_{dn} for 18 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Oral	0	5	28	33
Oral	0	5	22	27
Smithwick	0	0	3	3

Table 4.6-16 Hay Canyon Segment Number of Noise Sensitive Receptors Exceeding 65 dBA L_{dn} for 34 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Hay Canyon	1	3	4	7
Smithwick	0	3	0	3

Table 4.6-17 WG Divide Alternative Number of Noise Sensitive Receptors Exceeding 65 dBA L_{dn} for 34 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
WG Divide	1	0	3	4

Table 4.6-18 Oral Segment Number of Noise Sensitive Receptors Exceeding 65 dBA L_{dn} for 34 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Oral	0	10	22	32
Oral	0	7	20	27
Smithwick	0	3	0	3

Table 4.6-19 Hay Canyon Segment Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 8 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Hay Canyon	0	0	3	3
Smithwick	0	0	3	3

Table 4.6-20 WG Divide Alternative Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 8 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
WG Divide	0	0	1	1

Table 4.6-21 Oral Segment Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 8 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Oral	0	0	10	10
Oral	0	0	7	7
Smithwick	0	0	3	3

Table 4.6-22 Hay Canyon Alternative Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 18 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Hay Canyon	1	0	5	6
Smithwick	0	0	3	3

Table 4.6-23 WG Divide Alternative Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 18 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
WG Divide	0	1	2	3

Table 4.6-24				
Oral Segment				
Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 18 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Oral	0	0	18	18
Oral	0	0	15	15
Smithwick	0	0	3	3

Table 4.6-25				
Hay Canyon Segment				
Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 34 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Hay Canyon	1	2	3	6
Smithwick	0	2	1	3

Table 4.6-26				
WG Divide Segment				
Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 34 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
WG Divide	0	1	2	3

Table 4.6-27 Oral Segment Number of Noise Sensitive Receptors Exceeding 70 dBA L_{dn} for 34 Trains Per Day				
Alternative and Community				
	Wayside	Wayside/Horn	Horn	Total
Oral	0	6	19	25
Oral	0	4	18	22
Smithwick	0	2	1	3

The scattered, rural nature of the project area for these alternatives results in few noise-sensitive receptors being exposed to noise levels of concern. One house is located within 100 feet of the proposed alternatives for Hay Canyon and WG Divide. There are no houses within 100 feet along the Oral Alternative. Even at the 100 MNT level of operation, only 7, 4, and 32 noise sensitive receptors would be exposed to noise levels exceeding 65 dBA L_{dn} and 6, 3, and 25 noise sensitive receptors would be exposed to noise levels exceeding 70 dBA L_{dn} for the Hay Canyon, WG Divide, and Oral Alternatives, respectively. The number of noise sensitive receptors exposed to significant increases in noise levels along the Hay Canyon and WG Divide Alternatives is not considered to be significant by SEA. Along the Oral Segment, a greater number of noise sensitive receptors would be affected, primarily comprised of residences located in the community of Oral along the existing DM&E rail line. While still not considered a significant number of affected structures, SEA recognizes the noise impacts to Oral would be significant as the entire community would be exposed to a significant increase in noise levels.

4.6.6 BIOLOGICAL RESOURCES

4.6.6.1 Vegetation

Impacts to vegetation from the alternatives would be similar to those discussed in Section 4.4.10. They would primarily include the loss of vegetative cover due to construction activities converting the area to rail line right-of-way.

Hay Canyon

The Hay Canyon Segment would cross 11.1 miles (approximately 538.2 acres) of grasslands and 1.8 miles (approximately 87.3 acres) of cropland and pastures.

WG Divide

This alternative would cross 8.5 miles (approximately 412.1 acres) of grasslands and 6.3 miles (approximately 305.5 acres) of cropland and pasture.

Oral

This alternative would cross 12.9 miles (approximately 625.5 acres) of grasslands and 4.5 miles (approximately 218.2 acres) of croplands and pastures.

4.6.6.2 Wildlife

4.6.6.2.1 Big Game

Impacts to big game would be similar to those mentioned previously in Section 4.4.11.1. The only quantifiable impact to big game is the amount of habitat in the species' seasonal ranges converted to rail line right-of-way. Table 4.6-28 lists the number of miles of seasonal ranges crossed by each alternative and the acres converted to rail line right-of-way.

Big Game Species and Seasonal Range Category	Hay Canyon		WG Divide		Oral	
	miles	acres	miles	acres	miles	acres
Pronghorn						
Winter Range	1.5	72.7	2.0	97.0	2.1	101.8
Yearlong Range	None	None	None	None	None	None
Mule Deer/White-tailed Deer						
Winter Range	1.3	63.0	1.4	67.9	1.7	82.4
Yearlong Range	7.2	349.1	14.0	678.9	14.6	707.9

* In South Dakota, lands may be classified as more than one type of seasonal range, therefore the totals for ranges may be greater than the length of the Alternative.

4.6.6.2.2 Game Species

Upland Game Birds

Construction and operation impacts resulting from new rail line to upland game birds are discussed in detail in Section 4.4.11.2. Impacts would include habitat fragmentation and loss and noise disturbance, particularly to mating rituals performed by male sage grouse during the spring mating season. However, impacts to sage grouse are not anticipated as no sagebrush habitat is crossed by these alternatives. Grouse leks identified along the alternatives are therefore likely sharp-tailed grouse leks to which some disturbance may occur. Upland game birds could also be subject to direct mortality during construction and operation of any alternative as discussed in Section 4.4.11.2.

Hay Canyon

There would be 1 grouse lek within 0.25 mile and 3 leks within 2.0 miles of the Hay Canyon Segment. No woodland habitat for wild turkey would be converted to rail line right-of-way. Approximately 538.2 acres of grassland and 87.3 acres of cropland and pasture providing habitat for pheasants would be converted to rail line right-of-way.

WG Divide

The WG Divide Alternative would not be within 0.25 mile of any grouse leks. However, it would be within 2.0 miles of 2 leks. This alternative would not affect any woodlands but would convert approximately 412.1 acres of grassland and 305.5 acres of cropland and pasture to rail line right-of-way.

Oral

The Oral Segment would be within 2.0 miles of 3 grouse leks. It would convert approximately 625.5 acres of grassland and 218.2 acres of cropland and pasture to rail line right-of-way. No woodland would be affected by the Oral Segment.

Waterfowl

Potential impacts to waterfowl from construction and operation of new rail line are discussed in detail in Section 4.4.11.2. Impacts from these alternatives would generally include loss of nests and habitat in grassland areas, loss of wetland habitat for adults and brood rearing, and disturbance.

Hay Canyon

The Hay Canyon Segment would convert 11.1 miles (approximately 538.2 acres) of grassland habitat and 1.8 miles (87.3 acres) of cropland and pasture potentially providing nesting habitat for waterfowl to rail line right-of-way. It would cross 7 perennial streams, including the Cheyenne River, and 73 intermittent streams. The Hay Canyon Segment would also convert 0.4 mile (approximately 17.9 acres) of wetland habitat to rail line right-of-way.

WG Divide

The WG Divide Alternative would convert 8.5 miles (approximately 412.1 acres) of grassland habitat and 6.3 miles (305.5 acres) of cropland and pasture habitat to rail line right-of-way. This land would not longer be expected to provide suitable nesting habitat for waterfowl. Additionally, the WG Divide Alternative would cross 2 perennial streams, including the Cheyenne River, and 19 intermittent streams and would convert approximately 3.2 acres of wetland to rail line right-of-way.

Oral

The Oral Segment would convert approximately 12.9 miles (625.5 acres) of grasslands and 4.5 miles (305.5 acres) of cropland and pasture to rail line right-of-way. It would have only 1 perennial stream crossing along the new right-of-way, and 6 along existing right-of-way. The Oral Alternative would also have 13 new crossings and 12 existing crossings of intermittent streams. The Oral Segment would convert approximately 2.4 acres of emergent wetlands to rail line right-of-way.

Small Game and Furbearers

Potential impacts to small game animals and furbearers from new rail line construction and operation are discussed in Section 4.4.11.2. Those impacts would be similar to the types of impacts expected from any of the Hay Canyon Alternatives. As these species are found in nearly all habitats and are wide ranging, construction of any of these alignments would have the potential to disturb them and reduce their habitat. Each alternative would also likely result in some mortality to these species during operation. However, because the Hay Canyon and Oral Segments generally follow riparian areas, these alternatives would likely affect a larger amount of habitat for furbearers, particularly species such as beaver, muskrat, and mink, than the WG Divide Alternative which crosses primarily upland grasslands and agricultural lands.

4.6.6.2.3 Non-Game Species

Amphibians and Reptiles

The construction and operation impacts to amphibians and reptiles discussed in Section 4.4.11.3 would be similar to those expected for the Hay Canyon Alternatives. Reptiles and amphibians could occur anywhere along the alternatives and their lack of mobility makes them susceptible to mortality during construction and operation of a rail line. Of the three Hay Canyon Alternatives, the Hay Canyon Segment would likely have the greatest affect on reptiles and amphibians due to its location within the Hay Canyon drainage where water would be available. The Oral Segment, located along the sideslope of the Cheyenne River floodplain would be expected to have the next highest impact due to its location along the river. The WG Divide Alternative would be expected to have the least impact of all the alternatives on reptiles and amphibians because it crosses primarily uplands and does not follow a drainage providing a reliable source of water.

Songbirds

The primary impact to songbirds from construction and operation of a new rail line would be loss of habitat as discussed in Section 4.4.11.3. Both ground and tree nesting songbirds occur throughout the project area. However, only the WG Divide Alternative would impact any woody vegetation, approximately 0.2 acre of shrub/scrub wetland. The remainder of this alternative and all of the Hay Canyon and Oral Segments would affect only grasslands, cropland, or pasture serving as potential habitat for ground nesting songbirds (Section 4.6.6).

Shorebirds

Impacts to shorebirds would be similar to those discussed for waterfowl.

Small Mammals

Small mammals would be impacted during construction and operation by loss of habitat and mortality, as discussed in Section 4.4.11.3. Small mammals are expected to occur throughout the project area and along each of the Hay Canyon Alternatives. Because only minor differences in habitat along each alternative (0.2 acre of scrub/shrub along WG Divide Alternative with all remaining habitat along the alternatives being grassland, cropland, and pasture) would occur, no significant differences in the species along each alternative would be expected. Small mammals would be expected to move back into the right-of-way following reestablishment of vegetation

and, because of their high reproductive potential, all of the alternatives would be expected to have minimal impacts on small mammal populations.

Raptors

The potential impacts to raptors from the Hay Canyon Alternatives would be similar to those discussed in Section 4.4.11.3. However, no raptor nest would be impacted by any of the alternatives and no woodland habitat potentially providing roosting, nesting, or perching habitat for raptors would be lost. Each alternative would convert foraging lands and potential ground nesting habitat to rail line right-of-way. Raptors could be struck by trains if feeding or foraging along the rail line.

Aquatic and Fisheries

Potential impacts to aquatic and fishery resources include loss of habitat and reduced water quality as discussed in Section 4.4.11.4. No trout streams are crossed by any of the alternatives and none occur within the proposed project area. Impacts would most likely be in limited areas where the alternatives are in close proximity to perennial streams or drainages or at perennial stream crossings.

Hay Canyon

This alternative would cross 7 perennial streams, including 1 crossing of the Cheyenne River, and 73 intermittent streams, the majority of which are in Hay Canyon Creek. Approximately 6.5 miles of the Hay Canyon Segment would be located within the Hay Canyon Creek drainage valley.

WG Divide

This alternative would cross 2 perennial streams, including 1 crossing of the Cheyenne River, and 19 intermittent streams. The WG Divide Alternative would generally not follow any perennial drainage and would be over a mile from the Hay Canyon drainage and Sand Creek.

Oral

This alternative would cross 7 perennial streams, including 1 crossing of the Cheyenne River, and 25 intermittent streams. Of the 7 perennial stream crossings, 6 would be existing crossings along the existing DM&E rail line. Existing crossings would include 1 crossing of the Cheyenne River and 5 crossings of Sand Creek, as well as 12 intermittent stream crossings.

4.6.6.3 Endangered, Threatened, and Sensitive Species

The following section discusses the potential impacts to those Federally listed threatened or endangered species known to occur or potentially occur along the Hay Canyon Alternatives.

4.6.6.3.1 American Burying Beetle

The American burying beetle has not been documented in the vicinity of the Hay Canyon Alternatives. However, it could occur in areas of suitable soils. Compaction of soil and earthmoving activities could make soils unsuitable for use by burying beetle or may kill beetles already buried.

Hay Canyon

Approximately 7.7 miles (373.3 acres) of suitable soils along the Hay Canyon Segment would be converted to rail line right-of-way.

WG Divide

Approximately 4.5 miles (218.2 acres) of suitable soils would be converted to rail line right-of-way by this alternative.

Oral

Approximately 7.8 miles (378.2 acres) of suitable soils would be converted to rail line right-of-way for the Oral Segment.

4.6.6.3.2 Ute Ladies'-tresses Orchid

If populations of Ute Ladies'-tresses orchid occur within the right-of-way of the new rail line, individual plants or the population could be damaged or lost due to clearing, earthmoving, excavation, or other soil-disturbing activities. Adjacent populations could be impacted during operation of the rail line should the rail line right-of-way result in the establishment of noxious or invasive weeds that could out compete the orchid or if hazardous materials reach a population in the event of a spill.

Only one alternative, the Hay Canyon Segment, would cross a site considered to provide potential Ute Ladies'-tresses habitat. One site, Hay Canyon South, would be crossed by this alternative (Appendix K). No other potential sites were identified by SEA along or near any other areas of the Hay Canyon Alternatives.

4.6.6.3.3 Bald Eagle

Riparian corridors near the Hay Canyon Alternatives could be potential bald eagle winter habitat. Impacts to wintering bald eagles would be from human activity associated with project construction, operation and maintenance, as well as from the loss of any habitat for nesting, perching, and roosting. However, no bald eagle nests exist along any of these alternatives. Therefore, the only potential for impacts would be disturbance. As construction would generally not occur during the winter months, the potential for disturbance would be mainly from operating trains following project completion. Because trains would be expected to operate regularly over the rail line, eagles would be expected to either avoid suitable habitat along the rail line or adapt to train activities and continue to use the area.

Hay Canyon

There would be approximately 1.1 miles of potential bald eagle habitat within 0.5 mile of the Hay Canyon Segment, and within 1.0 mile there would be approximately 3.6 miles of potential habitat.

WG Divide

The WG Divide Alternative would have 1.5 miles of potential bald eagle habitat within 0.5 mile of the rail line. It would also have 5.8 miles of potential habitat within 1.0 mile.

Oral

There would be 6.5 miles of potential bald eagle habitat within 0.5 mile of the Oral Segment. Within 1.0 mile there would also be 10.8 miles of potential bald eagle habitat along the Oral Segment.

4.6.6.3.4 Mountain Plover

The potential impacts from the Hay Canyon Alternatives to mountain plovers would be similar to those types of impacts discussed in Section 4.4.12.8. They would generally include destruction of nests during construction and disturbance to nesting birds leading to nest failure

during both rail line construction and operation. Mountain plover nests and chicks would be particularly susceptible to mortality from vehicles and construction equipment, especially along two-track roads and where construction activities would cross prairie dog towns.

Hay Canyon

This alternative would convert 11.1 miles of grasslands (approximately 538.2 acres) that are considered potential nesting habitat to railroad right-of-way. Additionally, mountain plover appear to prefer prairie dog colonies for nesting because of the short-grass. There are 0.2 mile (approximately 9.7 acres) of prairie dog colonies along the Hay Canyon Segment that would be converted to railroad right-of-way. Additional habitat outside the right-of-way may be unsuitable for nesting due to human activity and noise during construction and operation.

WG Divide

The WG Divide Alternative would convert 8.5 miles of grasslands (approximately 412.1 acres) that are considered potential mountain plover nesting habitat to railroad right-of-way. Additionally, this alternative would convert 0.5 mile (approximately 24.2 acres) of prairie dog colonies to railroad right-of-way. Additional habitat outside the right-of-way may be unsuitable for nesting due to human activity and noise during construction.

Oral

This alternative would convert 12.9 miles of grasslands (approximately 625.5 acres) that are considered potential nesting habitat to railroad right-of-way. No mapping was completed for prairie dog colonies along this alternative. While it is likely some prairie dog colonies would be crossed by this alternative, it is unknown how much of this habitat would be converted to rail line right-of-way.

4.6.6.3.5 Swift Fox

Swift fox may occur in a variety of habitats throughout the project area (Section 4.4.12.9 and Appendix K). Swift fox are known to utilize prairie dog colonies, primarily for prey. Therefore, the amount of prairie dog colony converted to rail line serves as a means to compare the potential impacts of each alternative.

Hay Canyon

The Hay Canyon Segment would convert 0.2 mile (approximately 9.7 acres) of prairie dog colonies to railroad right-of-way.

WG Divide

This alternative would convert 0.5 mile (approximately 24.2 acres) of prairie dog colonies to railroad right-of-way.

Oral

No mapping of prairie dog colonies was completed for this alternative. While it is likely some prairie dog colonies would be crossed by this alternative, it is unknown how much of this habitat would be converted to rail line right-of-way.

4.6.6.3.6 Sturgeon Chub

Increased sedimentation in the Cheyenne River during construction could impact sturgeon chub. Increased silt in the water from erosion can reduce water quality and be harmful to chubs as well as increasing sedimentation that could reduce chub habitat.

Hay Canyon

The Hay Canyon Segment crosses the Cheyenne River once. Additionally, it has numerous crossings of Hay Canyon Creek just upstream of the Cheyenne River. Disturbance to bottom sediments and increased erosion at the Hay Canyon Creek crossings and along the approximately 6.5-miles of Hay Canyon Segment located within Hay Canyon could result in increased sedimentation and turbidity in the Cheyenne River.

WG Divide

The WG Divide Alternative would have 1 crossing of the Cheyenne River. Approximately 1.0 mile of alternative would be within the Cheyenne River floodplain. The remainder of this alternative would cross upland areas away from the river and perennial drainages.

Oral

The Oral Segment would cross the Cheyenne River once, involving replacement or reconstruction of the existing DM&E rail bridge over the river immediately north of Oral. It would also include replacement or reconstruction of five existing rail bridges across Sand Creek, upstream of the Cheyenne River.

4.6.6.3.7 Black-tailed Prairie Dog

Direct impacts to black-tailed prairie dogs are most likely to occur during construction if the animals occur in the right-of-way. Burrows and dens of inhabited colonies and within the construction right-of-way would be destroyed. Some mortality to individuals would also be expected during excavation and other earthmoving activities. During rail line operation, fragmentation of colonies could reduce their ability to sustain themselves as well as result in mortality to individuals crossing the rail line from one area of the colony to the other.

Hay Canyon

The Hay Canyon Segment would convert 0.2 mile (approximately 9.7 acres) of prairie dog colonies to railroad right-of-way.

WG Divide

This alternative would convert 0.5 mile (approximately 24.2 acres) of prairie dog colonies to railroad right-of-way.

Oral

No mapping of prairie dog colonies was completed for this alternative. While it is likely some prairie dog colonies would be crossed by this alternative, it is unknown how much of this habitat would be converted to rail line right-of-way.

4.6.7 TRANSPORTATION

Transportation impacts would be similar to those described in Section 4.4.13. They would include increased vehicle traffic and delay at new grade crossings during construction and vehicle delays due to passing trains during operation. SEA concluded that the potential effect of increased train traffic for highways with ADT volumes below 5,000 would be experienced by very few drivers and the additional vehicular delay would be minimal. None of the Hay Canyon

Alternatives would cross any roadways where the ADT would be 5,000 or greater. Therefore, SEA did not calculate potential vehicle delay or queue at these proposed new crossings.

Hay Canyon

The Hay Canyon Segment would have five new grade crossings of public roads, four in Custer and one in Fall River Counties.

WG Divide

The WG Divide Alternative would have 15 new grade crossings of public roads in Custer (4 crossings) and Fall River (11 crossings) Counties.

Oral

The Oral Segment would have four new grade crossings of public roads, including three crossings in Custer County and one crossing in Fall River County.

4.6.8 SAFETY

Construction and operation of a rail line has the potential to result in injury or loss of life, particularly at locations where the rail line would cross an active roadway grade. Vehicles operating across the rail line would be at risk for accidents during construction as well as being struck by a train during rail line operation. Section 4.4.14 provides a detailed discussion of the potential affects of construction and operation of new rail line on safety.

To further address potential accidents resulting from new grade crossings, SEA calculated accident frequency rates at all proposed public grade crossings. At existing crossings (such as some of those along the Oral Segment), SEA looked at the most recent five years of accident history available and calculated the potential change in the number of years between accidents. SEA's analysis procedure considered the type of existing warning devices at the highway/rail grade crossing, including passive devices (signs or crossbucks), flashing lights, or gates. The following presents the results of SEA's analysis for each county, at the various levels of proposed operation.

Hay Canyon

Custer County

20 MNT

SEA's safety analysis showed that for the four proposed public highway/railroad grade crossings along the Hay Canyon Segment, the highest predicted accident frequency at the 20 MNT level of operation is 0.008. This corresponds to 1 accident every 125 years. The predicted rate occurred at crossings 148th Avenue (Milepost 661.80), 268th Street (Milepost 662.10), County Highway 656 (Milepost 663.90) and County Highway County Line Road (Milepost 666.00). The proposed crossings in Custer County are all classified as Category B (see Section 4.4.14 for description of categories).

50 MNT

SEA's safety analysis showed that for the 4 proposed public highway/railroad grade crossings along the Hay Canyon Segment, the highest predicted accident frequency at the 50 MNT level of operation is 0.011. This corresponds to 1 accident every 91 years. The predicted rate occurred at crossings 148th Avenue (Milepost 661.80), 268th Street (Milepost 662.10), County Highway 656 (Milepost 663.90) and County Highway County Line Road (Milepost 666.00). The proposed crossings in Custer County are all classified as Category B.

100 MNT

SEA's safety analysis showed that for the 4 proposed public highway/railroad grade crossings along the Hay Canyon Segment, the highest predicted accident frequency at the 100 MNT level of operation is 0.015. This corresponds to 1 accident every 67 years. The predicted rate occurred at crossings 148th Avenue (Milepost 661.80), 268th Street (Milepost 662.10), County Highway 656 (Milepost 663.90) and County Highway County Line Road (Milepost 666.00). The proposed crossings in Custer County are all classified as Category B.

Fall River County

20 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Hay Canyon Segment at County Highway 2C (Milepost 670.90), the predicted accident

frequency at the 20 MNT level of operation is 0.008, which corresponds to 1 accident every 125 years. The proposed crossing in Fall River County is classified as Category B.

50 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Hay Canyon Segment at County Highway 2C (Milepost 670.90), the predicted accident frequency at the 50 MNT level of operation is 0.011, which corresponds to 1 accident every 91 years. The proposed crossing in Fall River County is classified as Category B.

100 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Hay Canyon Segment at County Highway 2C (Milepost 670.90), the predicted accident frequency at the 100 MNT level of operation is 0.015, which corresponds to 1 accident every 67 years. The proposed crossing in Fall River County is classified as Category B.

W G Divide

Custer County

20 MNT

SEA's safety analysis showed that for the 4 proposed public highway/railroad grade crossings along the WG Divide Alternative, the highest predicted accident frequency at the 20 MNT level of operation is 0.008. This corresponds to 1 accident every 125 years. The predicted rate occurred at the County Highway (Milepost 654.36), County Highway (Milepost 662.50), County Highway 656 (Milepost 662.80) and County Road (Milepost 664.70) crossings. The proposed crossings in Custer County are all classified as Category B.

50 MNT

SEA's safety analysis showed that for the 4 proposed public highway/railroad grade crossings along the WG Divide Alternative, the highest predicted accident frequency at the 50 MNT level of operation is 0.011. This corresponds to 1 accident every 91 years. The predicted rate occurred at the County Highway (Milepost 654.36), County Highway (Milepost 662.50), County Highway 656 (Milepost 662.80) and County Road (Milepost 664.70) crossings. The proposed crossings in Custer County are all classified as Category B.

100 MNT

SEA's safety analysis showed that for the 4 proposed public highway/railroad grade crossings along the WG Divide Alternative, the highest predicted accident frequency at the 100 MNT level of operation is 0.015. This corresponds to 1 accident every 67 years. The predicted rate occurred at the County Highway (Milepost 654.36), County Highway (Milepost 662.50), County Highway 656 (Milepost 662.80) and County Road (Milepost 664.70) crossings. The proposed crossings in Custer County are all classified as Category B.

Fall River County

20 MNT

SEA's safety analysis showed that for the 11 proposed public highway/railroad grade crossings along the WG Divide Alternative, the highest predicted accident frequency at the 20 MNT level of operation is 0.013. This corresponds to 1 accident every 77 years. The predicted rate occurred at the County Road 2G (Milepost 667.40), County Road 2B (Milepost 669.60, 669.80, and 671.20), County Road 2A (Milepost 672.20), County Road 2D (Milepost 673.30), County Road 2E (Milepost 675.30), County Road (Milepost 676.30) and County Road 2F (Milepost 678.50) crossings. The proposed crossings in Fall River County are all classified as Category B.

50 MNT

SEA's safety analysis showed that for the 11 proposed public highway/railroad grade crossings along the WG Divide Alternative, the highest predicted accident frequency at the 50 MNT level of operation is 0.018. This corresponds to 1 accident every 56 years. The predicted rate occurred at the County Road 2G (Milepost 667.40), County Road 2B (Milepost 669.60, 669.80, and 671.20), County Road 2A (Milepost 672.20), County Road 2D (Milepost 673.30), County Road 2E (Milepost 675.30), County Road (Milepost 676.30) and County Road 2F (Milepost 678.50) crossings. The proposed crossings in Fall River County are all classified as Category B.

100 MNT

SEA's safety analysis showed that for the 11 proposed public highway/railroad grade crossings along the WG Divide Alternative, the highest predicted accident frequency at the 100 MNT level of operation is 0.024. This corresponds to one accident every 42 years. The predicted rate occurred at the County Road 2G (Milepost 667.40), County Road 2B (Milepost

669.60, 669.80, and 671.20), County Road 2A (Milepost 672.20), County Road 2D (Milepost 673.30), County Road 2E (Milepost 675.30), County Road (Milepost 676.30) and County Road 2F (Milepost 678.50) crossings. The proposed crossings in Fall River County are all classified as Category B.

Oral Segment

Custer County

20 MNT

SEA's safety analysis showed that for the 3 proposed public highway/railroad grade crossings along the Oral Segment, the highest predicted accident frequency at the 20 MNT level of operation is 0.008. This corresponds to 1 accident every 125 years. The predicted rate occurred at the County Highway (Milepost 661.80), County Highway (Milepost 662.10) and County Highway 656 (Milepost 663.90) crossings. The proposed crossings in Custer County are all classified as Category B.

50 MNT

SEA's safety analysis showed that for the 3 proposed public highway/railroad grade crossings along the Oral Segment, the highest predicted accident frequency at the 50 MNT level of operation is 0.011. This corresponds to 1 accident every 91 years. The predicted rate occurred at the County Highway (Milepost 661.80), County Highway (Milepost 662.10), County Highway 656 (Milepost 663.90) crossings. The proposed crossings in Custer County are all classified as Category B.

100 MNT

SEA's safety analysis showed that for the 3 proposed public highway/railroad grade crossings along the Oral Segment, the highest predicted accident frequency at the 100 MNT level of operation is 0.015. This corresponds to 1 accident every 67 years. The predicted rate occurred at the County Highway (Milepost 661.80), County Highway (Milepost 662.10), County Highway 656 (Milepost 663.90) crossings. The proposed crossings in Custer County are all classified as Category B.

Fall River County

20 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Oral Segment at County Highway 2C (Milepost 670.90), the predicted accident frequency at the 20 MNT level of operation is 0.008, which corresponds to 1 accident every 125 years. The proposed crossing in Fall River County is classified as Category B.

50 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Oral Segment at County Highway 2C (Milepost 670.90), the predicted accident frequency at the 50 MNT level of operation is 0.011, which corresponds to 1 accident every 91 years. The proposed crossing in Fall River County is classified as Category B.

100 MNT

SEA's safety analysis showed that for the proposed public highway/railroad grade crossing along the Oral Segment at County Highway 2C (Milepost 670.90), the predicted accident frequency at the 100 MNT level of operation is 0.015, which corresponds to 1 accident every 67 years. The proposed crossing in Fall River County is classified as Category B.

4.6.9 HAZARDOUS MATERIALS

Section 4.4.15 provides a detailed discussion of the potential project related impacts to hazardous materials' transportation and sites. Because no hazardous materials are anticipated to be transported over Alternatives B, C, or D, none of the Hay Canyon Alternatives would have any impact on the transportation of this type of material. No hazardous waste sites have been identified along any of the alternatives. However, construction of any of them could impact unknown sites if they are located within the rail line right-of-way. DM&E should coordinate with the EPA and South Dakota Department of Environment and Natural Resources to obtain specific information on the location of known hazardous materials sites. However, due to the undeveloped and remote locations of the alternative, no such sites are anticipated to occur along the Hay Canyon Segment or WG Divide Alternative. No such sites are anticipated along the Oral Segment. However, because this segment utilizes existing rail line for much of its length and passes through the community of Oral, there would seem to be a greater possibility of hazardous material sites occurring along this alternative than the others.

4.6.10 ENERGY RESOURCES

Section 4.4.16 provides a detailed discussion of the potential impacts of the new rail line extension on energy resources, both their transportation and utilization, and on recyclable commodities. The Hay Canyon Alternatives vary in length from 14.7 to 20.5 miles, with the Oral Segment being the longest and the WG Divide Alternative being the shortest. Differences in length between the alternatives may make the shorter alternatives more fuel efficient than the longer alternatives. However, the grade consideration on the Hay Canyon Segment and WG Divide Alternative may counter any reduction in length, causing fuel consumption to be similar for each of the alternatives. No recyclable commodities would be transported by any of the proposed alternatives.

4.6.11 CULTURAL RESOURCES

Cultural resources occur throughout the project area and could be affected if important archaeological or historic sites are damaged or destroyed, particularly if they could add to the understanding of the area's human occupation. The potential types of impacts that could occur to cultural resources as a result of new rail line construction and operation are discussed in Section 4.4.17.

Construction and operation of the Hay Canyon Alternative have the potential to affect cultural resources by damaging or destroying them or altering the setting in which they occur. However, during construction, cultural materials encountered could be recovered and preserved for future study and research. Archaeologically, only one site is known along the Hay Canyon Alternatives. This site is actually a paleontological site containing bones of modern animals. However, each of the alternative alignments is considered to have a high potential for encountering archaeological sites, including sites of significance and eligible for the NRHP. The lack of known sites along the alternatives is most probably due to the lack of archaeological survey and study in the area due to its remoteness and undeveloped character.

Hay Canyon

The Hay Canyon Segment would be expected to have a high potential for encountering archaeological sites along the 6.5 miles of the segment that follow the Hay Canyon Creek drainage, at the Cheyenne River crossing, and those areas of the alignment north of the river. This is due to the Cheyenne River and Hay Canyon Creek providing a source of water that would have been attractive for campsites and hunting areas in prehistoric times.

WG Divide

The WG Divide Alternative would have a high potential of encountering archaeological resources along 3.7 miles of its northern-most section, north of its crossing of the Cheyenne River. Once across the river, the WG Divide Alternative would cross mainly upland areas away from reliable sources of water, reducing the potential for cultural resources.

Oral

The Oral Segment would be expected to have a high potential for encountering archaeological sites along the 13.3 miles of the alignment that include new right-of-way. This new right-of-way generally would follow the Cheyenne River corridor which contains numerous archaeological sites, as evidenced by the number of sites indicated for Alternatives B and C in Section 4.4.17. The reliable source of water provided by the Cheyenne River would have made this area attractive for campsites and hunting areas in prehistoric times. The remaining 7.2 miles of the Oral Segment would involve reconstruction of the existing DM&E rail line. While it is likely much of the cultural material present within the right-of-way was destroyed during initial rail line construction, undisturbed areas containing cultural material could still be present. Additionally, it is likely that the existing rail line would require some realignment onto new areas outside the existing right-of-way. Cultural materials in these areas would be susceptible to damage or destruction during construction. While the areas along the existing rail line are considered less likely to contain cultural resources, construction along this portion of the Oral Segment could encounter cultural resources.

The existing DM&E rail line portion of the Oral Segment was constructed nearly 100 years ago. Therefore, many of the structures associated with the existing rail line may meet the criteria of eligibility for the NRHP. SEA reviewed available information on these structures and determined that 12 bridges and culverts occur along the existing rail line portion of the Oral Segment. These include 4 pile bent bridges (none of which are eligible for the NRHP), 4 deck plate girder bridges (all of which are eligible for the NRHP), 1 through plate girder bridge (eligible for the NRHP), 1 through truss bridge (eligible for the NRHP), and 2 stone box culverts (both eligible for the NRHP).

4.6.12 SOCIOECONOMIC

The Hay Canyon Alternatives comprise a portion of the construction and operation of new rail line that would occur throughout Custer and Fall River Counties. Because they comprise only a small portion and are within 6.0 miles of each other in total length, the overall difference in their anticipated socioeconomic impacts to the counties in which they are located should be minimal.

Therefore, the socioeconomic impacts of the Hay Canyon Alternatives are included as part of the total socioeconomic impacts anticipated for the project. These impacts are discussed in detail in Section 4.4.16.

4.6.13 ENVIRONMENTAL JUSTICE

None of the Hay Canyon Alternatives would potentially impact any environmental justice communities.

4.6.14 RECREATION

Impacts to recreation from the Hay Canyon Alternatives would be similar in nature for each of the proposed alignments. The type of potential impacts would be similar to those discussed in Section 4.4.20. Generally, these impacts would include disturbance to individuals participating in a variety of recreational activities such as hunting, camping, horseback riding, and hiking. Additional lands adjacent to the right-of-way may also be considered by the public or landowners as undesirable due to trains disturbing horses during riding, game during hunting, and campers trying to sleep. During construction and operation, big game hunting (an important recreational activity in the area) may be particularly affected by noise and human presence. Noise and human presence would both cause game to seek areas undisturbed by these activities and, for safety reasons, require hunters to avoid areas near the rail line. This would further reduce the lands available for recreation.

In addition to noise disturbance, rail line construction and operation may also reduce the attractiveness of an area for recreation due to the alteration of the visual setting of the area. Construction and operation of a rail line would create an unnatural intrusion into the landscape considered by some to be unattractive, resulting in individuals changing their recreational patterns to avoid areas within site of the line.

All of these alternatives cross private lands. Public Federal and state lands would not be crossed by any of the alternatives. The alternatives would also be located in remote areas. Any recreational use of the areas along these alternatives would primarily be by the landowners, their families, and guests, reducing the number of individuals affected by the project. However, it is likely the remoteness and solitude these areas make them attractive to the individuals that engage in recreational activities in these areas.

4.6.15 AESTHETICS

Section 4.4.21 provides a detailed discussion of the potential project related impacts to the aesthetics of the project area. As noted in Section 4.4.21, no designated scenic areas or overlooks occur along the project alternatives, although many areas are considered by landowners and visitors as scenic. The same is true for the Hay Canyon area and alternatives.

There is also concern that emissions from operating locomotives could contribute to regional haze and impact visibility of nearby Class I airsheds (Badlands National Park/Sage Creek Wilderness Area and Wind Cave). The minimal emissions that would result along the Hay Canyon Alternatives due to their short length would not result in any reductions in air quality for these areas. However, as part of the total project, emissions along these alternatives could contribute to air quality affects for these areas. Section 4.4.21 discusses SEA's air quality analysis and presents its determinations concerning the potential air quality impacts to these Class I areas. This analysis includes the emissions that would result from the Hay Canyon Alternatives.

Hay Canyon

The Hay Canyon Segment would be constructed largely within the Hay Canyon drainage, a winding drainage through a topographically diverse area with steep and rolling hills. A viewer could obtain a vantage point to see the rail line from any of the numerous high points adjacent to the rail line. However, because of the hills and drainages in the area, construction of 18.5 miles of new rail for this segment would likely require numerous cuts, fills, and bridges or culverts for the stream crossing. This segment would create an obvious visual intrusion into this area, however, the topography of the area would likely limit the length of rail line visible from any one vantage point. The ruggedness, remoteness, and lack of roads in the area would limit the individuals potentially having access to the area to view the visual change. However, the change would likely be considered an undesirable view compared to that currently present by those that would see it.

WG Divide

The WG Divide Alternative would cross generally flatter, more open terrain, preventing hills and drainages from screening the rail line from view. However, such screening would occur throughout the alignment, depending on the location and vantage point of the viewer. The numerous grade crossings (15) would also provide opportunities for larger numbers of people to pass within view of the rail line and reduce the amount of scenery viewed by travelers that would be free of a rail line. However, the additional roads along the WG Divide Alternative provide other linear transportation corridors within the landscape. While such roadways tend to blend to the landscape, a rail line would generally be considered a compatible linear facility and not

contrast visually with the visual character created by these other facilities. Additionally, while the 14.7 miles of new rail line would be new to this area, encountering rail lines would not be considered an uncommon occurrence by travelers in the rural United States.

Oral

The Oral Segment would consist of rail construction along approximately 13.3 miles of new rail line right-of-way, the majority of which would be within the Cheyenne River floodplain or on the floodplain sideslopes. These portions of the rail line would be visible to individuals standing at the top of the floodplain sideslope overlooking the river, particularly to those on the opposite side of the river. However, the location of the rail line at the base of the sideslope, below the elevation of the adjacent areas would screen it from the view of individuals away from the river valley. The few roads along the new construction portion of the Oral Segment would reduce access to the area, limiting the number of individuals frequenting the area and capable of seeing the rail line.

The remaining 7.2-miles of the Oral Segment would include the reconstruction of the existing DM&E rail line. While reconstruction of this portion of rail line could involve substantial construction and require realignment of the existing rail line onto areas not currently rail line right-of-way, the new rail line would not present a visual change dramatically different from that currently present in the area due to the existing rail line.

* * * * *

4.7 BLACK THUNDER MINE LOOP ALTERNATIVES

As discussed in Chapter 2, two alternative routes have been proposed for use with either Alternative B, C, or D to access the Black Thunder mines. The following discussion provides a comparison of the potential impacts of these alternatives. In general, the types of impacts that would result from the Black Thunder Mine Loop Alternatives would be similar to those discussed in Section 4.4. Additionally, the impacts that would result from these alternatives would generally be the same for either Alternative B, C, or D. Information of the existing environment along these alternative alignments is provided in Section 4.1. More detailed discussion of the types, nature, and significance of impacts to the various resources discussed is included under each resource topic in Section 4.4.

4.7.1 GEOLOGY AND SOILS

Section 4.4.5 discusses the potential impacts to geology and soils that could result from new rail line construction and operation. Impacts would generally be expected to occur during the construction of new rail line and would include the creation of unstable areas leading to slope slumps or landslides, clearing and soil disturbance resulting in increased erosion, and loss or damage to paleontological resources.

4.7.1.1 Geologic Hazards

Black Thunder South Mine Loop

This alternative would cross 7.1 miles (approximately 344.2 acres) of potentially hazardous geologic formations, including approximately 3.9 miles of Fort Union Lebo and approximately 3.2 miles of the Wasatch Formations. The clay-mineral content of these rocks is moderate to high, so that they are susceptible to slumps and earth flows. The potential for slumps or landslides would be high along approximately 7.1 miles (344.2 acres) where this alternative would cross steep slopes.

Black Thunder North Loop

This alternative would cross 4.5 miles (approximately 218.2 acres) of potentially hazardous geologic formations, including approximately 3.6 miles of Fort Union Lebo and approximately 0.9 mile of the Wasatch Formations. The potential for slumps or landslides would be high where this alternative would cross steep slopes or where cutting or loading of slopes or unusually high precipitation may cause landsliding in these formations. This alternative would be approximately 2.6 miles shorter than the Black Thunder South Mine Loop. The potential for

slumps or landslides would be high along approximately 4.5 miles (218.2 acres) where this alternative would cross steep slopes.

4.7.1.2 Soil Impacts

Black Thunder South Mine Loop

The impacts to soil would be similar to the other portions of the Extension Alternatives which include the loss of topsoil, erosion, and the possibility of the introduction and establishment of noxious weeds. The Black Thunder South Mine Loop would disturb approximately 344.2 acres of soil over its 7.1-mile length. This alternative would cross 7.1 miles (344.2 acres) of soils with an erosion hazard. Construction on steep soils typically requires larger disturbed areas and longer cut and fill slopes to achieve design grades. Therefore, disturbance of soils in these areas could increase the potential for erosion. This alternative is 2.6 miles longer than the Black Thunder North Mine Loop. Its additional length would cause more total soil disturbance and could cause more potential erosion than the North loop. No prime farmland would be impacted by this alternative.

Black Thunder North Mine Loop

The impacts to soil would be similar to the other alternative. The Black Thunder North Mine Loop would disturb approximately 218.2 acres of Group 7 soil over its 4.5-mile length, all of which presents an erosion hazard. No prime farmland would be impacted by this alternative.

4.7.1.3 Paleontological Resources

Impacts to paleontological resources would occur if important fossils are damaged or destroyed during project construction. A description of paleontological resources located in this region and potential impacts are presented in Sections 4.2.3.5 and 4.4.5.3.1, respectively.

Black Thunder South Mine Loop

This alternative would cross approximately 3.9 miles of PFYC 3 soils and 3.2 miles of PFYC 5 soils.

Black Thunder North Mine Loop

This alternative would cross approximately 3.6 miles of PFYC 3 soils and 0.9 mile of PFYC 5 soils.

4.7.2 LAND USE

Potential project impacts to land use would include conversion of current land use to rail line right-of-way, preclusion of existing land uses within the right-of-way, and incompatibility with adjacent land uses. These impacts and others are discussed in more detail in Section 4.4.6. The following provides an overview of the land use types affected by each of the Mine Loop Alternatives.

4.7.2.1 Agriculture

Black Thunder South Mine Loop

This alternative would cross 5.8 miles (approximately 281.2 acres) of rangeland. Impacts to this resource would be similar to those discussed in Section 4.4.6.1 including the direct loss of forage during construction, fragmentation of allotments, isolation of water sources, and disruption of operations. This alternative would cross 3 pastures in 2 Federal grazing allotments. This would result in a loss of approximately 45.1 AUM's in these allotments.

Black Thunder North Mine Loop

This alternative would cross 3.8 miles (approximately 184.2 acres) of rangeland. Impacts to this resource would be similar to those mentioned above. This alternative would cross 5 pastures in 3 Federal grazing allotments resulting in the loss of approximately 2 AUM's.

4.7.2.2 Residential

No impacts to residential areas are expected for any of these alternatives.

4.7.2.3 Mineral and Mining

Black Thunder South Mine Loop

This alternative would cross 1.0 mile (approximately 48.5 acres) of strip mines, quarries, and gravel pits. It would also cross approximately 2.0 miles of reclaimed areas. Additional access would be provided to the Black Thunder Mine. It would also cross approximately 0.3 mile (14.5 acres) of industrial land.

Black Thunder North Mine Loop

This alternative would cross 0.6 mile (approximately 29.1 acres) of strip mines, quarries, and gravel pits. It would also cross approximately 2.4 miles of reclaimed areas. Additional access would be provided to the Black Thunder Mine. It would also cross approximately 0.1 mile (4.8 acres) of industrial land. This alternative could conflict with development plans of the Black Thunder Mine for their Thunder Cloud lease located on the north side of State Highway 450.

4.7.2.4 Federal Lands

4.7.2.4.1 Forest Service Lands

Black Thunder South Mine Loop

This alternative would cross 3.1 miles (approximately 150.3 acres) of USFS lands within TBNG. Impacts to these lands would include noise from railroad construction and operation and the visual intrusion of a new rail line, rail bed, and right-of-way. Recreational use of the area adjacent to the proposed mine loop may be reduced due to the reduction of game and increased disturbance in this area.

Black Thunder North Mine Loop

This alternative would cross 0.6 mile (approximately 29.1 acres) of USFS lands within TBNG. Impacts would be similar to those presented above.

4.7.2.4.2 Bureau of Land Management Lands

No impacts to BLM lands are expected from either of the alternatives.

4.7.2.4.3 Bureau of Reclamation Lands

No impacts to Reclamation lands are expected from either of the alternatives.

4.7.2.4.4 Fish and Wildlife Service Lands

No impacts to USFWS lands are expected from either of the alternatives.

4.7.2.5 Reservation and Treaty Lands

No impacts to these lands are expected from either of the alternatives.

4.7.2.6 State of Wyoming Lands

Black Thunder South Mine Loop

This alternative would cross 0.7 mile (approximately 33.9 acres) of State of Wyoming land.

Black Thunder North Mine Loop

This alternative would cross 2.7 miles (approximately 130.9 acres) of State of Wyoming land.

4.7.3 WATER RESOURCES

4.7.3.1 Surface Water Impacts

Potential types of impacts to water resources are discussed in detail in Section 4.4.7. Construction and operation of a new rail line could affect water resources by increasing erosion into the water and subsequently reducing water quality, disturbing or altering the stream causing changes in stream hydrology, contaminating water in the event of a spill, and damage to or loss of wetlands.

Black Thunder South Mine Loop

This alternative would cross 12 intermittent streams.

Black Thunder North Mine Loop

This alternative would cross nine intermittent streams.

4.7.3.2 Wetlands

Black Thunder South Mine Loop

Approximately 0.3 mile (14.5 acres) of wet meadow emergent wetlands would be lost during construction of this alternative. Wetlands located in adjacent areas could be affected by sedimentation and potential changes in surface water flow due to construction of the rail bed.

Black Thunder North Mine Loop

No wetlands would be crossed by this alternative. Impacts may occur to adjacent wetlands as mentioned above.

4.7.4 AIR QUALITY

Construction of either of the Black Thunder Mine Loops has the potential to impact local air quality, as discussed in Section 4.4.8. Impacts would generally result from fugitive dust during earthmoving activities and emissions from construction vehicles and equipment.

The impacts to air quality during operation would be dependent on the length of the alternative selected and the amount of coal from the Black Thunder mines that is actually shipped by DM&E over these mine loops. Since this information will not be determined until operation, the amounts of pollutants cannot be estimated for these track sections. However, in general, the longer mine loop, that being the Black Thunder South Mine Loop, would result in more locomotive emissions than the North Mine Loop.

4.7.5 NOISE

The construction and operation of the Black Thunder Mine Loops would increase noise levels along the rail line, as discussed in Section 4.4.9. Operation of construction equipment and train traffic meeting the Board's environmental analysis threshold for noise evaluation would occur along the entire alignment. No communities would be affected by either of these alternatives. These alternatives would not cause noise disturbance for any noise sensitive receptors. However, noise disturbance would occur for wildlife in the area. Potential impacts due to noise are presented in Section 4.4.11.

4.7.6 BIOLOGICAL RESOURCES

4.7.6.1 Vegetation

Impacts to vegetation from these alternatives would be similar to those discussed in Section 4.4.10. They would primarily include the loss of vegetative cover due to construction activities converting the area to rail line right-of-way.

Black Thunder South Mine Loop

The loss of 6.8 miles (approximately 329.7 acres) of grassland vegetation and 0.3 mile (14.5 acres) of emergent wetland vegetation would occur during construction of this alternative.

Black Thunder North Mine Loop

The loss of 4.5 miles (approximately 218.2 acres) of grassland vegetation would occur during construction of this alternative.

4.7.6.2 Wildlife

4.7.6.2.1 Big Game

Impacts to big game would be similar to those mentioned previously in Section 4.4.11.1. The only quantifiable impact to big game is the amount of habitat in the species' seasonal ranges converted to rail line right-of-way. Table 4.7-1 lists the number of miles of seasonal ranges crossed by each alternative and the acres converted to rail line right-of-way.

Table 4.7-1 Comparison of Wildlife Habitat between the Alternatives				
Big Game Species and Seasonal Range Category	Black Thunder South		Black Thunder North	
	miles	acres	miles	acres
Elk				
Winter Range	0	0	0.1	4.8
Yearlong Range	1.9	92.1	1.7	82.4
Pronghorn				
Winter Range	7.1	344.2	4.5	218.2
Yearlong Range	0	0	0	0
Whitetail				
Winter Range	0	0	0	0
Yearlong Range	0	0	0	0
Mule Deer				
Winter Range	0	0	0	0
Yearlong Range	3.7	179.4	2.5	121.2

4.7.6.2.2 Game Species

Upland Game Birds

Construction and operation impacts resulting from new rail line to upland game birds are discussed in detail in Section 4.4.11.2. There are no sage grouse leks within two miles of either Black Thunder Mine Loop.

Waterfowl

Potential impacts to waterfowl from construction and operation of new rail line are discussed in detail in Section 4.4.11.2. Impacts from these alternatives would generally include loss of nests and nesting habitat in grassland areas, loss of wetland habitat for adults and brood rearing, and disturbance.

Black Thunder South Mine Loop

This alternative would convert 5.8 miles (approximately 281.2 acres) of grassland habitat that could provide nesting habitat for waterfowl to rail line right-of-way. It would cross 12

intermittent streams and would convert approximately 14.5 acres of wet meadow emergent wetlands to rail line right-of-way.

Black Thunder North Mine Loop

This alternative would convert 3.8 miles (approximately 184.2 acres) of grassland habitat that could provide nesting habitat for waterfowl to rail line right-of-way. It would cross 9 intermittent streams. No wetlands are located within the proposed right-of-way.

Small Game and Furbearers

Potential impacts from new rail line construction and operation to small game animals and furbearers are discussed in Section 4.4.11.2. Those impacts would be similar to the types of impacts expected from either Black Thunder Mine Loop. As these species are found in nearly all habitats and are wide ranging, construction of either alignment would have the potential to disturb them and reduce their habitat. Both alternatives would also likely result in some mortality to these species during operation. However, because both of the Black Thunder Mine Loops include numerous stream crossings, it would likely affect a larger amount of habitat for furbearer, as these species would tend to utilize the riparian areas along streams.

4.7.6.2.3 Non-Game Species

Amphibians and Reptiles

The construction and operation impacts to amphibians and reptiles discussed in Section 4.4.11.3 would be similar to those expected for the Black Thunder and North Antelope Mine Loop Alternatives. Reptiles and amphibians could occur anywhere along the alternatives and their lack of mobility makes them susceptible to mortality during construction and operation of a rail line. However, the Black Thunder Mine Loops would likely have a greater impact to these species due to its location along the North Prong Little Thunder Creek and many stream crossings, which provide a potential source of water for amphibian habitat and breeding and foraging areas for reptiles.

Songbirds

The primarily impact to songbirds from construction and operation of the proposed alignment alternatives would be the loss of nesting habitat. Songbirds within the project area include both ground and tree nesters. However, no woody vegetation would be affected by either

alternative. The Black Thunder Mine Loops would convert approximately 344.2 (South Loop) and 218.2 (North Loop) acres of grassland to rail line right-of-way.

Shorebirds

Impacts to shorebirds would be similar to those discussed for waterfowl. The Black Thunder Segments would have numerous stream crossings and riparian areas.

Small Mammals

Small mammals would be impacted during construction and operation by loss of habitat and mortality, as discussed in Section 4.4.11.3. Small mammals are expected to occur throughout the project area and along both mine loop alternatives. Loss of habitat and any mortality are expected to be similar for both alternatives due to the similar habitats affected. However, because of the high reproductive potential of small mammal species and the limited amount of potential habitat lost, both the alternatives would have similar and generally minimal impacts to small mammal populations.

Raptors

The potential impacts to raptors from the Black Thunder Mine Loops would be similar to those discussed in Section 4.4.11.3. Both alternatives would convert foraging lands and potential ground-nesting habitat to rail line right-of-way. Noise and activity during construction and operation could disturb nesting raptors, resulting in nest abandonment and failure. Table 4.7-2 provides information on raptor nests within proximity to the alternatives. Raptors could be struck by trains if feeding on carrion along the rail line during the winter.

Table 4.7-2 Comparison of Raptor Nesting Sites between the Black Thunder Alternatives			
Raptor Types Present along each Alternative	Number of Nests and Distance		
	0.25 Mile	0.5 Mile	1.0 Mile
Black Thunder North			
Ferruginous Hawk	6	10	15
Red-Tail Hawk	1	1	1
Golden Eagle	0	0	1
Black Thunder South			
Ferruginous Hawk	6	8	12
Red-Tail Hawk	0	1	1
Golden Eagle	0	0	5
Great Horned Owl	0	0	1

4.7.6.3 Aquatic and Fisheries

Potential impacts to aquatic and fishery resources include loss of habitat and reduced water quality as discussed in Section 4.4.11.4. No trout streams are crossed by any of the alternatives. Impacts to aquatic and fishery resources would be most likely to occur in areas where the alternatives are in close proximity to streams or drainages or at stream crossings.

4.7.6.4 Endangered, Threatened, and Sensitive Species

The following section discusses the potential impacts to those Federally listed threatened or endangered species known to occur or potentially occurring along the Black Thunder and North Antelope Mine Loop Alternatives.

4.7.6.4.1 Mountain Plover

The potential impacts to mountain plovers would be similar to those types of impacts discussed in Section 4.4.12.8. They would generally include destruction of nests during construction and disturbance to nesting birds leading to nest failure during both rail line construction and operation across grassland areas. The Black Thunder South and North Mine Loop Alternatives would cross approximately 6.8 miles (329.7 acres) and 4.5 miles (218.2 acres), respectively. Mountain plover nests and chicks would be particularly susceptible to mortality from vehicles and construction equipment, especially along 2-track roads and where construction activities would cross prairie dog towns. The nesting habitat for plovers in the project area would

include short-grass prairie and black-tailed prairie dog colonies. The Black Thunder Mine Loops do not cross any prairie dog colonies.

4.7.6.4.2 Bald Eagle

Impacts to wintering bald eagles would occur from human activity associated with project construction, operation and maintenance, as well as loss of potential habitat for nesting, perching, and roosting along 0.9 mile of riparian habitat located within 0.5 mile of Little Thunder Creek. No nesting sites are located in proximity to these alternatives.

4.7.6.4.3 Swift Fox

Swift fox may occur in a variety of habitats throughout the project area (Section 4.4.12.9 and Appendix K). Impacts could include loss of habitat and mortality if struck by a train. Swift fox are known to utilize prairie dog colonies, primarily for prey. Therefore the amount of prairie dog colony converted to rail line serves as a means to compare the potential impacts of each alternative. There are no prairie dog colonies located along either Black Thunder Mine Loop.

4.7.7 TRANSPORTATION

Transportation impacts would be similar to those described in Section 4.4.13. They would include increased vehicle traffic and delays at new grade crossings during construction and vehicle delays due to passing trains during operation. SEA concluded that the potential effect of increased train traffic for highways with ADT volumes below 5,000 would be experienced by very few drivers and the additional vehicular delay would be minimal. Neither Mine Loop Alternative has any public highway/railroad grade crossings where average daily traffic (ADT) volumes are 5,000 or greater. Therefore, SEA did not calculate potential vehicle delay or queue at these new crossings.

Black Thunder South Mine Loop

The Black Thunder Mine Loop would only cross one roadway, State Highway 450 (ADT of 100) in Campbell County.

Black Thunder North Mine Loop

This alternative would not cross any state, county, or grassland roads.

4.7.8 SAFETY

Construction and operation of a rail line has the potential to result in injury or loss of human life, particularly at locations where the rail line would cross an active roadway grade. Vehicles operating across the rail line would be at risk of accidents during construction as well as being struck by a train during rail line operation. Section 4.4.14 provides a detailed discussion of the potential affects of construction and operation of new rail line on safety.

To further address potential accidents resulting from new grade crossings, SEA calculated accident frequency rates at proposed public grade crossings. SEA's analysis procedure considered the type of warning devices at the highway/rail grade crossing, including passive devices (signs and crossbucks), flashing lights, or gates.

SEA evaluated traffic levels at 20 MNT (8 trains), 50 MNT (18 trains), and 100 MNT (34 trains). The amount of rail traffic along each alternative would be dependent on the amount of coal hauled by DM&E from the Black Thunder Mine. The actual level of rail traffic has not yet been determined. As no contracts are currently in place, these evaluation levels are used to provide an assessment of the potential impacts along these mine loop alternatives at various levels of coal transportation from the mines. They do not represent the anticipated rail traffic at the 20 MNT, 50 MNT, and 100 MNT level of total project operation. SEA estimates that the projected levels of traffic from the Black Thunder Mine would not exceed 20 MNT.

Black Thunder South Mine Loop

Campbell County

20 MNT

SEA determined that the proposed construction would significantly increase the predicted accident risk at crossing Highway 450 at the 20 MNT level of operation. The estimated annual accident frequency at the 20 MNT level of operation would range from 0.010 to 0.016. This translates to an increase of 0.007 with an estimated annual accident frequency from 1 accident every 152 years. The proposed crossing would be classified as Catagory B.

50 MNT

SEA determined that the proposed construction would significantly increase the predicted accident risk at crossing Highway 450 at the 50 MNT level of operation. The estimated annual accident frequency would increase from 0.010 to 0.020. This translates into an increase of 0.011

with an accident frequency of 1 accident every 94 years. The proposed crossing would be classified as Category B.

100 MNT

SEA determined that the proposed construction would significantly increase the predicted accident risk at crossing Highway 450 at the 100 MNT level of operation. The estimated annual accident frequency would increase from 0.010 to 0.025. This translates into an increase of 0.015 with an accident frequency of 1 accident every 65 years. The proposed crossing would be classified as Category B.

Black Thunder North Mine Loop

The Black Thunder North Mine Loop would have no impact as it would have no roadway crossings.

4.7.9 HAZARDOUS MATERIALS

Section 4.4.15 provides a detailed discussion of the potential project related impacts to hazardous materials transportation and sites. Because no hazardous materials are anticipated to be transported over Alternatives B, C, or D, neither the Black Thunder Mine Loop would have any impact on their transportation. No hazardous waste sites have been identified along either of the alternatives. However, construction of either rail line could impact them if unknown sites are located within the rail line right-of-way. DM&E should coordinate with the EPA and Wyoming Department of Environment and Natural Resources to obtain specific information on the location of known hazardous materials sites. However, due to the undeveloped and remote location of these alignments, no such sites are anticipated to occur along either the Black Thunder Mine Loop.

4.7.10 ENERGY RESOURCES

Section 4.4.16 provides a detailed discussion of the potential impacts that would include the effects of the new mine loop alternatives on energy resources, their transportation and utilization. No recyclable commodities would be transported by either alternative.

4.7.11 CULTURAL RESOURCES

Potential impacts to cultural resources located in Wyoming within the proposed project area are presented in Section 4.2.17. The project area has a rich and long history of human

occupation and known sites of archaeological significance occur throughout the area. Potential impacts could occur to cultural resources as a result of new rail line construction. Inadvertent discovery of archaeological sites may damage or destroy significant sites. No archaeological sites are known along the alternatives. The lack of known sites along the alternatives is most probably due to the lack of archaeological survey and study in the area due to its remoteness and undeveloped character. Any impacts to discovered cultural resource sites associated with new construction would require mitigation in accordance with the PA (Appendix J).

4.7.12 SOCIOECONOMICS

The Black Thunder Mine Loops comprise a portion of the construction and operation of new rail line that would occur throughout Campbell County. Because they comprise only a small portion of the proposed construction within these counties, the overall difference in their anticipated socioeconomic impacts to the counties in which they are located should be minimal. Therefore, the socioeconomic impacts of the Black Thunder Mine Loops are included as part of the total socioeconomic impacts anticipated for the project. These impacts are discussed in detail in Section 4.4.16.

4.7.13 ENVIRONMENTAL JUSTICE

Neither of the Black Thunder Alternatives would potentially impact any environmental justice communities.

4.7.14 RECREATION

Impacts to recreation from the Black Thunder Mine Loops would be similar in nature for each of the proposed alignments. The type of potential impacts would be similar to those discussed in Section 4.4.20. Generally, these impacts would include disturbance to individuals participating in a variety of recreational activities such as hunting, camping, horseback riding, and hiking. Additional lands adjacent to the right-of-way may also be considered by the public or landowners as undesirable due to trains disturbing horses during riding, game during hunting, and campers trying to sleep. During construction and operation, big game hunting (an important recreational activity in the area) may be particularly affected by noise and human presence. Noise and human activities would both cause game to seek areas undisturbed by these activities and, for safety reasons, require hunters to avoid areas near the rail line. This would further reduce lands available for recreation.

In addition to noise disturbance, rail line construction and operation may also reduce the attractiveness of recreation areas due to the alteration of the visual setting of the area. Construction and operation of a rail line would create an unnatural intrusion into the landscape considered by some to be unattractive, resulting in individuals changing their recreational patterns to avoid areas within site of the rail line.

Black Thunder South Mine Loop

This alternative would cross 3.1 miles (150.3 acres) on TBNG, 0.7 mile (33.9 acres) of State of Wyoming land, and 3.3 miles (160.0 acres) of private land. For safety reasons, the lands within the right-of-way, approximately 344.2 acres, would be fenced and removed from public use.

Black Thunder North Mine Loop

This alternative would cross 0.6 mile (29.0 acres) of TBNG, 2.7 miles (130.9 acres) of State of Wyoming land, and 1.2 miles (58.2 acres) of private land. Approximately 218.2 acres of land would be directly converted to rail line right-of-way and removed from potential recreational use.

4.7.15 AESTHETICS

Section 4.4.21 provides a detailed discussion of the potential project related impacts to the aesthetics of the project area. As noted in Section 4.4.21, no designated scenic areas or overlooks occur along the project alternatives, although many areas are considered by landowners and visitors as scenic. Additionally, the USFS has developed VQOs for lands under its management in an attempt to quantify the scenic value of its areas (Section 4.4.21). Each of these alternatives would create a visual intrusion into the current landscape, altering the visual quality.

There is also concern that emissions from operating locomotives could contribute to regional haze and impact visibility. The minimal emissions that would result along the Black Thunder Alternatives, due to their short length, would not result in any reduction in air quality for these areas. However, as part of the total project, emissions along these alternatives could affect air quality for these areas.

Black Thunder South Mine Loop

This alternative would cross 2.7 miles of lands with a VQO of modification and 0.4 mile with a VQO of partial retention on TBNG. No areas with a high scenic integrity level (SIL) would be affected.

Black Thunder North Mine Loop

This alternative would cross 0.6 mile of lands with a VQO of modification and less than 0.1 mile with a VQO of partial retention on TBNG. No areas with a high SIL would be affected.

* * * * *

[THIS PAGE INTENTIONALLY LEFT BLANK]

4.8 NORTH ANTELOPE MINE LOOP ALTERNATIVES

As discussed in Chapter 2, two alternative routes have been proposed for use with either Alternative B, C, or D to access the North Antelope mines. The following discussion provides a comparison of the potential impacts of these alternatives. In general, the types of impacts that would result from the North Antelope Mine Loop Alternatives would be similar to those discussed in Section 4.4. Additionally, the impacts that would result from these alternatives would generally be the same for either Alternative B, C, or D. Information of the existing environment along these alternative alignments is provided in Section 4.1. More detailed discussion of the types, nature, and significance of impacts to the various resources is included under each resource topic in Section 4.4.

4.8.1 GEOLOGY AND SOILS

Section 4.4.5 discusses the potential impacts to geology and soils that could result from new rail line construction and operation. Impacts would generally be expected to occur during the construction of new rail line and would include the creation of unstable areas leading to slope slumps or landslides, clearing and soil disturbance resulting in increased erosion, and loss or damage to paleontological resources.

4.8.1.1 Geologic Hazards

North Antelope East Loop

This alternative would cross 1.5 miles (approximately 72.7 acres) of the Fort Union Lebo Formation. The potential for slumps or landslides would be high where this alternative would cross steep slopes, which are not common to this type of soil. Cutting or loading of slopes or unusually high precipitation may also cause landsliding in these formations.

North Antelope West Loop

This alternative would cross 2.4 miles (approximately 116.4 acres) of the Fort Union Lebo Formation. As with the other alternatives, the potential for slumps or landslides would be high where this alternative would cross steep slopes, which are not common to this type of soil. Cutting or loading of slopes or unusually high precipitation may also cause landsliding in these formations.

4.8.1.2 Soil Impacts

North Antelope East Mine Loop

Impacts to these soils would be similar to those discussed for the other alternatives. The 1.5-mile North Antelope East Mine Loop would disturb approximately 72.7 acres of soils with an erosion hazard. No prime farmland would be impacted by this alternative.

North Antelope West Mine Loop

Impacts to these soils would be similar to those discussed for the other alternatives. The 2.4-mile North Antelope West Mine Loop would disturb approximately 116.4 acres of erodible soils with an erosion hazard. This alternative is 0.9 mile longer than the North Antelope East Mine Loop, which would cause greater soil disturbance. No prime farmland would be impacted by this alternative.

4.8.1.3 Paleontological Resources

Impacts to paleontological resources would occur if important fossils are damaged or destroyed during project construction. A description of paleontological resources located in this region and potential impacts are presented in Sections 4.2.3.5 and 4.4.5.3.1, respectively. All of the soils located within the North Antelope Mine Loop alignments is classified as PFYC 3.

4.8.2 LAND USE

Potential project impacts to land use would include conversion of current land use to rail line right-of-way, preclusion of existing land uses within the right-of-way, and incompatibility with adjacent land uses. These impacts and others are discussed in more detail in Section 4.4.6. The following provides an overview of the land use types affected by each of the Mine Loop Alternatives.

4.8.2.1 Agriculture

North Antelope East Mine Loop

This alternative would cross 0.3 mile (approximately 14.5 acres) of cropland and 1.1 miles (approximately 53.3 acres) of pasture. No Federal grazing allotments would be crossed by this alternative.

North Antelope West Mine Loop

This alternative would cross 1.9 miles (approximately 92.1 acres) of cropland and 0.5 mile (approximately 24.2 acres) of pasture. No Federal grazing allotments would be crossed by this alternative.

4.8.2.2 Residential

No impacts to residential areas are expected for any of these alternatives.

4.8.2.3 Mineral and Mining

North Antelope East and West Mine Loops

No strip mines, quarries, or gravel pits would be impacted by these alternatives. No reclaimed areas would be crossed. Additional access would be provided to the North Antelope Mine.

4.8.2.4 Federal Lands

4.8.2.4.1 Forest Service Lands

No impacts to USFS lands are expected from either alternative.

4.8.2.4.2 Bureau of Land Management Lands

No impacts to BLM lands are expected from either of the alternatives.

4.8.2.4.3 Bureau of Reclamation Lands

No impacts to Reclamation lands are expected from either of the alternatives.

4.8.2.4.4 Fish and Wildlife Service Lands

No impacts to USFWS lands are expected from either of the alternatives.

4.8.2.4.5 Reservation and Treaty Lands

No impacts to these lands are expected from either of the alternatives.

4.8.2.5 State of Wyoming Lands

North Antelope East and West Mine Loops

No impacts would occur to State of Wyoming lands as a result of either of these alternatives.

4.8.3 WATER RESOURCES

4.8.3.1 Surface Water Impacts

Potential types of impacts to water resources are discussed in detail in Section 4.4.7. Construction and operation of a new rail line could affect water resources by increasing erosion into the water and subsequently reducing water quality, disturbing or altering the stream causing changes in stream hydrology, contaminating water in the event of a spill, and damage to or loss of wetlands.

North Antelope East Mine Loop

This alternative would cross two intermittent streams.

North Antelope West Mine Loop

This alternative would cross four intermittent streams.

4.8.3.2 Wetlands

North Antelope East Mine Loop

Approximately 0.1 mile of aquatic bed wetland (2.9 acres) would be lost during construction of this alternative. Impacts may occur to adjacent wetlands as mentioned above.

North Antelope West Mine Loop

No wetlands would be crossed by this alternative. Impacts may occur to adjacent wetlands as mentioned above.

4.8.4 AIR QUALITY

Construction of either of the North Antelope Mine Loop Alternatives has the potential to impact local air quality, as discussed in Section 4.4.8. Impacts would generally result from fugitive dust during earthmoving activities and emissions from construction vehicles and equipment.

The impacts to air quality during operation would be dependent on the length of the alternative selected and the amount of coal from the North Antelope mines that is actually shipped by DM&E over these mine loops. Since this information will not be determined until operation, the amounts of pollutants cannot be estimated for these track sections. However, in general, the longer mine loop, that being the North Antelope West Mine Loop, would result in more locomotive emissions than the East Mine Loop.

4.8.5 NOISE

The construction and operation of the North Antelope Mine Alternative would increase noise levels along the rail line, as discussed in Section 4.4.9. Operation of construction equipment and train traffic meeting the Board's environmental analysis threshold for noise evaluation would occur along the entire alignment. No communities would be affected by either of these alternatives. These alternatives would not cause noise disturbance for any noise sensitive receptors. However, noise disturbance would occur for wildlife in the area. Potential impacts due to noise are presented in Section 4.4.11.

4.8.6 BIOLOGICAL RESOURCES

4.8.6.1 Vegetation

Impacts to vegetation from these alternatives would be similar to those discussed in Section 4.4.10. They would primarily include the loss of vegetative cover due to construction activities converting the area to rail line right-of-way.

North Antelope East Mine Loop

The loss of 1.4 miles (approximately 223.0 acres) of croplands and pastures and 0.1 mile (approximately 2.9 acres) of wetland vegetation would occur during construction of this alternative.

North Antelope West Mine Loop

The loss of 1.9 miles (approximately 92.1 acres) of cropland and 0.5 mile (approximately 24.2 acres) of pasture vegetation would occur during construction of this alternative.

4.8.6.2 Wildlife

4.8.6.2.1 Big Game

Impacts to big game would be similar to those mentioned previously in Section 4.4.11.1. The only quantifiable impact to big game is the amount of habitat in the species' seasonal ranges converted to rail line right-of-way. Table 4.8-1 lists the number of miles of seasonal ranges crossed by each alternative and the acres converted to rail line right-of-way.

Table 4.8-1 Comparison of Wildlife Habitat between the Alternatives				
Big Game Species and Seasonal Range Category	North Antelope East		North Antelope West	
	miles	acres	miles	acres
Elk				
Winter Range	0	0	0	0
Yearlong Range	0	0	0	0
Pronghorn				
Winter Range	0	0	0	0
Yearlong Range	1.5	72.7	2.4	116.4
Whitetail				
Winter Range	0	0	0	0
Yearlong Range	1.5	72.7	0	0
Mule Deer				
Winter Range	0	0	2.1	101.8
Yearlong Range	1.5	72.7	0.3	14.5

4.8.6.2.2 Game Species

Upland Game Birds

Construction and operation impacts resulting from new rail line to upland game birds are discussed in detail in Section 4.4.11.2. There are no sage grouse leks within two miles of any of the four proposed mine loops.

Waterfowl

Potential impacts to waterfowl from construction and operation of new rail line are discussed in detail in Section 4.4.11.2. Impacts from these alternatives would generally include loss of nests and nesting habitat in grassland areas, loss of wetland habitat for adults and brood rearing, and disturbance.

North Antelope East Mine Loop

The North Antelope East Mine Loop would convert 1.4 miles (approximately 67.8 acres) of croplands and pasture that could provide nesting habitat for waterfowl to rail line right-of-way. It would cross 2 intermittent streams and convert 0.1 mile (approximately 2.9 acres) of aquatic bed wetlands to rail line right-of-way.

North Antelope West Mine Loop

This alternative would convert 2.4 miles (approximately 116.4 acres) of croplands and pasture that could provide nesting habitat for waterfowl to rail line right-of-way. It would cross 4 intermittent streams. No wetlands are located within the proposed right-of-way.

Small Game and Furbearers

Potential impacts from new rail line construction and operation to small game animals and furbearers are discussed in Section 4.4.11.2. Those impacts would be similar to the types of impacts expected from either North Antelope Mine Loop Alternatives. As these species are found in nearly all habitats and are wide ranging, construction of either alignment would have the potential to disturb them and reduce their habitat. Both alternatives would also likely result in some mortality to these species during operation.

4.8.6.2.3 Non-Game Species

Amphibians and Reptiles

The construction and operation impacts to amphibians and reptiles discussed in Section 4.4.11.3 would be similar to those expected for the Black Thunder and North Antelope Mine Loop Alternatives. Reptiles and amphibians could occur anywhere along the alternatives and their lack of mobility makes them susceptible to mortality during construction and operation of a rail line. However, the Black Thunder Mine Loops would likely have a greater impact to these species due to its location along the North Prong Little Thunder Creek and many stream crossings, which provide a potential source of water for amphibian habitat and breeding and foraging areas for reptiles.

Songbirds

The primary impact to songbirds from construction and operation of the proposed alignment alternatives would be the loss of nesting habitat. Songbirds within the project area include both ground and tree nesters. However, no woody vegetation would be affected by either alternative. The North Antelope Mine Loops would convert approximately 72.7 acres (East Loop) and 116.4 acres (West Loop) of pasture and cropland to rail line right-of-way.

Shorebirds

Impacts to shorebirds would be similar to those discussed for waterfowl.

Small Mammals

Small mammals would be impacted during construction and operation by loss of habitat and mortality, as discussed in Section 4.4.11.3. Small mammals are expected to occur throughout the project area and along both of the alternatives. Loss of habitat and any mortality are expected to be similar for both alternatives due to the similar habitat affected. However, because of the high reproductive potential of small mammal species and the limited amount of potential habitat lost, both the alternatives would have similar and generally minimal impacts to small mammal populations.

Raptors

The potential impacts to raptors from the North Antelope Alternatives would be similar to those discussed in Section 4.4.11.3. Both alternatives would convert foraging lands and potential

ground-nesting habitat to rail line right-of-way. Noise and activity during construction and operation could disturb nesting raptors resulting in nest abandonment or failure. Table 4.8-2 provides information on raptor nests within proximity to the alternatives. Raptors could be struck by trains if feeding on carrion along the rail line during the winter.

Table 4.8-2 Comparison of Raptor Nesting Sites between the North Antelope Alternatives			
Raptor Types Present along each Alternative	Number of Nests and Distance		
	0.25 Mile	0.5 Mile	1.0 Mile
North Antelope East			
Golden Eagle	1	1	2
Great Horned Owl	1	1	1
North Antelope West			
Red-Tail Hawk	1	1	1
Golden Eagle	0	1	1
Great Horned Owl	0	0	1

4.8.6.3 Aquatic and Fisheries

Potential impacts to aquatic and fishery resources include loss of habitat and reduced water quality as discussed in Section 4.4.11.4. No trout streams are crossed by any of the alternatives. Impacts to aquatic and fishery resources would be most likely to occur in areas where the alternatives are in close proximity to streams or drainages or at stream crossings.

4.8.6.4 Endangered, Threatened, and Sensitive Species

The following section discusses the potential impacts to those Federally listed threatened or endangered species known to occur or potentially occur along the North Antelope Mine Loop Alternatives.

4.8.6.4.1 Mountain Plover

The potential impacts to mountain plovers would be similar to those types of impacts discussed in Section 4.4.12.8. They would generally include destruction of nests during construction and disturbance to nesting birds leading to nest failure during both rail line construction and operation. Mountain plover nests and chicks would be particularly susceptible to mortality from vehicles and construction equipment, especially along two-track roads and

where construction activities would cross prairie dog towns. The nesting habitat for plovers in the project area would include short-grass prairie and black-tailed prairie dog colonies. Surface disturbances to prairie dog colonies could displace nesting mountain plovers in the area.

North Antelope East Mine Loop

The North Antelope East Mine Loop does not pass through any prairie dog colonies and would cross approximately 0.3 mile of cropland and 1.1 miles of pasture.

North Antelope West Mine Loop

The North Antelope West Mine Loop would pass through prairie dog colonies for 0.6 mile and cross approximately 1.9 miles of cropland and 0.5 mile of pasture.

4.8.6.4.2 Bald Eagle

Impacts to wintering bald eagles would occur from human activity associated with project construction, operation and maintenance, as well as loss of potential habitat for nesting, perching, and roosting along 2.3 miles of riparian habitat located within 0.5 mile of Antelope Creek. No nest are located in proximity to the proposed mine loops.

4.8.6.4.3 Swift Fox

Swift fox may occur in a variety of habitats throughout the project area (Section 4.4.12.9 and Appendix K). Impacts could include loss of habitat and mortality if struck by a train. Swift fox are known to utilize prairie dog colonies, primarily for prey. Therefore the amount of prairie dog colony converted to rail line serves as a means to compare the potential impacts of each alternative. Surface disturbance to prairie dog colonies will reduce potential habitat availability for Swift Fox.

North Antelope East Mine Loop

No prairie dog colonies are located within the proposed East Mine Loop alignment.

North Antelope West Mine Loop

The North Antelope West Mine Loop would pass through prairie dog colonies for 0.6 mile.

4.8.6.4.4 Black-tailed Prairie Dog

Direct impacts to black-tailed prairie dogs are most likely to occur during construction if the animals occur in the right-of-way. Burrows and dens of inhabited colonies and within the construction right-of-way would be destroyed. Some mortality to individuals would also be expected during excavation and other earthmoving activities. During rail line operation, fragmentation of colonies could reduce their ability to sustain themselves as well as result in mortality to individuals crossing the rail line from one area of the colony to the other. The North Antelope West Mine Loop would pass through 0.6 mile of prairie dog colonies. No colonies would be crossed by the East Mine Loop.

4.8.7 TRANSPORTATION

Transportation impacts would be similar to those described in Section 4.4.13. They would include increased vehicle traffic and delays at new grade crossing during construction and vehicle delays due to passing trains during operation. SEA concluded that the potential effect of increased train traffic for highways with ADT volumes below 5,000 would be experienced by very few drivers and the additional vehicular delay would be minimal. None of the Mine Loop Alternatives have any public highway/railroad grade crossings where average daily traffic (ADT) volumes are 5,000 or greater. Therefore, SEA did not calculate potential vehicle delay or queue at these new crossings.

North Antelope East Mine Loop

This alternative would not cross any state, county, or grassland roads.

North Antelope West Mine Loop

The North Antelope West Mine Loop would cross one road, Irwin Road (ADT of 100) in Converse County.

4.8.8 SAFETY

Construction and operation of a rail line has the potential to result in injury or loss of life, particularly at locations where the rail line would cross an active roadway grade. Vehicles operating across the rail line would be at risk of accidents during construction as well as being struck by a train during rail line operation. Section 4.4.14 provides a detailed discussion of the potential affects of construction and operation of new rail line on safety.

To further address potential accidents resulting from new grade crossings, SEA calculated accident frequency rates at proposed public grade crossings. SEA's analysis procedure considered the type of warning devices at the highway/rail grade crossing, including passive devices (signs and crossbucks), flashing lights, or gates.

SEA evaluated traffic levels at 20 MNT (8 trains), 50 MNT (18 trains), and 100 MNT (34 trains). The amount of rail traffic along each alternative would be dependent on the amount of coal hauled by DM&E from the North Antelope Mine. The actual level of rail traffic has not yet been determined. As no contracts are currently in place, these evaluation levels are used to provide an assessment of the potential impacts along these mine loop alternatives at various levels of coal transportation from the mines. They do not represent the anticipated rail traffic at the 20 MNT, 50 MNT, and 100 MNT level of total project operation. SEA estimates that the projected levels of traffic from the North Antelope Mine would not exceed 20 MNT.

North Antelope East Mine Loop

The North Antelope East Mine Loop would have no impact on safety as it would have no roadway crossings.

North Antelope West Mine Loop

Converse County

20 MNT

SEA determined that the proposed construction would significantly increase the predicted accident risk at crossing Irwin Road at the 20 MNT level of operation. The estimated annual accident frequency would increase from 0.010 to 0.016. This translates into an increase of 0.007 with an accident frequency of 1 accident every 152 years. The proposed crossing would be classified as Category B.

50 MNT

SEA determined that the proposed construction would significantly increase the predicted accident risk at crossing Irwin Road at the 50 MNT level of operation. The estimated annual accident frequency would increase from 0.010 to 0.020. This translates into an increase of 0.011 with an accident frequency of 1 accident every 94 years. The proposed crossing would be classified as Category B.

100 MNT

SEA determined that the proposed construction would significantly increase the predicted accident risk at crossing Irwin Road at the 100 MNT level of operation. The estimated annual accident frequency would increase from 0.010 to 0.025. This translates into an increase of 0.015 with an accident frequency of 1 accident every 65 years. The proposed crossing would be classified as Category B.

4.8.9 HAZARDOUS MATERIALS

Section 4.4.15 provides a detailed discussion of the potential project related impacts to hazardous materials transportation and sites. Because no hazardous materials are anticipated to be transported over Alternatives B, C, or D, neither the Black Thunder or North Antelope Mine Loops would have any impact on their transportation. No hazardous waste sites have been identified along either of the alternatives. However, construction of either rail line could impact them if unknown sites are located within the rail line right-of-way. DM&E should coordinate with the EPA and Wyoming Department of Environment and Natural Resources to obtain specific information on the location of known hazardous materials sites. However, due to the undeveloped and remote location of these alignments, no such sites are anticipated to occur along either the Black Thunder or North Antelope Mine Loops.

4.8.10 ENERGY RESOURCES

Section 4.4.16 provides a detailed discussion of the potential impacts that would include the effects of the new mine loop alternatives on energy resources, their transportation and utilization. No recyclable commodities would be transported by either alternative.

4.8.11 CULTURAL RESOURCES

Potential impacts to cultural resources located in Wyoming within the proposed project area are presented in Section 4.2.17. The project area has a rich and long history of human occupation and known sites of archaeological significance occur throughout the area. Potential impacts could occur to cultural resources as a result of new rail line construction. Inadvertent discovery of archaeological sites may damage or destroy significant sites. No archaeological sites are known along the alternatives. The lack of known sites along the alternatives is most probably due to the lack of archaeological survey and study in the area due to its remoteness and undeveloped character. Any impacts to discovered cultural resource sites associated with new construction would require mitigation in accordance with the PA (Appendix J).

4.8.12 SOCIOECONOMICS

The North Antelope Mine Loops comprise a portion of the construction and operation of new rail line that would occur throughout Converse Counties. Because they comprise only a small portion of the proposed construction within these counties, the overall difference in their anticipated socioeconomic impacts to the counties in which they are located should be minimal. Therefore, the socioeconomic impacts of the North Antelope Alternatives are included as part of the total socioeconomic impacts anticipated for the project. These impacts are discussed in detail in Section 4.4.16.

4.8.13 ENVIRONMENTAL JUSTICE

Neither of the North Antelope Alternatives would potentially impact any environmental justice communities.

4.8.14 RECREATION

Impacts to recreation from the North Antelope Alternatives would be similar in nature for each of the proposed alignments. The type of potential impacts would be similar to those discussed in Section 4.4.20. Generally, these impacts would include disturbance to individuals participating in a variety of recreational activities such as hunting, camping, horseback riding, and hiking. Additional lands adjacent to the right-of-way may also be considered by the public or landowners as undesirable due to trains disturbing horses during riding, game during hunting, and campers trying to sleep. During construction and operation, big game hunting (an important recreational activity in the area) may be particularly affected by noise and human presence. Noise and human activities would both cause game to seek areas undisturbed by these activities and, for safety reasons, require hunters to avoid areas near the rail line. This would further reduce the lands available for recreation.

In addition to noise disturbance, rail line construction and operation may also reduce the attractiveness of an area for recreation due to the alteration of the visual setting of the area. Construction and operation of a rail line would create an intrusion into the landscape considered by some to be unattractive, resulting in individuals changing their recreational patterns to avoid areas within site of the rail line.

Because these alternatives cross mainly private lands, as discussed for each alternatives below, and the alternatives pass through remote areas, impacts to recreation would generally occur to a small number of individuals, including landowners, their families, and guests.

North Antelope East Mine Loop

No public lands would be crossed by this alternative. Construction of the 1.5-mile North Antelope East Alternative would directly remove approximately 72.7 acres of private land from recreational use.

North Antelope West Mine Loop

No public lands would be crossed by this alternative. Construction of the 2.4-mile North Antelope East Alternative would directly remove approximately 116.4 acres of private land from recreational use.

4.8.15 AESTHETICS

Section 4.4.21 provides a detailed discussion of the potential project related impacts to the aesthetics of the project area. As noted in Section 4.4.21, no designated scenic areas or overlooks occur along the project alternatives, although many areas are considered by landowners and visitors as scenic. Additionally, the USFS has developed VQOs for lands under its management in an attempt to quantify the scenic value of its areas (Section 4.4.21). Each of these alternatives would create a visual intrusion into the current landscape, altering the visual quality.

There is also concern that emissions from operating locomotives could contribute to regional haze and impact visibility. The minimal emissions that would result along the North Antelope Alternatives, due to their short length, would not result in any reduction in air quality for these areas. However, as part of the total project, emissions along these alternatives could affect air quality for these areas. The North Antelope Mine Loops do not cross USFS lands.

* * * * *

[THIS PAGE INTENTIONALLY LEFT BLANK]

4.9 SOUTH DAKOTA BYPASS - BROOKINGS

During the scoping process for this project, two proposals for bypasses of communities along the existing DM&E rail line in South Dakota were received by SEA. These proposals were for a bypass of Brookings and Pierre. As discussed in Chapter 2, SEA reviewed these proposals. SEA determined the Pierre bypass proposal would result in significant impacts to the environment, as well as pose significant permitting and feasibility concerns. The Pierre proposal was therefore dropped from further analysis. SEA found the Brookings Bypass to be reasonable, although it too would result in environmental impacts. The following discusses the results of SEA's impact analysis of the Brookings Bypass alternatives.

The following compares the potential impacts along the existing DM&E rail line through Brookings to those resulting from construction of the proposed bypass north of the city. Based on the DM&E siding plan, SEA determined that one siding location is proposed for the existing rail segment of Alternatives B-2 and B-3. The potential impacts discussed in this section are only those anticipated to occur as a result of the alternatives listed below. The alternatives evaluated include:

Alternative B-1: No-Action

This alternative would involve denial of the total project. No new rail construction or existing rail line reconstruction would occur. DM&E would continue to operate under existing conditions.

Alternative B-2: Existing Rail Line

This alternative would involve reconstruction of approximately 13.3 miles of existing DM&E rail line through Brookings, South Dakota. All train traffic, existing and future, would utilize this rail line.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Alternative B-3 would include continued maintenance of the 13.3-mile segment of existing DM&E rail line through Brookings. It would also include construction and operation of the bypass proposed by the City of Brookings. The existing rail line through town would not be reconstructed as part of this alternative. The proposed bypass would extend approximately 14.5 miles around the north side of Brookings, connecting with the existing rail line at either end. Existing rail traffic (three trains per day) would remain on the existing rail line. Coal trains would be routed over the bypass.

Alternative B-4: Bypass for all Rail Traffic

This alternative would be similar to Alternative B-3, except the existing rail line would not be used for existing rail traffic. All rail traffic, except that required to serve shippers in Brookings, would operate over the bypass.

Alternative B-1, No-Action

The No-Action Alternative, B-1, for Brookings would involve denial of the overall PRB Extension Project by the Board, as noted above. The No-Action Alternative would result in no construction activities related to rehabilitation of the existing rail line and no operational changes in train activity through Brookings. None of the construction impacts associated with reconstruction of the existing line would occur, such as:

- disruption to adjacent land uses,
- conversion of land to rail related facilities,
- disturbance to and erosion of soil,
- clearing of vegetation,
- disturbance of wildlife,
- air emissions from construction vehicles and fugitive dust,
- increases in noise from construction equipment,
- disruption of traffic flow at grade crossings, and
- increased economic activity from construction workers,

Additionally, none of the operational impacts would occur. Noise levels along the existing rail line would remain the same, as would air emissions from locomotives, vehicle delays at grade crossings, and train and vehicle safety. DM&E's safety record would be expected to remain at or below its current level with a continued deterioration of the existing rail line. Service and reliability concerns of existing shippers, as discussed in Chapter 1, would continue, reducing the competitiveness of these shippers in their respective markets. This lack of competitiveness and rail service reliability would likely result in a greater reliance of shippers on trucks for transportation, resulting in additional trucks being added to local roadways. Increased truck numbers would increase wear on roads within Brookings and reduce vehicle safety. Lack of improvements to the existing conditions of the DM&E rail line may jeopardize the viability of the rail line causing loss of rail service. The associated loss of jobs and tax revenue, with the DM&E headquarters located in Brookings, could have economic impacts within Brookings and small neighboring communities where many railroad employees reside.

The following sections discuss the potential impacts of each of the alternatives for each natural and human resource evaluated.

4.9.1 CLIMATE

No impacts to the climate of the Brookings area would result from the construction of any of these alternatives.

4.9.2 TOPOGRAPHY

Alternative B-1: No-Action

No reconstruction or construction activities would result from this alternative. Modifications to the local physiography would have been made when the original railroad was built nearly 100 years ago. No further impacts would result from this alternative.

Alternative B-2: Existing Rail Line

The reconstruction and operation of Alternative B-2 would not likely alter the physiography of the project area. However, channelization and bank modifications may be required at stream crossings due to construction and modification of bridges over the Big Sioux River, Sixmile Creek, and other area streams. Drainage outside the railroad right-of-way could be changed. These changes are not expected to be significant.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

The portion of this alternative that utilizes the existing rail line would cause no additional impacts to the physiography of the project area. No construction or reconstruction activities would occur along the existing rail line.

The construction of the bypass portion of Alternative B-3 would create changes in the physiography of the project area due to cut and fill operations designed to provide a suitable grade for construction of the proposed rail line. The drainage of the project area could be affected by alterations in the terrain as a result of these activities. Channelization and bank stabilization may be required at stream crossings along Alternative B-3. Significant cut and fill could be necessary for part of the alternative, particularly where it would cross the Big Sioux River. Any changes to the natural course of a stream could alter drainage in the project area. During operation of Alternative B-3, the presence of the rail bed could create a damming effect for surface water which could alter drainage in adjacent areas.

Alternative B-4: Bypass for all Rail Traffic

Construction of a bypass could create impacts to the physiography of the project area similar to those described for the construction and operation of the bypass portion of Alternative B-3.

4.9.3 GEOLOGY AND SOILS

4.9.3.1 Geology and Soils

Alternative B-1: No-Action

Any soil impacts associated with reconstruction of the existing rail line would not be experienced with this alternative. Operational impacts would be limited to the potential for soil contamination from a derailment or accidental spill. Minor localized soil disturbance resulting from general maintenance of the existing rail line could also occur. No prime farmland would be affected. Land within the existing corridor was made unavailable for agricultural production when the existing rail line was constructed nearly 100 years ago.

Alternative B-2: Existing Rail Line

This alternative, approximately 13.3 miles, would involve reconstruction within an already disturbed and established rail corridor. Therefore, impacts to soil would be minimal. Potential impacts resulting from this alternative would generally be limited to the soils within the right-of-way. Potential impacts during construction could include erosion, compaction from heavy equipment, mixing, and loss of productivity in undeveloped areas. These impacts could affect revegetation of any disturbed areas within the right-of-way. Impacts during operation could include localized soil disturbance from maintenance of the railroad right-of-way. Potential spills of hazardous substances could cause contamination of streams during operation. However, spills are unlikely due to expected reduction in derailments and compliance with regulatory procedures for handling, storing, and disposing of potential contaminants.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

The existing rail line segment of Alternative B-3 would have the same potential impacts as described above for Alternative B-1.

The bypass portion of this alternative would impact areas that are not currently used for railroad activities. Soils located along the bypass alignment consist primarily of silty clay loams

with some silt loam and loam present. The dominant soil types in the area consist of Lamoure silty clay loam, Volga silty clay loam, and Vienna loam. These soils are nearly level with slopes of 0-2 percent. Top soil depths range from 0 to 20 inches. The silty clay loam soils are somewhat poorly drained and are found in higher and less concave alluvial positions. Approximately 659.4 acres of soil would be disturbed during construction of the 14.5-mile bypass north of Brookings. The removal of vegetation during the construction process would increase the possibility of erosion resulting from wind and rain.

Construction activities using heavy equipment would compact the soil decreasing its productivity. Approximately 127.2 acres of prime farmland would be converted to railroad right-of-way. Cut and fill operations could cause mixing of soil profiles. Impacts would be primarily restricted to the proposed rail line right-of-way.

Potential contamination could occur due to accidental spills of hazardous substances during construction or operation of the proposed rail line. However, spills are unlikely due to improved track conditions and compliance with regulatory procedures for handling, storing, and disposing of potential contaminants.

Alternative B-4: Bypass for all Rail Traffic

Construction and operation impacts would be the same as those described for the bypass segment of Alternative B-3. Construction of a 14.5-mile bypass around the City of Brookings would impact the soil in areas not currently used for railroad activity. Construction of Alternative B-4 could increase the potential for erosion and the possibility of contamination from hazardous substances in the unlikely event of a spill, as described for the bypass segment of Alternative B-3.

4.9.3.2 Paleontological Resources

Paleontological resources may occur throughout the Brookings project area, primarily in gravel deposits and bedrock. Any such resources occurring along the existing rail line right-of-way for Alternatives B-1, B-2, or B-3 were likely destroyed during initial construction of rail facilities within the rail corridor. Only minimal excavation is anticipated during construction and reconstruction due to most of each of the alignments being relatively level. Excavation would largely include surface earthwork within previously disturbed areas. Additionally, the deep soils and agricultural cultivation in the project area and scattered nature of paleontological resources make it unlikely such resources would be encountered. Disturbance of bedrock or sediment is not anticipated. However, cut activities along the Big Sioux River could encounter such resources. Construction of the bypass portion of Alternatives B-3 and B-4 could disturb paleontological resources that may be present in the area, although this is considered unlikely.

4.9.4 LAND USE

The potential changes to local land use due to construction and operation of the proposed project are evaluated in this section. The land use types evaluated include agricultural, residential, business and industrial, and public lands. Land used for roadways and distances across rivers and streams are not evaluated as land use in this section and accounts for land use totals not adding up to the total distance. Impacts to public facilities such as hospitals and schools are generally addressed in this section as components of land use categories, but are not quantified as a land use type.

4.9.4.1 Agriculture

The approximate amount of land use designated as agricultural was measured and calculated to determine the linear miles adjacent to each alternative. Land deemed to be agricultural is that which appears to be or has been cultivated for the production of crops and pasture or grassland that has not been cultivated. Woodland is also included in this category.

Alternative B-1: No-Action

This alternative would not cause any impacts to approximately 10.2 miles of cropland and approximately 5.6 miles of pasture and grassland adjacent to the existing DM&E rail line. No construction or reconstruction activities would occur, and there would be no loss of agricultural land associated with this alternative.

Alternative B-2: Existing Rail Line

The existing rail line would be adjacent to approximately 10.2 miles of cropland and approximately 5.6 miles of pasture and grassland in Brookings, South Dakota. The majority of reconstruction for this alternative would occur within the existing rail corridor. Potential impacts to agricultural land could include soil compaction and crop damage from construction equipment where cropland has encroached on the existing right-of-way or should construction activities be required outside the existing right-of-way. The risk of derailment, crop damage, and safety at public grade crossings for area farmers and motorists would potentially be reduced from the current Alternative B-1 levels due to the improved condition of the DM&E rail system in the area.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

The portion of this alternative that utilizes the existing rail line for existing traffic would create no additional impacts.

The bypass segment of this alternative would cross approximately 11.8 miles of cropland, resulting in Alternative B-3 being adjacent to 23.6 additional miles of cropland following construction. Construction of the bypass segment of this alternative would result in a loss of approximately 284.8 acres of agricultural land. Approximately 2.5 acres of wooded fence rows would be cleared. Long-term impacts to agricultural use would include the conversion of approximately 127.2 acres of prime farmland to railroad right-of-way. While farmers would be compensated for this land, they would no longer have the farm revenue generated from use of these acres. Potential impacts during construction could also include soil mixing and compaction, crop damage, and erosion.

During construction and throughout operation of the proposed rail line, area farmers could be affected by reduced access to fields and safety concerns. The proposed rail line would cross numerous agricultural fields, resulting in portions of those fields being located on opposite sides of the rail line from the farmer's headquarters. Access to these areas would be limited to existing roads or, if installed, equipment crossings of the proposed new rail line. During operation of the project, farmers would be required to either drive equipment on local roads, crossing the proposed rail line at public grade crossings to access these fields, or cross the proposed rail line at unprotected private crossings. Under both scenarios, farmers would experience increased inconvenience and reduced safety. Farmers would be required to cross the rail line at unprotected crossings to move farm machinery or travel on roadways with large, slow moving farm machinery, which would create a safety hazard to themselves, motorists traveling on the same roadways, and operating trains and their crews. In some cases, the field on one side of the line could be of too small a size to economically continue to farm. These lands could be sold to adjacent farmers and consolidated with other existing fields, or taken out of production and left fallow. Removal from production would decrease the available land and production of these farms, reducing farm income.

Alternative B-4: Bypass For all Rail Traffic

Construction of Alternative B-4 would result in the loss of approximately 284.8 acres of agriculture land. Impacts during construction and operation of Alternative B-4 would be the same as those presented for the bypass segment of Alternative B-3.

4.9.4.2 Residential

Alternative B-1: No-Action

Residential land, approximately 2.0 miles, adjacent to the existing rail line would continue to experience the same conditions that are currently present. No additional residential land would be affected by Alternative B-1.

Alternative B-2: Existing Rail Line

Approximately 2.0 miles of residential land would be adjacent to Alternative B-2. Impacts to residential areas resulting from the reconstruction and operation of the railroad would be similar to those discussed in Section 4.3.6.2 and include increased noise, dust, safety concerns, and traffic delays. These specific impacts are discussed in more detail for Brookings in Sections 4.9.1.6 (Air Quality), 4.9.1.7 (Noise and Vibration), 4.9.1.12 (Transportation), and 4.9.1.13 (Safety).

In addition to these impacts, residents of Brookings expressed concerns during scoping that residential real estate values would decrease due to increased rail traffic. SEA recognizes real estate values are partially a reflection of what people are willing to pay to live in a particular location and the environment that location provides. While some persons may not be affected by rail traffic, others may wish to avoid it. Thus a persons willingness to locate near an active rail line is a result of their perception of the condition and their sensitivity to it. The Brookings Register reported on June 14, 2000 that, although the PRB Expansion Project still has not been decided upon, homes along the existing rail line have maintained their value and are selling at a comparable rate to homes elsewhere in Brookings.¹ Much of this seems to be due to staffing and student attendance associated with South Dakota State University, located in Brookings. Such activity would continue regardless of the outcome of the Board's decision on this project.

In some cases, a person may have little other choice but to purchase a home along the rail line. This may be the case should this project be approved. Project approval would require DM&E to hire additional staff, some of whom would likely need to relocate to the Brookings headquarters. Because few other communities are close to Brookings, many new employees would likely elect to live in Brookings, increasing the demand for housing and helping to support real estate values.

¹ The article was published June 14, 2000 in the Brookings Register, written by John Kubal, titled "Homes moving well". The article includes several quotes and statistics from local real estate professionals.

SEA understands the concerns of local residents along the rail line, particularly those currently residing along the rail line. Increased rail operations would certainly change the environment for these residences. However, while these residents are concerned about real estate values, SEA does not believe significant declines to real estate values would occur as a result of Alternative B-2.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Under this alternative, the impacts to the 2.0 miles of residential land along the existing rail line would remain the same. Construction of a bypass to route future coal traffic north of Brookings would impact approximately 0.4 additional mile of residential land that would be adjacent to the bypass. Construction of Alternative B-3 could potentially require the acquisition and removal of as many as 2 houses that would potentially be located within the proposed rail line right-of-way and conversion of approximately 4.4 acres of residential land to rail line right-of-way. Potential construction impacts would include relocations, increased noise for rural residents, dust, traffic delays, and safety concerns. During operation, residences near the bypass would experience noise from passing trains, vehicle delays and potential safety concerns at new grade crossings, and potential impacts to real estate values. These impacts are discussed in greater detail in the Noise, Transportation, Safety, and Socioeconomic subsections. Additionally, the presence of the bypass could make the lands around it unattractive for future residential development.

Alternative B-4: Bypass for all Rail Traffic

Impacts due to construction and operation of Alternative B-4 would be the same as those presented for the bypass portion of Alternative B-3.

4.9.4.3 Business and Industrial

Business and industrial land would include areas which contains shops, store fronts, manufacturing facilities, and other places of commerce. The potential types of impacts to business and industrial lands are described in Section 4.3.6.3 and could include increased noise, dust, safety concerns, and traffic delays.

Alternative B-1: No-Action

Businesses, located along approximately 3.8 miles of commercial land adjacent to the existing route, would continue to experience the current level of impact. Businesses, both future

and existing, would not experience the benefits of a safe, reliable railroad. Potential improvements in rail service would not be available.

Alternative B-2: Existing Rail Line

Approximately 3.8 miles of business and industrial land lies adjacent to the 13.3 miles of existing rail line through Brookings. Impacts during reconstruction would be similar to those described in Section 4.3.6.3. Temporary impacts, such as reduced access for customers and employees, safety concerns due to the presence of large construction equipment, and possible interruption of rail service, could affect businesses and shippers located adjacent to the existing rail line during construction. During construction and operation, increased noise, dust, and traffic delays could affect businesses adjacent to the existing rail corridor. Conditions would likely improve during operation, following reconstruction of the existing rail line.

During operation, shippers, including L.G. Everist, Inc., Minnesota Mining & Manufacturing Company, Farmers Co Op, Perry Electric, Rainbow Play Systems, South Dakota/Dacotah Cement, South Dakota Soybean Processors, Land O'Lakes Agricultural Service Center, and Land O'Lakes Dairy, would be provided with improved rail service and safety for transport of products and materials. Efficient rail service combined with close access to Interstate 29 and U.S. Highway 14, and the open, relatively level lands outside Brookings could make the area more attractive to new business and industry.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Businesses located along the approximately 3.8 miles of commercial property, located adjacent to the existing rail line, would continue to experience the current level of impact.

No commercial property would be crossed by the proposed bypass portion of Alternative B-3. The bypass portion of Alternative B-3 would offer the opportunity for new businesses to have access to modern and efficient rail service. Properties adjacent to the proposed bypass, that are suitable for industrial development, may increase in value.

Alternative B-4: Bypass for all Rail Traffic

No land described as commercial would be crossed by the proposed bypass or impacted by the construction of Alternative B-4. New businesses could be attracted to the area by the benefits of a new modern rail line and potential for new commercial development.

4.9.4.4 Public Services

Alternative B-1: No-Action

Public services in and around Brookings would continue to experience the current level of impacts from the operation of the DM&E railroad. Deteriorated track conditions pose a higher risk of accident and derailment which could require public services such as police, fire department, and ambulance services in the event of such an occurrence.

Alternative B-2: Existing Rail Line

The existing railroad corridor in Brookings passes within approximately 900 feet of the nearest church. The existing rail corridor also passes within approximately 0.5 mile of the nearest hospital and approximately 0.2 mile of the nearest school. Due to the distance from the existing rail line, impacts of noise and dust during reconstruction should not affect these facilities. During reconstruction and operation, users of these facilities could experience traffic delays, increased road traffic, and safety concerns as discussed in Section 4.3. Emergency vehicles could potentially experience inconvenience and reduced access, due to reconstruction at grade crossings or a passing train blocking a crossing used to access public facilities.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Conditions along the existing rail line would be the same as those presented for Alternative B-1. The proposed bypass segment would lie within 0.6 mile of the nearest church, 1.7 miles of the nearest hospital, and 0.7 mile of the nearest school. Patrons of these public facilities would likely experience inconvenience and traffic delays due to closed crossings during construction or a passing train, which would block crossings along rural roadways used to access public facilities. Due to the low level of traffic, distance of crossings from these facilities, and the rural setting in the area, these impacts would not have a significant effect on use of public facilities. During operation, rail traffic through grade crossings located along the proposed rail line could require establishment of new routes for emergency vehicles to avoid vehicle delays during an emergency event.

Alternative B-4: Bypass for all Rail Traffic

Impacts from Alternative B-4 would be the same as those presented for the bypass segment under Alternative B-3.

4.9.4.5 Public Lands

Alternative B-1: No-Action

No public lands are crossed by Alternative B-1. Lions Park is located adjacent to the existing rail in Brookings. Lions Park has a basketball court, play ground equipment, and picnic facilities. Pioneer Park, located approximately 600 feet north of the existing rail line, is the location of the annual Brookings Summer Arts Festival. Hillcrest Park is approximately 0.5 mile north of the existing rail line. It contains facilities for swimming, tennis and racquetball. No additional impacts beyond the existing noise, access, and safety concerns presented by existing rail operation to the park or its users would result from this alternative.

Alternative B-2: Existing Rail Line

No public lands are crossed by Alternative B-2. However, several parks, as noted under Alternative B-1, are near the existing rail line. Impacts during reconstruction and operation of the existing rail line could include increased noise disturbing users, safety concerns for pedestrians and children going to and from the parks, and reduced access to park facilities due to delays at nearby grade crossing during increased train crossing events.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Impacts along the existing rail line would be the same as those presented for Alternative B-1. No public lands are crossed by Alternative B-3. However, the South Dakota Assembly of the Church of God camp, a 14-acre facility located along the west side of the Big Sioux River, would be adjacent to the south side of the proposed bypass route. Impacts to this property, during construction and operation, could include increased noise, dust, safety concerns, and inconvenience for those using camp facilities in close proximity to the proposed bypass rail line.

Alternative B-4: Bypass for all Rail Traffic

Construction and operation conditions would be the same as those described for the bypass segment of Alternative B-3.

4.9.5 WATER RESOURCES

4.9.5.1 Surface Water Impacts

Alternative B-1: No-Action

There are 12 surface water bodies, 10 intermittent streams, 1 perennial (Big Sioux river) stream, and 1 perennial stretch within an intermittent stream, crossed by Alternative B-1. Because no construction or reconstruction would occur at these waterway crossings, no impacts would occur to these surface waters as a result of this alternative.

Alternative B-2: Existing Rail Line

The 12 water body crossings present along Alternative B-1 would also be present along Alternative B-2. Impacts to streams such as increased sedimentation from erosion and instream work during reconstruction of the existing rail line, would be considered temporary as they would only occur during the short time of construction (about a day for culvert placement and reconstruction of 1.0 mile of rail line, and approximately 14 days for bridge placement). Also during reconstruction, erosion at these water crossings or along the remainder of the rail line could affect water quality within nearby, downstream lakes and waterways, such as Goldsmith Lake, Sixmile Creek, North Deer Creek and downstream portions of the Big Sioux River. Long term impacts could result from alterations to stream banks and beds during reconstruction at crossings changing stream flow patterns. Section 4.3.7.1 describes the potential impacts, such as increased total suspended solids (TSS) and contamination from potential chemical spills, resulting from the reconstruction and operation of existing rail line. Potential spills of hazardous substances could cause contamination of streams during operation. This contamination would likely be temporary, lasting until completion of clean up measures or the contaminate is diluted or flushed from the site by stream flow. However, spills are unlikely due to expected reduction in derailments and compliance with regulatory procedures for handling, storing, and disposing of potential contaminants.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Under Alternative B-3, no impacts would occur at the existing water crossing along the existing rail line.

The proposed bypass portion of Alternative B-3 would cross 20 streams. Of these, 19 are intermittent and 1, the Big Sioux River crossed once, is perennial. These streams could be temporarily affected during construction. Disturbed earth and removal of ground cover adjacent

to stream crossings could cause soil erosion within the proposed right-of-way, leading to sedimentation and increased TSS in surface waters. Installation of culverts and bridges would require instream work that could disturb bottom sediments and increase suspended material. Some channelization and realignment of streams may be necessary to construct crossings. This could change stream flow patterns for short distances downstream of the crossing. Accidental spills, during construction and operation, could introduce contaminants into streams. However, spills are unlikely due to expected reduction in derailments and compliance with regulatory procedures for handling, storing, and disposing of potential contaminants. Long-term impacts would include the potential alteration of stream banks and stream beds due to construction of stream crossings, potentially changing drainage patterns, stream flow velocities and flood plain characteristics. The presence of the proposed rail line could also act as a dam resulting in changes to surface drainage patterns along the rail line.

Alternative B-4: Bypass for all Rail Traffic

Impacts associated with the construction and operation of Alternative B-4 would be the same as those presented for the bypass segment of Alternative B-3.

4.9.5.2 Wetlands

Alternative B-1: No-Action

Approximately 5.8 acres of wetlands, the majority of which (5.0 acres) are palustrine emergent wetlands, are present within the existing rail line right-of-way. Much of these wetlands are directly adjacent to the existing DM&E rail line. It is likely that these wetlands occur in the drainage ditches adjacent to the rail bed. The rail bed would be considered partially responsible for the existence of these wetlands by acting as a dam for surface water run-off. While these wetlands provide wildlife habitat and other wetland features, they are not anticipated to be considered jurisdictional wetlands by the Corps of Engineers. There is also approximately 0.1 acre of palustrine aquatic bed wetlands, and approximately 0.7 acre of palustrine forested wetlands. These wetlands could be impacted by the existing rail line in the unlikely event of an accidental fuel or chemical spill. However, no significant change is expected due to the continued operation and maintenance of the existing rail line.

Alternative B-2: Existing Rail Line

Approximately 5.8 acres of wetlands, as described for Alternative B-1, were identified within the existing right-of-way for Alternative B-2. Reconstruction activities within the existing right-of-way would cause a disturbance or loss of these areas. As described in Section 4.3.7.3,

impacts to wetlands would vary depending on the nature of the reconstruction activity. Heavy equipment may be required to drive through wetland areas causing damage to sensitive wetland vegetation and soils. Potential cut and fill activities necessary for any siding construction could lead to the total loss of wetlands in some areas within the existing rail line right-of-way. Rehabilitation of rail bed drainage ditches would also likely result in the loss of most, if not all the existing wetlands within the right-of-way.

Wetlands adjacent to the rail line right-of-way could experience increased sedimentation from erosion of the right-of-way. Restoration of drainage in the right-of-way could result in adjacent wetlands also being drained and lost. Should construction activities be required outside the existing DM&E right-of-way, adjacent wetlands could experience soil disturbance and damage to existing vegetation.

Impacts to wetlands within the existing right-of-way, during operation and maintenance of the railroad, would not be expected. Most of these right-of-way wetlands would be lost. However, adjacent wetlands could be affected. In the unlikely event of a chemical spill, run-off of chemicals, such as herbicides, lubricants, and fuel that may be present from activities occurring within the right-of-way, could result in contamination. The limited quantity of chemicals transported by DM&E, improvement in rail safety, and compliance with regulatory procedures for handling, storing, and disposing of potential contaminants would make such an event unlikely. Over time, some wetlands would be expected to reestablish in the drainage ditches along the rail line.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Impacts to wetlands adjacent to the existing rail line portion of this alternative would be the same as described for Alternative B-1.

Approximately 5.1 acres of wetlands would be lost within the right-of-way for the Brookings bypass alignment. This would include approximately 4.2 acres of palustrine emergent wetlands, 0.1 acre of palustrine aquatic bed wetlands, and approximately 0.7 acre of palustrine forested wetlands. Wetlands within the proposed right-of-way would most likely be lost from construction of a raised rail bed and drainage systems for the new rail bed. The loss of wetlands would include a loss of their beneficial characteristics, such as flood control, wildlife habitat, ground water recharge, storm water storage, and water purification. Portions of wetlands in areas adjacent to the proposed rail line could be degraded during construction due to increased run-off and sedimentation. Adjacent wetlands could also be lost if right-of-way drainage also drains these areas. Fuels, lubricants, and herbicides could potentially cause contamination in wetlands in the event of an accidental spill. The limited quantity of chemicals transported by DM&E,

improvement in rail safety, and compliance with regulatory procedures for handling, storing, and disposing of potential contaminants would make such an event unlikely.

The raised rail bed would likely act as a dam for surface run-off and could provide conditions suitable for the reestablishment of wetland communities in drainage ditches along the proposed right-of-way. Any wetlands reestablishing within the right-of-way would likely be subject to periodic disturbance from activities designed to restore or maintain rail bed drainage.

Alternative B-4: Bypass for all Rail Traffic

Impacts associated with the construction and operation of Alternative B-4 would be the same as those presented for the bypass segment of Alternative B-3.

4.9.5.3 Groundwater

Since there are no activities described within the proposed project that involve subsurface alterations, the potential of affecting ground water would most likely be insignificant for the areas described for the alternatives proposed for the City of Brookings. However, in the event of an accidental spill of hazardous materials, leaching of hazardous substances could potentially contaminate groundwater. Since the transport of hazardous materials by DM&E is negligible, the potential of a spill occurring would be very insignificant. Contamination could result from an accidental spill of fuel or oil during maintenance or operation of trains along the proposed rail line. However, spills would be unlikely due to improved track conditions and compliance with regulatory procedures for handling, storing, and disposing of potential contaminants.

4.9.6 AIR QUALITY

The potential for affects to air quality would be similar for each of the Brookings action alternative. The amount of emissions during reconstruction and construction is relative to the type of activity and the length of the alternative. New construction would have greater emissions than reconstruction of existing rail line due to more heavy equipment, particularly for earthwork, greater ground disturbance, and longer time necessary to complete the work. Longer alternatives would have greater emissions during operation due to increased fuel consumption. Emissions from motor vehicles waiting at grade crossings could also contribute to local air quality effects during operation of the rail line. Air quality impacts were calculated according to the methodology presented in Appendix E. Table 4.9-1 presents gross-ton miles for each alternative. Operational impacts for designated levels of rail traffic are presented in Table 4.9-2. SEA also examined the issue of fugitive coal dust and exposure to diesel locomotive emissions. These are discussed in more detail in Section 3.2.8.

Table 4.9-1 Brookings Alternatives Alternative Operations Data					
Alternative	Length (miles)	Fuel Fac. GTM*/gallon	Number of Trains	tons/year	GTM
B-1	13.0	993.8	3 trains	8,817,165	117,268,294.5
B-2	13.0	993.8	11 trains	32,329,605	429,983,746.5
			21 trains	72,067,118	958,492,669.0
			37 trains	134,539,615	1,789,376,879.5
B-3	27.5	993.8	11 trains	32,329,605	458,198,674.5
			21 trains	72,067,118	1,032,618,848.0
			37 trains	137,587,275	1,937,734,076.0
B-4	14.5	993.8	11 trains	32,329,605	468,779,272.5
			21 trains	72,067,118	1,044,973,211.0
			37 trains	137,587,275	1,950,824,417.5

* Gross-ton miles

Alternative B-1: No-Action

This alternative would require continued operation of approximately 13.3 miles of existing DM&E rail line. No reconstruction or construction impacts would occur. Train traffic on the existing DM&E rail line would continue to operate at slow speeds, and train emissions would remain the same. The additional operational impact of motor vehicle emissions at crossings, would remain at the current level.

Alternative B-2: Existing Rail Line

During reconstruction of approximately 13.3 miles of the existing rail line through Brookings, road closures and rerouted traffic could result in more emissions from motor vehicles if they result in congested areas along detour routes and delays at crossings. Increased dust and vehicle emissions would be produced by reconstruction activities. Trains delayed during construction would potentially increase emissions in the area they are stopped.

Operational impacts for designated levels of rail traffic are presented in Table 4.9-2. The types of potential air quality impacts anticipated during rail line operation are discussed in Section 4.3.8. SEA determined that none of the existing grade crossings met the threshold for analysis of

emissions from delayed vehicles. These emissions were therefore not quantified. However, an increase in the number of trains passing through the area would increase the overall amount of locomotive emissions and could increase vehicle emissions due to a greater number of delay events. Depending on the scheduling of train traffic, an increase in emission amounts could result from the increased frequency of vehicle delays at grade crossings. However, an overall decrease in emissions concentrations could be expected due to the improved track condition allowing for an increase in train speeds. Trains would pass through the area more quickly and the number of vehicles and their delay time at intersections would be decreased. Less emission would therefore occur per train passing event, with these emissions dispersing following each train event and not building up to concentrations of concern. Additionally, under certain conditions, such as high winds, fugitive coal dust could result from transport of coal along the existing rail line. Fugitive coal dust, while likely an inconvenience, is not anticipated to be substantial, as discussed in Section 4.3.8.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Impacts associated with the continued operation of the existing rail line are described under Alternative B-1.

The bypass segment of Alternative B-3 would be constructed around the north side of Brookings and would involve the most new construction. Approximately 322.4 acres of ground would be disturbed for construction of the bypass. Ground disturbance and earthwork could result in fugitive dust. Emissions from construction equipment would also add to air emissions.

During rail line operation, locomotive traffic on the new rail line would contribute emissions to the airshed along the rail line. The estimated amount of pollutants produced during operation by this alternative, under operating levels of 20 MNT (8 coal trains), 50 MNT (18 coal trains), and 100 MNT (34 coal trains), are presented in Table 4.9-2. Additional impacts would include increased emissions from vehicles delayed at grade crossings during train passing events in areas where such emissions do not presently occur. SEA determined that vehicle delays at proposed grade crossings along the bypass route would not meet thresholds requiring these emissions be quantified. All occur in generally rural areas with little vehicle traffic and good air quality. Additionally, fugitive coal dust could occur along the new rail line but the rural nature of the area and limited amount would result in it going largely unnoticed.

Alternative B-4: Bypass for All Rail Traffic

Impacts associated with the construction and operation of Alternative B-4 would be the same as those presented for the bypass segment of Alternative B-3.

**Table 4.9-2
Brookings Alternatives
Emissions Levels of Proposed Alternatives**

Alternative	Number of Trains	Emissions Levels													
		HC		CO		NO _x		SO ₂		PM ₁₀		Pb			
		Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold	Increase	Threshold		
B-1	3 trains	N/A	100	N/A	100	N/A	100	N/A	100	N/A	100	N/A	100	N/A	0.6
B-2	11 trains	3.47	100	9.30	100	57.89	100	5.82	100	2.35	100	0.000191	0.6		
	21 trains	9.28		24.89		150.81		15.58		6.27		0.000510			
	37 trains	18.40		49.40		296.89		30.92		12.45		0.001011			
B-3	11 trains	3.78	100	10.13	100	62.85	100	6.34	100	2.56	100	0.000208	0.6		
	21 trains	10.09		27.08		163.84		17.58		6.82		0.000554			
	37 trains	20.03		53.78		322.97		33.66		13.55		0.001101			
B-4	11 trains	3.90	100	10.44	100	64.71	100	6.54	100	2.63	100	0.000214	0.6		
	21 trains	10.22		27.44		166.01		17.17		6.92		0.000562			
	37 trains	20.17		54.17		325.27		33.90		13.65		0.001109			

HC - Hydrocarbons
SO₂ - Sulfur Dioxide
CO - Carbon Monoxide
PM₁₀ - Particulate Matter
NO_x - Oxides of Nitrogen
Pb - Lead

4.9.7 NOISE AND VIBRATION

4.9.7.1 Noise

The construction, reconstruction, and operation of each of the Brookings alternatives would result in increased noise levels. Section 4.3.9 provides a description of noise sources associated with rail line construction and operation, such as construction equipment, wayside noise, and locomotive horn sounding. SEA determined that train traffic on each of the Brookings action alternatives would meet thresholds for noise analysis. SEA calculated the distance (contour) from the rail line at which the average daily noise level (L_{dn}) would be equal to 65 audible noise decibels (dBA) and 70 dBA during project operation, as discussed in Section 4.3.9. This distance was calculated for the existing level of railroad traffic for Alternative B-1, as well as the proposed levels of railroad traffic for the proposed action alternatives.

Alternative B-1: No-Action

No construction related noise changes would occur as a result of this alternative. The total number of noise sensitive receptors exposed to average daily noise levels from train operations of 65 dBA and 70 dBA would remain at 545 and 354 respectively (Table 4.9-3).

Alternative B-2: Existing Rail Line

Increased noise would occur during reconstruction and operation along the existing rail line for Alternative B-2. A description of impacts, such as noise created by construction machinery and the duration of construction activities is presented in Section 4.3.9. The number of noise sensitive receptors that would be affected by noise, during operation of Alternative B-2, would increase as rail traffic increases. Tables 4.9-3 and 4.9-4 show the number of noise sensitive receptors that would be exposed to average daily noise levels of 65 dBA and 70 dBA at the levels of rail line operation evaluated.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Noise impacts along the existing rail line would be consistent with those described for Alternative B-1.

Increased noise levels would occur during construction and operation of the bypass segment of this alternative. Machinery used for construction activities, such as grading, rail installation, and site preparation would produce noise during construction of the project, as described in Section 4.3.9. Blasting, if necessary for cut excavation, would also contribute to

noise levels. Few noise sensitive receptors would be exposed to these increases due the rural nature of the area.

During operation of the proposed rail line, rail traffic along the bypass alignment would increase noise level exposure to noise sensitive receptors along the proposed rail line. The sparsely populated rural setting in which the proposed bypass would be built would limit the number of noise sensitive receptors exposed to average daily noise levels of 65 dBA and 70 dBA during rail line operation. The number of potential noise sensitive receptors along Alternative B-3 are presented in Tables 4.9-5 thru 4.9-7.

Alternative B-4: Bypass for all Rail Traffic

Noise impacts associated with the construction and operation of Alternative B-4 would be the same as those presented for the bypass segment of Alternative B-3. During operation of Alternative B-4, noise impacts would be slightly greater than for the new rail line portion of Alternative B-3 due to a greater number of trains operating over Alternative B-4. As shown in Table 4.9-8, the sparsely populated, rural setting in which the proposed bypass would be built results in a few noise sensitive receptors being exposed to increased noise levels.

Table 4.9-3 Brookings Alternatives Number of Noise Sensitive Receptors at 65 dBA L_{dn} for Alternatives B-1*and B-2				
County and Community Along Existing Line Segment	Number of Noise Sensitive Receptors at 65 dBA L_{dn}			
	Wayside	Wayside/Horn	Horn	Total
Existing Condition*				
Brookings	0*	25*	520*	545*
Brookings	0*	24*	397*	421*
Volga	0*	1*	121*	122*
11 trains (20 MNT)				
Brookings	0	140	1,067	1,207
Brookings	0	126	880	1,006
Volga	0	13	184	197
21 trains (50 MNT)				
Brookings	0	273	1,443	1,716
Brookings	0	226	1,218	1,444
Volga	0	45	221	266

Table 4.9-3				
Brookings Alternatives				
Number of Noise Sensitive Receptors at 65 dBA L_{dn} for Alternatives B-1*and B-2				
County and Community Along Existing Line Segment	Number of Noise Sensitive Receptors at 65 dBA L_{dn}			
	Wayside	Wayside/Horn	Horn	Total
37 trains (100 MNT)				
Brookings	0	448	1,855	2,303
Brookings	0	352	1,548	1,900
Volga	0	94	300	394
*total for existing rail line at current level of operation under Alternative B-1, B-2, and B-3				

Table 4.9-4				
Brookings Alternatives				
Number of Noise Sensitive Receptors at 70 dBA L_{dn} for Alternatives B-1*and B-2				
County and Community Along Existing Line Segment	Number of Noise Sensitive Receptors at 70 dBA L_{dn}			
	Wayside	Wayside/Horn	Horn	Total
Existing Condition*				
Brookings	0*	3*	351*	354*
Brookings	0*	3*	292*	295*
Volga	0*	0*	57*	57*
11 trains (20 MNT)				
Brookings	0	28	491	519
Brookings	0	28	379	407
Volga	0	0	110	110
21 trains (50 MNT)				
Brookings	0	113	735	848
Brookings	0	111	577	688
Volga	0	2	157	159
37 trains (100 MNT)				
Brookings	0	151	1,170	1,321
Brookings	0	129	969	1,098
Volga	0	21	197	218

Table 4.9-5 Brookings Alternatives Number of Noise Sensitive Receptors for Alternative B-3					
City	Number of Trains	Number of Noise Sensitive Receptors at 65 dBA L _{dn} /70 dBA L _{dn}			
		Wayside	Wayside/Horn	Horn	Total
Brookings	8 trains	0 / 0	2 / 2	4 / 2	6 / 4
	18 trains	0 / 0	2 / 2	10 / 3	12 / 5
	34 trains	0 / 0	3 / 2	13 / 8	16 / 10

Table 4.9-6 Brookings Alternatives Number of Noise Sensitive Receptors at 65 dBA L_{dn} for Alternative B-3										
City	Number of Trains	Noise Sensitive Receptors at 65 dBA L _{dn}								
		Wayside			Wayside w Horn			Horn		
		E	B	BR	E	B	BR	E	B	BR
Brookings	11 trains	0	0	0	140	5	2	1,067	8	319
	21 trains	0	0	0	273	5	2	1,443	14	325
	37 trains	0	1	0	448	6	3	1,855	18	328

E=all traffic on existing line B= all traffic on bypass
 BR=coal traffic (8 trains) on bypass with remaining traffic (3 trains) on existing rail line

Table 4.9-7 Brookings Alternatives Number of Noise Sensitive Receptors at 70 dBA L_{dn} for Alternative B-3										
City	Number of Trains	Noise Sensitive Receptors at 70 dBA L _{dn}								
		Wayside			Wayside/Horn			Horn		
		E	B	BR	E	B	BR	E	B	BR
Brookings	11 trains	0	0	0	28	2	2	491	5	133
	21 trains	0	0	0	113	2	2	735	7	134
	37 trains	0	1	0	151	4	2	1,170	10	139

E=all traffic on existing line B= all traffic on bypass
BR=coal traffic (8 trains) on bypass with remaining traffic (3 trains) on existing rail line

Table 4.9-8 Brookings Alternatives Number of Noise Sensitive Receptors for Alternative B-4				
Number of Trains	Noise Sensitive Receptors at 65 dBA L _{dn} /70 dBA L _{dn}			
	Wayside	Wayside/Horn	Horn	Total
11 trains	0/0	5/2	8/5	13/7
21 trains	0/0	5/2	14/7	19/9
37 trains	1/0	6/4	18/10	25/14

Based on its analysis, SEA determined Alternative B-2 would have a significant increase in noise sensitive receptors exposed to adverse noise levels. Alternatives B-3 and B-4 would also expose noise sensitive receptors to adverse noise levels, although the rural nature of the area along the bypass greatly reduces the number that would be exposed.

4.9.7.2 Vibration

Structures along the proposed alternatives could experience varying degrees of vibration and different levels of impact, as discussed in Section 4.3.9.2. Those within 100 feet of the rail line are most likely to experience potential structural damage. Beyond 100 feet, the only potential effects would be to hospitals or other facilities with sensitive equipment. Increased vibration

could cause such equipment to function improperly. Structures beyond 100 feet would not likely be structurally damaged. However, vibration may be felt and cause concern or annoyance.

Alternative B-1: No-Action

There are 6 houses located within 100 feet of the existing rail line. There are 117 houses located between 101 and 200 feet of the existing rail line, and 203 houses within 201 and 400 feet of the existing rail line (Table 4.9-9). The level of vibration created by the existing DM&E rail traffic on the existing rail corridor would remain the same under Alternative B-1.

Alternative B-2: Existing Rail Line

The number of houses located within the specific ranges of the existing rail line is the same as for Alternative B-1. Houses built in proximity to the existing rail line may have structural fortification appropriate for the vibration levels generated by operation of a rail line. However, structures that are currently located in proximity of the existing rail line could experience an increase in vibration, based on DM&E's proposed transport of heavier loads at higher speeds. Structures within 100 feet of the existing DM&E rail line currently not experiencing damage from vibration could potentially be exposed to damaging levels under operation of unit coal trains over the existing rail line. No facilities were identified along the existing rail line with sensitive equipment close enough to potentially be affected by rail generated vibration.

Alternative B-3: Existing Rail Line and Bypass for coal Traffic

The number of structures that could potentially experience vibration from this alternative is provided in Table 4.9-9. Impacts for structures along the existing rail line (6 within 100 feet) would be the same as those presented for Alternative B-1. Unlike houses built in proximity to the existing rail line, houses built in the area along the bypass (2 within 100 feet) may not contain the structural fortifications appropriate for the vibration levels generated by operation of a rail line. Therefore, these residences, especially those within 100 feet of the proposed new rail line, may be more susceptible to damage from vibration.

Beyond 100 feet, the only potential damaging affects would be to hospitals or other facilities with sensitive equipment. Increased vibration could cause such equipment to function improperly. There are no hospitals, or other facilities known to contain sensitive equipment, located within 1.0 mile of the proposed bypass corridor. At this distance, no impacts from vibration would be expected.

Alternative B-4: Bypass for all Rail Traffic

Impacts associated with the construction and operation of Alternative B-4 would be the same as those presented for the bypass segment of Alternative B-3.

Alternative	0-100 feet	101-200 feet	201-400 feet	Total
B-1	6	117	203	326
B-2	6	117	203	326
B-3	8	117	205	330
B-4	2	0	2	4

4.9.8 BIOLOGICAL RESOURCES

The existing biological resources within the project area are described in Section 4.1.8. The following discusses the potential impacts to these resources due to the various Brookings alternatives. The distances measured adjacent to the existing rail line are miles totaled from both sides of the existing track. The distance of land presented for the proposed new rail line bypass, includes land that would be converted from its present condition to railroad right-of-way.

4.9.8.1 Vegetation

Alternative B-1: No-Action

The No-Action Alternative would have no impacts to vegetation other than the minimal trimming, mowing, and herbicide control that currently occurs within the existing rail corridor as part of normal rail line operation and maintenance.

Alternative B-2: Existing Rail Line

The existing corridor in Brookings is adjacent to approximately 5.6 miles of grassland, 1.3 miles of wooded fence rows, 1.3 miles of wetlands, and approximately 10.2 miles of agricultural land. Impacts would primarily occur within the existing rail line right-of-way. Impacts to these communities would likely include clearing or damage from construction equipment, loss due to herbicide use, trimming and mowing, and ground disturbance. Soil disturbance during

construction could allow the introduction of non-native or undesirable species within the project area. Following completion of construction, the edge of the proposed right-of-way would be expected to revegetate as described in Section 4.3.10.1.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Impacts associated with the existing portion of this alternative would be the same as those described for Alternative B-1.

Construction activities associated with the development of the proposed bypass segment could cause temporary and permanent impacts to vegetation. Construction of the proposed bypass segment would require the conversion of 89.6 acres of grassland and 9.7 acres of wooded fence rows to railroad right-of-way. Woody vegetation and grasses would be cleared or disturbed during construction. Conversion of approximately 284.8 acres of agricultural land to railroad right-of-way could cause loss of crops, if planted prior to construction. Approximately 5.1 acres of wetland vegetation would also be lost. Disturbance of soils could cause the loss of native plant communities within the disturbed area. Impacts associated with construction and operation of the proposed rail line, such as soil loss due to erosion and the introduction of non-native and undesirable species, where vegetation and surface soils are disturbed, are presented in Section 4.3.10. Potential spills of hazardous substances used during construction and operation of the proposed rail line may affect vegetative communities both within the right-of-way and in adjacent areas.

Following completion of construction, the edge of the proposed right-of-way would be expected to revegetate as described in Section 4.3.10.1. These areas would be maintained by DM&E, and could require mowing and trimming to control excess growth of ground cover and woody vegetation. The use of herbicides to control weeds during operation of the proposed rail line could affect adjacent vegetative communities by killing or damaging vegetation that may be exposed to herbicides.

Alternative B-4: Bypass for all Rail Traffic

Impacts from Alternative B-4 would be the same as those described for the bypass portion of Alternative B-3.

4.9.8.2 Wildlife

The types and species of wildlife found within each project area are described in Section 4.1.8.2.

Alternative B-1: No-Action

Impacts to wildlife that currently inhabit the existing rail corridor would remain at existing levels under Alternative B-1. Wildlife inhabiting the area have likely adapted to some extent to the existing rail traffic. Additionally, much of this existing corridor, approximately 13.3 miles, is through developed areas that would tend to have only limited types and numbers of wildlife present.

Alternative B-2: Existing Rail Line

Wildlife using habitat along the existing rail line have become habituated to activities associated with rail line traffic. However, short-term and long-term impacts are anticipated during reconstruction and operation of the existing rail line. Reconstruction and operational impacts, as presented in Section 4.3.11, may include habitat loss, increased noise, train-wildlife collisions, increased human presence and the potential introduction of contaminants into the environment. Increased rail traffic and train speed would increase disturbance to wildlife and potential mortality to individuals using the rail line right-of-way.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Impacts associated with the existing rail line would be consistent with impacts described for Alternative B-1.

During construction of the bypass segment of this alternative, vegetation within the proposed bypass corridor would be cleared or disturbed, decreasing habitat for wildlife species. The loss of approximately 284.8 acres of agricultural land would require wildlife using the area for cover and forage to relocate to nearby areas during construction. Wildlife utilizing the woody vegetation located within approximately 9.7 acres of wooded fence rows within the proposed right-of-way would lose this habitat. Loss of approximately 5.1 acres of wetland habitat would reduce this habitat for wildlife that use it, including waterfowl, some species of upland birds, amphibians, songbirds, and reptiles. These species would be displaced during construction and would need to find other suitable habitat. Construction of the rail line could cause the loss of ground nests and nesting adult birds. Wildlife would lose nesting, foraging, and cover habitat, and be presented with the obstacle of crossing a rail line where none previously existed.

During operation, additional impacts could include increased noise disturbance and mortality to wildlife. Some species could abandon habitats in the adjacent areas due to disturbance created by passing trains. Loss due to collisions with trains would increase, as

suggested in Section 4.3.11, for deer and other animals that may cross the proposed rail line or use it as a travel path.

Alternative B-4: Bypass for all Rail Traffic

Impacts associated with the construction and operation of Alternative B-4 would be the same as those presented for the bypass segment of Alternative B-3.

4.9.8.3 Aquatic and Fisheries

Trout streams are present throughout the South Dakota project area. These streams are an important element of South Dakota's natural history as well as a source of recreation. Impacts to surface waters could include introduction of increased sediment from construction run-off, changes in the hydrology due to channelization and stream bank stabilization, and loss of suitable stream habitat. These impacts would be a for all fishery resources, but particularly for trout streams due to trout having less tolerance for these types of impacts than warm water fish species. Any impact to a trout stream would be considered significant, as would permanent impacts to important warm water fisheries. However, there are no trout streams crossed by any of the Brookings alternatives.

Alternative B-1: No-Action

There are 12 waterbody crossings by the existing DM&E rail line, including one of the Big Sioux River. This alternative would have no impact on these resources as it would not involve any construction or reconstruction activities. The only impact would be the minimal potential for a spill of contaminants in the unlikely event of a train derailment.

Alternative B-2: Existing Rail Line

The existing DM&E rail line through Brookings crosses the Big Sioux River, a perennial water body, and 11 other waterbodies. Potential impacts to aquatic organisms, such as alteration of available habitat and abrasion of gills due to increased sediment, are described in Section 4.3.11.4. During reconstruction of the existing rail line, these would potentially occur primarily in the Big Sioux River, as aquatic resources in intermittent streams would be limited. In areas where sediment is deposited, the development of eggs and larvae of aquatic organisms could be disrupted. Changes in hydrology could result in a change in the natural movements and migrations of aquatic populations or the loss of habitat for some species. The abundance of food resources may also be reduced. Instream bridge or culvert activities would damage fish habitat and mussel beds if they are present at the crossing site. Accidental spills of contaminants such as

oil, lubricants, and fuel during reconstruction and operation could pose a hazard to fish and mussels if these materials enter waterways in sufficient quantities to significantly reduce water quality.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

No significant impacts are expected to occur along the existing rail line due to the continued operation and maintenance practices on the existing rail line. Impacts expected to occur along the existing rail line for this alternative are the same as those described for Alternative B-1.

The proposed rail line around Brookings would cross 1 perennial stream (the Big Sioux River) and approximately 19 intermittent or seasonal streams. Impacts to aquatic resources would occur primarily from the crossing of the Big Sioux River. Impacts to the Big Sioux River would be similar to those of Alternative B-2, as both alternatives would involve installation of a new bridge.

Alternative B-4: Bypass for all Rail Traffic

Impacts associated with this alternative would be the same as those described for the bypass segment of Alternative B-3.

4.9.8.4 Endangered, Threatened, and Sensitive Species

A list of threatened and endangered species within the South Dakota project area is provided in Section 4.1.8.4. Of these, only the Federally endangered Topeka shiner would potentially be impacted by the Brookings alternatives.

Alternative B-1: No-Action

The existing DM&E rail line through Brookings crosses four streams where the Topeka shiner is known to occur. The streams are located in the Big Sioux River basin. They include Deer Creek, North Deer Creek, Sixmile Creek, and an unnamed Big Sioux River tributary. Since no change in current activities would occur with this alternative, no change in impacts are expected. No construction or reconstruction affects, except those that would be part of normal rail line maintenance, would occur. However, continued deterioration of the existing rail line increases the risk of accidental spills occurring in sensitive habitats. Should a spill of contaminants occur as a result of a derailment and contaminants enter streams inhabited by

Topeka shiners, downstream populations could be at risk. Loss of individual shiners or local populations would be a significant impact on the species.

Alternative B-2: Existing Rail Line

The existing DM&E rail line through Brookings crosses four streams where the Topeka shiner is known to occur, as noted above under Alternative B-1. Increased sedimentation due to erosion and in-stream work where the rail line crosses inhabited streams could affect downstream populations of Topeka shiners. Silt-free areas are utilized by the Topeka shiner for spawning. Sediment could reduce habitat and forage, as well as harm individuals. Channelization of streams, if necessary, at crossings could negatively impact many aquatic species, including the Topeka shiner, by eliminating and degrading instream habitats, altering the natural hydrography, and changing water quality. Channelization could also cause the elimination of pool habitats, and decrease instream debris and woody riparian vegetation. Water velocities may increase and deep silt may be deposited on downstream substrates where water velocities return to normal. This potential increase in sedimentation may increase organic nutrients, resulting in a decrease of dissolved oxygen from decomposition of these materials. Although the Topeka shiner can tolerate some degree of short-term degradations, they could be affected if these conditions are created by reconstruction.

Reconstruction of stream crossings and operation of a railroad would provide the potential opportunity for spills of contaminants or herbicides to enter streams, as discussed in Section 4.9.1.9.3. Reduced water quality from contaminants could harm individuals, reduce population sizes, or eliminate populations downstream of where the spill enters the waterway, causing significant impacts to the species.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Impacts resulting from the continued operation and maintenance of the existing rail line for this alternative are the same as those described for Alternative B-1.

The proposed bypass route would cross the same streams that are crossed by the existing route through Brookings. Potential impacts would be consistent with those described for Alternative B-2. Although no stream crossings currently exist at locations along the proposed bypass, installation of new stream crossings would have similar impacts to the removal and installation or reconstruction of the existing crossing structures along the existing rail line.

Alternative B-4: Bypass for all Rail Traffic

Impacts associated with this alternative would be the same as those described for the bypass portion of Alternative B-3.

4.9.9 TRANSPORTATION

The types of impacts to transportation in the Brookings area, resulting from the reconstruction or construction of any of the action alternatives, would be similar to those described in Section 4.3.12. Potential impacts would include traffic delays for motorists and rail traffic, detours, and inconvenience for pedestrians and vehicles crossing the rail line.

To determine the potential operational impacts to transportation, SEA calculated potential changes in vehicle delay at crossings where average daily traffic (ADT) volumes were 5,000 or greater as discussed in more detail in Section 4.3.12.

Alternative B-1: No-Action

Under Alternative B-1, no changes in the existing transportation environment would occur. Rail traffic and operating speeds would remain at the present level. Traffic delays at 18 grade crossings (Table 4.1-15), along the existing rail line, would remain unchanged. Alternative B-1 has 3 crossings where the ADT is 5,000 or greater. The grade separated crossing at Interstate 29/US Highway 71 would not be upgraded.

Alternative B-2: Existing Rail Line

Alternative B-2 would cross 18 roads, highways, and city streets grade (Table 4.1-15). All roadways crossed could experience impacts related to reconstruction similar to those described in Section 4.3.12, such as traffic delays, reduced access, and rerouted traffic.

Alternative B-2 would have 3 crossings where the ADT is 5,000 vehicles per day or greater. During operation, impacts to transportation would include delays to vehicles at grade crossings. While individual train events would result in shorter delays due to increased train speeds, more trains would result in a greater number of delay events for motorists and pedestrians, making it more likely they could encounter a train. The following summarizes SEA's delay analysis for those crossing with ADTs over 5,000 vehicles per day by level of rail traffic.

20 MNT

There are 3 public crossings in Brookings with ADT's above 5,000 (22nd Avenue -FRA crossing 197478H, MP 289.30; Medary Avenue - FRA crossings 197480J, MP 290.30; Main Avenue - FRA crossing 197481R, MP 290.90) for which SEA performed vehicle delay calculations. All 3 crossings would experience a reduction in delay per stopped vehicle ranging from 1.8 to 1.4 minutes. The level of service following reconstruction of the existing rail line would be A for both train length scenarios. These crossings would also experience a reduction in maximum vehicle queue length, from 19.7 to 13.4, from 19.9 to 13.6, and 12.4 to 8.5, respectively.

50 MNT

All 3 public crossings analyzed in Brookings County would experience a reduction in delay per stopped vehicle ranging from 1.8 to 1.4 minutes. The levels of service following rail line reconstruction would be B for 22nd Avenue (FRA crossing 197478H, MP 289.30) for both the 6,400 foot and 7,400 foot train lengths. The level of service at Medary Avenue (FRA crossings 197480J, milepost 290.30) and Main Avenue (FRA crossing 197481R, milepost 290.90) would be A for both train length scenarios. All these crossings would also experience a reduction in maximum vehicle queue length, from 19.7 to 13.4, from 19.9 to 13.6, and 12.4 to 8.5, respectively.

100 MNT

All 3 public crossings analyzed would experience a reduction in delay per stopped vehicle ranging from 1.8 to 1.4. The levels of service for each reconstructed crossing would be B for the 6,400 feet train scenario and C for the 7,400 feet scenario. These crossings would also experience a reduction in maximum vehicle queue length from 19.7 to 13.4, from 19.9 to 13.6, and 12.4 to 8.5, respectively.

The reconstruction of DM&E's existing rail line proposed under Alternative B-2 would likely result in improved rail transportation service, reliability and efficiency. Rail shippers throughout South Dakota would benefit from these improvements, as would rail shippers located in the Brookings area (Section 4.9.1.4.3).

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Along the existing DM&E rail line, 18 roadways have grade crossings within the Brookings project area. Impacts along the existing rail line would be the same as those described for Alternative B-1.

The proposed bypass segment would cross 16 roadways, including Interstate Highway 29 (I-29), 3 county roads and highways, and 12 city streets or avenues in the Brookings area. The proposed crossings would experience traffic delays and detours during construction of the grade crossings. Long-term impacts would include vehicle delays during train events. The Brookings bypass does not have any crossings where ADT volumes are 5,000 vehicles per day or greater. SEA concluded that the potential effect of increased train traffic for highways with ADT volumes below 5,000 would be experienced by very few drivers and that vehicular delay would be minimal. However, the bypass would require construction of a new grade separated crossing at I-29 north of Brookings. Construction of this crossing could result in traffic delays for interstate travelers due to lane reductions, detours, or temporary closures to allow for construction over the interstate.

Alternative B-3 would provide a new rail line over which future unit coal trains would operate. This route, combined with the reconstruction of other portions of the DM&E rail line, would provide an improved and efficient rail transportation route for coal. However, existing rail traffic, including through-trains and trains servicing Brookings' area shippers, would be unable to realize the full benefit of reconstruction of these other portions of rail line due to the existing rail line through Brookings not being reconstructed. These trains would continue to operate over the existing rail line, under current speed and weight restrictions.

Speed restrictions would reduce train cycle times, but only slightly due to the short distance under speed restriction. Trains operating at slower speeds along this stretch of rail line could also complicate rail operations as passing siding locations are determined based on operating speeds of 49 mph (westbound) and 45 mph (eastbound). The combination of slower trains on the existing rail line and faster trains on the bypass would require careful attention to avoid unnecessary train delay and potentially dangerous situations for trains on this and other portions of the rail system. Such complications would be particularly apparent if a train were required to stop and wait either along the bypass or existing line, blocking roadways, in order to provide for safe passage of other trains. Should mistakes be made, two trains could risk operating on the same stretch of line in opposite directions or in the same direction with a train slowing to enter the existing portion of the Brookings' rail line while a faster train approaches from behind to operate over the bypass.

Rail car weight restrictions on this portion of the rail line would dictate the maximum allowable weight for all cars operating on the entire system that would be required to use this section of the existing rail line. It would be inefficient, if not impractical, to transfer loads from one rail car to others to “top them off” after they had passed through Brookings. This would prevent shippers whose cars must pass through Brookings from upgrading railcar loads from the current 263,000 pound restriction to the industry standard 286,000 pounds. Therefore existing shippers would not recognize the efficiencies associated with rebuilding the entire line, or be able to ship loads comparable to their competitor on other rail lines.

In addition, the bypass route would cross DM&E’s Sioux Valley spur, a rail line connecting the DM&E mainline to the South Dakota/Dakota Cement Plant. The cement plant is the only shipper served by this spur. The spur is used to queue and store rail cars for loading and unloading. Construction of the bypass across this spur would make this process infeasible as insufficient space would be available between the plant and the bypass to store an entire train. A train loading or unloading at the plant would be required to stop across the bypass, be moved back and forth, instead of in only one direction, to facilitate complete loading or unloading of the train, or be split into smaller trains in the Sioux Valley yard and then reassembled in the yard. Because of these existing operational processes, construction and operation of the Brookings bypass would require additional rail spur construction to provide sufficient space for trains, or the plant and DM&E would be required to implement less efficient procedures. This would increase loading and unloading times and rail transportation costs for this shipper.

Alternative B-4: Bypass for all Rail Traffic

The transportation impacts of Alternative B-4 for vehicles would be similar to those described for the bypass portion of Alternative B-3. However, delay incidents would be increased by three per day due to the addition of the existing DM&E rail traffic over the bypass. Because all train traffic would travel over the bypass, the inefficiencies related to continued operation of trains over the existing rail line would not result. However, the access problems described for the South Dakota/Dakota Cement Plant would still occur.

4.9.10 SAFETY

Any of the proposed alternatives present potential safety hazards for motorists at grade crossings and pedestrians at designated crossings and along the rail line. As discussed in Section 4.3.13, safety impacts could occur as a result of reconstruction of the rail line. During reconstruction and construction, impacts would include increased traffic and congestion on roadways due to road closings, transportation of materials and crews to work sites reducing road safety. Impacts would also include accelerated wear and tear on roadways due to the operation of

heavy trucks to move materials and machinery, also making roads potentially more hazardous to travel. Routes for emergency vehicles may need to be redesigned to avoid delays at congested or closed crossings. Pedestrians would also be required to modify their routing to avoid hazards in construction areas.

During operation, the increases in rail traffic could impact safety within the Brookings area. Trains traveling on the existing rail line present a safety hazard for impatient motorists who may try to beat a train at a grade crossing to avoid the delay created by the passing train. Improvements to the existing rail line may decrease the time a motorist would be delayed. However, the increased frequency of trains in the area would increase the likelihood of motorists and pedestrians encountering a train and the incidences of subsequent safety hazards for motorists and pedestrians at grade crossings. Increased train speeds on an improved rail line may create a safety hazard to those who might underestimate the time needed for the train to reach the location at which they choose to cross the track. The risk of derailments and resultant loss or damage of cargo, damage to vehicles, and rail equipment associated with them would be decreased by the improved conditions of the rail line.

To evaluate the significance of potential changes in accident frequency for the Brookings Alternatives, SEA categorized highway/railroad grade crossings into two categories. Category A consisted of highway/railroad grade crossings with a history of relatively frequent train-vehicle accidents. SEA considered highway/rail grade crossings in South Dakota with accident frequency rates at or above the state's 50th highest accident frequency rate of 1 accident every 20 years (0.051067 accident frequency rate) to be Category A highway/railroad grade crossings. For all Category A highway/railroad grade crossings, SEA considered the relatively small accident frequency rate increase of 1 accident every 100 years (a 0.01 accident frequency rate increase) to be significant.

Category B consisted of highway/railroad grade crossings with a history of relatively infrequent train-vehicle accidents. SEA considered highway/rail grade crossings in South Dakota with accident frequency rates less than 1 accident every 20 years (less than 0.051067 accident frequency rate) to be Category B highway/rail grade crossings. For these crossings, SEA considered an accident frequency rate increase of 1 accident every 20 years (a 0.05 accident

frequency rate increase) to be significant. The results of this analysis are discussed for each alternative.

Alternative B-1: No-Action

Safety issues related to construction, reconstruction, and increased rail operation would not be experienced as a result of this alternative. Grade crossing safety would remain at the current level. However, the operational safety of the existing traffic on the existing rail line would continue to present potential risk. Lack of upgrades along the existing DM&E rail line may potentially increase the potential for train accidents. The grade separated road crossing at Interstate 29/US Highway 71 would not be upgraded.

Alternative B-2: Existing Rail Line

Reconstruction of the existing rail line through Brookings would result in safety impacts similar to those described in Section 4.3.13. Pedestrian safety could be of concern with this alternative due to its proximity to developed areas and public facilities. It would be within approximately 900 feet of the nearest church and approximately 1,000 feet of the nearest school. There are 522 houses located within 500 feet of the existing rail line right-of-way. This setting places a large number of persons and vehicles in proximity of the rail line. Impacts to pedestrians and motorists would include reduced access and the presence of large construction equipment which could be potential safety hazards.

The nearest hospital is approximately 2,700 feet from the existing rail line. The safety of emergency vehicles and their clients during an emergency event would require establishment of routes that would reduce and minimize delay by construction activities or operating trains at crossings used for access across the rail line.

A bike path, along the west side of Interstate 29/US Highway 71, and 2 pedestrian walkways, located between 17th Avenue and Medary Avenue, cross the existing rail line grade, creating safety concerns for pedestrians and cyclists using these pathways. As described in Section 4.3.17, operational impacts to trail safety would tend to be concentrated at grade crossings. Potential delays during construction and operation could cause unsafe conditions for pedestrians and cyclists. Those inconvenienced by detours could cross at unprotected crossings, walk along the rail line right-of-way, or cross at unauthorized locations.

Rail safety along the reconstructed rail line would be expected to improve. The potential for derailments and crossing incidents would be reduced.

SEA evaluated the potential for accidents at grade crossings for Alternative B-2. The results of this analysis were the same for each of the Extension Alternatives (Alternatives B, C, and D). These results are presented below for each level of operation evaluated.

20MNT

SEA's safety analysis showed that for the 18 highway/railroad grade crossings affected by the reconstruction of the existing rail line for Alternative B-2, the predicted accident frequency at the 20 MNT level of operation would range from 0.001 to 0.005. This translates into a range of estimated accident frequency from 1 accident every 1,180 years to 1 accident every 198 years, respectively. SEA found these predicted rates to be below the criteria for significance.

An overall increase in the accident frequency would be observed for several of the grade crossings following reconstruction. The system-wide change in accident frequency in Brookings is 0.046. This represents a predicted increase of 1 accident every 22 years.

50 MNT

SEA's safety analysis showed that for the 18 highway/railroad grade crossings affected by the reconstruction and increased operation of the existing rail line as part of Alternative B-2, the predicted accident frequency at the 50 MNT level of operation would range from 0.002 to 0.026. This translates into a range of estimated accident frequency from 1 accident every 415 years to 1 accident every 38 years, respectively. SEA determined the predicted increases resulting from the reconstruction was significant for crossings at 22nd Ave (197478H, MP 289.30) and Main Ave (197481R, MP 290.90). These crossings are classified at Category A. SEA found the predicted rates at other locations to be below the criteria for significance.

An increase in the accident frequency would be observed for several of the grade crossings along Alternative B-2. The system-wide change in accident frequency in Brookings is 0.167. This represents a predicted increase of 1 accident every 6 years.

100 MNT

SEA's safety analysis showed that for the 18 highway/railroad grade crossings affected by Alternative B-2, the predicted accident frequency at the 100 MNT level of operation would range from 0.006 to 0.045. This translates into a range of estimated accident frequency from 1 accident every 167 years to 1 accident every 22 years, respectively. SEA determined the predicted increases resulting from the reconstruction was significant for crossings at 22nd Ave (197478H, MP 289.30), Main Ave (197481R, MP 290.90), and Medary Ave (197480J, MP 290.30). These

crossings are classified as Category A. SEA found the predicted rates at other locations to be below the criteria for significance.

An increase in the accident frequency is observed for several of the grade crossings along Alternative B-2. The system-wide change in accident frequency in Brookings is 0.283. This represents a predicted increase of 1 accident every 4 years.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Safety concerns along the existing rail line would be the same as those described for Alternative B-1. SEA's safety analysis showed that for the 18 public highway/railroad grade crossings impacted by 3 trains per day on the existing rail line through Brookings, the predicted accident frequency at all levels of operation would range from 0.003 to 0.139. This translates into a range of estimated accident frequency from one accident every 333 years to one accident every 7 years, respectively. SEA determined that the proposed operation significantly impacts the potential for accidents at 22nd Avenue (FRA crossing 197478H, milepost 289.30). SEA found the predicted rates at the other locations to be below the criteria for significance.

The bypass segment would be constructed in a predominantly rural area. Safety concerns during construction would include detours and reduced access for pedestrians and motorists. The presence of large construction equipment and closed crossings would be temporary and limited to the area of construction. Proposed rail construction and operation could affect safety of motorists and school buses at proposed grade crossings. Impacts associated with school bus traffic at grade crossings are presented in Section 4.3.13. The number of school bus crossings at public grade crossings are presented in Table 4.9-10. The safety of emergency vehicles and their clients during an emergency event would require establishment of routes that would reduce or minimize the potential delay by construction activities or operating trains at crossings used for access.

SEA analysis of predicted accident frequency at new grade crossings along the bypass is discussed below by level of rail line traffic.

20 MNT

SEA's safety analysis showed that for the 16 additional public highway/railroad grade crossings required for the Brookings bypass, the predicted accident frequency at the 20 MNT level of operation would range from 0.004 to 0.05. This translates into a range of estimated annual accident frequency from 1 accident every 250 years to 1 accident every 20 years, respectively. SEA found these predicted rates to be below the criteria for significance.

50 MNT

SEA's safety analysis showed that for the 16 additional public highway/railroad grade crossings required for the Brookings bypass, the predicted accident frequency at the 50 MNT level of operation would range from 0.008 to 0.091. This translates into a range of estimated annual accident frequency from 1 accident every 125 years to 1 accident every 11 years, respectively. SEA determined that the proposed operation significantly impacts the potential for accidents at the crossings of US-14, CR 77, CR 9, CR 7 and CR 5. SEA found the predicted rates at the other locations to be below the criteria for significance.

100 MNT

SEA's safety analysis showed that for the 16 additional public highway/railroad grade crossings required for the Brookings bypass, the predicted accident frequency at the 100 MNT level of operation would range from 0.008 to 0.091. This translates into a range of estimated annual accident frequency from 1 accident every 125 years to 1 accident every 11 years, respectively. SEA determined that the proposed operation significantly impacts the potential for accidents at US-14, Landfill Road, CR 77, CR 9, CR 7 and CR 5. SEA found the predicted rates at the other locations to be below the criteria for significance.

Alternative B-4: Bypass for all Rail Traffic

Safety concerns would be the same as those described for the bypass segment of Alternative B-3. The increased number of trains along the bypass segment would create a change in the predicted accident frequency during operation. The predicted accident frequencies are described below.

20 MNT

SEA's safety analysis showed that for the 16 additional public highway/railroad grade crossings required for the Brookings bypass, the predicted accident frequency at the 20 MNT level of operation would range from 0.005 to 0.056. This translates into a range of estimated annual accident frequency from 1 accident every 200 years to 1 accident every 18 years, respectively. SEA determined that the proposed operation significantly impacts the potential for accidents at US-14 and CR 77. SEA found the predicted rates at the other locations to be below the criteria for significance.

50 MNT

SEA's safety analysis showed that the predicted accident frequency at the 50 MNT level of operation would range from 0.007 to 0.068. This translates into a range of estimated annual accident frequency from 1 accident every 143 years to 1 accident every 15 years, respectively. SEA determined that the proposed operation significantly impacts the potential for accidents at US-14, CR 77, CR 9, and CR 5. SEA found the predicted rates at the other locations to be below the criteria for significance.

100 MNT

SEA's safety analysis showed that the predicted accident frequency at the 100 MNT level of operation would range from 0.009 to 0.079. This translates into a range of estimated annual accident frequency from 1 accident every 111 years to 1 accident every 13 years, respectively. SEA determined that the proposed operation significantly impacts the potential for accidents at US-14, CR 77, CR 9, CR 7 and CR 5. SEA found the predicted rates at the other locations to be below the criteria for significance.

4.9.11 HAZARDOUS MATERIALS

Transportation of Hazardous Materials

Alternative B-1: No-Action

No construction would occur as a result of this alternative. This alternative would not result in an increase in the types or amounts of hazardous materials being transported by DM&E. The likelihood of an accident involving hazardous materials is currently low due to the minimal quantities of such materials transported. However, the poor condition of DM&E's track increases the chances of derailment that could potentially release hazardous materials.

Alternative B-2: Existing Rail Line

Neither the reconstruction nor operation of this alternative would result in an increase in the type or amounts of hazardous materials being transported by DM&E. As stated in Section 4.3.14, the reconstruction of the existing rail line would likely further reduce the potential for an accident involving the release of hazardous substances by providing an improved, safer rail line. The likelihood of such an accident is currently low due to the minimal quantities of such materials transported.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Neither construction nor operation of this alternative would result in an increase in the types or amounts of hazardous materials currently transported by DM&E. The new rail line bypass would provide a safe route for the transport of coal. Train derailment on this portion of rail line would be unlikely. Should one occur, the only potential contaminants released would be diesel fuel and lubricants necessary for train operations. However, hazardous materials currently transported over the existing DM&E rail line would continue to be transported over the existing rail line in its existing condition. The poor condition of DM&E's existing track increases the chances of a derailment that could potentially release hazardous materials. However, the likelihood of such an accident is currently low due to minimal quantities of hazardous materials transported.

Table 4.9-10 School Bus Crossings for Brookings Alternatives		
School District and Bus Service	Street Name	Number of Crossings/Day
Brookings, SD	Bypass:	
	475th Avenue	2
	213th Street	2
	US Highway 14 (Northwest of Aurora)	10
	473rd Avenue	4
	Co Road 77/471st Avenue	8
	470th Avenue	4
	Co Highway 9	2
	Co Highway 34	0
	Co Highway 5	0
	Co Highway 7	0

Table 4.9-10 School Bus Crossings for Brookings Alternatives		
School District and Bus Service	Street Name	Number of Crossings/Day
Brookings, SD (continued)	Existing Rail Line:	
	475th Avenue	2
	1st Street	0
	Main Avenue S.	3
	Medary Avenue	10
	Orchard Street	0
	2nd Street S.	0
	17th Avenue S.	25
	6th Avenue S.	17
	6th Street	0
	22nd Avenue	9
	US Highway 14 (West of Volga)	0
	Western Avenue	2

Alternative B-4: Bypass for all Rail Traffic

Transportation impacts would be the same as those described for Alternative B-3, except that existing hazardous materials traffic would be routed over the bypass. Therefore, this traffic would be operated over a rail line of improved condition, reducing the potential for a track-condition related derailment.

Hazardous Material Sites

Alternative B-1: No-Action

Because no construction or reconstruction would occur with this alternative, Alternative B-1 would have no impact on existing hazardous materials sites. Because of the condition of the existing rail line, the potential for a derailment would remain relatively high. Such a derailment could result in a spill of hazardous materials, resulting in a reportable spill and a new recorded hazardous materials site.

Alternative B-2: Existing Rail Line

As described in Section 4.3.14, hazardous material sites are places where release of hazardous materials have been reported to local, state, or Federal authorities. In Brookings County, 17 LUST sites (Table 4.1-21) were listed. No other sites were identified within Brookings County. If any of these sites are located within or adjacent to the proposed rail line right-of-way, appropriate action would be necessary to avoid disturbance of the site. There is the potential for railroad operations to result in new sites of contamination in the event of spills during derailments or improper handling of hazardous materials necessary for normal operations. However, this is unlikely due to the expected reduction in derailments from improved rail conditions and compliance with regulations regarding handling, storage, and disposal of hazardous materials.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Since this information is based on the county in which these alternatives are located, the information for hazardous material sites would be basically the same as that presented for Alternative B-2.

Alternative B-4: Bypass for all Rail Traffic

Impacts would be basically the same as those presented for Alternative B-2.

4.9.12 ENERGY RESOURCES

No change in the present impacts to energy resources would be expected with Alternative B-1. In Section 4.3.15, impacts related to the transport and utilization of energy resources are presented. Upgrading the existing DM&E rail line or construction of associated alternatives would result from DM&E successfully constructing a rail line extension into the PRB and

obtaining contracts to transport coal from the basin to utilities throughout the midwest. This would provide a more cost-effective transportation route for PRB coal. It would help alleviate service and congestion problems, making the transportation of PRB coal more efficient and reliable. Energy resources would be available to users at a more economical rate with higher reliability and greater efficiency. The shorter route proposed by DM&E would result in significant diesel fuel savings for the transportation of PRB coal. Because the existing rail line is slightly shorter than the bypass, Alternative B-2 would provide the more fuel efficient routing for existing and future rail traffic.

4.9.13 CULTURAL RESOURCES

An investigation of the South Dakota archaeological records for the proposed alternatives showed no sites located along the existing rail line in the Brookings area. However, two sites were identified within the proposed bypass right-of-way. One site (39BK41) is a historic artifact scatter and the other site (39BK37) is an artifact scatter with no known cultural affiliation. Neither site is considered eligible for listing on the NRHP. However, as discussed in Sections 4.3.15 and 4.4.17, unknown cultural resources could be encountered during reconstruction and construction activities and be damaged or destroyed. Because of previous disturbance within the existing rail line right-of-way, reconstruction activities are considered by SEA to have limited potential to contain undisturbed cultural resources of significance. However, significant cultural resources yet unknown and undisturbed could occur along the alignment for the bypass, particularly where it would cross the Big Sioux River.

4.9.14 SOCIOECONOMICS

Alternative B-1: No-Action

Provided DM&E remained a viable railroad, there would be no change in the social or economic characteristics of the Brookings area from this alternative. No new jobs would be created and tax revenues would remain the same. However, if denial of the project results in DM&E ceasing to operate, several hundred persons throughout Brookings and the surrounding area would lose their jobs and potentially relocate from the area for employment elsewhere.

Alternative B-2: Existing Rail Line

The population and demographics for South Dakota are presented in Section 4.1.14.1. Within Brookings County, the unemployment rate was reported at 2.7 percent in 1996. Construction activities along the DM&E rail line would create 62 two-year jobs directly associated with the railroad and an estimated 30 jobs indirectly associated with the railroad

reconstruction activities (Table 4.3-20). Local and non-local workers could be hired to fill positions with the railroad. Economic and employment benefits, such as purchase of construction materials from local suppliers and use of local lodging and eating facilities, are described in Section 4.3.17. Non-local construction workers would not likely relocate permanently to this community. However, the community would benefit from the income spent by these workers while located in the area. Income from railroad construction work would total an estimated \$9.2 million county-wide. This would generate an estimated \$1.0 million in sales and use taxes (Table 4.3-23) some of which would be available to the county. Additional workers moving to the area due to obtaining permanent rail related jobs would increase the demand for housing, potentially balancing any negative impact the increase in rail traffic would have to real estate in proximity to the rail line. Property improvements made to the DM&E rail line could provide an estimated \$1.3 million increase in property taxes for Brookings County.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Since socioeconomic information is based on the county in which these alternatives are located and the extent of reconstruction or construction activity, the information for socioeconomics would be basically the same as that presented for Alternative B-2. Actual monetary amounts may be greater for this alternative due to construction taking longer than reconstruction and including slightly more (1.2 miles) length of rail line. Land values may increase along the proposed bypass segment if land is attractive to commercial or industrial developers.

Alternative B-4: Bypass for all Rail Traffic

Socioeconomic impacts from construction and operation of Alternative B-4 would be similar to those discussed for Alternative B-3.

4.9.15 ENVIRONMENTAL JUSTICE

Nine census block groups in Brookings along the existing DM&E rail line were determined by SEA to meet the criteria for classification as environmental justice, as discussed in Section 4.3.17. All the census block groups were classified as environmental justice due to having a percentage of persons in the census block group at or below the poverty level that was 10 percent or more than the percentage for Brookings County.

SEA evaluated the impacts of the proposed increases in rail traffic to these environmental justice census block groups and compared these impacts to the impacts expected to non-environmental justice census block groups. SEA's analysis determined that 3 of the census block

groups potentially containing environmental justice communities would experience disproportionate impacts due to increased noise. Disproportionate impacts would occur to 1 census block group at the 20 MNT level of operation and all three census block groups at the 50 MNT and 100 MNT levels.

In addition, SEA determined 3 environmental justice census block groups would be disproportionately impacted for grade crossing safety due to grade crossings at 22nd Avenue (crossing 197478H, MP 289.30), Main Avenue (crossing 197481R, MP 290.90), and Medary Avenue (crossing 197480J, MP 290.30) within the census block groups calculated to experience an increased accident frequency meeting SEA's criteria for significant impact. These impacts would occur at the 50 MNT level of rail traffic for 22nd and Main Avenues, and for all 3 crossings at the 100 MNT level of traffic. All 3 census block groups would be affected by the Medary Avenue crossing. The 22nd Avenue crossing would affect 1 census block group and the Main Avenue crossing would affect 2 census block groups. One of the census block groups affected by the Main Avenue crossing was also calculated to be disproportionately impacted by increased noise levels at all 3 levels of rail operation. The census block group affected by the 22nd Avenue crossing was also calculated to be disproportionately impacted by increased noise levels at the 50 MNT and 100 MNT levels of rail operation.

SEA also analyzed census block groups to determine if any environmental census block groups would be disproportionately impacted by the proposed rail line reconstruction and increased levels of operation due to being adversely impacted by more than one evaluation criteria (noise, safety, air, transportation, etc). SEA's analysis did not identify any environmental justice census block groups that would be adversely impacted by more than one evaluation criteria. Therefore, no disproportionate impacts would be borne by environmental justice communities due to being adversely affected by multiple impact categories.

No census block groups meeting the criteria for classification as environmental justice communities were identified along the proposed new rail bypass alignment considered for Alternatives B-3 and B-4. Construction and operation of either of these alternatives would have no impact on environmental justice communities.

4.9.16 RECREATION

Alternative B-1: No-Action

There are a limited number of recreational opportunities in the areas adjacent to the existing rail line and the proposed bypass. There are 3 parks located within a mile of the existing rail line. The closest of these is Lions Park, located adjacent to the existing rail in Brookings.

Lions Park has a basketball court, play ground equipment, and picnic facilities. Pioneer Park, located approximately 600 feet north of the existing rail line, is the location of the annual Brookings Summer Arts Festival. Hillcrest Park is approximately 0.5 mile north of the existing rail line. It contains facilities for swimming, tennis and racquetball. A non-motorized access exercise course, along the west side of Interstate 29/US Highway 71, and 2 pedestrian walkways, between 17th Avenue and Medary Avenue, cross the existing rail line. Rail related impacts to these facilities would remain at their current level under this alternative.

Alternative B-2: Existing Rail Line

The recreational facilities and activities described for Alternative B-1 would be the same for this alternative. Reconstruction activities along the existing rail line could impact the quality of activities at these facilities due to increased dust, noise, and access, delay, and safety concerns for motorists and pedestrians. During operation, participants along the non-motorized access exercise course and pedestrian walkways could be inconvenienced by increased numbers of trains passing through the area which could cause delays in traveling the course and safety concerns for those crossing the tracks. Those using park facilities could experience an increased frequency of noise disturbance due to the increase in railroad traffic through the area. Users of the parks may also have concerns regarding access and safety if traveling over the rail line moving to or from the parks. Only those in proximity of the grade crossings would be affected by these conditions while using these facilities.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

Conditions along the existing rail line would remain relatively the same. No changes in conditions or rail traffic would occur. No impacts would occur along the existing rail line.

Recreation located in the area along the proposed bypass would include fishing and canoeing on the Big Sioux River and hunting in the fields along the alignment. The types of recreational impacts that could potentially occur would be similar to those described in Section 4.1.16. Construction and operation of the proposed bypass could affect the quality of certain recreational experiences such as hiking, camping, fishing, and hunting. A 14-acre camping facility, operated by the South Dakota Assembly of the Church of God, could be affected by the presence of the proposed bypass rail line. Church camp facilities are used occasionally for youth activities, and for a summer camp during the month of July. Increased dust and noise from construction and operation could displace recreational users from the immediate vicinity of the proposed rail line as well as disturb users throughout the area. Due to the sporadic nature and short-term use of these facilities, impacts are not expected to be significant.

Alternative B-4: Bypass for all Rail Traffic

Impacts during construction and operation would be the same as those described for the bypass segment of Alternative B-3.

4.9.17 AESTHETICS

Wild and Scenic Rivers

There are no wild and scenic rivers within the area described for the reconstruction project or the new build project. None would be impacted by any of the proposed alternatives.

Viewsheds/Scenic Values

Alternative B-1: No- Action

Alternative B-1 would have no impact on the scenic value of the project area. However, the presence of a deteriorating rail line could contribute to the perception of the area as unkept and dilapidated.

Alternative B-2: Existing Rail Line

The source of visual distraction created during reconstruction of the project would largely be limited to the proposed right-of-way and would include ground and vegetation disturbance and the presence of heavy equipment. The visual impacts created during construction would also reach beyond the proposed rail line right-of-way and likely be noticed from adjacent areas, such as residences, trails, and parks. Operational impacts to scenic values would result from the installation of the proposed rail line, bridges, and culverts. These structures would likely be more noticeable due to the lack of weathering. However, the reconstructed rail line and the presence of rail traffic would be consistent with the current visual nature of the area for this alternative. Alternative B-2 would result in an upgrade of the existing rail corridor and existing DM&E rail line. The proposed clean-up of the area and installation of new rail material would help to improve the current visual nature of the area from one of a dilapidated industrial corridor.

Alternative B-3: Existing Rail Line and Bypass for Coal Traffic

The impacts along the existing DM&E rail line would be the same as those presented for Alternative B-1.

Impacts to the scenic value of the project area are difficult to quantify. Since there are no railroads currently in the project area of the proposed bypass segment, the scenery of the area along the new rail line portion of Alternative B-3 would change. The construction process would likely create a temporary detraction from the existing landscape by clearing vegetation and soil disturbance. The operation of the alternative would forever change the composition of the surrounding countryside by the addition of a visible linear corridor. However, visual impacts are not necessarily negative. There are numerous clubs and organizations dedicated to the hobby of train watching. What may be perceived as a visual detraction to some could in fact be desirable to others. In addition, numerous roadways criss-cross the project area. The bypass segment of Alternative B-3 would add another such corridor. While no established scenic areas would be impacted, the relatively undeveloped Big Sioux River valley and surrounding farmlands present a scenic value. This would be changed by construction and operation of the new rail line portion of Alternative B-3.

Alternative B-4: Approval of Bypass for all Rail Traffic

Impacts due to construction and operation of Alternative B-4 would be the same as those described for the bypass segment of Alternative B-3.

* * * * *

4.10 RECONSTRUCTION STAGING AND MARSHALING YARDS

The impacts created from the construction and operation of the various rail yards are described in this section. Should the No-Action Alternative be chosen, the impacts described for Alternatives B, C and D would not occur. Impacts are based on the conversion of the present land use at the proposed yard location to railroad right-of-way. Because of operational conflicts, rail yards may be located in different locations depending on the alternative selected for rail line expansion. Rail yard locations for one alternative may not be feasible for another alternative. Therefore, rail yards are discussed based on their proposed locations for each Extension Alternative. When a proposed rail yard location is the same for more than one alternative, this is indicated. A summary of impacts for each yard is presented in tabular form at the end of each alternative.

4.10.1 PRB EXTENSION - ALTERNATIVE B

4.10.1.1 Central Staging and Marshaling Yards and Shops

4.10.1.1.1 Location

The Central Staging and Marshaling Yards and Shops (Central Yard) would begin approximately 0.3 mile west of Cavour, South Dakota and end approximately 1.0 mile east of Huron, South Dakota. It would be located between mile posts 354.3 and 359.7 on both sides of the existing rail line. The yard would be 5.4 miles in length and 1,000 feet in width, with a total area of approximately 654.5 acres.

4.10.1.1.2 Geology and Soils

The proposed yard between Cavour and Huron would be constructed in an area containing deposits of glacial till. The dominant soil type is Houdek-Prosper loam. This soil has moderate permeability and high available water capacity. The slope of the soil generally ranges from 0-6 percent with average top soil depths of 7 to 10 inches. The soils are moderately erodible and easily blown away by the wind. No prime farmland was identified within the proposed rail yard boundaries. Impacts during construction could include increased erosion and loss of top soil within the proposed rail yard site and any disturbed adjacent areas. Soils would be graded and covered with rail beds, gravel, concrete, and asphalt. Based on the soil type, the proposed yard site should be graded to shed water, and the base material should be strengthened to support vehicular and rail traffic. During operation, run-off from the yard or redirected surface water, due to impermeable surfaces and structures within the rail yard, could cause increased erosion in surrounding areas.

4.10.1.1.3 Land Use

Agriculture

Approximately 585.7 acres, within the proposed rail yard, is agricultural land. No prime farmland was identified within the proposed yard site. The land use would be changed and lost for agricultural production through conversion to a rail yard.

Residential

Approximately 2.4 acres of residential land is present within the proposed rail yard site. There are two residences located within the proposed yard site. This land would be acquired by the railroad and converted to railroad use. The buildings would be removed or converted for railroad use. There are 7 residences located within 500 feet of the proposed rail yard boundary. These consist of rural farmsteads. Impacts to these residences, during construction could include noise, dust, increased road traffic, and vehicle delays associated with the movement of construction equipment and road closures on area roadways. These impacts would be temporary during construction of the proposed rail yard. Nearby residences would experience increased noise and inconvenience from road closure during operation of the proposed rail yard.

Commercial

The sewage treatment lagoons for Cavour are located approximately 200 feet southeast of the proposed rail yard location. The sewage lagoons for the City of Huron are located approximately 1,000 feet southwest of the proposed rail yard location. Construction and operation of the proposed rail yard would not be expected to affect these facilities. No commercial property is located within the proposed rail yard boundary. There are no businesses located within 500 feet of the proposed rail yard boundary.

4.10.1.1.4 Water Resources

Surface Water

There are three intermittent streams located within the proposed rail yard site. These would require possible realignment or channelization. There are also three stock ponds located within the proposed yard boundary. These ponds would likely be drained and filled during construction of the proposed rail yard. Impacts to surface water, as described in Section 3.2.7.1, could include an increase in water velocity due to channelization and stream bank stabilization, scouring and erosion of streams, and potential contamination from hazardous substances washing

from the yard site during rain fall events. Changes in the ground surface, created by the presence of the proposed rail yard, could alter surface drainage to adjacent waterways.

Wetlands

Approximately 66.4 acres of wetlands are located within the proposed rail yard boundary much of which is a part of the USFWS wetland easement program. There are approximately 60.1 acres of palustrine emergent wetlands and approximately 6.3 acres of palustrine aquatic bed wetlands. Construction of the Central Yard would likely result in the total loss of these wetlands. Loss would result from draining or filling of these wetlands. Impacts to adjacent wetlands are discussed in Section 3.2.7.2, including increased sedimentation and changes in hydrology.

Groundwater

The construction of the proposed rail yard should not result in significant impacts to groundwater. However, possible contamination could result from a spill of hazardous substances during construction or operation of the proposed yard. During operation of the proposed yard, small spills of fuel and lubricants could occur that could accumulate over time, resulting in impacts to groundwater. Spills are unlikely, due to expected reduction in derailments and compliance with regulatory procedures for handling, storing and disposing of potential contaminants.

4.10.1.1.5 Air

Construction and operation activities associated with the Central Yard could create local impacts to air quality. During construction, approximately 654.5 acres of ground would experience varying degrees of disturbance which could be a source of fugitive dust. Construction equipment such as graders and earth movers would be a source of emissions while operating. While more concentrated and occurring for a longer period, these emissions would be similar to emissions and fugitive dust generated from current agricultural use of the yard site. Construction related affects to air quality would be limited to the period of yard construction. Vehicle emissions from motorists delayed during yard construction would not occur as the only roads affected by this yard have low ADTs (Section 4.10.1.1.8) and would be permanently closed and traffic rerouted.

Locomotive emissions would be the primary source of air quality impacts from the Central Yard. This yard would serve as the center of DM&E's operations and maintenance. Locomotives would spend approximately 3.0 hours at a time idling at this yard (10 locomotives idling at the shop could spend 6 hours of time idling). It will serve as the primary locomotive

refueling center. Escaping fumes during refueling could contribute to air quality impacts. SEA has calculated air quality impacts due to the operation of the yard according to the methodology presented in Appendix E. Table 4.10-1 presents the amount of emissions from locomotive activities under the 20 MNT (11 trains per day), 50 MNT (21 trains per day), and 100 MNT (37 trains per day) operating scenarios.

**Table 4.10-1
Emission Levels of Proposed Central Staging & Marshaling Yard and Shops**

Operating Level	HC		CO		NO _x		SO ₂		PM ₁₀		Pb	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
20 MNT (11 trains per day)	18.81	78.99	51.22	215.11	268.09	1125.97	32.21	139.49	12.80	53.78	1.04E-03	0.00436944
20 MNT (with 10 locomotives idling at shop)	11.40	47.87	31.04	130.37	162.48	682.41	20.13	84.54	7.76	32.59	6.31E-04	0.00264815
50 MNT (21 trains per day)	39.90	150.79	97.78	410.67	511.81	2149.58	63.40	266.29	24.44	102.67	1.99E-03	0.00834167
50 MNT (with 10 locomotives idling at shop)	11.40	47.87	31.04	130.37	162.48	682.41	20.13	84.54	7.76	35.59	6.31E-04	0.00264815
100 MNT (37 trains per day)	63.26	265.68	172.28	723.56	901.75	3787.36	111.71	469.18	43.07	180.89	3.50E-03	0.01469722
100 MNT (with 10 locomotives idling at shop)	11.40	47.87	31.04	130.37	162.48	682.41	20.13	84.54	7.76	32.59	6.31E-04	0.00264815

4.10.1.1.6 Noise

Noise impacts would be present during construction and operation of the proposed Central Yard. Noise associated with construction activities would be temporary, generally occurring only during grading, site preparation and installation of yard facilities. The majority of construction noise produced would be from heavy equipment and vehicles. The duration of yard construction is expected to last for one to two construction seasons, generally extending from April 1 through November 1. Although the activities and noise associated with construction would be temporary, they could occur around the clock under certain conditions.

During operation, noise is generated by a variety of sources in a rail yard. Idling and operating locomotives, retarders, pumps, coupling and uncoupling of rail cars all contribute to noise. However, these sources are scattered throughout the yard; reducing the magnitude of noise by spreading it over a greater distance. Although potential noise impacts occur over a greater area, they are of less magnitude than if concentrated in one location. Additionally, noise sources at rail yards are generally within the interior of the yard, providing an area between the noise sources and the rail yard boundary in which noise can begin to decrease. This further reduces the potential noise impacts to areas adjacent to the rail yard.

While proposed rail yard locations have been determined for each alternative, the location of yard tracks and other equipment is unavailable. Modeling to determine potential noise impacts requires the location of noise generation equipment. Therefore, noise contours could not be generated for rail yards. Because of the usual scattered nature of noise sources and their location within the interior of the proposed yards, SEA conservatively determined noise sensitive receptors within 500 feet of the rail yard boundary would be those most likely impacted. There are 7 noise sensitive receptors located within 500 feet of the proposed rail yard (Table 4.10-2). These receptors would potentially experience increased noise levels due to operation of the proposed rail yard.

Table 4.10-2 Noise Sensitive Receptors Located within 500 Feet of Proposed Central Staging and Marshaling Yard and Shops		
Distance from Rail Yard	Location	Number of Noise Sensitive Receptors
0-100 feet	north of existing rail line	2
101-200 feet	north of existing rail line	1
201-400 feet	1 - north of existing rail line 1 - south of existing rail line	2
401-500 feet	1 - north of existing rail line 1 - south of existing rail line	2

4.10.1.1.7 Biological Resources

Vegetation

Construction activities associated with the development of the proposed rail yard facilities could cause temporary and permanent impacts to vegetation. The conversion of approximately 585.7 acres of agricultural land to a rail yard facility could cause the loss of crops, if planted prior to construction. Approximately 66.4 acres of wetland vegetation would be lost or disturbed during construction of the proposed rail yard. Isolated patches of timber and woody shrubs including fence rows would be removed during construction. Woody vegetation and grasses that occur along the existing rail line would likely be cleared during construction due to the proposed Central Yard being on both sides of the rail line. Cropland would no longer be available for crop production. Impacts associated with the construction and operation of the proposed rail yard, such as soil loss due to erosion and the introduction of non-native or non-desirable species in buffer areas where vegetation and surface soils are disturbed, are presented in Section 4.3.10.1. In the unlikely event a hazardous substance would be spilled in the proposed site of the Central Yard, rapid clean-up would be necessary to protect local plants. Potential spills of hazardous substances used during construction or operation of the proposed rail yard may impact vegetative communities in adjacent areas.

Grasses and woody species would likely reestablish naturally, or through reseeding and planting in the outer areas and along fence lines of the proposed yard where rail facilities are absent. These areas would need to be maintained by mowing or trimming during operation to control excessive growth of ground cover and woody vegetation. If not administered correctly,

herbicides used to control weeds could damage adjacent vegetative communities during operation of the proposed rail yard if herbicides drift or wash into these areas.

Wildlife

Wildlife using habitat in the proposed rail yard have become habituated to activities associated with the existing rail line. However, short-term and long-term impacts are anticipated during construction and operation of the proposed rail yard. Operational and construction impacts, as presented in Section 4.3.11 could include habitat loss, noise, train-wildlife collisions, increased human presence and the introduction of contaminants into the environment.

During construction, vegetation within the proposed rail yard would be cleared or disturbed, decreasing available habitat for wildlife species. Small mammals, reptiles and amphibians could experience an increase in mortality from train collisions in the Central Yard. All wildlife that currently utilize the area of the proposed rail yard would be displaced during construction. The loss of habitat due to construction would require wildlife using the area for cover and forage to relocate to nearby areas. Hunting and poaching pressure on local game populations could increase with increased human presence during construction in the area. Loss of wetlands within the proposed yard site would reduce waterfowl habitat. Because waterfowl are ground nesters, disturbance during nesting could result in destruction of nests and loss of nesting hens if nests were located within the proposed rail yard site. Wildlife that utilize the isolated parcels of woodlands and woody shrubs in fence rows would experience a loss of habitat when these vegetative resources are removed during construction.

During operation, impacts to wildlife would be primarily due to disturbance from yard activity. However, the level of activity and lack of habitat within the proposed rail yard would likely result in most wildlife seeking more secluded habitats. Impacts during operation could also include retention or filtration structures for run-off from the rail yard that may attract animals from surrounding wildlife communities, safety hazards to small animals that may enter the yard, and sporadic noise disturbance that may affect wildlife occupying adjacent habitats. The impacts to fish and mussels from rail yard operations would occur primarily from fuel and chemical spills, and herbicide applications to the right-of-way entering nearby waterways.

4.10.1.1.8 Transportation and Safety

SEA has determined that there are 5 roadways that currently pass through the proposed rail yard site. These roadways are 408th, 407th, 406th, 405th, and 404th avenues. All of these roadways have low traffic levels with none having ADTs over 45. It would be necessary to reroute or terminate these roadways prior to crossing the existing DM&E rail line or entering the

proposed yard. During construction and operation of the proposed rail yard, road traffic would no longer have access through this area. Impacts associated with these road crossings, such as vehicle delays and the opportunity for accidents would no longer exist. Traffic rerouted to other roadways could increase the amount of traffic and safety concerns along other roadways and their grade crossings. However, the low number of vehicles on these roadways would likely cause little change to traffic on other roadways. Potential vehicle delays and reduced access of emergency vehicles could occur from closures and detours. Construction traffic on local roads could cause additional traffic delays, wear on local roads, and increased safety concerns.

4.10.1.1.9 Socioeconomics

During construction, approximately 89 two-year jobs may be created that are directly related to construction of the proposed rail yard. Jobs in the construction trades such as heavy equipment operators, carpenters, electricians and landscapers may be filled by local workers when available. Non-local workers could be used to fill shortages in construction positions and for actual rail construction activities. These workers would not likely locate permanently in the area. They would likely utilize temporary lodging, such as motels, hotels, rental property, recreational vehicle parks and campgrounds. These facilities are provided in the larger nearby communities of Huron and Wolsey.

The estimated earnings for workers would total approximately \$12.3 million (Table 4.10-3). A portion of this income would likely be spent on local goods and services. Additional short-term employment opportunities may be created in the service areas due to this spending and demand for goods and services. A portion of the earnings from construction would also provide tax revenues of approximately \$937,300 for the state and county.

Approximately 250-300 permanent rail jobs would be expected during the start-up of operations at this facility. At full operation, approximately 600 rail jobs would be provided. It is expected that these jobs would be filled by both local and non-local persons. With the 1.1 percent decrease in the population of Beadle County between 1986 and 1994 (Table 4.1-24), the influx of these workers and their families should not be a problem for the county to accommodate. Since the increase in employment represents less than 1 percent of the population of Beadle County, no significant impacts should occur related to the county's ability to maintain adequate services to its citizens.

With an estimated 2.6 percent unemployment rate (Table 4.3-20), workers within the county, searching for employment, would benefit from the presence of high paying railroad jobs. Employment opportunities are expected to increase and unemployment decrease throughout the area. Commercial lodging and eating facilities are expected to be utilized by rail crews and

workers and no DM&E facilities are expected to be provided at this location. Facilities located in nearby communities, such as Cavour and Huron, could provide these services. An increase in support related jobs and contract jobs to fill these needs would be likely. Additional lodging and eating facilities could become established near the proposed yard site to provide convenient services to railroad workers. The potential increase in jobs could also provide additional tax revenues to the communities in surrounding areas and the county. Property taxes collected on new facilities would help Beadle County continue the services it provides, and possibly allow them to upgrade or increase what they currently provide.

Yard Location	Estimated Earnings	Tax Revenues generated
Central Staging and Marshaling Yards and Shops	\$12,300,000	\$937,300
Middle West Staging and Marshaling Yards and Shops	\$3,800,000*	\$309,200

*Estimated earnings for Middle West Yard based on figures from the Middle East yard which is similar in specification

4.10.1.1.10 Hazardous Materials

Neither construction nor operation of the proposed project would result in an increase in the types or amounts of hazardous materials currently transported by DM&E. Potential impacts during construction could include disturbance of hazardous material sites that may have been located within the proposed rail yard site. Prior to construction, DM&E would coordinate with the EPA, SDDEQ to determine if the proposed yard site had prior hazardous material contamination. This information would be included in the Phase 1 Environmental Site Assessment, which is used as a basis for determining contamination before acquiring a property. Searches of state and Federal databases, including RCRA, SHWS and CERCLIS-NFRAP were conducted to identify any listed contamination sites within a mile of the existing rail line. One CERCLIS site was listed for Beadle County. It is located at the DM&E Roundhouse in Huron, South Dakota. LUST and ERNS database searches investigated the area within 0.5 miles of the existing rail line. In Beadle County, 9 LUST sites and 2 Spill Notification Reports were identified. If any of these sites are located within the proposed yard location, appropriate action would be necessary to avoid disturbance of the sites.

During project operation, no impacts should occur to existing hazardous material sites. There would be a potential for spills resulting from derailments or improper handling of hazardous materials such as fuel, oil, and lubricants. Contamination from spills would be unlikely due to the expected reduction in derailments and required compliance with regulatory procedures regarding handling, storage, and disposal of hazardous substances.

4.10.1.1.11 Cultural Resources

There are no known cultural resources or historic sites located within the proposed rail yard. A survey of the area would be conducted to determine if any sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.10.1.2 New Wolsey BNSF Connections

4.10.1.2.1 Location

The New Wolsey BNSF Connection would be located between mile posts 373.9 and 376.3 within the town of Wolsey, South Dakota. It would extend east approximately 2.4 miles with a right-of-way of 200 feet. The new connection would cover an area of approximately 58.2 acres. Construction would occur within the existing right-of-way. Impacts would be similar to those for reconstruction of the existing rail line as described in Section 3.2.

4.10.1.2.2 Land Use

No agricultural land is present within the proposed connection site. There is no residential or commercial property located within the proposed rail line site. However, there are 21 residences and 11 businesses located within 500 feet of the proposed connection. The Omaha Home for Boys is located approximately 200 feet south of the proposed connection and the existing rail line. Impacts would include noise, dust, increased road traffic, vehicle delays during construction and operation of the proposed rail line connection.

4.10.1.2.3 Water Resources

There are approximately 9.8 acres of palustrine emergent wetlands located within the proposed connection site. Impacts would be similar to those presented in Section 4.10.1.1.4.

4.10.1.2.4 Noise

There are 21 noise sensitive receptors located within 500 feet of the proposed rail line connection. Impacts due to noise would be addressed under the reconstruction section for the rail line. Analysis of impacts are presented in Section 4.3.9.

4.10.1.2.5 Biological Resources

Construction activities would be expected to be confined to the existing right-of-way. No additional vegetation or habitat would be permanently altered. Disturbance of wildlife during construction would not be significant due to the presence of the existing rail line and development of the surrounding area. Disturbance in adjacent areas could occur during construction due to access needs of crews and construction equipment. Impacts would be temporary during construction.

4.10.1.2.6 Transportation and Safety

There are three roadways that cross the proposed rail line connection location. Impacts associated with the construction and operation of the proposed rail line connection could include temporary closure of crossings during construction activities, inconvenience to motorists, increased road traffic, vehicle delays, and increased safety concerns for motorists and pedestrians.

4.10.1.2.7 Socioeconomics

This location would serve as an interchange facility with the BNSF Railroad at Wolsey, South Dakota. No employees or facilities are expected to be located in this area. There would be no crew change at this location. No employees are expected to be based at this location.

Income earned by construction workers during installation of this facility would benefit the surrounding communities and county. Additional taxes would contribute to revenue for local, county and state programs and services.

4.10.1.2.8 Hazardous Materials

Hazardous material sites and impacts associated with construction and operation in Beadle County are presented in the Hazardous Materials section for the Middle East Staging and Marshaling Yards and Shops under Alternative D.

4.10.1.2.9 Cultural Resources

There are no known cultural resources or historical sites located within the proposed rail yard. A survey of the area would be conducted to determine if any sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.10.1.3 Middle West Staging and Marshaling Yard

4.10.1.3.1 Location

Under Alternative B, the Middle West Staging and Marshaling Yard (Middle West Yard) would begin approximately 6.0 miles west of Phillip, South Dakota and end approximately 3.0 miles east of Cottonwood, South Dakota. It would extend from mile post 567.5 to mile post 569.6. The proposed rail yard would be 2.1 miles in length with a width of 300 feet. The proposed rail yard site would cover an area of approximately 76.4 acres.

4.10.1.3.2 Geology and Soils

The proposed rail yard between the towns of Phillip and Cottonwood would be constructed in an area containing alluvium and clay with an underlying material of Pierre Shale. Absted silt loam and Kyle clay are the dominant soil types throughout the proposed rail yard site. Slope of the soil ranges from 0-3 percent within the proposed rail yard area. Average top soil depths range from 3 to 4 inches. Permeability is slow to very slow. No prime farmland was identified within the proposed rail yard location. Impacts during construction could include run-off during rain events and loss of top soil in the proposed rail yard site and any disturbed adjacent areas. Soil would be graded and covered with rail beds, gravel, concrete, and asphalt. During operation, run-off from the yard or redirected surface water, due to impermeable surfaces and structures within the rail yard, could cause increased erosion and areas of flooding during heavy rain events.

4.10.1.3.3 Land Use

Agriculture

Approximately 24.6 acres of cropland would be located within the proposed rail yard site. There would be approximately 50.8 acres of pasture or grassland within the proposed rail yard. No prime farmland identified within the proposed rail yard. Land use would be changed and lost for agricultural production through conversion to a rail yard.

Residential

No residential land was identified within the proposed rail yard site. There are no residences located within 500 feet of the proposed rail yard boundary. No impacts would likely occur to residential land at this proposed rail yard location.

Commercial

No commercial land was identified within the proposed rail yard site. There are no businesses located within 500 feet of the proposed rail yard boundary. No impacts would likely occur to commercial property at this proposed rail yard location.

4.10.1.3.4 Water Resources

Surface Water

There are no streams crossing the proposed rail yard site. Run-off from the proposed rail yard location could impact surface waters in adjacent areas. Changes in the ground surface created by the presence of the proposed rail yard could alter surface drainage to adjacent waterways. Potential contamination could occur due to hazardous substances that could wash from the proposed rail yard site during rain fall events.

Wetlands

Approximately 1.0 acre of emergent wetlands are located within the proposed rail yard site. These wetlands would likely be lost with the construction of the proposed rail yard. Loss would result from draining or filling these wetlands. Impacts to adjacent wetlands could include sedimentation, redistribution or loss of top soils, and change in hydrology.

Groundwater

Groundwater impacts would be similar to those described under Groundwater for the Central Staging and Marshaling Yards and Shops in Alternative B (Section 4.10.1.1.4).

4.10.1.3.5 Air

Construction and operation of the Middle West Yard could create local impacts to the air quality. During construction, approximately 76.4 acres of ground would experience disturbance which would create fugitive dust. Construction equipment would produce exhaust emissions

while operating. While more concentrated and occurring for a longer period of time, these emissions and dust would be similar to what is currently generated by agricultural activity in the project area. Vehicle emissions from motorists delayed at grade crossing would not occur as the only road in the area of the proposed rail yard would be closed and traffic rerouted.

During operation of the Middle West Yard, locomotives would be the primary source of air quality impacts. During operation, each locomotive to use the yard would spend approximately 0.5 hour idling. Table 4.10-4 presents the amount of emissions from locomotive activities under the 20 MNT, 50MNT, and 100MNT operating scenarios.

**Table 4.10-4
Emission Levels of Proposed Middle West Staging and Marshaling Yard**

Operating Level	HC		CO		NO _x		SO ₂		PM ₁₀		Pb	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
20 MNT (11 trains per day)	3.13	13.16	8.54	35.85	44.68	187.66	5.54	23.25	2.13	8.96	1.73E-04	0.00072824
50 MNT (21 trains per day)	5.98	25.13	16.30	68.44	85.30	358.26	10.57	44.38	4.07	17.11	3.31E-04	0.00139028
100 MNT (37 trains per day)	10.54	44.28	28.71	120.59	150.29	631.23	18.86	76.2	7.18	30.15	5.83E-04	0.00244954

4.10.1.3.6 Noise

There are no noise sensitive receptors located within the proposed rail yard location. There are no noise sensitive receptors within 500 feet of the proposed rail yard boundary.

4.10.1.3.7 Biological Resources

Vegetation

Construction activities associated with the development of the proposed yard facilities could cause temporary and permanent impacts to vegetation. The conversion of approximately 24.6 acres of cropland could cause the loss of crops, if planted prior to construction. This cropland would no longer be available for crops. Approximately 50.8 acres of pasture or rangeland would be cleared of vegetation during construction. Approximately 1.0 acre of emergent wetland vegetation would also be lost or disturbed. Impacts associated with the construction and operation of the railroad, such as soil loss due to erosion and the introduction of non-native or non-desirable species in buffer areas where vegetation and surface soils would be disturbed, are presented in Section 3.2.10.1. Potential spills of hazardous substances used during construction of the proposed rail yard could impact vegetative communities in adjacent areas.

Grasses and woody species would likely reestablish naturally, or through reseeded and planting in the outer area and along fence lines of the proposed yard where rail facilities are absent. These areas would need to be maintained by mowing or trimming during operation to control excessive growth of ground cover and woody vegetation. Herbicides used to control weeds could impact adjacent vegetative communities during operation of the proposed rail yard.

Wildlife

Impacts for the Middle West facilities would be similar to those described for the Central Staging and Marshaling Yard and Shops. Operational and construction impacts, as presented in Section 3.2.11, may include habitat loss, noise, train-wildlife collisions, increased human presence and the introduction of contaminants into the environment.

4.10.1.3.8 Transportation and Safety

No public roadways cross the proposed rail yard location. One private road crosses the proposed rail yard location. It would be necessary to reroute or terminate this roadway prior to crossing the existing DM&E rail line or entering the proposed rail yard. During construction and operation of the proposed rail yard, traffic would no longer have access through this area.

Impacts associated with this private crossing, such as vehicle delay and the opportunity for accidents would no longer exist. Potential traffic delays, increased safety concerns and reduced access of emergency vehicles on local roadways could occur due to construction traffic on local roads. Construction traffic could also cause increased wear on local roads.

4.10.1.3.9 Socioeconomics

During construction, approximately 28 two-year jobs would be created that are directly related to construction of the proposed rail yard. Jobs in the construction trades such as heavy equipment operators, carpenters, electricians and landscapers may be filled by local workers when available. Non-local workers could be used to fill shortages in construction positions and for actual rail construction activities. These workers would not likely locate permanently in the area. They would likely utilize temporary lodging, such as motels, hotels, rental property, recreational vehicle parks and campgrounds in nearby communities including Wall, Phillip and Cottonwood.

The estimated earnings for workers would total approximately \$3.8 million (Table 4.10-3). A portion of this income would likely be spent on local goods and services. Additional short-term employment opportunities may be created in service areas due to this spending and demand for goods and services. A portion of the earnings from construction would also provide tax revenues of approximately \$309,200 for the state and county.

Approximately 20-30 permanent rail jobs would be expected during start-up of operations at this facility. At full operation, approximately 40-50 jobs would be provided. These jobs would be filled by local and non-local persons. With the -9.7 percent decrease in the population of Haakon County between 1986 and 1994 (Table 4.3-20), the influx of workers and their families should not be a problem for the county to accommodate. Although the increase in employment represents approximately 2 percent of the population of Haakon County, due to prior decreases in the county's population, no significant impacts should occur related to the county's ability to maintain adequate services to its citizens.

With an estimated 3.2 percent unemployment rate (Table 4.3-20), workers within the county, searching for employment, would benefit from the presence of high paying railroad jobs. Employment opportunities are expected to increase and unemployment decrease throughout the area. Commercial lodging and eating facilities are expected to be utilized by rail crews and workers and no DM&E facilities are expected to be provided at this location. Facilities located in nearby communities, such as Wall and Phillip, could provide these services. An increase in support related jobs and contract jobs to fill these needs would be likely. Additional lodging and eating facilities could become established near the proposed yard site to provide convenient services to railroad workers. The potential increase in jobs could also provide additional tax

revenues to communities in surrounding areas and the county. Property taxes collected on new facilities would help Haakon County continue the services it provides, and possibly allow them to upgrade or increase what they currently provide.

4.10.1.3.10 Hazardous Materials

Neither construction nor operation of the proposed project would result in an increase in the types or amounts of hazardous materials currently transported by DM&E. Potential impacts during construction could include disturbance of hazardous material sites that may have been located within the proposed rail yard site. Searches of state and Federal databases, including RCRA, SHWS and CERCLIS-NFRAP were conducted to identify any listed contamination sites within a mile of the existing rail line. In Haakon County, two LUST sites were identified. If any sites are located within the proposed yard location, appropriate action would be necessary to avoid disturbance of the sites. Impacts due to construction and operation would be similar to those presented for Hazardous Materials under Central Staging and Marshaling Yard for Alternative B, Section 4.10.1.1.10.

4.10.1.3.11 Cultural Resources

There are no known cultural resources or historical sites located within the proposed rail yard. A survey of the area would be conducted to determine if any sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

Yard	Agricultural (Acres)	Residential (Acres)	Commercial (Acres)
Central	585.7	2.4	0
Middle West	75.4	0	0

Yard	Acres (approx.)	Prime Farmland	No. Of Streams	Acres of Wetlands	Noise Sensitive Receptors within 500 feet
Central	654.5	0	3	66.4	7
Middle West	76.4	0	0	1.0	0

Yard and Roadways	Location	Average Daily Traffic
Central		
408 Avenue	Mile Post 354.8	15
407 Avenue	Mile Post 355.8	15
Co Highway 27	Mile Post 356.8	37
405 Avenue	Mile Post 357.8	44
404 Avenue	Mile Post 358.8	40

4.10.2 PRB EXTENSION - ALTERNATIVE C

4.10.2.1 Central Staging and Marshaling Yards

4.10.2.1.1 Location

Under Alternative C, the Central Staging and Marshaling Yard (Central Yard) would begin approximately 2.0 miles west of Huron, South Dakota and end approximately 4.0 miles east of Wolsey, South Dakota. It would be situated between mile posts 367.1 and 371.9, along the north side of the existing rail line. The yard would be 5.0 miles in length and 1,000 feet in width. The proposed rail yard would cover approximately 606.1 acres.

4.10.2.1.2 Geology and Soils

The proposed yard between Huron and Wolsey would be constructed in an area containing deposits of glacial till. The dominant soil type is Houdek-Prosper loam interspersed

with small areas of Tetonka-Hoven silt loams. This soil has moderate permeability and high available water capacity. The slope of the soil generally ranges from 2-6 percent with an average top soil depth of approximately 7 inches. These soils are moderately erodible and easily blown away by the wind. No prime farmland was identified within the proposed rail yard boundary. Impacts to geology and soils would be similar to those presented for Geology and Soils in the Central Staging and Marshaling Yards under Alternative B (Section 4.10.1.1.2).

4.10.2.1.3 Land Use

Agriculture

The predominant land use is agriculture. Approximately 535.8 acres of cropland are located within the proposed rail yard. No prime farmland was identified within the proposed rail yard site. Land converted to use by the railroad would be lost for agricultural production.

Residential

No residential land was identified within the proposed rail yard site. There are no residences located within 500 feet of the proposed rail yard.

Commercial

No commercial land was identified within the proposed rail yard site. There are no businesses located within 500 feet of the proposed rail yard.

4.10.2.1.4 Water Resources

Surface Water

No streams are present within the area of the proposed rail yard. However, run-off from the proposed rail yard site, during construction and operation, could potentially cause an increase in sediment and plant material, and increase the potential of contamination with hazardous substances, of streams and seasonal water reservoirs during rain fall events. Changes in the ground surface, created by the presence of the proposed rail yard, could alter surface drainage to adjacent waterways.

Wetlands

Approximately 55.9 acres of wetlands are located within the proposed rail yard. There are approximately 55.4 acres of palustrine emergent wetlands and approximately 0.5 acre or aquatic

bed wetlands present within the proposed rail yard. These wetlands would likely be lost with the construction of the proposed rail yard. Loss would result from draining or filling these wetlands. A National Waterfowl Production area lies approximately 4,000 feet northeast of the proposed rail yard site. Impacts to adjacent wetlands could include sedimentation, redistribution or loss of top soil, and changes in hydrology.

Groundwater

No significant impact should result due to construction of the proposed rail yard. Impacts would be similar to those presented for Groundwater in Central Yard under Alternative B, Section 4.10.1.1.4.

4.10.2.1.5 Air

Impacts to the air quality from the construction and operation of the Central Yard would be similar to those described for this yard under Alternative B (Section 4.10.1.1.5).

4.10.2.1.6 Noise

No noise sensitive receptors are located within the proposed rail yard. There were no noise sensitive receptors within 500 feet of the proposed rail yard boundary.

4.10.2.1.7 Biological Resources

Vegetation

Construction activities associated with the development of the proposed yard facilities would cause both temporary and permanent impacts to vegetation. The conversion of approximately 535.8 acres of agricultural land to a rail yard facility could cause the loss of crops, if planted prior to construction. This cropland and pasture would no longer be available for agricultural production. Approximately 51.7 acres of emergent wetland vegetation and 0.7 acre of aquatic bed wetland vegetation would likely be cleared or disturbed during construction. Impacts associated with the construction and operation of the rail yard, such as soil loss due to erosion and the introduction of non-native or non-desirable species in buffer areas, where vegetation and surface soils are disturbed, are presented in Section 3.2.10.1. Potential spills of hazardous substances could affect water quality or soil properties in adjacent areas.

Grasses and woody species would likely reestablish naturally, or through reseeding and planting in the outer area and along fence lines of the proposed yard where rail facilities are absent. These areas would need to be maintained by mowing or trimming during operation to control excessive growth of ground cover and woody vegetation. Herbicides used to control weeds could impact adjacent vegetative communities during operation of the proposed rail yard.

Wildlife

A National Waterfowl Production area lies approximately 4,000 feet northeast of the proposed rail yard area. Impacts to wildlife in these wetland communities may be significant. Impacts to wildlife would be similar to those described for the Central Staging and Marshaling Yard under Alternative B (Section 4.10.1.1.7).

4.10.2.1.8 Transportation and Safety

There are four roadways (Section 4.10.1.1.8) that currently pass through the proposed rail yard site. It would be necessary to reroute or terminate these roadways prior to crossing the existing DM&E rail line or entering the proposed yard. Impacts associated with construction and operation would be similar to those presented for Transportation and Safety in the Central Staging and Marshaling Yard under Alternative B.

4.10.2.1.9 Socioeconomics

Approximately 250-300 rail jobs are expected during start-up of operations. At full operation, approximately 600 jobs would be provided. Impacts during construction and operation would be similar to those presented for Socioeconomics in the Central Staging and Marshaling Yard under Alternative B (Section 4.10.1.1.9).

4.10.2.1.10 Hazardous Materials

Impacts during construction and operation would be similar to those presented for Hazardous Materials in the Central Staging and Marshaling Yard under Alternative B (Section 4.10.1.1.10).

4.10.2.1.11 Cultural Resources

One cultural resource site (39BE2003) was identified within the area described for this location of the Central Staging and Marshaling Yard. A survey of the area would be conducted to determine if any other cultural resources or historic sites may be present. Any sites identified

would be addressed according to the Programmatic Agreement (Appendix J).

4.10.2.2 New Wolsey BNSF Connection

The location and description would be the same as listed in Section 4.10.1.2 of Alternative B. Impacts due to construction and operation would also be the same.

Table 4.10-8 Current Land Use for Proposed Rail Yards Located Along Alternative C			
Yard	Agricultural (Acres)	Residential (Acres)	Commercial (Acres)
Central	535.8	0	0

Table 4.10-9 Summary of Selected Impacts for Rail Yards Located Along Alternative C					
Yard	Acres (approx.)	Prime Farmland	Streams	Wetlands	Noise Sensitive Receptors <500 feet
Central	606.1	0	0	55.9 acres	0

Table 4.10-10 Roadways Impacted by Proposed Rail Yards in South Dakota Along Alternative C		
Yard and Roadways	Location	Average Daily Traffic
Central		
395 Avenue	Mile Post 368.0	20
Co Highway 15	Mile Post 369.0	305
393 Avenue	Mile Post 370.0	35
392 Avenue	Mile Post 371.0	20

4.10.3 PRB EXTENSION - ALTERNATIVE D

4.10.3.1 Middle East Staging and Marshaling Yards and Shops

4.10.3.1.1 Location

Under Alternative D, the Middle East Yard would be located approximately 2.0 miles west of Hetland, South Dakota. It would cross Lake Preston and end approximately 1.5 miles east of the Town of Lake Preston, South Dakota. It would be located between mile posts 316.0 and 319.0. The yard would be located primarily on the south side of the existing rail line. The yard would be 3.0 miles in length and 1,000 feet in width, with an area of approximately 363.6 acres.

4.10.3.1.2 Geology and Soils

The proposed Middle East Yard between Hetland and Lake Preston would be constructed in an area containing deposits of glacial till and alluvium. The dominant soil type is Poinsett-Waubay silt clay loams with an area containing Barnes-Buse loams at the northeastern end of the proposed rail yard site. These soils have moderate and moderately slow permeability respectively. The slope of the soil generally ranges from 1-6 percent with top soil depths ranging from 0 to 14 inches. These soils are well drained and susceptible to wind and water erosion. There are approximately 246.2 acres of prime farmland present within the proposed rail yard site. Impacts would be similar to those presented for the Central Staging and Marshaling Yards under Alternate B (Section 4.10.1).

4.10.3.1.3 Land Use

Agriculture

Approximately 261.7 acres within the proposed rail yard site are predominantly cropland. Approximately 3.7 acres contain woodlots or wooded fence rows. There are approximately 246.2 acres of prime farmland present within the proposed yard site. The land use would be changed and lost for agricultural production through conversion to a rail yard.

Residential

Approximately 6.8 acres of residential land is present within the proposed rail yard site. There are 2 houses located within the proposed rail yard site. This land would be acquired by the railroad and converted to railroad use. The buildings would be removed or converted to railroad

use. There are 4 residences located within 500 feet of the proposed rail yard boundary. These consist of rural farmsteads. Impacts to these residences, during construction, could include noise, dust, increased road traffic and vehicle delays associated with the movement of construction equipment and road closures on area roadways. These impacts would be temporary, during construction of the proposed rail yard. Nearby residences would experience rail yard noise and inconvenience from road closure during operation of the proposed rail yard.

Commercial

There is no commercial property located within the proposed rail yard. There are no businesses located within 500 feet of the proposed rail yard boundary. Approximately 12.0 acres of property within the proposed rail yard consists of the existing DM&E rail line.

4.10.3.1.4 Water Resources

Surface Water

No defined streams are located within the proposed yard site. There are 2 lakes located in close proximity to the proposed rail yard. Lake Preston is bisected along the south edge by the existing DM&E rail line. Construction of the proposed rail yard would require draining or filling approximately 59.8 acres of the Lake Preston. Run-off from the proposed yard could affect water quality within Lake Whitewood, which is located approximately 3,000 feet south of the proposed rail yard site. Impacts to surface water, as described in Section 3.2.7.1, could include an increase in TSS and decaying plant material within these waterbodies. Potential hazardous substance spills could occur during construction or operation of the proposed rail yard, potentially causing contamination of surface water. Changes in the ground surface created by the presence of the rail yard could alter surface drainage to adjacent waterways.

Wetlands

Approximately 81.9 acres of emergent wetland and 1.2 acres of aquatic bed wetlands are present within the proposed rail yard site. Approximately 59.8 acres of these wetlands are contained within the boundary of Preston Lake. These wetlands would likely be lost with the construction of the proposed rail yard. Loss would result from draining or filling these wetlands.

Impacts to adjacent wetlands could include sedimentation, redistribution or loss of top soil, and changes in hydrology.

Groundwater

Impacts to groundwater would be similar to those described in the Groundwater section of the Central Staging and Marshaling Yard under Alternative B (Section 4.10.1.1.4).

4.10.3.1.5 Air

Impacts to air quality from the construction and operation of the Middle East Yard would be similar to those described for the Central Yard under Alternative B (Section 4.10.1.1.5).

4.10.3.1.6 Noise

Noise disturbance would be present during construction and operation of this proposed rail yard facility. Noise associated with the construction and operation of a rail yard are described previousl under the Central Staging and Marshaling Yard for Alternative B. There are 4 noise sensitive receptors located within 500 feet of the proposed rail yard (Table 4.10-11).

Table 4.10-11 Noise Sensitive Receptors Located within 500 Feet of Proposed Middle West Staging and Marshaling Yard for Alternative D		
Distance from Rail Yard	Location	Number of Noise Sensitive Receptors
0-100 feet	east of proposed yard boundary	1
101-200 feet	east of proposed yard boundary	1
201-400 feet	north of proposed yard boundary	1
401-500 feet	south of proposed yard boundary	1

4.10.3.1.7 Biological Resources

Vegetation

Construction activities associated with the development of the proposed yard facilities would cause both temporary and permanent impacts to vegetation. The conversion of approximately 259.4 acres of agricultural land to a rail yard facility could cause the loss of crops, if planted prior to construction. This cropland would no longer be available for crop production. Approximately 3.7 acres of woody vegetation would be cleared or disturbed during construction

of the proposed rail yard. Impacts associated with the construction and operation of the rail yard, such as soil loss due to erosion and the introduction of non-native or non-desirable species in buffer areas, where vegetation and surface soils are disturbed, are presented in Section 3.2.10.1. Potential spills of hazardous substances could affect water quality or soil properties in adjacent areas.

Wildlife

Wildlife habitat in the proposed rail yard area have become habituated to activities associated with the existing rail line. However, short-term and long-term impacts are anticipated during construction and operation of the rail yard. Operational and construction impacts, as presented in Section 3.2.11, may include habitat loss, noise, train-wildlife collisions, increased human presence and the introduction of contaminants into the environment. Impacts during construction and operation would be similar to those presented for the Central Yard under Alternative B (Section 4.10.1.1.7).

4.10.3.1.8 Transportation and Safety

There are no roadways located within the proposed yard site. Construction traffic on local roads could cause traffic delay, wear on local roads, and increased safety concerns.

4.10.3.1.9 Socioeconomics

During construction, approximately 89 two-year jobs would be expected that are directly related to construction of the proposed rail yard. Jobs in the construction trades such as heavy equipment operators, carpenters, electricians and landscapers may be filled by local workers when available. Non-local workers could be used to fill shortages in construction positions and for actual rail construction activities. These workers would not likely locate permanently in the area. They would likely utilize temporary lodging, such as motels, hotels, rental property, recreational vehicle parks and campgrounds. These facilities are provided in the nearby communities of Lake Preston, Arlington, and DeSmet.

The estimated earnings for workers would total approximately \$12.3 million (Table 4.10-3). A portion of this income would likely be spent on local goods and services. Additional short-term employment opportunities may be created in the service areas due to this spending and demand for goods and services. A portion of the earnings from construction would also provide tax revenues of approximately \$937,300 for the state and county.

Approximately 250-300 permanent rail jobs are expected during the start-up of operations at this facility. At full operation, approximately 600 rail jobs could be provided. These jobs would be filled by both local and non-local persons. With the -8.5 percent decrease in the population of Kingsbury County between 1986 and 1994 (Table 4.3-20), the influx of these workers and their families should not be a problem for the county to accommodate. Although the increase in employment represents approximately 10 percent of the population of Kingsbury County, no significant impacts should occur related to the county's ability to maintain adequate services to its citizens, due to the prior decreases in population.

With an estimated 3.8 percent unemployment rate (Table 4.3-20), workers within the county, searching for employment, would benefit from the presence of high paying railroad jobs. Employment opportunities are expected to increase and unemployment decrease throughout the area. Commercial lodging and eating facilities are expected to be utilized by rail crews and workers and no DM&E facilities are expected to be provided at this location. Facilities located in nearby communities, such as Lake Preston and Hetland, could provide these services. An increase in support related jobs and contract jobs to fill these needs would be likely. Additional lodging and eating facilities could become established near the proposed yard site to provide convenient services to railroad workers. The potential increase in jobs could also provide additional tax revenues to the communities in surrounding areas and the county. Property taxes collected on new facilities would help Kingsbury County continue the services it provides, and possibly allow them to upgrade or increase what they currently provide.

4.10.3.1.10 Hazardous Materials

Searches of state and Federal databases, including RCRA, SHWS and CERCLIS-NFRAP were conducted to identify any listed contamination sites within a mile of the existing rail line. LUST and ERNS database searches investigated the area within 0.5 mile of the existing rail line. In Beadle County, 4 LUST sites, 1 ERNS site and 2 Spill Notification Reports were identified. If any of these sites are located within the proposed yard location, appropriate action would be necessary to avoid disturbance of the sites. Impacts during construction and operation are presented under Hazardous Materials for the Central Staging and Marshaling Yards in Alternative B (Section 4.10.1.2).

4.10.3.1.11 Cultural Resources

There are no known cultural resources or historic sites located within the proposed rail yard. A survey of the area would be conducted to determine if any sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.10.3.2 New Wolsey BNSF Connection

Location and description would be the same as listed in this section of Alternative B (Section 4.10.1.2).

4.10.3.3 Middle Staging and Marshaling Yard

4.10.3.3.1 Location

Under Alternative D, the Middle Yard would begin approximately 2.0 miles southwest of Capa, South Dakota and end approximately 1.0 mile east of Midland, South Dakota. The proposed yard would be located between mile posts 527.0 and 531.0. It would be 4.0 miles in length and 300 feet in width. The area of the proposed yard would be approximately 145.4 acres.

4.10.3.3.2 Geology and Soils

The proposed rail yard between Capa and Midland would be constructed in an area containing alluvium deposits with a Pierre Shale bedrock. A majority of the soils have moderate to very slow permeability. The dominant soil types in the area consist of Nimbro silty clay loam, Wendte silty clay, and Bullcreek clay. Slopes generally range from 0-6 percent with top soil depths of 0 to 8 inches. Soils are susceptible to erosion. No prime farmland is located within the proposed rail yard boundary. Impacts due to construction and operation of the proposed rail yard would be similar to those presented for the Central Staging and Marshaling Yard under Alternative B (Section 4.10.1.1.2).

4.10.3.3.3 Land Use

Agriculture

Approximately 132.6 acres within the proposed rail yard site are agricultural land. No prime farmland is located within the proposed rail yard boundary. The land use would be changed and lost for agricultural production through conversion to a rail yard. Approximately 0.5 acre of woody vegetation along streams and fence rows would be cleared. This land would also be converted to railroad use.

Residential

No residential land is present within the proposed rail yard site. One residence would be located within 500 feet of the proposed rail yard boundary. Impacts to this residence could

include noise, dust, an increase in road traffic, and reduced access during construction and operation of the proposed rail yard. Residents could be inconvenienced by the closure of access roads to their property.

Commercial

No commercial land is present within the proposed rail yard site. There are no businesses within 500 feet of the proposed rail yard boundary. Approximately 12.3 acres of land within the proposed rail yard consists of existing DM&E rail line.

4.10.3.3.4 Water Resources

Surface Water

There are 5 intermittent streams which cross the proposed rail yard site. These would require realignment or channelization. The Bad River is located within 100 feet of the proposed rail yard. Impacts to surface water, as described in Section 3.2.7.1, could include an increase in water velocity due to channelization and stream bank stabilization, scouring and erosion of streams, and potential contamination from hazardous substances washing from the proposed yard site during rain fall events. Changes in the ground surface, created by the presence of the proposed rail yard, could alter surface drainage to adjacent waterways. Increased sediment and plant material in run-off could affect water quality in the Bad River and its tributaries in adjacent areas.

Wetlands

There are no wetlands found within the proposed yard site. Potential impacts to wetlands located in adjacent areas would be similar to those discussed in Section 3.2.7.2 and could include increased sedimentation and redistribution or loss of top soils.

Groundwater

Impacts to groundwater due to construction and operation of the proposed rail yard would be similar to those presented for the Central Staging and Marshaling Yard under Alternative B (Section 4.10.1.1.4).

4.10.3.3.5 Air

Air quality impacts from the construction and operation of the Middle Yard would be similar to those presented the Middle West Yard under Alternative B (Section 4.10.1.3.5).

4.10.3.3.6 Noise

Noise impacts due to construction and operation of the proposed rail yard would be similar to those presented for the Central Staging and Marshaling Yard of Alternative B (Section 4.10.1.1.6). There is one noise sensitive receptor located approximately 250 feet south of the proposed rail yard site.

4.10.3.3.7 Biological Resources

Vegetation

Impacts to vegetation from the construction and operation of the Middle Yard would be similar to those presented for the Middle West Yard under Alternative B (Section 4.10.1.3.7).

Wildlife

Impacts to wildlife due to the construction and operation of the proposed rail yard would be similar to those described for the Middle West Yard under Alternative B (Section 4.10.1.3.9).

4.10.3.3.8 Transportation and Safety

There are no roadways crossing the proposed yard site. Bad River Road extends along the north side of the proposed rail yard. Residents currently using the road to travel to and from their homes and fields could be impacted by increased road traffic, vehicle delays and inconvenience due to road closures during construction and operation of the proposed rail yard.

4.10.3.3.9 Socioeconomics

Socioeconomic impacts due to the construction and operation of the proposed rail yard would be similar to the socioeconomic impacts described for the Middle West Marshaling Yards under Alternative B (Section 4.10.1.3.9).

4.10.3.3.10 Hazardous Materials

Hazardous Material impacts due to the construction and operation of the proposed rail yard would be similar to the hazardous material impacts described for the Middle West Marshaling Yards under Alternative B (Section 4.10.1.3.10).

4.10.3.3.11 Cultural Resources

There are no known cultural resources or historic sites located within the proposed rail yard. A survey of the area would be conducted to determine if any sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

Table 4.10-12 Current Land Use for Proposed Rail Yards Located Along Alternative D			
Yard	Agricultural (Acres)	Residential (Acres)	Commercial (Acres)
Middle East	261.7	6.8	0
Middle	132.6	0	0

Table 4.10-13 Summary of Selected Impacts for Proposed Rail Yards Along Alternative D					
Yard	Acres (approx.)	Prime Farmland	Streams	Wetlands	Noise Sensitive Receptors <500 feet
Middle East	363.6	246.2	0	83.1 acres	4
Middle	145.4	0	5	0	1

* * * * *

[THIS PAGE INTENTIONALLY LEFT BLANK]

4.11 RAIL LINE EXTENSION STAGING AND MARSHALING YARDS

The impacts created from the construction and operation of the rail yards located along the proposed alternatives for extending DM&E's rail line in South Dakota and Wyoming are described in this section. Should the No-Action Alternative be chosen, the impacts described for Alternative B, C and D would not occur. Impacts are based on the conversion of the present land use at the proposed yard location to railroad right-of-way. Because of operational conflicts, rail yards could be located in different places depending on the alternative selected for rail line expansion. Rail yard locations for one alternative may not be feasible for another alternative. Therefore, rail yards are discussed based on their proposed locations for each extension alternative. When a proposed rail yard location would be the same for more than one alternative, this is indicated.

4.11.1 PRB EXTENSION - ALTERNATIVE B

4.11.1.1 New BNSF Interchange Yard

4.11.1.1.1 Location

The new BNSF Interchange Yard (Edgemont Yard) would be located northwest of Edgemont, South Dakota; and would be designed to operate as an interchange facility with BNSF Railroad. The Edgemont Yard would be located between mile post 720.0 and 723.0 on the north side of the rail line. The proposed Edgemont Yard would be 150 feet wide and 3.0 miles long, with a total area of approximately 54.5 acres.

4.11.1.1.2 Geology and Soils

Soils within the Edgemont Yard have a shallow bedrock layer and low water capacity. Hydric soils are present in the wetland at the site. The primary impact to soils would be the conversion of the property to an industrial site. During construction, the soils would be graded and covered with rail beds, gravel, concrete and asphalt. This conversion would remove these soils from producing forage for livestock and wildlife. In addition, during construction of the yards, erosion and loss of top soil could occur. This could increase erosion of adjacent soils unless proper drainage is provided. During operation, run-off from the Edgemont Yard or redirected surface water due to impermeable surfaces and structures within the Edgemont Yard could cause increased erosion and the formation of gullies in surrounding areas.

4.11.1.1.3 Land Use

Agriculture

The Edgemont Yard is designated as herbaceous rangeland. This designation encompasses most of the 54.5-acre site. Potential forage acreage and grazing land would be lost with the conversion to an industrial site. However, the loss of this rangeland would not be considered a significant impact, as herbaceous cover is abundant in the area.

Residential

A few scattered residences are located close to the Edgemont Yard. In addition, the Edgemont Yard is located within 0.5 mile of Dudley. However, the Edgemont Yard would be located close to the existing BNSF rail tracks and would not result in significant new impacts to residences. The noise levels would not vary much from those currently experienced by residents.

Commercial

There is no commercial property located within the proposed Edgemont Yard site.

4.11.1.1.4 Water Resources

Surface Water

The proposed Edgemont Yard would cross one intermittent stream, which is a tributary of the Cheyenne River. This stream would require realignment or channelization. Impacts to surface water, as described in Section 4.3.7.1, could include an increase in water velocity due to channelization and stream bank stabilization, scouring and erosion of the stream and potential contamination from hazardous substances. Changes in the hydrology created by the presence of the Edgemont Yard altering surface drainage could impact aquatic communities causing a loss of desired habitat.

Wetlands

One emergent wetland of approximately 0.5 acre is located within the project area. The construction of the Edgemont Yard would result in the loss of this wetland. In addition, wetlands located near the Edgemont Yard could be indirectly impacted by road construction. This activity could cause erosion, resulting in sediment reaching adjacent wetlands. Increased sedimentation could reduce the size, water depth and quality of adjacent wetlands. However, base facilities

would not be constructed at the site. This could reduce construction disturbances and the wetland impacts. Edgemont Yard operational impacts to wetlands would not occur as no facilities would be located at this location.

Groundwater

The construction of the Edgemont Yard would not result in significant impacts to groundwater. However, possible contamination of the aquifer could result from a fuel or contaminant spill during construction or operation of the Edgemont Yard. If a fuel or chemical spill occurred during Edgemont Yard operations, it could cause significant impacts to groundwater aquifers if clean-up operations were not initiated quickly. During operation of the Edgemont Yard, small spills of fuel and lubricants could occur that would accumulate over time, resulting in impacts to groundwater. It is unlikely that aquifer contamination would occur; although groundwater contamination would be considered a significant impact.

4.11.1.1.5 Air

Construction and operation of the Edgemont Yard would create impacts to the air quality in the project area. Approximately 54.5 acres of ground would be disturbed during the construction of this yard. Fugitive dust created during ground clearing, and exhaust from construction vehicles would contribute to emission levels. However, these air impacts would be considered temporary.

During operation of this rail yard, locomotive emissions would be the primary source of air quality impacts. Locomotives moving through the Edgemont Yard would be expected to generate emissions which would contribute to air quality impacts. The function of this yard would be to serve as a location for two different railroads, DM&E and BNSF to deliver and pickup cars from one another. Locomotives would be expected to idle for short periods of time while changing cars. The amount of time trains spend exchanging cars and the number of trains using this yard has not been determined, therefore impacts to air quality would be expected to be similar to that of the existing rail line (Section 4.3.8) for Fall River County. Because this yard would contain no service and fueling facilities, no air quality impacts associated with such activities would exist.

4.11.1.1.6 Noise

The construction and operation of the Edgemont Yard would create noise impacts. Noise generated during construction would be temporary, occurring primarily during the use of heavy equipment and installation of rail line and other facilities. However, the Edgemont Yard would be

located in a rural location, with very few residences located in close proximity to the project area. This factor eliminated the potential for significant impacts to residential areas.

During operations, noise would be generated by a variety of sources including diesel locomotive engines, retarders, pumps, and the coupling and uncoupling of rail cars. These noise sources would be scattered throughout the Edgemont Yard, thus reducing the magnitude of noise by spreading it over the Edgemont Yard. This would reduce the noise impacts in areas adjacent to the Edgemont Yard.

While the Edgemont Yard location has been determined, the exact location of rail tracks and other equipment is unavailable. Modeling to determine potential impacts requires the location of noise generating equipment. Therefore, noise contours could not be generated for rail yards. Because of the usual scattered nature of noise sources and their location within the interior of the Edgemont Yard, SEA conservatively determined that noise sensitive receptors within 500 feet of the Edgemont Yard boundary would be impacted.

4.11.1.1.7 Biological Resources

Vegetation

The Edgemont Yard would cross 54.0 acres of herbaceous grassland and 0.5 acre of emergent wetlands. Converting this plant community to an industrial facility would not result in significant impacts to project area vegetation, as this habitat is abundant in the region. Impacts associated with the construction and operation of this railroad yard would include clearing of vegetation, soil loss due to erosion and the introduction of non-native or undesirable species. These impacts are presented in more detail in Section 4.3.11. Potential spills of hazardous substances used during construction of the Edgemont Yard could impact vegetative communities in adjacent areas.

Grasses would likely reestablish naturally or through reseeding and planting by DM&E around the outer edges of the Edgemont Yard where rail facilities are absent. These areas would need to be maintained by mowing or trimming during operation to control vegetation growth.

Wildlife

The loss of grassland habitat would result in wildlife being displaced. Short-term and long-term impacts are anticipated during construction and operation of the Edgemont Yard. Operational and construction impacts could include habitat loss, noise, train-wildlife collisions, increased human presence and the introduction of contaminants into the environment.

During construction, vegetation within the Edgemont Yard would be cleared or disturbed, decreasing available habitat for some wildlife species. Small mammals, birds and reptiles/amphibians would likely be displaced during construction of the Edgemont Yard. The loss of habitat due to construction would require wildlife using the area for cover and forage to relocate to adjacent grasslands. With abundant grassland habitat within the project area, the wildlife would be able to move to this adjacent habitat.

Loss of the wetland within the proposed Edgemont Yard would reduce waterfowl habitat. Because waterfowl are ground nesters, disturbance during nesting could result in destruction of nests and loss of nesting hens in the grasslands.

During construction activities, increased TSS could reach the Cheyenne River through the tributaries. This potentially could impact fish and other aquatic species downstream.

During operation, impacts to wildlife would be primarily due to disturbance from Edgemont Yard activity. However, no facilities are planned which would lessen operational impacts at the proposed Edgemont Yard. Depending on the level of disturbance, many smaller wildlife species could return to habitat within the Edgemont Yard after construction activities. Potential impacts to fish and aquatic species could result from fuel, herbicide and chemical contamination of the intermittent stream. This stream is in the Cheyenne River watershed, and a spill could impact aquatic species in the river.

Sensitive, Threatened, and Endangered Species

Potential impacts to threatened and endangered species could occur from activities at the Edgemont Yard. Contamination from diesel fuel or other hazardous materials could enter the intermittent stream and reach the Cheyenne River, potentially impacting the sturgeon chub and other endangered or threatened species in the river. If an accidental discharge were to occur, the impacts to these species could be significant. Potential noise disturbance would decrease as eagles using the Cheyenne River would become acclimated to the noise and activities associated with the Edgemont Yard.

4.11.1.1.8 Transportation and Safety

Construction activities at the Edgemont Yard could impact some small rural, ranching roads. However, impacts would be minimal and could result in some rerouting and in the termination of existing roads. Potential impacts during construction would include increased traffic congestion due to the transportation of materials and work crews to the Edgemont Yard.

The operation of the Edgemont Yard could increase use of area roads as motorists find alternative routes to those closed or rerouted during construction. However, this yard is located in a rural area, with minimal traffic and any increase in road use would not likely slow the transportation systems. Traffic delays and safety concerns associated with grade crossings would not be experienced at the rerouted roadways following construction of this yard.

4.11.1.1.9 Socioeconomics

No employees or facilities are expected to be located at the Edgemont Yard, therefore this yard would have no impact on the socioeconomic climate of the Edgemont area.

4.11.1.1.10 Hazardous Materials

Neither construction or operation of the proposed Edgemont Yard would result in an increase in the types or amounts of hazardous materials currently transported by DM&E. Potential impacts during construction could include disturbance of hazardous waste sites that could have been located within the proposed Edgemont Yard. During operation of the Edgemont Yard, DM&E would coordinate with the EPA and the South Dakota Department of Environmental Quality to determine if the proposed Edgemont Yard had prior hazardous waste contamination. This information would be included in the Phase 1 Environmental Site Assessment, which is used as a basis for determining contamination before acquiring property.

During operation, no impacts would occur to existing hazardous material sites. There would be a potential for spills resulting from derailments or improper handling of hazardous materials such as fuel, oil and lubricants. Contamination from spills would be unlikely due to the expected reduction in derailments and required compliance with regulatory procedures regarding handling, storage and disposal of hazardous substances.

4.11.1.1.11 Cultural Resources

The disturbance of cultural resources during the construction of the Edgemont Yard is likely. A survey of the area would be conducted to determine if any sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.11.1.2 West Staging & Marshaling Yard

4.11.1.2.1 Location

The West Staging and Marshaling Yard (West Yard) is located northwest of Edgemont in Weston County, Wyoming. The West Yard would be located between mile posts 760.0 and 764.0 on the north side of the DM&E rail line. The proposed West Yard would be 1,300 feet wide and 3.1 miles long, with a total area of approximately 488.5 acres.

4.11.1.2.2 Geology and Soils

The proposed West Yard site contains soils that have a shallow bedrock layer and have low available water capacity. In addition, steep slope soils with a 15 percent grade are present at the site. These soils would be classified as having high erosion potential. The primary impact to soils would be that the proposed West Yard site would be converted to long-term industrial use. This conversion would remove these soils from producing forage for livestock and wildlife. Soils would be graded and covered with rail beds, gravel, concrete and asphalt. In addition, during construction and operation of the West Yard, runoff may increase to adjacent areas. This could increase erosion unless proper drainage is provided. Construction activities would avoid steep slope areas, thus preventing erosion in these highly sensitive soils. The development of the West Yard would be a long-term impact as the soils would be taken out of grass production and converted to an industrial facility.

4.11.1.2.3 Land Use

Agriculture

The development of the West Yard would convert approximately 488.5 acres of herbaceous rangeland to an industrial facility. Converting this land to an industrial facility would reduce grazing on this property, which would displace livestock. Ranchers using this property would have to relocate livestock to other range within the project area. This impact would be long-term, as the property would be unsuitable for grazing for the duration of the project.

Rangeland

The development of the West Yard would impact grazing allotments on USFS lands. The loss of these allotments would be long-term and require that they be moved to other available NFS property. In addition, cattle trails, guards and watering sites present in the West Yard would

require mitigation. The loss of grazing within the West Yard would be long-term and would last for the life of the West Yard.

Residential

There are no residential areas within the proposed West Yard site. No identified residences are located within 500 feet of the West Yard boundaries.

Commercial

There is no commercial property located within the proposed West Yard site.

Forest Service Lands

The proposed West Yard would cross approximately 1.5 miles of TBNG. Removal of this land from the TBNG matrix could be a significant impact; and would likely require that private land be transferred to the USFS to mitigate the loss of Federal property.

4.11.1.2.4 Water Resources

Surface Water

Approximately eight intermittent streams, tributaries of Lodgepole Creek, would be crossed by the West Yard. These could require realignment or channelization. During construction and operation of the West Yard, the potential for increased erosion and an increase in water velocity due to channelization and stream bank erosion exists. However, seeding and mulching of disturbed areas would reduce erosion during and following construction. Once post-construction revegetation is completed, the probability of erosion would decrease.

Potential contamination of intermittent streams could impact aquatic resources in Lodgepole Creek. However, safe rail operations and proper handling of hazardous materials would minimize potential contamination impacts. Changes in hydrology created by the presence of the West Yard altering surface drainage could impact aquatic communities. These changes could cause a loss of desired habitat and disrupt the current balance within aquatic communities. Overall, with proper construction and operation procedures followed, no significant impacts to surface water would occur.

Wetlands

No wetlands would be located at the West Yard site under Alternative B

Groundwater

The impacts to groundwater would be similar to what is discussed for the BNSF Interchange Yard in Section 4.11.1.1.4.

4.11.1.2.5 Air

Construction and operation activities associated with the West Yard could create local impacts to air quality. During construction, approximately 488.5 acres of ground would experience varying degrees of disturbance which would be a likely source of fugitive dust. Construction equipment such as graders and earth movers would be a source of emissions while operating. While more concentrated and occurring for a longer period, these emissions would be similar to emissions and fugitive dust generated from current agricultural use of the yard site. Construction related affects to air quality would be limited to the period of yard construction. Vehicle emissions from motorists delayed during yard construction would not occur as the only roads affected by this yard would be rural with low ADTs (Section 4.11.1.2.9).

Locomotive emissions would be the primary source of air quality impacts from the West Yard. The West Yard would have limited refueling facilities. Escaping fumes during refueling could contribute to air quality impacts. SEA has calculated air quality impacts due to the operation of the yard according to the methodology presented in Appendix E. Table 4.11-1 presents the amount of emissions from locomotive activities under the 20 MNT (8 trains per day), 50 MNT (18 trains per day), and 100 MNT (34 trains per day) operating scenarios.

**Table 4.11-1
Emission Levels of Proposed West Staging & Marshaling Yard**

Operating Level	HC		CO		NO _x		SO ₂		PM ₁₀		Pb	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
20 MNT (8 trains per day)	2.28	9.57	6.21	26.07	32.50	136.48	4.03	16.91	1.55	6.52	1.26E-04	0.00052963
50 MNT (18 trains per day)	5.13	21.54	13.97	58.67	73.12	307.08	9.06	38.04	3.49	14.67	2.84E-04	0.00119167
100 MNT (34 trains per day)	9.69	40.69	26.38	110.81	138.11	580.05	17.11	71.86	6.60	27.70	5.36E-04	0.00225093

4.11.1.2.6 Noise

The noise impacts from the West Yard would be similar to what is discussed in Section 4.7.1.1.6.

4.11.1.2.7 Biological Resources

Vegetation

The West Yard would cross mostly herbaceous grassland; although riparian plant communities exist along the intermittent streams. Conversion of herbaceous grassland to an industrial facility would not result in significant impacts to project area vegetation, as this habitat is abundant in the region. However, any loss of riparian plant communities would be a significant impact of an important regional resource. Riparian corridors provide important wildlife habitat and are used by livestock for resting/grazing. The construction activities would avoid these areas, thus preventing long-term impacts to this plant community.

Big Game

The proposed West Yard is used as yearlong range by pronghorn and mule deer. Development of the West Yard would involve fencing of the property, which could impede movement of big game in the project area. This could result in long-term impacts to big game in the project area, as travel corridors may be blocked that were used to reach watering and resting habitat. The loss of herbaceous grassland would not be significant for big game in the area, as the plant community is abundant in the project area.

Non-Game Species

The clearing of grasslands during construction would result in short-term impacts to nesting habitat used by non-game birds. Most birds utilizing the property would move to suitable habitat in the vicinity of the West Yard. Grassland habitat is abundant in the region, thus no significant, long-term impacts to local bird populations would occur. Once construction is completed, and the site is revegetated, many species could return to suitable habitat in the West Yard. Small mammals and reptiles would also be displaced during construction, returning once the West Yard has been revegetated.

Raptors

Raptor surveys of this proposed West Yard have not been completed to date. However, raptors would likely nest along the riparian corridors within the West Yard. Construction and operation of the West Yard would result in noise that would probably make nesting along the riparian areas unsuitable. The raptors that are now nesting within the project area would move, or become acclimated to the West Yard noise and continue utilizing their sites. Raptors that are displaced would be able to find suitable habitat in the region.

Sensitive, Threatened, and Endangered Species

The development of the West Yard could impact black-tailed prairie dog colonies. If colonies were disrupted, impacts could occur to species dependent on such habitat, such as mountain plovers and swift fox. The West Yard would cross numerous intermittent streams and is close to Lodgepole Creek, increasing the chance that a toxic spill could reach the Cheyenne River and impact Federally-listed threatened and endangered species. If impacts to candidate and listed species were to occur, they would be considered significant and would require mitigation.

4.11.1.2.8 Transportation and Safety

No major roads would be crossed by the West Yard. However, short term impacts to rural roads would occur during construction and operation. Construction and operation traffic could cause wear on local roads and increased traffic concerns. However, due to the rural nature of the area, no major impacts to traffic would result from the West Yard development.

4.11.1.2.9 Socioeconomics

During construction, approximately 63 two-year jobs would be created that are directly related to construction of the West Yard. Jobs in the construction trades such as heavy equipment operators, carpenters, electricians and landscapers would be filled by local workers when available. Non-local workers could be used to fill shortages in construction positions and for actual rail construction activities. These workers would not locate permanently in the area, however, they would utilize temporary lodging, such as motels, hotels, rental property, recreational vehicle parks and campgrounds.

Approximately 100 employees would be expected to be based in Weston County at the start-up of West Yard operations. At full operation, the facility would be expected to employ about 300 railroad employees. In addition, an increase in contract and support related jobs would be expected once the West Yard would be fully operational. An increase in jobs could provide

additional tax revenue to Weston County. The West Yard is expected to be a major rail staging facility, and would include maintenance and minor repair units.

4.11.1.2.10 Hazardous Materials

The potential impacts from hazardous materials would be the same as discussed for BNSF Interchange Yard (Section 4.11.1.1.10).

4.11.1.2.11 Cultural Resources

The disturbance of cultural resources during the construction of the West Yard would be likely. A survey of the proposed site would be required to determine if any cultural resource sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.11.1.2.12 Aesthetics

Viewsheds/Scenic Values

The portion of the West Yard that crosses NFS land is within a VQO of modification. This visual designation requires that facilities, buildings, roads and signs must utilize materials, textures and colors from the existing environment.

4.11.2 PRB EXTENSION - ALTERNATIVE C

4.11.2.1 Middle West Staging and Marshaling Yard

4.11.2.1.1 Location

The Middle West Staging and Marshaling Yard (Middle West Yard) is located north of Wall. The Middle West Yard would be located between mile posts 590.4 and 592.5 on the north and south side of the DM&E rail line. The proposed Middle West Yard would be 300 feet wide and 2.1 miles long, with a total area of approximately 76.4 acres.

4.11.2.1.2 Geology and Soils

The proposed Middle West Yard site at Wall, South Dakota would cross soils that have a shallow bedrock layer and have low available water capacity. In addition, hydric soils are present in wetlands at the site. The primary impact to soils could be that the proposed Middle West Yard

site would be converted to long-term industrial use. Soils would be graded and covered with rail beds, gravel, concrete and asphalt. This conversion would remove these soils from producing forage for livestock and wildlife. In addition, during construction and operation of the Middle West Yard, runoff would increase to adjacent areas. This would increase erosion of adjacent soils unless proper drainage is provided.

4.11.2.1.3 Land Use

Agriculture

The proposed Middle West Yard is primarily classified as cropland and pasture. This designation encompasses most of the 76.4-acre site. Construction of the Middle West Yard would require the permanent conversion of this agricultural land to railroad right-of-way.

Residential

A portion of the Middle West Yard could affect residential areas around Wall. Construction activities near residences would result in noise, dust, increased traffic and increases in emissions from construction equipment. These impacts would be short-term, and would exist only during the construction activities at the Middle West Yard.

Potential impacts to residential areas in Wall from operation of the Middle West Yard would result from noise, emissions/dust and increased traffic. However, there are no residents within 500 feet of the proposed rail yard therefore, impacts to residential area would be minimal.

4.11.2.1.4 Water Resources

Surface Water

No surface water is located within the proposed Middle West Yard site.

Wetlands

Construction of the Middle West Yard could impact 3 emergent wetlands located within the project area. Total acreage of the wetlands is approximately 15.0 acres. Any degradation or loss of wetlands could be considered a significant impact. In addition, wetlands located near the Middle West Yard could be indirectly impacted by road construction. Clearing of vegetation, grading and earthmoving could lead to erosion, resulting in sediment reaching adjacent wetlands.

Increased sedimentation could reduce the size, water depth and quality of the wetlands. During operation of the Middle West Yard, run-off could result in sediment reaching adjacent wetlands.

Groundwater

Potential impacts to groundwater from construction and operation of this yard would be similar to those described in Section 4.11.1.1.4.

4.11.2.1.5 Air

Construction and operation of the Middle West Yard could create local impacts to air quality. During construction, approximately 76.4 acres of ground would experience disturbance which would create fugitive dust. Construction equipment would produce exhaust emissions while operating. While more concentrated and occurring for a longer period of time, these emissions and dust would be similar to what is currently generated by agricultural activity in the project area. Vehicle emissions from motorists delayed at grade crossings would not occur as the only road in the area of the proposed rail yard would be closed and traffic rerouted.

During operation of the Middle West Yard, locomotives would be the primary source of air quality impacts. During operation, each locomotive to use the yard would spend approximately 0.5 hour idling. Table 4.11-2 presents the amount of emissions from locomotive activities under the 20 MNT, 50 MNT, and 100MNT operating scenarios.

**Table 4.11-2
Emission Levels of Proposed Middle West Staging & Marshaling Yard**

Operating Level	HC		CO		NO _x		SO ₂		PM ₁₀		Pb	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
20 MNT (11 trains per day)	3.13	13.16	8.54	35.85	44.68	187.66	5.54	23.25	2.13	8.96	1.73E-04	0.00072824
50 MNT (21 trains per day)	5.98	25.13	16.30	68.44	85.30	358.26	10.57	44.38	4.07	17.11	3.31E-04	0.00139028
100 MNT (37 trains per day)	10.54	44.28	28.71	120.59	150.29	631.23	18.86	76.2	7.18	30.15	5.83E-04	0.00244954

4.11.2.1.6 Noise

There would be no noise sensitive receptors located within 500 feet of the proposed Middle West Yard therefore, impacts from noise would not occur.

4.11.2.1.7 Biological Resources

Vegetation

The proposed Middle West Yard site would require the conversion of approximately 76.4 acres of cropland and pasture into railroad right-of-way. Cropland could no longer be available for production. Impacts to vegetation associated with the construction and operation of the Middle West Yard would include soil loss due to erosion, and the introduction of non-native or non-desirable plant species during reseeding.

Grasses would likely reestablish naturally or through reseeding and planting in the outer areas of the Middle West Yard where facilities are absent. The buffer areas of the Middle West Yard could be reestablish with grasses along fence rows after construction is complete. The use of herbicides to control weeds could impact adjacent vegetation communities during operation of the Middle West Yard if not administered properly.

Wildlife

The loss of the three emergent wetlands could result in reduction of waterfowl and wildlife habitat in the project area. Construction activities in the spring/summer could result in destruction of waterfowl nests and nesting hens. It is expected that waterfowl and shorebirds using the wetlands would leave the area and utilize similar habitat in the project area. Small mammals, songbirds and amphibians using the wetlands would also be displaced during construction of the Middle West Yard.

The clearing of cropland could displace wildlife using this habitat. It is expected that the smaller, less mobile species would suffer mortality from the construction activities at the Middle West Yard. However, many wildlife species would leave the area and seek similar habitat near the project area. During operation, impacts to wildlife would be primarily due to disturbance from the Middle West Yard activity. However, the level of activity and lack of grassland habitat within the proposed Middle West Yard would likely result in most wildlife moving to adjacent habitat.

4.11.2.1.8 Transportation and Safety

The Middle West Yard would cross 1 public roadway, Township Road, resulting in impacts to local traffic. The ADT for this roadway is 100 vehicles per day. During construction and operation of the Middle West Yard traffic would no longer have access through this area. It would be necessary to reroute or terminate this roadway prior to crossing the DM&E rail line or entering the proposed rail yard. Potential traffic delays, increased safety concerns and reduced emergency vehicle access on local roadways could occur due to construction traffic on local roads. Construction traffic could cause increased wear on local roadways.

4.11.2.1.9 Socioeconomics

Approximately 20-30 jobs would be expected to be based at the Middle West Yard at the start-up of operations. However, once it is in full operation, the Middle West Yard is expected to create 40-50 permanent jobs. These job estimates only include direct railroad employees. Crew lodging and eating facilities are not planned here, as it is expected that commercial facilities would be utilized. Additional lodging and eating facilities could become established near the proposed Middle West Yard site to provide convenient services to railroad workers. In addition, an increase in contract and support related jobs would be expected once the Middle West Yard is fully operational. The potential increase in jobs could also provide additional tax revenues to the communities in the surrounding areas and the county.

4.11.2.1.10 Hazardous Materials

The impacts resulting from hazardous materials would be similar to those discussed in Section 4.11.1.1.10.

4.11.2.1.11 Cultural Resources

The disturbance of cultural resources during the construction of the Middle West Yard would be likely. A survey of the proposed site would be required to determine if any cultural resource sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.11.2.2 New BNSF Interchange Yard

4.11.2.2.1 Location

The New BNSF Interchange Yard (Edgemont Yard) would be designed to operate as an interchange facility with BNSF Railroad at Edgemont (Dudley), South Dakota. The Edgemont Yard would be located at mile post 761.75 and extend northeast along the BNSF rail line. The Edgemont Yard would be 150 feet wide and 1.5 miles long, with a total land area of approximately 27.3 acres.

4.11.2.2.2 Geology and Soils

The primary soil types would include loamy fine sand, silt loams, and some clay soils. Approximately 1.4 acres of prime farmland would be lost during construction of the rail yard. Permeability is very slow to rapid. Slopes range from 0-2 percent for the Tilford and Arvada soils to 6-25 percent for the Dwyer soils at the south end of the proposed rail yard. Soils are generally poorly suited for building sites due to shrink-swell potential and steep slopes. The Edgemont Yard could result in increased erosion unless proper drainage is provided.

4.11.2.2.3 Land Use

Agriculture

The Edgemont Yard would be constructed in an area that is primarily herbaceous rangeland. Potential forage acreage would be lost with the conversion to an industrial facility. Approximately 26.7 acres of rangeland would be lost. Approximately 1.4 acres of prime farmland would be lost. Impacts would not be significant due to the abundance of rangeland in the area and the close proximity to an existing rail line.

4.11.2.2.4 Water Resources

Surface Water

The Edgemont Yard would cross one intermittent stream, a tributary of the Cheyenne River. In addition, the Edgemont Yard would be located within 0.5 mile of the Cheyenne River. Water quality issues associated with erosion and contamination could result in impacts to the Cheyenne River. However, safe rail operations and limited transportation of hazardous materials would minimize potential contamination impacts. Erosion impacts would be minimal, as facilities

would not be constructed at the Middle West Yard. The development of the Edgemont Yard would not result in significant impacts to surface water.

Wetlands

The Edgemont Yard would cross approximately 0.7 acre of emergent wetland. Impacts to this wetland would be the same as discussed for the BNSF Yard in Alternative B.

Groundwater

Impacts to groundwater would be similar to those discussed in Section 4.11.1.1.4.

4.11.2.2.5 Air

Impacts to air quality from the construction and operation of this rail yard would be similar to what is described in Section 4.11.1.1.5, for the Edgemont Yard under Alternative B.

4.11.2.2.6 Noise

Impacts from noise would be similar to those discussed in Section 4.11.1.1.6.

4.11.2.2.7 Biological Resources

Vegetation

The vegetation community at the proposed Edgemont Yard site would be composed of approximately 26.7 acres of cropland and pasture and 0.7 acre of emergent wetlands. During construction of this yard the 27.3 acres would be converted to railroad right-of-way. The loss of grassland and wetland vegetation during construction would be a permanent, long-term impact. Any grassland acres removed would mean less habitat and forage available for wildlife and cattle in the project area.

Wildlife

The loss of grassland habitat would result in wildlife being displaced. However, most species would be able to move to similar grassland habitat within the project area. Small mammals, songbirds and reptiles could be displaced during the initial development of the Edgemont Yard; although they could return once the site is stabilized and revegetated. The

development of the Edgemont Yard would not result in significant impacts to wildlife in the project area.

Sensitive, Threatened, and Endangered Species

The impacts to threatened and endangered species would be the same as discussed for the BNSF Yard in Alternative B (Section 4.11.1.1.7).

4.11.2.2.8 Transportation and Safety

The Edgemont Yard would cross Fall River County Road 15, and would require that this roadway be terminated or an alternate road be developed.

During operation of the Edgemont Yard, increased use of area roads could occur as DM&E employees drive from Edgemont to the site. However, any impacts are expected to be insignificant to the traffic patterns. The Edgemont Yard is located in a rural area, with minimal traffic and any increase in road use would not slow the transportation patterns.

4.11.2.2.9 Socioeconomics

No employees or facilities are expected to be located at the Edgemont Yard. However, the facility would create positions for several employees who would most likely live in the Edgemont area. Overall, the socioeconomic impacts from development of the Edgemont Yard are not expected to be significant.

4.11.2.2.10 Hazardous Materials

Potential impacts from hazardous material would be similar to what is described in Section 4.11.1.1.10.

4.11.2.2.11 Cultural Resources

The disturbance of cultural resources during the construction of the Edgemont Yard would be likely. A survey of the proposed site would be required to determine if any cultural resource sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.11.2.3 West Staging and Marshaling Yards

4.11.2.3.1 Location

Option A

The 945.0-acre West Staging and Marshaling Yard (West Yard) would be located on the Campbell and Weston County, Wyoming boundary. The West Yard would be located between mile posts 787.0 and 793.0 and would include 71.0 acres of USFS land, 78.0 acres of state land and 795.0 acres of private land. The West Yard would be 1,300 feet wide and 6 miles long.

Option B

Option B would be a 945.0-acre alternative for the West Yard. This alternative would be the same size as Option A, but would avoid impacts to USFS lands, and would be composed of private and state properties. The West Yard would be located between mile post 787.0 and 793.0.

4.11.2.3.2 Geology and Soils

Option A and B

The proposed West Yard site would include soils that have a shallow bedrock layer and low available water capacity. In addition, soils with a slope greater than 15 percent exist at the West Yard, and these soils would have a high erosion potential. The primary impact to soils would be that the proposed West Yard site would be converted to long-term industrial use. This conversion would remove these soils from producing forage for livestock and wildlife. In addition, during construction and operation of the West Yard, runoff may increase to adjacent areas. This could increase erosion unless proper drainage is provided. Construction activities would avoid steep slope areas, thus preventing erosion in these highly sensitive soils. The development of the West Yard would be a long-term impact as the existing soils would be taken out of grass and crop production and converted to an industrial facility.

4.11.2.3.3 Land Use

Agriculture

Option A

The development of the West Yard would affect approximately 945.0 acres of herbaceous rangeland and some cropland. Converting this site to an industrial facility would remove this land from grazing and some agricultural production. However, the loss of this land would not be considered a significant impact as herbaceous rangeland is abundant in the region.

Option B

The development of the West Yard option would primarily affect herbaceous rangeland. The conversion to an industrial facility would remove this land from current and future agricultural use. However, the loss of this land use would not be considered a significant impact as herbaceous rangeland is abundant in the region.

Residential

No residential lands are located within 500 ft of the West Staging Yard.

Forest Service Lands

The West Yard would be composed of 71.0 acres of TBNG, which is administered by the NFS. Removal of this property from the TBNG matrix would be a significant impact, and would result in mitigation, possibly resulting in transfer of private property to the USFS. The primary use of this property is the USFS grazing allotment program.

Option A

The West Yard would significantly impact several Federal grazing allotments. Development would eliminate the School Creek Allotment- Little Thunder pasture, Small Allotment- Little Thunder pasture, and the Keeline Allotment -- South Burdwick and Bull pastures, from using grassland within the West Yard. The loss of Federal grazing on this land would be a permanent, long-term impact and would need to be mitigated by DM&E railroad.

Option B

Most of this option would impact grazing on private property. However, a segment of this option would cross Wyoming state property, eliminating the use of this land for grazing. The loss of this grazing on state owned property would be a significant impact, as ranchers would have to move cattle to another property. Availability of Federal or state land for grazing in the project area could be a concern, as construction of the rail line eliminates allotments. The loss of these allotments would require mitigation.

State Lands

Option A

The West Yard would be composed of 78.0 acres of Wyoming state land, which is used for grazing. Development of the West Yard would result in eliminating the grazing on this land. This loss of grazing land could result in significant impacts to some ranchers who utilize the property. However, the extent of the impacts is not known, and would be dependent on whether a rancher has access to other grazing properties.

Option B

Option B would be composed of approximately 45.0 acres of Wyoming state land, which is used for grazing. The impacts from development of this property are discussed in the previous section on grazing.

4.11.2.3.4 Water Resources

Surface Water

Option A

The West Yard would cross 21 intermittent streams, all tributaries to Little Thunder Creek. These would require realignment or channelization. This could result in changes to hydrology in these streams, as water velocity could increase and cause significant erosion within the West Yard. Water quality issues associated with erosion and contamination could impact Little Thunder Creek. However, safe rail operations and limited transportation of hazardous materials would minimize potential contamination impacts. The construction of facilities at the West Yard would increase erosion into streams, possibly impacting water quality in Little Thunder Creek. In addition, failure to stabilize disturbed slopes adjacent to streams could result

in increased erosion and sedimentation of surface waters. Seeding, mulching and the use of riprap in disturbed areas would reduce erosion during and following construction. The use of proper construction procedures would result in no significant impacts to surface water in the project area.

West Yard operations could result in sediment reaching Little Thunder Creek and impacting aquatic life in the watershed. A spill of hazardous materials or chemicals at the West Yard could potentially enter the watershed and impact aquatic organisms. However, safe handling procedures and adherence to regulations would minimize this potential impact.

Option B

This option would cross six intermittent streams, all tributaries to Little Thunder Creek. The impacts to surface water would be the same as described for Option A.

Wetlands

No wetlands would be located at the proposed West Yard site.

Groundwater

The impacts to groundwater would be the similar to what is discussed in Section 4.11.1.1.4.

4.11.2.3.5 Air

Impacts to air quality resulting from construction and operation of the West Yard would be similar those described under Alternative B (Section 4.11.2.1.5).

4.11.2.3.6 Noise

Noise impacts would be similar to those discussed for the West Yard under Alternative B (Section 4.11.2.1.6).

4.11.2.3.7 Biological Resources

Option A and B

Vegetation

The West Yard would cross mostly herbaceous grassland, although some riparian plant communities exist along the intermittent streams. Conversion of herbaceous grassland to an industrial facility would not result in significant impacts to project area vegetation, as this habitat is abundant in the region. However, any loss of riparian plant communities would be a significant impact of an important regional resource. Riparian zones provide important wildlife habitat and are used by livestock for resting and grazing. The construction activities would avoid these areas, thus preventing long-term impacts to this plant community.

Some reestablishment of grasses would naturally occur after the facilities have been constructed. This would occur primarily along the outer areas of the West Yard where facilities are absent. The use of herbicides to control weeds could impact adjacent vegetation communities during operation of the West Yard.

Big Game

Option A

The West Yard is used as yearlong range by pronghorn and mule deer. Development of the West Yard would involve fencing of the property, which could prevent big game south of the West Yard from moving north to water at Little Thunder Creek. This could result in long-term impacts to big game populations in the project area, as individuals and herds may need to move to other habitat for watering. The loss of herbaceous grassland would not be significant for big game in the area, as the habitat is abundant in the project area.

Option B

The West Yard is used as yearlong range by pronghorn and mule deer. Potential impacts could occur from fencing the West Yard and interrupting migration corridors for these species. This impact could be significant for those individuals and herds who utilize the West Yard for travel. However, the impacts would be short-term, as big game would leave the project area and utilize different travel corridors.

Non-Game Species

Option A and B

The clearing of grasslands during construction would result in short-term impacts to nesting habitat used by non-game birds and small mammals. Most birds and small mammals utilizing the property would move to suitable habitat in the vicinity of the West Yard. Grassland habitat is abundant in the region, thus no significant, long-term impacts to local bird populations would occur. Once construction is completed, and the site revegetated, many species could return to suitable habitat in the West Yard.

Raptors

Option A

Almost the entire six (6) miles of the West Yard is within 500 feet of Little Thunder Creek, and within 500 feet of four (4) raptor nests. One golden eagle nest and 1 red-tailed hawk nest are located within 500 feet of the West Yard along Little Thunder Creek. In addition, 3 red-tailed hawk nests are within 1 mile of the West Yard. Construction and operation of the West Yard would result in noise that would probably make nesting habitat along the creek unsuitable for raptors. The raptors that are now nesting along the creek could move, or they could become acclimated to the West Yard noise and continue utilizing their sites. Development of the West Yard would not result in significant, long-term impacts to regional raptor populations. However, short-term impacts would result in some displacement of birds as the West Yard is developed.

Option B

No surveys of Option A have been completed for the occurrence of raptors. However, raptors could utilize stands of cottonwood occurring along the intermittent streams within the West Yard. Construction and operation of the West Yard could make existing nests unsuitable for raptors. It is likely that West Yard development would result in birds leaving existing sites and seeking more remote habitat.

Sensitive, Threatened and Endangered Species

Option A

The development of the West Yard has the potential to adversely impact numerous black-tailed prairie dog colonies. If colonies were disrupted, impacts could occur to species dependent

on such habitat, such as mountain plovers and swift fox. Depending on the level of disturbance, the impacts could be short-and long-term. The loss of prairie dog habitat at the West Yard would also mean that future use of the West Yard by black-footed ferrets would not occur. Yard disturbances during construction and operations would likely displace wintering bald eagles along Little Thunder Creek. The West Yard crosses numerous intermittent streams and is close to Little Thunder Creek, increasing the chance that a toxic spill could reach the Cheyenne River and impact Federally-listed threatened and endangered species. If impacts occur to listed species they would be considered significant and would require mitigation.

Option B

The impacts to threatened and endangered species would be the same as discussed for Option A. However, this option is not as close to Little Thunder Creek, thus it would not have the potential to impact as many raptors as Option A.

4.11.2.3.8 Transportation and Safety

Option A and B

No major roads are crossed by the West Yard. However, short-term impacts to smaller roads would occur during construction activities at the West Yard. Construction traffic on local roads could cause additional traffic delays, wear on local roads and increased safety concerns. During operation of the West Yard, increased use of area roads would also occur. However, no impacts to traffic would result, as the rural roads would be able to handle the increased use.

4.11.2.3.9 Socioeconomics

Option A and B

About 100 employees are expected to be based at the West Yard at the start-up of coal transport operations. At full operations, the facility would be expected to employ about 300 direct railroad employees. In addition, an increase in contract and support related jobs would be expected once the West Yard is fully operational. Additional lodging and eating facilities could become established near the proposed West Yard site to provide convenient services to railroad workers. This increase in jobs and businesses could provide additional tax revenues to the communities in the surrounding areas and Weston County. The West Yard is expected to be a major rail staging facility, and would include maintenance and minor repair units.

4.11.2.3.10 Hazardous Materials

Option A and B

Potential impacts from hazardous materials would be similar to those discussed in Section 4.7.1.1.10.

4.11.2.3.11 Cultural Resources

The disturbance of cultural resources during the construction of the West Yard would be likely. A survey of the proposed site would be required to determine if any cultural resource sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.11.2.3.12 Aesthetics

Viewsheds/Scenic Values

The portion of the West Yard within NFS property would be subject to a VQO of modification. Development of a major rail staging West Yard in an open, prairie environment would change the character of the property to industrial use. The facilities would dominate the landscape and could significantly impact the visual qualities of the area. Mitigation techniques such as using local construction materials and painting the buildings to blend in with the natural surrounding could be required. This impact to the visual qualities of the area would be long-term, lasting the life time of the West Yard.

4.11.3 PRB EXTENSION - ALTERNATIVE D

4.11.3.1 New BNSF Interchange Yard

The BNSF Interchange Site location and impacts are the same as discussed for Alternative B.

4.11.3.2 Middle West Staging Yard

4.11.3.2.1 Location

The Middle West Staging Yard (Middle West Yard) would be located in Custer County, between mile posts 68.9 and 65.8. This segment of Alternative D would parallel the existing Chicago and Northwestern rail line. The Middle West Yard would begin north of Fairburn and end just south of the city. The Middle West Yard would be 300 feet wide and 3.1 miles long, with a total area of approximately 112.7 acres.

4.11.3.2.2 Geology and Soils

The proposed Middle West Yard site would cross soils that have a shallow bedrock layer and have low available water capacity. The impacts to soils would primarily be from conversion of the grassland to an industrial facility. Soils would be graded and covered with rail beds, gravel, concrete and asphalt. Runoff would occur during construction, increasing the potential for erosion. However, adherence to proper construction methods, such as mulching, would minimize these impacts. Impacts to soils would be short-term, and would stabilize after development of the Middle West Yard. During operations, the impact to soils would be primarily from run-off and erosion from the Middle West Yard.

4.11.3.2.3 Land Use

Agriculture

The Middle West Yard site would be primarily 112.7 acres of herbaceous grassland, and is used for livestock grazing. Conversion of this grassland to an industrial site would be a long-term impact. However, the impact of losing this grazing land would not be considered a significant impact, as grassland is abundant in the project area.

Residential

A portion of the Middle West Yard would affect a residential and developed area where the site intersects the town of Fairburn. Construction activities near residences would result in noise, dust, increased traffic and increases in emissions from construction. These impacts would be short-term, and would exist only during the construction activities at the Middle West Yard. However, permanent long-term impacts would result from the operations at the Middle West Yard.

Permanent impacts in residential areas would result from noise, emissions/dust and increased traffic. These impacts could be considered significant as they could disrupt residents living close to the Middle West Yard. However, the Middle West Yard would be located near an existing transportation corridor, and the residents would be accustomed to noise.

4.11.3.2.4 Water Resources

Surface Water

The Middle West Yard would cross one intermittent stream, a tributary to French Creek. This stream would require realignment or channelization. Impacts to surface water would include an increase in water velocity due to channelization and stream bank stabilization, scouring and erosion of streams and potential water quality issues associated with construction and operation of the Middle West Yard. Proper construction activities would minimize the potential for erosion. Safer rail operations and limited transportation of hazardous materials would prevent potential contamination impacts.

Wetland

No wetlands are located at the Middle West Yard.

Groundwater

Impacts to groundwater would be similar to what is discussed in Section 4.7.1.1.4.

4.11.3.2.5 Air

Construction and operation of the Middle West Yard would create air quality impacts similar to those described in Section 4.7.1.3.5.

4.11.3.2.6 Noise

The noise impacts from this yard would be similar to those discussed in Section 4.7.1.3.6.

4.11.3.2.7 Biological Resources

Vegetation

The Middle West Yard would cross mostly herbaceous grassland. Conversion of this plant community to an industrial facility would not result in significant impacts to project area vegetation, as this habitat is abundant in the area. In addition, riparian plant communities exist along the intermittent stream. Any degradation or loss of this plant community would be considered a significant impact. Riparian corridors are important habitat for regional wildlife and livestock. The construction activities would avoid these areas, which would prevent long-term impacts to this plant community.

Wildlife

Wildlife using habitat in the Middle West Yard have become habituated to activities associated with the existing rail line. However, short-term and long-term impacts would be anticipated during construction and operation of the Middle West Yard. Operational and construction impacts may include habitat loss, noise, train-wildlife collisions, increased human presence and the introduction of contaminants into the environment.

The loss of grassland habitat would result in wildlife being displaced. However, most species would be able to move to similar habitat in the project area. Small mammals, songbirds and reptiles could be displaced during initial development of the Middle West Yard; although, they could return when the site is stabilized and revegetated. Avoidance and protection of riparian zones would minimize disturbance of the wildlife utilizing stream corridors.

During operation, impacts to wildlife would be primarily due to disturbance from Middle West Yard activity. However, the level of activity and lack of habitat within the proposed Middle West Yard would likely result in most wildlife seeking more secluded habitat.

4.11.3.2.8 Transportation and Safety

The construction and operation of the Middle West Yard would impact streets and roads around Fairburn, resulting in alternate roads and bypasses being constructed. However, the exact location of facilities has not been determined and impacts to the transportation system would be difficult to determine at this time.

During operation of the Middle West Yard, increased traffic on project area roads would occur. Depending on the increased traffic volume, new control signs or lights could need to be designed to ensure road safety. It is expected that transportation impacts would be short-term, and would improve once the Middle West Yard is fully operational.

4.11.3.2.9 Socioeconomics

Approximately 20-30 jobs would be created at the start-up of Middle West Yard operations. However, once the Middle West Yard is fully operational, it is expected to create 40-50 permanent jobs. These job estimates only include direct railroad employees. Crew lodging and eating facilities would not be planned in the area, as it is expected that commercial facilities would be utilized. In addition, an increase in contract and support related jobs would be expected once the Middle West Yard is fully operational.

4.11.3.2.10 Hazardous Materials

The potential impacts resulting from hazardous materials would be similar to those discussed in Section 4.11.1.1.10.

4.11.3.2.11 Cultural Resources

The disturbance of cultural resources during the construction of the Middle West Yard would be likely due to the presence of a stream at the yard site. A survey of the proposed site would be required to determine if any cultural resource sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

4.11.3.3 West Staging and Marshaling Yard

4.11.3.3.1 Location

The West Staging and Marshaling Yard (West Yard) would be located in Crook County, and is southeast of Moorcroft. All facilities and West Yard operations would be located between mile post 563.0 and 568.0. The proposed West Yard would be 1,300 feet wide and 5 miles long, with a total area of approximately 787.9 acres.

4.11.3.3.2 Geology and Soils

The proposed West Yard site would cross soils that have a shallow bedrock layer and have low available water capacity. In addition, steep slope soils would be crossed that have a high potential for erosion. The soils at the West Yard would be disturbed during the construction phase, and could result in runoff and erosion. However, if proper erosion prevention measures would be incorporated, the degree of soil loss could be minimized. It is not known at this time how many facilities would be constructed at this site. Once a plan is developed for the West Yard, the impacts to soils would be easier to measure. During operations, the primary impact would be from run-off and erosion. This could increase erosion of adjacent soils unless proper drainage is provided.

4.11.3.3.3 Land Use

Agriculture

The development of the West Yard would affect approximately 175 acres of herbaceous grassland. Converting this site to an industrial facility would remove this land from grazing. However, the loss of this land would not be considered a significant impact as herbaceous grassland is abundant in the region.

BLM Lands

The proposed West Yard would parallel approximately one mile of BLM property.

The West Yard has the potential to impact BLM grazing allotments. If grazing allotments were reduced in size, the BLM would require mitigation to acquire the land needed to maintain the allotments. In addition, if cattle watering sites and trails were impacted by construction of the West Yard, mitigation would be required to maintain the needs of livestock.

4.11.3.3.4 Water Resources

Surface Water

The West Yard would cross approximately 13 intermittent streams. Impacts to these streams would be the same as discussed for the other yards.

Wetlands

There would be no wetlands located within the construction site for this yard.

Groundwater

The impacts to groundwater would be the same as discussed for the other yards.

4.11.3.3.5 Air

Impacts to air quality from the construction and operation of the West Yard under Alternative D would be similar to what is described in Section 4.11.1.2.6.

4.11.3.3.6 Noise

The impacts resulting from noise would be similar to what is discussed in Section 4.7.1.1.6.

4.11.3.3.7 Biological Resources

Vegetation

The vegetation at the West Yard is primarily herbaceous grassland. Riparian corridors are also present along the intermittent stream within the West Yards. Impacts to these plant communities would be the same as discussed for the other yards.

Big Game

The West Yard is used as yearlong range for pronghorn and mule deer. Impacts to big game would be the same as discussed for the other yards in Wyoming.

Non-Game Species

Impacts to non-game species would be similar to those discussed for the other yards.

Raptor

No raptor surveys have been completed for the proposed West Yard. It is assumed that raptors are using the riparian corridors along the intermittent streams. Raptors utilizing this

habitat within the project area have been exposed to noise and disturbance from the Burlington Northern Rail Line that Alternative D is paralleling. This ensures that impacts to raptors would be minimal, as the additional disturbance would not displace birds utilizing habitat in the project area.

Sensitive, Threatened, and Endangered Species

No surveys of threatened and endangered species or black-tailed prairie dogs have been completed for the proposed West Yard. If prairie dogs are present at the West Yard, it is assumed that mountain plovers and swift fox may also inhabit the project area. Any impacts to these species would be considered significant, and would require mitigation.

4.11.3.3.8 Transportation and Safety

The West Yard would cross Buffalo Creek Road which intersects with Route 16 on the north side of the BNSF right-of-way. Once the location of facilities is finalized, the impacts to transportation will be easier to determine. However, the impacts to transportation would be the same as discussed for the other yards.

4.11.3.3.9 Socioeconomic

The West Yard would employ 100 employees at the start of operations. Once the West Yard would be fully operational, the facility is expected to employ 300 employees. The West Yard would be expected to be a major rail staging facility, and would include maintenance and minor repair units. In addition, an increase in support related jobs and contract jobs to support the West Yard would be likely. Additional lodging and eating facilities could become established near the proposed West Yard site to provide convenient services to railroad workers. The potential increase in jobs and businesses could also provide additional tax revenues to the communities in the surrounding areas and the county.

4.11.3.3.10 Hazardous Materials

The potential impacts from hazardous material would be similar to what is discussed in Section 4.11.1.1.10.

4.11.3.3.11 Cultural Resources

The disturbance of cultural resources during the construction of the West Yard would be likely due to the number of streams that are located at the yard site. A survey of the proposed site would be required to determine if any cultural resource sites are present. Any sites identified would be addressed according to the Programmatic Agreement (Appendix J).

* * * * *

[THIS PAGE INTENTIONALLY LEFT BLANK]