

3.9 LAND USE, RECREATION, AND VISUAL RESOURCES

3.9.1 Introduction

The proposed Project would affect land use on or near the pipeline right-of-way (ROW) and in the locations of appurtenant facilities. Construction, operation, and maintenance would cause temporary and permanent impacts to land uses such as agriculture, rangeland, forestland, residential and planned development, commercial and industrial land, recreation and special interest areas, and visual resources.

3.9.2 Environmental Setting

3.9.2.1 Land Ownership

Steele City Segment

Most of the Project along the Steele City Segment would be on private land. Land ownership along the pipeline ROW is displayed in Table 3.9.2-1. Of the 850.7 miles of land that would be crossed by the pipeline within the segment, private land accounts for 767.7 miles (90.2 percent), state land accounts for 43.5 miles (5.1 percent), and federal land accounts for 42.4 miles (5.0 percent). The Steele City Segment would cross through 282.5 miles of Montana (33 percent), 314.1 miles of South Dakota (37 percent), and 254.1 miles of Nebraska.

TABLE 3.9.2-1 Ownership Crossed by the Proposed Project in Distance (Miles)					
	Federal	State	Private	Total	Percent of Total
Steele City Segment					
Montana	42.3	19.5	220.7	282.5	33%
South Dakota	0.1	21.1	292.9	314.1	37%
Nebraska	0.0	0.0	254.1	254.1	30%
<i>Segment Total</i>	<i>42.4</i>	<i>40.6</i>	<i>767.7</i>	<i>850.7</i>	<i>100%</i>
Gulf Coast Segment					
Oklahoma	0.0	2.1	153.3	155.4	32%
Texas	0.0	0.8	324.0	324.8	68%
<i>Segment Total</i>	<i>0.0</i>	<i>2.9</i>	<i>477.3</i>	<i>480.2</i>	<i>100%</i>
Houston Lateral					
Texas	-	-	48.6	48.6	100%
Project Total	42.4	43.5	1,293.6	1,379.5	100%

Source: Keystone 2009c.

Construction of the Project would affect a total of 22,494 acres, not including power lines, access roads, or construction camps (see Table 3.9.2-2). Private land would comprise 94.8 percent of the total, federal land 2.6 percent, and state land 2.6 percent. Of the land affected, 13,852 acres or 61.5 percent would be

in the Steele City Segment, 7,798 or 34.7 percent would be in the Gulf Coast Segment, and 2.9 percent would be in the Houston Lateral.

TABLE 3.9.2-2 Land Ownership Affected by Construction (Acres)					
	Federal	State	Private	Total	Percent of Total
Steele City Segment					
Montana	578.0	276.0	3,754.0	4,608.0	33%
South Dakota	1.0	306.0	4,758.0	5,065.0	37%
Nebraska	0.1	-	4,179.0	4,179.0	30%
<i>Segment Total</i>	<i>579.0</i>	<i>582.0</i>	<i>12,691.0</i>	<i>13,852.0</i>	<i>100%</i>
Cushing Extension					
Kansas	0.0	0.0	12.0	12.0	100%
Gulf Coast Segment					
Oklahoma	0.0	0.1	2,671.0	2,671.1	33%
Texas	0.0	0.1	5,307.0	5,307.1	67%
<i>Segment Total</i>	<i>0.0</i>	<i>0.2</i>	<i>7,978.0</i>	<i>7,978.2</i>	<i>100%</i>
Houston Lateral					
Texas	-	-	652.0	652.0	100%
Project Total	579.0	582.0	21,333.0	22,494.0	100%

Source: Keystone 2009c.

Note: Acreages do not include disturbance associated with power lines, access roads or construction camps so totals are less than those presented in Table 2.1.4-1.

Keystone Cushing Extension

Two new pump stations would be constructed along the previously permitted Cushing Extension of the Keystone Pipeline system to accommodate increased crude oil volumes associated with the Project. Approximately 12 acres of privately owned land in Kansas would be required for these two new pump stations.

Gulf Coast Segment

The Gulf Coast Segment would cross 480.2 miles in Oklahoma and Texas, 68 percent (326.5 miles) in Oklahoma and 32 percent (153.7 miles) in Texas. Nearly all of the land (477.3 miles) is in private ownership, and the remaining 2.9 miles is under state management. The Gulf Coast Segment would not cross any federally-owned land.

Houston Lateral

The Houston Lateral would cross 48.6 miles in Texas, all privately owned.

3.9.3 Land Use

Land use along the proposed pipeline route varies. As shown in Table 3.9.3-1, of the 853.5 miles that would be crossed in the Steele City Segment, 550.9 miles are rangelands, 268.7 miles are agricultural land, 16.1 miles are water/wetland, 9.7 miles are developed land and 8.1 miles are forest land.

The land use type for the pump stations in Kansas is agricultural land.

Within the Gulf Coast Segment (480.2 miles), 179.1 miles are rangelands, 152.6 miles are forest land, 57 miles are agricultural land, 56.2 miles are developed land, and 35.3 miles are water/wetlands.

Within the Houston Lateral (48.6 miles), 19.1 miles are rangelands, 17.7 miles are forest land, 6.9 miles are water/wetlands, 3.2 mile are agricultural land, and 1.7 miles are developed land.

	Developed	Agriculture	Rangeland	Forest¹	Water/ Wetland	Total
Steele City Segment						
Montana	2.9	70.9	203.3	0.9	4.5	282.5
South Dakota	2.9	82.5	222.9	3.6	5.0	316.9
Nebraska	3.9	115.3	124.7	3.6	6.6	254.1
<i>Segment Total</i>	<i>9.7</i>	<i>268.7</i>	<i>550.9</i>	<i>8.1</i>	<i>16.1</i>	<i>853.5</i>
Cushing Extension						
Kansas	0	<1	0	0	0	<1
Gulf Coast Segment						
Oklahoma ²	18.0	11.1	82.4	41.1	2.8	155.4
Texas ²	38.2	45.9	96.7	111.5	32.5	324.8
<i>Segment Total²</i>	<i>56.2</i>	<i>57.0</i>	<i>179.1</i>	<i>152.6</i>	<i>35.3</i>	<i>480.2</i>
Houston Lateral						
Texas	1.7	3.2	19.1	17.7	6.9	48.6
Project Total	67.6	328.9	749.1	175.7	58.3	1,379.6

¹ No groves or nurseries are crossed by the Project. Locations of forestland are identified by milepost in Appendix O.

² Includes pipeline ROW; additional temporary workspace areas; pipe storage, rail sidings, and contractor yards, and pump station/delivery facilities.

Note: Miles account for Keystone XL construction only and do not include disturbances from construction of new pump stations within the Keystone Cushing Extension. Workspace locations do not reflect environmental survey results. Discrepancies in totals are due to rounding.

Source: Keystone 2009c.

3.9.3.1 Construction

Types of land use along the construction ROW vary. As shown in Table 3.9.3-2, rangeland is the most common land type, accounting for 11,533 acres of the total land that would be affected during construction. Agricultural land accounts for 5,484 acres. Forestland accounts for 2,523 acres, developed land accounts for 945 acres, and water and wetlands make up the remaining 747 acres.

Construction would affect 13,851 acres of land in the Steele City Segment. Rangelands make up 8,719 acres, agriculture constitutes 4,631 acres, water and wetlands amount to 237 acres, developed land makes up 175 acres and forest land amounts to 89 acres.

There are 12 acres in Kansas associated with new pump station construction, all agricultural land.

Construction would affect 6,717 acres of land in the Gulf Coast Segment. Rangeland and forestland are the most common land uses within the segment, covering 2,547 acres and 2,198 acres, respectively. Agricultural land amounts to 798 acres, developed land accounts for 748 acres, and water and wetlands comprise 426 acres.

Construction would affect 652 acres in the Houston Lateral. The most common land uses are rangeland and forestland, covering 267 acres and 236 acres, respectively. The remaining land uses are water and wetlands accounting for 83 acres, agricultural makes up 43 acres, and developed lands account for 23 acres.

TABLE 3.9.3-2 Current Uses of Land Which Would be Affected by Construction (Acres)						
	Developed	Agriculture¹	Rangeland	Forest²	Water/ Wetland	Total³
Steele City Segment						
Montana	47	1,253	3,232	12	64	4,608
South Dakota	48	1,434	3,504	10	68	5,064
Nebraska	80	1,944	1,983	67	105	4,179
<i>Segment Total</i>	<i>175</i>	<i>4,631</i>	<i>8,719</i>	<i>89</i>	<i>237</i>	13,851
Cushing Extension						
Kansas	0	12	0	0	0	12
Gulf Coast Segment						
Oklahoma ³	230	160	1,178	598	40	2,206
Texas ³	518	638	1,369	1,600	386	4,511
<i>Segment Total³</i>	<i>748</i>	<i>798</i>	<i>2,547</i>	<i>2,198</i>	<i>426</i>	6,717
Houston Lateral						
Texas	23	43	267	236	83	652
Project Total	945	5,484	11,533	2,523	747	21,232⁴

¹ Includes land listed by the NRCS (2007) as potential prime farmland if adequate protections from flooding and adequate drainage are provided.

² No groves or nurseries are crossed by the Project. Locations of forestland are identified by milepost in Appendix O.

³ Includes pipeline ROW; additional temporary workspace areas; pipe storage, rail sidings, and contractor yards, and pump station/delivery facilities.

⁴ Additional areas of 465 acres and 796 acres are affected by construction in Oklahoma and Texas, respectively, for pipe storage sites, rail sidings, and contractor's yards. These acres have not been included in land use categories. These would be included after survey completion.

Note: Acreage does not include acres of disturbance associated with construction camps, access roads, or disturbance associated with power lines. Discrepancies in totals are due to rounding.

3.9.3.2 Operation

Operation of the Project would also affect land use. As shown in Table 3.9.4-3, rangeland would be the most common land use affected by operation of the Project, accounting for 4,698 acres. Agricultural land would account for 2,011 acres, forestland would account for 1,071 acres, developed land 465 acres, and water and wetlands would make up 368 acres.

Pipeline operation would affect 5,320 acres in the Steele City Segment. The most common land uses would be rangeland and agricultural land, accounting for 3,478 acres and 1,638 acres, respectively. The remaining affected land uses in the segment would be water and wetlands, developed, and forestland, accounting for 102, 66, and 36, acres respectively.

Operations of the Cushing Extension associated with the Project would impact about 12 acres of privately-owned land currently being used for agricultural purposes.

Operation of the Gulf Coast Segment would affect 2,987 acres of land. Rangeland and forestland are the most common uses, covering 1,104 and 930 acres respectively. Developed, agricultural, and water and wetlands would comprise the remaining uses at 388, 342, and 223 acres, respectively.

Operation of the Houston Lateral would affect 294 acres. The most common uses are rangeland and forestland, covering 116 and 105 acres, respectively. The remaining affected land uses are water and wetlands, agricultural and developed lands, accounting for 42, 19, and 12 acres, respectively.

	Developed	Agriculture¹	Rangeland	Forest²	Water/ Wetland	Total
Steele City Segment						
Montana	18	451	1,253	5	27	1,754
South Dakota	19	512	1,380	6	29	1,946
Nebraska	29	675	845	25	46	1,620
<i>Segment Total</i>	<i>66</i>	<i>1,638</i>	<i>3,478</i>	<i>36</i>	<i>102</i>	<i>5,320</i>
Cushing Extension						
Kansas	0	12	0	0	0	12
Gulf Coast Segment						
Oklahoma	120	70	508	256	21	975
Texas	268	272	596	674	202	2,012
<i>Segment Total</i>	<i>388</i>	<i>342</i>	<i>1,104</i>	<i>930</i>	<i>223</i>	<i>2,987</i>
Houston Lateral						
Texas	12	19	116	105	42	294
Project Total	465	2,011	4,698	1,071	368	8,613

¹ Includes land listed by the NRCS (2007) as potential prime farmland if adequate protection from flooding and adequate drainage is provided.

² Acreage does not include acres of disturbance associated with pipe storage/contractor yards or disturbance associated with power lines.

Source: Keystone 2009c.

Note: Discrepancies in totals are due to rounding.

3.9.3.3 Temporary and Permanent Access Roads

Keystone would access most of the construction ROW by public and existing private roads. Before construction would begin, Keystone would consult with state transportation agencies and would check road infrastructure such as bridges to determine if heavy loads could be handled. If infrastructure is insufficient to handle the project loads, Keystone would develop a plan to avoid or reinforce it. No improvement or maintenance is likely to be required for paved roads before or during construction, although because of high use, gravel and dirt roads may require maintenance during that time. Keystone would use private roads and temporary access roads only with permission of the affected landowner or management agency. In the event that oversized or overweight loads would be needed to transport construction materials to the Project work spreads, Keystone would submit required permit applications to the appropriate state regulatory agencies.

Construction of the Project would require the use of 918 acres for access roads (see Table 3.9.3-4) including 424 acres in the Steele City Segment, 432 acres in the Gulf Coast Segment, and 62 acres in the Houston Lateral. Project operations would require 124 acres for permanent access roads, including 31 acres in the Steele City Segment, 74 acres in the Gulf Coast Segment, and 19 acres in the Houston Lateral.

TABLE 3.9.3-4 Land Affected by Access Roads (Acres)		
	Construction (Temporary)	Operation (Permanent)
Steele City Segment		
Montana	265	22
South Dakota	103	9
Nebraska	56	-
<i>Steele City Subtotal</i>	<i>424</i>	<i>31</i>
Keystone Cushing Extension		
Kansas	-	-
Gulf Coast Segment		
Oklahoma	103	19
Texas	329	55
<i>Gulf Coast Subtotal</i>	<i>432</i>	<i>74</i>
Houston Lateral		
Texas	62	19
Project Total¹	918	124

¹ Acres of disturbances from temporary and permanent access roads are calculated based upon a 30-foot width.

Source: Keystone 2009c.

3.9.3.4 Agricultural Land, Rangeland and Prime Farmland

As shown in Tables 3.9.3-2 and 3.9.3-3, agricultural land and rangeland together make up 80 percent of the land that would be affected by Project construction and 78 percent of the land that would be affected by Project operation. For the overall Project construction is expected to affect 5,484 acres of agricultural

land and 11,533 acres of rangeland. Operation is expected to affect 2,011 acres of agricultural land and 4,698 acres of rangeland.

Prime farmland exists within several of the listed land use categories shown in Tables 3.9.3-2 and 3.9.3-3. Table 3.9.3-5 shows acreages affected by construction and operation of the Project by state. Construction would affect 6,495 acres of prime farmland and operation of the Project would affect 3,204 acres of prime farmland.

TABLE 3.9.3-5 Prime Farmland¹ Affected by the Project (Acres)		
	Construction¹	Operation
Steele City Segment		
Montana	1,294	549
South Dakota	1,935	863
Nebraska	518	307
<i>Segment Total</i>	<i>3,747</i>	<i>1,719</i>
Cushing Extension		
Kansas	10	10
Gulf Coast Segment		
Oklahoma	434	842
Texas	1,858	434
<i>Segment Total</i>	<i>2,292</i>	<i>1,276</i>
Houston Lateral		
Texas	446	199
Project Total	6,495	3,204

¹ Includes land listed by the NRCS (2007) as potential prime farmland if adequate protection from flooding and adequate drainage is provided.

² Acreage does not include land disturbance associated with pipe storage/contractor yards or that associated with power lines.
Source: Keystone 2009c.

3.9.3.5 Crop Types in Affected Areas

Crops grown along the Project route vary somewhat by state, but are typical of those in the Great Plains, Heartland, and Prairie regions of the country. As shown in Table 3.9.3-6, the principal crops include wheat, hay, barley, corn, soybeans, and sorghum.

TABLE 3.9.3-6 Acreages of Largest Crops Grown in Project Area, 2008		
State	Crop	Harvested Acres (1,000)
Steele City Segment		
Montana	Wheat, All	5,470
	Hay, All	2,400
	Barley, All	740
	<i>Total Principal Crops</i>	<i>8,757</i>

**TABLE 3.9.3-6
Acreages of Largest Crops Grown in Project Area, 2008**

State	Crop	Harvested Acres (1,000)
South Dakota	Corn For Grain	4,400
	Soybeans	4,060
	Wheat All	3,420
	Hay, All	3,850
	<i>Total Principal Crops</i>	<i>16,715</i>
Nebraska	Corn For Grain	8,550
	Soybeans	4,860
	Hay, All	2,570
	Wheat, All	1,670
	<i>Total Principal Crops</i>	<i>18,231</i>
Gulf Coast Segment and Houston Lateral		
Kansas	Wheat, All	8,900
	Corn For Grain	3,630
	Soybeans	3,250
	Hay, All	2,750
	Sorghum for Grain	2,750
	<i>Total Principal Crops</i>	<i>21,577</i>
Oklahoma	Wheat, All	4,500
	Hay, All	2,910
	Soybeans	360
	Corn For Grain	320
	<i>Total Principal Crops</i>	<i>8,090</i>
Texas	Hay, All	4,430
	Cotton, Upland	3,400
	Wheat, All	3,300
	Sorghum For Grain	3,050
	<i>Total Principal Crops</i>	<i>17,066</i>

Source: USDA National Agricultural Statistics Service (NASS) Quick Stats, accessed June 22, 2009.

3.9.3.6 Conservation Programs

USFWS Wetland Easements are areas which have permanent protection from conversion of natural land cover. It also grants federally listed endangered or threatened species protection through out the area. The easement protects the predominate areas while allowing for localized, low-intensity, or broad extraction of natural resources (e.g., logging or mining).

The Natural Resources Conservation Service (NRCS) and Farmland Services Agency (FSA) of the USDA manage various types of government land conservation, cost-sharing, and financial programs. Among the most popular NRCS programs are the Wetland Reserve Program (WRP), Farm and Ranchland Protection Program (FRPP), and Wildlife Habitat Incentives Program (WHIP). Similar to USFWS easements, these areas have long-term or permanent protection for areas the landowner has restored to

natural land cover type with NRCS funding assistance. Precise location information was not available, but more general information by state was provided by the agency (Keystone 2008).

Among the most popular FSA programs are the Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), Farmable Wetlands Program (FWP) and the Emergency Conservation Program (ECP). The CRP is one of the largest conservation programs in the country. Under it, landowners with CRP contracts are provided rental payments and cost sharing to develop long-run resource-conserving vegetative covers on eligible farmland. The program goals are the reduction of erosion, improvement of water quality, enhancement of forest and wetlands resources, and establishment of wildlife habitat. Landowners are encouraged to plant grasses, trees, and other vegetation on highly-erodible cropland.

Table 3.9.3-7 lists the conservation easements that would be crossed by the Project by state. Within the Steele City Segment of the pipeline corridor numerous tracts of land may be partially or entirely enrolled in the CRP. There are no CRP tracts in either the Gulf Coast Segment or Houston Lateral. The full listing of affected tracts in the Steele City Segment may be found in Appendix K, Conservation Reserve Program Facilities. The tracts extend from MP 4.21 in Montana to MP 849.64 in Nebraska.

TABLE 3.9.3-7 USFWS, NRCS and Other Easements Crossed by the Project		
Easements	Approximate Mileposts	Miles Crossed
Montana		
Cornwell Ranch Conservation Easement (FWP)	49 and 70	3.0
Philips County USFWS Wetland Easement	4.2 - 5.0	0.8
CRP Contract Land (consists of 39 easements)	Multiple	33.7
South Dakota		
Wetlands of America Trust, Inc	799	0.7
CRP Contract Land (consists of 39 easements)	Multiple	10.6
Nebraska		
CRP Contract Land (consists of 27 easements)	Multiple	6.4
Oklahoma		
WRP Contract Land (consists of 1 easement)	Near 130	0.02
Texas		
WRP Contract Land (consists of 2 easements)*	Near 165	0.2
<i>*to be crossed using HDD to avoid impacts</i>		

Source: Keystone 2009c.

3.9.3.7 Forest Land

Forestland in the Steele City Segment, Gulf Coast Segment, and Houston Lateral would be affected by the Project. As shown in Table 3.9.3-8, a total of 7.5 miles of the Project would affect forestland in the Steele City Segment from MP 25.7 to MP 849.5. A total of 176.1 miles of the Project would affect forestland in the Gulf Coast Segment from MP 0.7 to MP 480.2. A total of 2.95 miles of the Project would affect forestland in the Houston Lateral from MP 0.0 to MP 40.8. A total of 186.55 miles of the Project would affect forestland across all segments (Keystone 2009a).

TABLE 3.9.3-8 Forestland Along Project Route (Miles)		
	Miles Crossed	Mileposts
Steele City Segment		
Montana	1.2	25.7 to 229.6
South Dakota	1.4	399.5 to 595.7
Nebraska	4.9	599.7 to 849.5
<i>Segment Total</i>	7.5	
Cushing Extension		
Kansas	0	--
Gulf Coast Segment		
Oklahoma	42.4	0.7 to 155.4
Texas	133.7	155.4 to 480.2
<i>Segment Total</i>	176.1	
Houston Lateral		
Texas	2.95	0 to 40.8
Project Total	186.55	

Source: Keystone 2009c.

Distances crossed reflect the sum of the actual distance within the referenced mileposts.

Note: Totals were rounded to the nearest 1/10 of a mile. Values less than 1/10 of a mile, but greater than zero, were rounded to 1/20 of a mile.

The acreages of forestland affected by the construction and operation of the Project by state are shown in Table 3.9.3-9. Construction would affect 2,523 acres of forestland and operation of the Project would affect 1,071 acres of forestland.

TABLE 3.9.3-9 Forestland Affected by the Project (Acres)		
	Construction¹	Operation
Steele City Segment		
Montana	12	5
South Dakota	10	6
Nebraska	67	25
<i>Segment Total</i>	89	36
Cushing Extension		
Kansas	-	-
Gulf Coast Segment		
Oklahoma	598	256
Texas	1,600	674
<i>Segment Total</i>	2,198	930
Houston Lateral		
Texas	236	105
Project Total	2,523	1,071

¹ Acreage does not include acres of disturbance associated with pipe storage/contractor yards or disturbance associated with power lines.

Note: Discrepancies in totals are due to rounding.

3.9.3.8 Water and Wetlands

Construction of the Project would affect 747 acres of water and wetlands and operation of the Project would affect a total of 367 acres of water and wetlands, as shown by state in Table 3.9.3-10.

During construction, 237 acres would be affected within the Steele City Segment, 426 acres would be affected within the Gulf Coast Segment, and 83 acres of water and wetlands would be affected within the Houston Lateral. During operations, 102 acres would be affected within the Steele City Segment, 223 acres would be affected within the Gulf Coast Segment, and 42 acres would be affected within the Houston Lateral.

TABLE 3.9.3-10 Water and Wetlands Affected by the Project (Acres)		
	Construction¹	Operation
Steele City Segment		
Montana	64	27
South Dakota	68	29
Nebraska	105	46
<i>Segment Total</i>	<i>237</i>	<i>102</i>
Cushing Extension		
Kansas	-	-
Gulf Coast Segment		
Oklahoma	40	21
Texas	386	202
<i>Segment Total</i>	<i>426</i>	<i>223</i>
Houston Lateral Segment		
Texas	83	42
Project Total	747	367

Source: Keystone 2009a.

¹ Total acres affected by construction in Oklahoma and Texas include 465 acres and 196 acres, respectively, of pipe storage sites, rail sidings, and contractors yards that are not included in land use categories. Acres do not include disturbances associated with power lines, access roads, or construction camps.

Based on aerial photo interpretation, NWI map review, and 2008 and 2009 field survey results, approximately five percent of total construction disturbance associated with the Project by mile would occur in wetlands. Wetland easements that would be crossed by the Project are shown in Table 3.9.3-7.

Construction of the proposed pipeline would cross several waterbodies. Table 3.9.3-11 lists the number of waterbody crossings that would occur along the Project by state. The table also provides the type of waterbodies that would be crossed. A total of 1,926 waterbody crossings would occur along the entire Project route. The Steele City Segment would cross 905 waterbodies, the Gulf Coast Segment would cross 1,001 waterbodies, and the Houston Lateral would cross 20 waterbodies.

TABLE 3.9.3-11 Waterbody Crossings								
	Perennial Rivers or Streams	Intermittent Streams	Ephemeral Streams	Natural Ponds	Canals	Reservoirs	Other¹	Total
Steele City Segment								
Montana	20	107	243	--	15	4	--	389
South Dakota	15	125	206	4		5	--	355
Nebraska	21	52	75	1	9	3	--	161
<i>Segment Total</i>	<i>54</i>	<i>284</i>	<i>524</i>	<i>5</i>	<i>24</i>	<i>12</i>	<i>0</i>	<i>905</i>
Keystone Cushing Extension								
Kansas	--	--	--	--	--	--	--	--
Gulf Coast Segment								
Oklahoma	83	137	136	--	--	--	12	368
Texas	199	198	215	--	9	--	12	633
<i>Segment Total</i>	<i>282</i>	<i>335</i>	<i>351</i>	<i>0</i>	<i>9</i>	<i>0</i>	<i>24</i>	<i>1,001</i>
Houston Lateral								
Texas	5	2	8		3	--	2	20
Total	341	621	883	5	36	12	26	1,926

¹ Artificial water paths, seasonal water, and unclassified waterbodies.

3.9.3.9 Developed Land – Residential/Commercial/Industrial

Construction of the Project would affect 946 acres of developed land along the Project route as shown by state in Table 3.9.3-12. This includes 175 acres within the Steele City Segment, 748 acres within the Gulf Coast Segment, and 23 acres within the Houston Lateral.

TABLE 3.9.3-12 Developed Land Affected by the Project (Acres)		
	Construction	Operations
Steele City Segment		
Montana	47	18
South Dakota	48	19
Nebraska	80	29
<i>Segment Total</i>	<i>175</i>	<i>66</i>
Cushing Extension		
Kansas	0	0
Gulf Coast Segment		
Oklahoma	230	120
Texas	518	268
<i>Segment Total</i>	<i>748</i>	<i>388</i>
Houston Lateral		
Texas	23	12
Project Total	946	466

¹ Acreage does not include acres of disturbance associated with pipe storage/contractor yards or disturbance associated with power lines.

Note: Discrepancies in totals are due to rounding.

Operation of the Project would affect 466 acres of developed land along the Project route. This includes 66 acres within the Steele City Segment, 388 acres within the Gulf Coast Segment, and 12 acres within the Houston Lateral.

Keystone surveyed the Project area to discern the number of buildings within 25 feet and within 500 feet of the construction ROW. The results are shown in Table 3.9.3-13. Approximately 167 structures are within 25 feet of the ROW, including 58 in the Steele City Segment, 100 in the Gulf Coast Segment, and 9 in the Houston Lateral. The approximate number of structures within 500 feet of the construction ROW is 2,014, with 726 in the Steele City Segment, 1,190 in the Gulf Coast Segment, and 98 in the Houston Lateral. At the new pump station locations in Kansas, no structures occur within 500 feet of the construction ROW.

TABLE 3.9.3-13		
Number of Structures Within 25 and 500 Feet of Construction ROW		
	Within 25 feet of the ROW	Within 500 feet of the ROW
Steele City Segment		
Montana	17	141
South Dakota	12	126
Nebraska	14	218
<i>Segment Total</i>	43	485
Cushing Extension		
Kansas	0	0
Gulf Coast Segment		
Oklahoma	26	415
Texas	71	1,548
<i>Segment Total</i>	97	1,963
Houston Lateral		
Texas	11	100
Project Total	151	2,548

Source: Keystone 2009c.

Note: Excludes swimming pools, above and below ground, power poles, groundwater wells, and baseball fields.

The types of structures within 25 feet and 500 feet of the construction ROW are shown in Table 3.9.3-14.

TABLE 3.9.3-14				
Types of Structures Within 25 and 500 Feet of the Construction ROW				
Type of Structure	Within 25 feet of the ROW	Percent of Total	Within 500 feet of the ROW	Percent of Total
Barn	40	26.5%	203	0.52%
Building	5	3.3%	8	0.31%
Cabin	1	0.7%	1	0.0%
Camp Hut	-	0.0%	1	0.0%
Church	1	0.7%	-	0.0%

**TABLE 3.9.3-14
Types of Structures Within 25 and 500 Feet of the Construction ROW**

Type of Structure	Within 25 feet of the ROW	Percent of Total	Within 500 feet of the ROW	Percent of Total
Commercial Building	2	1.3%	72	2.8%
Commercial Structure	3	2.5%	11	0.4%
Garage	2	1.3%	13	0.5%
Home/Residence*	41	27.2%	763	29.9%
Hunting Lodge	1	0.7%	1	0.0%
Industrial	1	0.7%	5	0.2%
Other	45	12.4%	1185	46.5%
Out-Building	2	1.3%	165	6.48%
Public Assembly	-	0.0%	1	0.0%
School	-	0.0%	1	0.0%
Shelter	1	0.7%	-	0.0%
Storage Building	4	2.6%	118	4.63%
Storm Shelter**	2	1.3%	-	0.0%
Project Total	151	100.0%	2,548	100.0%

*Includes mobile homes and homes with swimming pools.

**Above and below ground combined.

Source: Keystone 2009c.

3.9.4 Recreation and Special Interest Areas

The Project would cross several recreation and special interest areas in Montana, South Dakota, and Oklahoma as shown in Table 3.9.4-1. Recreational and special interest areas include state or federal public lands, important recreational waterbodies, state and national parks, state and national forests, national historic trails, wildlife management areas, and wildlife refuges. The Project would not cross any national parks or forests, but would cross six national historic trails.

The Project would cross a total of 61.8 miles of recreational and special interest areas in Montana, including 19.2 miles of Montana State Trust Lands, 42 miles of BLM land, 0.2 miles of navigable water (classified in Montana as recreational areas), and 0.4 miles of U.S. Department of Defense land. The proposed Project would pass within 2 miles of the Bear Creek recreational area in Montana. The Project would cross a total of 21.6 miles of recreation and special interest areas in South Dakota, including 0.3 miles of waterbodies (classified in South Dakota as recreational areas), and 21.3 miles of state school land. In southeastern Oklahoma the Project would cross the Western Ouachita region, a popular destination for recreationists (Keystone 2008).

The field offices under BLM’s jurisdiction are required to manage public lands according to the resource management plans for the Big Dry (April 1996), the Powder River (March 1985), and the Judith Valley Phillips Plan (*in* Keystone 2009c). The BLM lands are primarily composed of grasslands leased to farmers with livestock. Construction and operation of the Project would be consistent with the agreements in place, according to the management plans and current land uses.

TABLE 3.9.4-1 Recreation and Special Interest Areas Crossed by the Project		
State	Name / Ownership	Miles Crossed
Steele City Segment		
Montana	Montana State Trust Lands (consists of 25 parcels)	19.2
	BLM (consists of 50 parcels)	42
	Missouri River (MP 88.9); Yellowstone River (MP 196.0)	0.2
	US Dept of Defense	0.4
	Lewis and Clark National Historic Trail	<1
South Dakota	Spring Creek (MP 346.8); Cheyenne River (MP 425.6); Sarah Larabee Creek (MP 464.8)	0.3
	State School Land	21.3
Nebraska	Bureau of Reclamation - canal	0.1
	Mormon Pioneer National Historic Trail	<1
	Pony Express National Historic Trail	<1
	California National Historic Trail	<1
	Oregon National Historic Trail	<1
<i>Segment Total</i>		<i>83.5</i>
Keystone Cushing Extension		
Kansas	--	--
Gulf Coast Segment		
Oklahoma	Deep Fork Wildlife Management Area - Oklahoma Department of Wildlife Conservation	1.2
	Western Ouachita Region	--
Texas	El Camino Real de los Tejas National Historic Trail	<1
Houston Lateral		
Texas	--	--
Project Total		84.7

Source: Keystone 2008.

For information on waterbodies that support recreational and commercial fisheries, see Section 3.7.

3.9.5 Visual Resources

Visual resources are landscape characteristics which have an aesthetic value to residents and visitors from sensitive viewpoints such as residences, recreation areas, rivers, and highways. Characteristics include the aesthetics of natural and developed landscapes, and are considered an element of land use on federally managed lands. Other than in Montana, there are no formal guidelines for managing visual resources for private or state owned lands (Keystone 2008).

Construction and operation of the Project would have some visual impacts, although most would be temporary. Such impacts would be associated with construction ROW; additional temporary workspace; clearing and removal of existing vegetation; exposure of bare soils; earthwork and grading scars; trenching; rock formation alteration; machinery and pipe storage; new aboveground structures; and various landform changes. Visual impacts associated with construction would be of limited duration.

BLM is responsible for identifying and protecting scenic values on BLM administered public lands. The Visual Resource Management (VRM) system was developed by BLM to assist in the identification and protection of scenic lands in a systematic and interdisciplinary manner. The VRM system uses several aesthetic value classes to define the rehabilitation objective when landscapes are altered. The system classifies resources based on scenic quality, viewer sensitivity to visual change, and viewing distance. The system includes four classes. The class I objective is to preserve the existing character of the landscape, including the natural ecological qualities. Some very limited management activity is permitted. The class II objective is also to preserve the existing character of the landscape and to keep landscape changes at a minimum. Landscape changes should reflect the ambient colors, textures, and form of the surrounding features. The class III objective is to keep landscape changes moderate and retain some portion of the existing character of the landscape. Management activities should not attract much attention or dominate the view. Landscape changes should reflect the basic features found in the landscape character. The class IV objective is to allow management activities that require major alterations in the existing character of the landscape. The view may be dominated by management activities. However, the location, disturbance, and blending with the surrounding landscape should be minimized (Keystone 2008).

3.9.6 Right-of-Way Acquisition Process

The Project would require the acquisition of temporary and permanent easements with landowners along the pipeline ROW. Pipeline construction would require temporary workspaces which would necessitate the negotiation of temporary ROW easements. Operation and maintenance of the pipeline and ancillary facilities would require permanent ROW easements for the expected 50 year life of the Project. Keystone would provide monetary compensation to landowners who grant easements for the Project to cover the loss of use of the land during construction, loss of crops, loss of nonrenewable or other resources, lost use of private roads, and the long term use associated with Project operation and maintenance. Keystone would also restore land or compensate landowners for any unavoidable construction-related damage to property. For some areas such as water crossings, road/railroad crossings, steep or rocky slopes, additional temporary workspaces may be needed. Keystone would also purchase some sites in fee for certain aboveground facilities.

3.9.7 Potential Impacts and Mitigation

Keystone has committed to measures that would reduce Project impacts. These measures are described in the Project CMR Plan (Appendix B). The CMR Plan, broadly, includes such general conditions as worksite appearance, noise control, and dust control. The CMR plan includes specific conditions for construction within agricultural, forest, pasture, range, and grass lands; drain tile systems; and wetland crossings; waterbodies and riparian lands. As noted in the CMR Plan, Keystone may deviate from specific requirements of the plan based on agreements with landowners and land managers. In all cases Keystone would comply with the conditions of applicable federal, state, and local permits.

Construction of the pipeline would involve several key land use issues and impacts, including:

- Lease or acquisition and development of the pipeline ROW and land for appurtenant facilities.
- Possible damage to agricultural features such as irrigation systems or drain tiles.
- Temporary loss of the agricultural productivity of the land.

- Potential visual impacts attributable to removal of existing vegetation and visibility of exposed soil.
- Increased dust and noise to neighboring residential and commercial areas.

Duration of construction would impact land uses. Keystone plans to construct the pipeline in 17 separate “spreads.” The company anticipates concurrent construction activity on the spreads within each segment (Keystone 2008). It is anticipated that each spread would require from six to eight months for construction and that all pump stations would be completed in 18 to 24 months.

Acreage required for construction and operation of the Project would impact land uses. Keystone would require a 110-foot-wide construction ROW for installation of the 36-inch diameter pipeline, including a 60-foot temporary easement and a 50-foot permanent easement (Keystone 2008). The construction ROW width would be reduced to 85 feet in some areas, which may include wetlands, cultural sites, and residential and commercial/industrial areas. Table 3.9.7-1 provides estimates of the total acreage of land impacted during construction of the Project as well as estimates by Project segment and by state. Total Project land use is estimated to be 23,768 acres¹. Pipeline ROW is estimated at 17,567 acres, pipe and contractor yards at 2,891 acres, additional temporary workspace areas at 1,164 acres, access roads at 918 acres, lateral ROW at 652 acres, and the remaining 576 acres for construction camps, pump stations/delivery facilities, and tank farm.

Changes in land use due to construction are generally expected to be temporary. Temporary land use issues include loss of agricultural productivity, potential damage to drain tiles (see Section 3.9.9) or other irrigation systems, visual impacts from the removal of vegetation within the ROW, and increased noise and dust. Existing commercial or industrial sites with public or private road access would be used when practical and all temporary workspaces would be restored to preconstruction levels (Keystone 2008). All disturbed acreage, other than 368 acres of permanent ROW that would be used for such aboveground facilities as pump stations and valves, would be returned to its previous aboveground use.

Temporary and permanent changes in vegetation due to the clearing of trees and shrubs, pipeline excavation, and general construction activity are expected in the ROW preparation process. It is estimated that disturbed pastures, croplands, and grassy rangelands may take one to five years to recover to preconstruction levels. Depending on the species and age, herbaceous vegetation, low shrubs, and forestlands are estimated to take 1 to 5 years, 5 to 15 years, and 20 or more years to recover, respectively (Keystone 2008). Keystone would periodically inspect the entire pipeline, which would require occasional removal of woody vegetation and of trees from the permanent easement. Landowners would be permitted to cultivate crops in the permanent easement.

¹ This total number of acres varies from the total provided in Table 3.9.1-1 (21,232 acres) since it includes: pipe storage, rail, and contractor yards in Oklahoma (≈ 465 acres) and Texas (≈ 796 acres); access roads (≈ 918 acres); construction camps (≈ 320 acres); and the tank farm (≈ 50 acres). Variations between the two numbers also result from mathematical rounding.

**TABLE 3.9.7-1
Summary of Land Affected During Construction¹ (Acres)**

	Pipeline ROW	Lateral ROW	Additional Temporary Workspace Areas ⁶	Pipe Stockpile Sites, Rail Sidings, and Contractor Yards	Constr. Camps	Pump Stations Delivery Facilities	Access Roads ⁷	Tank Farm	Subtotal
Steele City Segment									
Montana	3,767		278	521	160	42	265		5,033
South Dakota	4,188		255	579	160	42	103		5,327
Nebraska	3,388		186	525	-	30	56	50	4,235
<i>Segment Subtotal^{3,5}</i>	<i>11,343</i>	<i>-</i>	<i>719</i>	<i>1,625</i>	<i>320</i>	<i>114</i>	<i>424</i>	<i>50</i>	<i>14,595</i>
Keystone Cushing Extension⁵									
Kansas ^{3,4,5}	-		-	-	-	12	-	-	12
Gulf Coast Segment									
Oklahoma	2,044		130	465	-	32	103	-	2,774
Texas	4,180		283	796	-	48	329	-	5,636
<i>Segment Subtotal³</i>	<i>6,224</i>	<i>-</i>	<i>413</i>	<i>1,261</i>	<i>-</i>	<i>80</i>	<i>432</i>	<i>-</i>	<i>8,410</i>
Houston Lateral									
Texas		652	32	5	-	-	62	-	751
Project Total^{3,4,5,6}	17,567	652	1,164	2,891	320	206	918	50	23,768

¹ Disturbance is based on a total of 110-foot construction ROW for a 36-inch diameter pipe, except in certain wetlands, cultural sites, shelterbelts, residential areas, and commercial/industrial areas where an 85-foot construction ROW would be used, or in areas requiring extra width for workspace necessitated by site conditions. Disturbance also includes pipe stock piles, contractor yards, and construction camps.

² Operational acreage was estimated based on a 50-foot permanent ROW in all areas. All pigging facilities would be located within either pump stations or delivery facility sites. Intermediate mainline valves and densitometers would be constructed within the construction easement and operated within a 50-foot by 50-foot area or 50 foot x 66 foot area, respectively, within the permanently maintained 50-foot ROW. Other mainline valves, check valves and block valves, and meters would be located within the area associated with a pump station, delivery site or permanent ROW. Consequently, the acres of disturbance for these aboveground facilities are captured within the Pipeline ROW and Pump Station/Delivery Facilities categories within the table.

³ Discrepancies in total acreages are due to rounding.

⁴ Disturbance associated with the Keystone Cushing Extension in this table is for the two new pump stations to be constructed for this Project. For discussion of previously permitted disturbance associated with the construction of the Keystone Cushing Extension see TransCanada (2006).

⁵ Includes disturbances associated with construction of the Steele City Segment, the Gulf Coast Segment, and the Houston Lateral. This total includes 12 acres associated with construction and operation of new pump stations along the Keystone Cushing Extension.

⁶ Includes staging areas of approximately 5 acres. Does not include the potential for extended additional TWAs necessary for construction in rough terrain or in unstable soils. These locations are currently undergoing identification and analysis. Potential disturbance associated with these areas would be included in supplemental filings when these additional temporary work spaces are identified.

⁷ Access roads temporary and permanent disturbances are based on a 30-foot width; all non-public roads are conservatively estimated to require upgrades and maintenance during construction.

Source: Keystone 2009c, Table 2.1-3, in which total land affected by the Project is shown as 23,768 acres.

Table 3.9.7-2 provides estimates of the total acreage of land impacted during operation of the Project as well as estimates by Project segment and by state. Total Project land use during operations is estimated to

be 8,737 acres². Pipeline ROW is estimated at 8,063 acres, access roads at 124 acres, lateral ROW at 294 acres, and the remaining 256 acres for pump stations/delivery facilities, and tank farm.

TABLE 3.9.7-2 Summary of Land Affected During Operation¹ (Acres)						
	Pipeline ROW	Lateral ROW	Pump Stations Delivery Facilities	Access Roads⁷	Tank Farm	Subtotal
Steele City Segment						
Montana	1,712		42	22	-	1,776
South Dakota	1,904		42	9	-	1,955
Nebraska	1,540		30	-	50	1,620
<i>Steele City Subtotal^{3,5}</i>	<i>5,156</i>	<i>-</i>	<i>114</i>	<i>31</i>	<i>50</i>	<i>5,351</i>
Keystone Cushing Extension⁵						
Kansas ^{3,4,5}	-		12	-		12
Gulf Coast Segment						
Oklahoma	942		32	19	-	993
Texas	1,965	-	48	55	-	2,068
<i>Gulf Coast Subtotal³</i>	<i>2,907</i>	<i>-</i>	<i>80</i>	<i>74</i>	<i>-</i>	<i>3,061</i>
Houston Lateral						
Texas	-	294	-	19		313
Project Total^{3,4,5,6}	8,063	294	206	124	50	8,737

¹ Disturbance is based on a total of 110-foot construction ROW for a 36-inch diameter pipe, except in certain wetlands, cultural sites, shelterbelts, residential areas, and commercial/industrial areas where an 85-foot construction ROW would be used, or in areas requiring extra width for workspace necessitated by site conditions. Disturbance also includes pipe stock piles, contractor yards, and construction camps.

² Operational acreage was estimated based on a 50-foot permanent ROW in all areas. All pigging facilities would be located within either pump stations or delivery facility sites. Intermediate mainline valves and densitometers would be constructed within the construction easement and operated within a 50-foot by 50-foot area or 50 foot x 66 foot area, respectively, within the permanently maintained 50-foot ROW. Other mainline valves, check valves and block valves, and meters would be located within the area associated with a pump station, delivery site or permanent ROW. Consequently, the acres of disturbance for these aboveground facilities are captured within the Pipeline ROW and Pump Station/Delivery Facilities categories within the table.

³ Discrepancies in total acreages are due to rounding.

⁴ Disturbance associated with the Keystone Cushing Extension in this table is for the two new pump stations to be constructed for this Project. For discussion of previously permitted disturbance associated with the construction of the Keystone Cushing Extension see TransCanada (2006).

⁵ Includes disturbances associated with construction of the Steele City Segment, the Gulf Coast Segment, and the Houston Lateral. This total includes 12 acres associated with construction and operation of new pump stations along the Keystone Cushing Extension.

⁶ Includes staging areas of approximately 5 acres. Does not include the potential for extended additional TWAs necessary for construction in rough terrain or in unstable soils. These locations are currently undergoing identification and analysis. Potential disturbance associated with these areas would be included in supplemental filings when these additional temporary work spaces are identified.

⁷ Access roads temporary and permanent disturbances are based on a 30-foot width; all non-public roads are conservatively estimated to require upgrades and maintenance during construction.

Source: Keystone 2009c, Table 2.1-3, in which total land affected by the Project is shown as 8,737 acres.

² This total number of acres varies from the total provided in Table 3.9.1-1 (21,232 acres) since it includes: pipe storage, rail, and contractor yards in Oklahoma (~465 acres) and Texas (~796 acres); access roads (~918 acres); construction camps (~320 acres); and the tank farm (~50 acres). Variations between the two numbers also result from mathematical rounding.

3.9.7.1 Agricultural Land and Rangeland

Construction may have varied adverse impacts on agricultural land and rangeland and result in reduced land productivity and crop loss. The Project would require clearing of vegetation and obstacles along the pipeline ROW.

Agricultural Land

On agricultural land where crops are present, crops would be disked or mowed to ground level to provide clear, safe, and efficient access for construction. In agricultural areas with timber shelterbelts within the construction ROW, Keystone would only remove the minimum necessary to construct the pipeline.

Construction and operation of the pipeline may also have other physical impacts on agricultural land, including impacts to:

- Soil profiles;
- Irrigation systems; and
- Drainage systems.

Impacts to soil profiles could include topsoil degradation, soil compaction, and rock introduction or redistribution. The CMR plan commits Keystone to measures that would protect the soil profile. These include: segregating the upper 12 inches of topsoil during construction and replacing it during site restoration; utilizing soil ripping or chiselling to alleviate soil compaction and return the soil to pre-construction conditions; ploughing wood chips, manure, or other organic matter into the soil to further enhance soil aeration, if required; removing excess rock that is greater than 3 inches in diameter from the top 12 inches of soil in all active agricultural fields, pastures, hayfields, and residential areas.

Irrigation systems such as ditches, flood, pivots, wheels, or other types may be impacted by construction of the Project. If pipeline construction crosses active irrigation ditches, they would not be stopped or obstructed except during the typical one day or less time period needed to install the pipeline beneath the ditch.

Construction activities may also damage drain tiles, fences, or farm terraces during construction. Keystone would repair or restore drain tiles, repair fences either using original material or high quality new material, and restore farm terraces to their preconstruction functions.

Construction may cause the loss of crops or forage on affected lands. Other than the typical disturbances associated with annual planting operations, there would be minimal changes to agricultural areas because they would be allowed to revegetate with a similar preconstruction plant cover (Keystone 2008). Landowners would be compensated for any crop or forage loss.

Rangeland

Impacts to rangeland could include:

- Loss of forage;
- Livestock harassment or injury; and
- Fence damage or removal.

The CMR plan (Appendix B) includes measures that Keystone would implement to reduce these potential impacts. These include: restoring disturbed areas with custom seed mixes (approved by landowners and land managers) to match the native foliage; providing access to rangeland when practicable; installing temporary fences with gates around construction areas to prevent injury to livestock or workers; leaving hard plugs (short lengths of unexcavated trench) or installing soft plugs (areas where the trench is excavated and replaced with minimal compaction) to allow livestock and wildlife to cross the trench safely; removing litter, garbage, and any pipeline shavings at the end of each construction day, to protect livestock and wildlife from accidental ingestion; prohibiting construction personnel from feeding or harassing livestock; prohibiting construction personnel from carrying firearms or pets into the construction area; securing rangeland fences to prevent drooping; closing any openings in the fence at the end of each day to prevent livestock escape; maintaining all existing improvements such as fences, gates, irrigation ditches, cattle guards, and reservoirs to the degree practicable; and returning any damaged improvements to at least their condition prior to construction.

Compensation

Keystone presumes that production on all areas disturbed during construction would be temporarily lost. Agricultural lands would become productive during the next planting season, while rangelands would be productive after reclamation is successful. In its CMR plan, Keystone commits to compensate landowners for any demonstrated decreases in land productivity resulting from Project-related soil degradation. Further, Keystone would compensate land owners for yields less than those on unaffected lands where lesser yields would result from Project impacts. Compensation for crop losses would be based on the types of crop planted or planned specific to the impacted land. Crop values would be assessed based on values of those crops in the specific area as well as local crop prices at grain elevators. Keystone would compensate landowners for crop loss effects over three years. During the year of construction, 100 percent of calculated losses would be compensated. In the second year 75 percent would be compensated and during the third year 50 percent would be compensated. If landowners demonstrate that crop losses persist beyond three years, Keystone would provide further compensation.

3.9.7.2 Conservation Programs

Pipeline construction and operation should have no effect on landowners' participation in CRP. Affected landowners would be required to contact their local FSA offices. FSA would require that landowners, prior to pipeline construction, notify the FSA of the planned construction activities; and commit to restoring their land to its pre-construction condition (M. Braun, pers. comm. 2009). In doing so, land owners should not lose their eligibility for participation in the CRP. Keystone has indicated that cleanup shall occur immediately after backfill operations, assuming favorable weather and seasonal conditions. Should CRP participants be required to leave the program because of the Project, they would be compensated. Compensation would be for any lost CRP payments, including retroactive forfeit payments.

3.9.7.3 Forestland

Impacts to forest land use could include:

- Removal of trees;
- Introduction of slash along the Project ROW;
- Grubbing of tree stumps to a height which permits grading and safe equipment operation; and

- Disposing of any trees in accordance with landowner or land manager wishes.

Keystone would minimize adverse impacts to forestland with various protection, reclamation, and remediation measures committed to in its CMR Plan, including remediation to reverse effects on windbreaks, shelterbelts, and living snow fences. Examples of protective or restorative measures on forestlands would include:

- Routing the Project along existing ROW areas in forestlands, when practical;
- Felling trees toward the pipeline centerline to minimize land and tree disturbance;
- Recovering all trees and slash that fall outside the ROW;
- Depositing all tree materials according to specific protection measures and in accordance with landowner or land manager requirements; and
- Removing stumps using equipment that helps preserve organic matter.

In some circumstance, trees would be removed from the ROW. Prior to removal, landowners would be consulted to determine if the timber has a commercial or salvage value. Landowners could contract with Keystone to clear and harvest trees in the ROW. Tree removal and disposal would be accomplished consistent with all local, state, and federal permit requirements. Trees would be allowed to regrow on all but 641 acres of the Project ROW after construction, consistent with DOT pipeline safety standards and Keystone requirements for aerial pipeline safety inspections.

3.9.7.4 Waterbodies and Wetlands

Impacts to waterbodies and wetlands land use could include:

- Changes to flow rates within affected waterbodies;
- Changes to hydrological and vegetation characteristics of wetland areas;
- Increases in turbidity within waterbodies as a result of construction; and
- Introduction of fill materials into wetland areas.

The CMR plan (Appendix B) includes measures that Keystone would implement to reduce these potential impacts. These include:

- Reducing the construction ROW to 85 feet in wetland areas to minimize potential adverse effects unless non-cohesive soil conditions require utilization of a greater width;
- Posting visible advisory signs on the construction ROW and on roads which provide access to waterbody crossing sites;
- Maintaining adequate flow rates to protect aquatic life and prevent interruption of downstream uses;
- Utilizing specific construction techniques to preserve the hydrological and vegetation characteristics of wetlands that could be adversely affected by construction;
- Restoring all wetland areas within conservation lands or easements to levels established by the appropriate agency;

- Using appropriate methods to cross small streams, temporary water drainages, and wetlands based on site-specific conditions;
- Using the HDD crossing method on selected perennial and other stream or river crossings;
- Conducting topographic surveys prior to construction in USFWS wetlands and installing sediment barriers to protect wetlands adjacent to construction ROW;
- Grading and restoring USFWS wetlands to within 0.1 foot of preconstruction elevation;
- Complying with USACE Section 404 guidelines for construction through wetlands, including limiting the discharge of dredged or fill material into wetland areas if a practicable, less environmentally-adverse alternative is available;
- Consulting with each pertinent USACE district regarding required compensation for the conversion of forested wetland to herbaceous wetland.

The Project would not result in any permanent loss of wetlands, although approximately 82 acres of forested wetland would be permanently converted to herbaceous wetlands. Within palustrine emergent wetlands some short term loss of herbaceous vegetation would result in temporary habitat loss for some wildlife species. Reclamation to pre-construction levels would take three to five years and trees in forested wetlands would take approximately 20 to 50 years to recover.

3.9.7.5 Developed Land – Residential/Commercial/Industrial

Impacts to developed land could include:

- Construction or operations related noise effects;
- Construction or operations related dust effects;
- Hindrances to short or long term land uses on lands within or in near proximity to the ROW.

It is reasonable to expect that occupants of residences or commercial/industrial buildings within 25 feet of the construction work area would be more affected by the Project than those within 500 feet or further. However, residences within one mile of the construction ROW may be affected by noise and dust.

Some current land uses would be converted to long-term utility use for the life of the Project. The long-term conversion would put long-run constraints on development of private land. Keystone would not permit certain objects such as bushes, catch basins, leaching fields, garages, guy wires, houses, leaching fields, poles, septic tanks, sheds, swimming pools, or any other structures that are not easily removed to remain on the permanent ROW. Such structures could impair maintenance or emergency access to the pipeline. No dwellings could be placed within the 50-foot operational ROW, which would be maintained in an open condition for the life of the pipeline.

The CMR plan (Appendix B) includes measures that Keystone would implement to reduce these potential impacts. These include:

- Before construction begins, Keystone would conduct surveys to confirm the location of buildings relative to the pipeline and to ascertain whether the buildings are occupied residences or businesses;

- Residential and commercial/industrial structures within 25 feet of the construction ROW would require site-specific protective constructions plans;
- Control noise levels during non-daylight hours in compliance with any applicable noise regulations around residential and commercial/industrial areas;
- If noise levels are expected to exceed regulations, Keystone would give advance notice to all residences within 500 feet of the construction ROW;
- Keystone will also limit the hours that activities with high noise levels occur and will make extra efforts coordinate schedules to expedite the construction work through the area;
- In some cases, Keystone would grant written permission for certain objects related to current land uses to remain in the permanent ROW;
- Where practical, Keystone would reduce the construction ROW width;
- Keystone would consider shielding land improvements such as fences and sheds from construction activities;
- Keystone would consider preserving landscaping and mature trees in some cases;
- Keystone would fence workspaces from residential areas where appropriate;
- Keystone would accelerate construction schedules where possible to reduce effects on nearby residences and businesses;
- Keystone would provide vehicle access and assist in traffic flows in construction areas (including emergency vehicles);
- Keystone would remove and dispose of trash and debris from the construction site each day;
- Keystone would install plating to cover open trenches during non-construction times in developed areas;
- For areas in which the pipeline is within 25 feet of a residential structure, Keystone would delay excavation of the pipeline trench until the pipe is ready to be installed, then immediately backfilling after installation;
- Following installation of the pipeline and backfilling, Keystone would restore all fences, landscaping improvements, shrubs, lawn areas, and other structures to pre-construction aesthetics (or as directed by the landowner); and
- Keystone would hire individuals with knowledge of local horticulture and turf establishment practices for developed landscape restoration.

The potential impacts of Project construction and operation on local resources, including available housing and critical services are addressed in Section 3.10.

Compensation

Commercial and industrial landowners would be compensated for any construction-related impacts based upon land values determined by local professional appraisers. Any damaged infrastructure would be repaired or replaced by Keystone, or the owner would be compensated for the damage.

The construction ROW is 110 feet wide and residents with homes within 500 feet would experience short-term inconveniences (see tables 3.9.4-13 and 3.9.4-14). Dust and noise from equipment may occur for a

period of 7 to 30 days. During this time, Keystone would be required to comply with any local construction noise restrictions. Noise and dust impacts would be mitigated as outline in the CMR Plan.

The Gulf Coast Segment has the largest concentration of structures within 25 feet of the construction ROW (Table 3.9.4-13). In the spring of 2009, Keystone conducted surveys of these structures to determine if they are inhabited or abandoned and to develop site-specific crossing plans and procedures for residences in close proximity.

3.9.8 Recreation and Special Interest Areas

Construction activities would temporarily affect recreational traffic and use patterns in special management and recreational areas, and sightseers, hikers, wildlife viewers, fishers and hunters, and other recreationists would be temporarily dislocated. In some cases, construction of the pipeline may cause disrupted or delayed recreational usage of private lands. Keystone would negotiate any resulting damages with affected landowners. Keystone would cooperate with local agencies to reduce the conflict between recreational users and Project construction. Impacts are expected to be only short term. Noise impacts from pump stations are expected to be minor. In Butler County in Kansas, noise levels in recreational land use areas are required to be kept below 55 dBA during daytime hours, for one hour. Recreational use access would not be affected by Project operations within special management areas.

The proposed Project does not cross rivers within any reaches that have been designated as federal Wild and Scenic Rivers declared as scenic or wild nor does it cross any national parks or forests. However, areas with slow or fast moving waters are popular recreation areas and often hold recreationally and commercially valuable fish species. The Project would cross several properties under the management of the Montana State Lands Department. The CMR Plan includes measures to minimize impacts to these properties.

3.9.9 Visual Resources

Table 3.9.9-1 displays the VRM classes on Federal lands that would be affected by the Project. The lands crossed range from MP 0.0 to MP 282.5, are under the management of BLM or Department of Defense, and are all within the Steele City Segment. The lands crossed include 35.9 miles of class II, 37.1 miles of class III, and 209.5 miles of class IV.

TABLE 3.9.9-1					
Visual Resource Management Classifications of Land Crossed by the Project					
BLM's Visual Resource Management Classification					
(Distance in Miles)					
Type of Federal Land Crossed	Class I	Class II	Class III	Class IV	Total
BLM	--	28.6	12.4	142.7	183.7
BLM and Department of Defense	--	2.4	--	--	2.4
None	--	4.9	24.7	66.8	96.4
Total	--	35.9	37.1	209.5	282.5

Source: Keystone 2008.

Visual impacts due to construction would be temporary and may include removal of existing vegetation, exposure of bare soils, earthwork and grading scars, and landform alterations. Keystone would adjust the pipeline route to minimize adverse aesthetic features where possible and would implement measures to

reduce long term visual impacts to insignificant levels. Keystone would paint aboveground facilities in accordance with standard industry painting practices to further reduce visual impacts. They would also consult with landowners to address any visual aesthetic issues that arise.

3.9.10 Connected Actions

3.9.10.1 Power Distribution Lines and Substations

The Project would require electrical service from local power providers (see Section 2.3.1). This section addresses the land use, recreation, and visual resource effects of the proposed power distribution lines.

Land Ownership

Land ownership crossed by power distribution lines is summarized in Table 3.9.10-1. Power distribution lines would primarily affect privately-owned land, crossing 356 miles, which accounts for 82.9 percent of the total linear miles of power distribution lines required for the Project. The power distribution lines would also be located on public lands, including federal land at 44 miles (10.3 percent of the total) and state land at 29.3 miles (6.8 percent).

TABLE 3.9.10-1 Land Ownership Affected by Power Distribution Lines (Miles Crossed)					
	Federal	State	Private	Total	Percent of Total
Steele City Segment					
Montana	42.3	17.7	87.6	147.4	34.3%
South Dakota	1.7	11.6	148.5	161.8	37.7%
Nebraska	0	0	68.1	68.1	15.9%
<i>Segment Total</i>	<i>44.0</i>	<i>29.3</i>	<i>304.2</i>	<i>377.3</i>	<i>87.9%</i>
Cushing Extension New Pump Stations					
Kansas	0.0	0.0	21.4	21.4	5.0%
Gulf Coast Segment					
Oklahoma	0	0	16.9	16.9	3.9%
Texas	0	0	13.5	13.5	3.1%
<i>Segment Total</i>	<i>0</i>	<i>0</i>	<i>30.4</i>	<i>30.4</i>	<i>7.1%</i>
Houston Lateral					
Texas	-	-	-	-	-
Project Total	44	29.3	356.0	429.1	100%
Total Percent	10.3%	6.8%	82.9%	100%	

Source: Keystone 2009c.

As shown in Table 3.9.10-1, the proposed power distribution lines within the Steele City Segment would comprise approximately 377 miles, primarily in South Dakota and Montana. Of this total, 304 miles would be on privately-owned land, 44 miles on federally-owned land, and 29.3 miles on state-owned land. The two new pump stations in Kansas would require 21.4 miles of new power distribution lines, all

of which would be located on privately-owned property. Similarly, all power distribution lines in the Gulf Coast Segment, approximately 30.4 miles, would be on privately-owned land.

Land Use

The proposed power distribution lines would be located on lands in a range of different uses. For this analysis, land uses affected include agricultural and rangeland, forestland, water and wetlands, and developed land (i.e., residential, commercial, and industrial). The extent of land uses affected would vary during the construction and operations phases of the Project based on different sizes of proposed ROW and construction and design requirements, as discussed below.

Assumptions on Land Use Disturbance

Construction Assumptions

Assumptions used to calculate temporary impacts from ground disturbances during power distribution line construction are displayed in Table 3.9.10-2. As shown, a 69-kV structure with a maximum height to 40-60 feet, spaced 350 feet apart and spanning 300-400 feet, would disturb a 60-foot radius, on average. Structures supporting 115-kV and 138-kV lines would disturb, on average, a 70-foot and 80-foot radius, respectively. An H-frame power line of any voltage would disturb, on average, a 90-foot radius.

TABLE 3.9.10-2 Power Distribution Line Construction Impact Assumptions				
Transmission Structure	Maximum Structure Height (feet)	Spacing Between Structures (feet)	Average Structure Span (feet)	Average Disturbance Radius (feet)
69 kV	40-60	350	300-400	60
115 kV	50-70	550	500-600	70
138 kV	60-80	650	600-700	80
H-frame	70-90	800	700-900	90

Source: Keystone 2009c.

In addition, other facilities and construction techniques would result in ground disturbance. Power distribution line construction would require the development of temporary access roads, which have a 20-foot wide area within the ROW for all power poles. Pulling and tensioning areas would require one acre per change in direction. Turnaround areas would require a 30-foot radius at each structure. Lastly, staging areas would require one acre every 25 miles.

Operations Assumptions

Assumptions used to calculate permanent impacts from ground disturbances during power distribution line operation are displayed in Tables 3.9.10-3 and 3.9.10-4. As shown, a 69 kV, 115 kV, and 138 kV structure would each permanently disturb, on average, a 12 square-foot area. An H-frame power line of any voltage would permanently disturb approximately 24 square-feet. Once the area of ground disturbance was calculated, this area was proportionally divided to each land use and vegetation cover type, including open water, found along each route. Actual impacts may differ based on more specific power line designs developed by each power provider.

TABLE 3.9.10-3 Power Distribution Line Operation Impact Assumptions				
Structure	Maximum Structure Height (feet)	Spacing Between Structures (feet)	Average Structure Span (feet)	Average Disturbance (square feet)
69 kV	40-60	350	300-400	12
115 kV	50-70	550	500-600	12
138 kV	60-80	650	600-700	12
H-frame	70-90	800	700-900	24

Source: Keystone 2009c.

ROW widths in forested areas are listed in Table 3.9.10-4. As shown, a 69 kV, 115 kV, and a 138 kV structure with a ROW of 60 to 80 feet with each disturb 80 square feet, on average. An H-frame structure with a ROW 100 to 150 feet, on average, would disturb 150 square feet.

TABLE 3.9.10-4 Power Distribution Line Operation Impact Assumptions in Forestland		
Structure	ROW (feet)	Average Disturbance (square feet)
69 kV	60-80	80
115 kV	60-80	80
138 kV	60-80	80
H-frame	100-150	150

Source: Keystone 2009c.

Agricultural Land and Rangeland

Tables 3.9.10-5 and 3.9.10-6 show land uses, by segment and state, which would be affected by power distribution line construction and operations, respectively. As shown in these tables, the proposed power distribution lines would primarily be located on agricultural land and rangeland, which together comprise 87.3 percent and 79.8 percent of the total land area that would be disturbed by Project construction and operations. This is consistent with the rural character of the area. Specifically, construction and operations are estimated to disturb 387.5 acres and 271.2 acres of agricultural land, as well as 891.2 acres and 640.2 acres of rangeland, respectively.

Along the Steele City Segment, power distribution line construction and operation are expected to disturb, respectively, 331.7 acres and 238.2 acres of agricultural land. The largest area of agricultural land temporarily and permanently disturbed by Project construction and operations would be in South Dakota. For rangeland, construction and operation are expected to disturb 796.1 acres and 582.6 acres, respectively. The largest area of rangeland disturbance would be in South Dakota.

For the two new pump stations in Kansas, construction and operation of power distribution lines would disturb 30.8 acres and 21.8 acres of agriculture land, respectively, and 31.7 acres and 22.3 acres of rangeland, respectively.

Along the Gulf Coast Segment, power distribution line construction and operation would disturb 25.3 acres and 10.8 acres of agricultural land, respectively, all of which is located in Texas. Construction and operation are expected to disturb, respectively, 63.2 and 35.1 acres of rangeland throughout both Oklahoma and Texas.

TABLE 3.9.10-5						
Existing Land Uses Temporarily Affected by Construction of Power Distribution Lines (Acres)						
	Developed	Agriculture¹	Rangeland	Forest²	Water/ Wetland	Total
Steele City Segment						
Montana	21.1	107.7	377.2	1.9	10.5	518.1
South Dakota	56.4	116.9	327.1	1.3	10.7	512.6
Nebraska ¹	14.4	107.1	91.8	5.6	5.8	224.5
<i>Segment Total</i>	<i>91.9</i>	<i>331.7</i>	<i>796.1</i>	<i>8.8</i>	<i>27.0</i>	1,255.2
Cushing Extension New Pump Stations						
Kansas	6.8	30.8	31.7	1.7	2.3	73.4
Gulf Coast Segment						
Oklahoma	10.6	0	34.1	13.3	3.4	61.5
Texas	12.3	25.3	29.1	8.5	0	74.2
<i>Segment Total</i>	<i>22.9</i>	<i>25.3</i>	<i>63.2</i>	<i>21.8</i>	<i>3.4</i>	135.7
Houston Lateral						
Texas	--	--	--	--	--	--
Project Total²	121.6	387.5	891.2	31.1	33.7	1,464.2

¹ Includes power to Steele City Tank Farm.

² Discrepancies in totals are due to rounding.

Source: Keystone 2009c.

TABLE 3.9.10-6						
Existing Land Uses Permanently Affected by Power Distribution Lines during Operations (Acres)						
	Developed	Agriculture¹	Rangeland	Forest²	Water/ Wetland	Total
Steele City Segment						
Montana	14.4	73.3	261.5	6	7.4	362.6
South Dakota	42.6	86.5	253.8	4.8	10.9	399.2
Nebraska	10.6	78.4	67.3	21.8	8.9	187.4
<i>Segment Total</i>	<i>67.6</i>	<i>238.2</i>	<i>582.6</i>	<i>32.6</i>	<i>27.2</i>	<i>949.2</i>
Cushing Extension New Pump Stations						
Kansas	4.8	21.8	22.3	6	5.5	60.6
Gulf Coast Segment						
Oklahoma	6.8	0.0	23.0	46.9	6.3	82.9
Texas	5.8	10.8	12.1	20.2	0.0	48.9
<i>Segment Total</i>	<i>12.6</i>	<i>10.8</i>	<i>35.1</i>	<i>67.1</i>	<i>6.3</i>	<i>131.8</i>
Houston Lateral						
Texas	--	--	--	--	--	--
Project Total	85.0	271.2	640.2	105.9	39.2	1,141.5

¹ Includes power to Steele City Tank Farm.

² Discrepancies in totals are due to rounding.

Source: Keystone 2009c.

Forest Land

Forestland along the power distribution line corridors would be affected by construction and operations. As shown in Tables 3.9.10-5 and 3.9.10-6, a total of 31.1 and 105.9 acres of forestland would be disturbed by construction and operation, respectively.

During construction, 8.8 acres of forestland would be disturbed by power distribution lines along the Steele City Segment, including 1.9 acres in Montana, 1.3 acres in South Dakota and 5.6 acres in Nebraska. In Kansas, 1.3 acres of forestland would be disturbed during construction in Kansas. Along the Gulf Coast Segment, 21.8 acres of forestland would be disturbed during construction, including 13.3 acres in Oklahoma and 8.5 acres in Texas.

The amount of forestland disturbed during operation of the power distribution lines is relatively greater than during construction. Operation of power distribution lines would disturb 32.6 acres along the Steele City Segment, including 6.0 acres in Montana, 4.8 acres in South Dakota, and 21.8 acres in Nebraska. Approximately 6.0 acres of forestland would be disturbed along the power distribution line corridors for the two new pump stations in Kansas, and along the Gulf Coast Segment, 67.1 acres of forestland would be disturbed, including 46.9 acres in Oklahoma and 20.2 acres in Texas.

Water and Wetlands

As shown in Table 3.9.10-6, construction of the power distribution lines would disturb 32.7 acres of water and wetlands along the power distribution line corridor. Of this total, 27.0 acres are located along the Steele City Segment, including 10.5 acres in Montana, 10.7 acres in South Dakota, and 5.8 acres in Nebraska. In Kansas, 2.3 acres of water and wetlands would be disturbed by construction. Along the Gulf Coast Segment, 3.4 acres of water and wetlands would be disturbed, all of which are located in Oklahoma.

Operation of the power distribution lines would disturb a total of 39.2 acres of water and wetlands. Along the Steele City Segment, 27.2 acres of water and wetlands would be disturbed, including 7.4 acres in Montana, 10.9 acres in South Dakota, and 8.9 acres in Nebraska. In Kansas, 5.5 acres of water and wetlands would be disturbed by power distribution line construction, and along the Gulf Coast Segment, 6.3 acres would be disturbed in Oklahoma.

Developed Land – Residential, Commercial, and Industrial

Construction of the Project would temporarily affect 121.6 acres of developed land along power distribution line routes (see Table 3.9.10-5). Along the Steele City Segment, 91.9 acres would be disturbed, including 21.1 acres in Montana, 56.4 acres in South Dakota, and 14.4 acres in Nebraska. In Kansas, 6.8 acres of developed land would be disturbed during construction. Along the Gulf Coast Segment, 22.9 acres of developed land would be disturbed, including 10.6 acres in Texas and 12.3 acres in Oklahoma.

Operation of the power distribution lines would permanently affect 85 acres of developed land along power distribution line routes. Along the Steele City Segment, 67.6 acres of developed land would be disturbed including 14.4 acres in Montana, 42.6 acres in South Dakota, and 10.6 acres in Montana. In Kansas, 4.8 acres of developed land would be disturbed by operations. Along the Gulf Coast Segment, 12.6 acres of developed land would be affected, including 6.8 acres in Oklahoma and 5.8 acres in Texas.

Aerial interpretation and field surveys were used to discern the number of buildings within 50 feet of the power distribution line route (see Table 3.9.10-7). An estimated 81 structures would occur within 50 feet

of the proposed power distribution line route, including 62 in the Steele City Segment, 6 in Kansas, and 13 in the Gulf Coast Segment.

TABLE 3.9.10-7 Number of Buildings Within 50 Feet of a Power Distribution Line	
	Number of Structures within 50 Feet
Steele City Segment	
Montana	15
South Dakota	35
Nebraska	12
<i>Segment Total</i>	62
Cushing Extension New Pump Stations	
Kansas	6
Gulf Coast Segment	
Oklahoma	5
Texas	8
<i>Segment Total</i>	13
Houston Lateral	
Texas	--
Project Total	81

Source: Keystone 2009c.

Note: Discrepancies in totals are due to rounding.

Recreation and Special Interest Areas

The power distribution lines would cross several special interest areas in Montana and South Dakota along the Steele City Segment, portions of which may provide recreation opportunities to local residents and visitors (see Table 3.9.10-8). In Montana, the power distribution lines would cross Montana State Trust Lands, BLM land, Bureau of Reclamation land, and U.S. Department of Defense land. In South Dakota, power distribution lines would cross South Dakota Game, Fish, and Park land, BLM land, and State School land. There are no special interest areas crossed in Nebraska, Kansas, Oklahoma, or Texas.

TABLE 3.9.10-8 Special Interest Areas Crossed by Power Distribution Lines	
State	Name / Ownership
Steele City Segment	
Montana	Montana State Trust Lands
	BLM
	Bureau of Reclamation
	US Dept of Defense
South Dakota	BLM
	South Dakota Game, Fish, and Park Lands
	State School Land

TABLE 3.9.10-8 Special Interest Areas Crossed by Power Distribution Lines	
State	Name / Ownership
	US Dept of Defense
Nebraska	None
Cushing Extension New Pump Stations	
Kansas	None
Gulf Coast Segment	
Oklahoma	None
Texas	None
Houston Lateral	
Texas	None

Source: Keystone 2009c.

Note: Discrepancies in totals are due to rounding.

Visual Resources

Visual resources are natural or developed landscape characteristics which have an aesthetic value to residents and visitors from sensitive viewpoints such as residences, recreation areas, rivers, and highways. The Visual Resource Management (VRM) system was developed by BLM to assist in the identification and protection of scenic lands in a systematic and interdisciplinary manner. See Section 3.9.5 for a description of the VRM classification system.

Table 3.9.10-9 displays the VRM classes on Federal lands crossed by the proposed power distribution line corridor, which include lands managed by BLM, Bureau of Reclamation, and Department of Defense along the Steele City Segment. The proposed power distribution line corridor is located on lands designated as VRM Class II (1.6 miles), Class III (31.4 miles), Class IV (10.0 miles), and 1.9 miles of unclassified lands.

TABLE 3.9.10-9 Visual Resource Management Classifications in the Power Distribution Line Corridor (Miles)						
Type of Federal Land Crossed	BLM's Visual Resource Management Classification					Total
	Class I	Class II	Class III	Class IV	Unclassified	
BLM	--	1.2	30.8	10.0	1.9	43.9
Bureau of Reclamation	--	--	0.6	--	--	0.6
Department of Defense	--	0.4	--	--	--	0.4
Total	--	1.6	31.4	10.0	1.9	44.9

Source: Keystone 2009c.

Note: Discrepancies in totals are due to rounding.

Potential Impacts

This section addresses the potential impacts on land use, recreation, and visual resources due to construction and operations and maintenance of the proposed power distribution lines associated with the

Project. The construction of power distribution lines would require the acquisition of temporary and permanent easements with landowners along power distribution line routes. Each electric power provider is responsible for obtaining the necessary easements.

Impacts on Land Use

Proposed power line routes were evaluated for potential disturbances through aerial interpretation of preliminary routes and field surveys. The evaluation process included the survey of land ownership, land use, and residential structures. Impacts to land use are based upon surface disturbance areas. Impacts associated with service drops from adjacent distribution lines are expected to be minimal and comparable to those associated with supplying electricity to the average home or farm.

Land Use Impacts during Construction

Construction of power distribution lines would temporarily disturb different types of land use along the power distribution line corridor. The areas of disturbance during construction have been estimated based on the number and type of proposed structures. Exact power distribution line design specifications are not yet finalized, therefore acreage disturbances are based upon the percentage of each land use type within each power line construction ROW. Disturbance impacts during Project construction are presented above in Table 3.9.13-5.

The ROW area would be cleared to prepare for construction, resulting in a short-term deviation from existing land uses. Limited clearing would be required along existing roads in native and improved rangelands and agricultural lands. Some trees may require removal to provide adequate clearance between the conductors and underlying vegetation. Where possible, trees would be trimmed to avoid removal.

Once the power distribution poles are in place and the conductor wires are strung between poles, all disturbed lands (i.e., agriculture, rangeland, forestland, water and wetlands, and developed lands) within the construction ROW would be reclaimed pursuant to each power provider's requirements. Soil reshaping and contouring back to original condition would occur in disturbed areas as well as any reseeding specified by landowners. All remaining materials and litter would be removed from the construction area and properly disposed of.

Preliminary power lines have been identified in consultation with each utility company. Where feasible, the entire length of each of these preliminary power line routes would be placed along existing county roads, section lines, or field edges to minimize interference with adjacent agricultural lands. Upon completion, power providers would restore the work area around the new service drop as required by local permits.

Temporary impacts associated with turnaround areas and structure placement pad footprint could occur simultaneously. This includes construction of access roads, structure placement pads, staging areas, and pulling and tensioning areas. All construction-related impacts on existing land uses are considered temporary.

Land Use Impacts during Operations

Due to the smaller size of the permanent ROW required for operation of the proposed power distribution line, the extent of land uses permanently affected is smaller than temporary construction effects (see Table 3.9.10-6); however, there would be similar patterns of land uses disturbed by the power distribution lines during operations. Specific to power distribution line operations, each power provider would

maintain a ROW free of woody vegetation where identified as a forested land use and vegetation cover type. All operations-related impacts on land use are considered permanent. (Impacts associated with permanent access roads for use during operation are not included in this analysis due to the lack of detailed power line specifications including number and location of these roads; actual impacts may be higher as a result.)

Impacts on Recreation and Special Interest Areas

Power distribution line impacts on recreation and special interest areas are unknown. To the extent that the power distribution lines would change the character, general use, and/or recreation opportunities provided on special interest lands, there would be an adverse impact. However, no information is currently available that documents recreation opportunities and land uses on these lands.

Impacts on Visual Resources

Outside Montana, there are no formal guidelines for managing visual resources on private- or state-owned lands (Keystone 2008). BLM is responsible for identifying and protecting scenic values on public lands under several provisions of the Federal Land Policy Management and NEPA. It is plausible that the proposed power distribution lines could generate adverse impacts on visual resources due to their high visibility, although other power distribution lines are assumed to be present in the study area. Preliminary evaluations of visual impacts from power lines are in process; therefore, such impacts are currently unknown.

3.9.10.2 Lower Brule to Witten 230-kV Transmission Line

The Western Area Power Administration (Western) determined that a 230-kV transmission line would be required to support power requirements for pump stations 21 and 21 in the Witten, South Dakota area (Keystone 2008). To meet these requirements, the existing Big Bend-Fort Thompson No. 2 230-kV line turning structure would be converted to a double circuit structure. Western would construct 2.1 miles of new double circuit transmission line south to the new Lower Brule Substation and would construct the Lower Brule Substation. Western would own and operate the 2.1 mile line. Ownership of the Lower Brule Substation would be transferred to the Basin Electric Power Cooperative (BEPC).

BEPC has proposed construction and operation of a new 230-kV transmission line from the Lower Brule Substation to the existing Witten Substation, the latter owned by Rosebud Electric Cooperative. The approximately 70 mile line would be built, owned, and operated by BEPC. The proposed line would be built within a 125-foot ROW, although the specific type of structure has not yet been determined. All substation and switchyard work would be within secured areas. The Lower Brule substation site and the Witten area expansion site would be cleared and leveled. Topsoil would be separated from underlying soils and placed on disturbed areas outside security fences. Substation components would be moved to the site on local highways and roads.

As described in Section 4.4 of the EIS, Western and BEPC have identified two alternative corridors ('A' and 'B') for the proposed Lower Brule to Witten 230-kV transmission line project, and there are several route options within each corridor. For corridor A, all of the route options would cross between 6.8 and 7.0 miles of the Lower Brule Reservation, depending upon the alternative chosen (Table 3.9.10-10). For corridor B, all of the route options would cross between 8.7 and 9.0 miles of the Lower Brule Reservation, depending upon the alternative chosen (Table 3.9.10-11). Consultation between DOS and the Lower Brule Tribe is ongoing. A Programmatic Agreement (PA) is being developed to address the

identification, evaluation and protection of historic properties as part of the consultation effort, as outlined in Section 3.11.3.2. Visual effects to historic properties are also discussed as part of Section 3.11.

Land Ownership

Land ownership that would be crossed by the alternative alignments that are being considered for the Lower Brule to Witten Transmission Project is summarized in Tables 3.9.10-10 and 3.9.10-11. All affected land would be in South Dakota, and no other states are therefore included in the tables.

TABLE 3.9.10-10 Land Ownership Affected by Lower Brule to Witten 230-kV Transmission Project for Corridor A by Alternative (Miles Crossed)					
	Western	BEPC-A	BEPC-B	BEPC-C	BEPC-D
Federal ¹					
Lower Brule Reservation	6.8	7.0	7.0	7.0	7.0
State ²	0.3	0	0.0	0.3	0
Private ³	60.1	62.7	63.1	64.4	65.0
Total	67.2	69.7	70.1	71.7	72.0

¹ Federal lands and Lower Brule Reservation from ESRI.

² State Lands from South Dakota GIS.

³ Private Lands are the difference in length from total transmission line, federal land, and state land.

TABLE 3.9.10-11 Land Ownership Affected by Lower Brule to Witten 230-kV Transmission Line by Alternative for Corridor B (Miles Crossed)				
	BEPC-E	BEPC-F	BEPC-G	BEPC-H
Federal ¹				
Lower Brule Reservation	8.8	8.7	8.7	9.0
State ²	0	0	0.3	0
Private ³	65.1	65.9	65.5	66.2
Total	73.9	74.6	74.5	75.2

¹ Federal lands and Lower Brule Reservation from ESRI.

² State Lands from South Dakota GIS.

³ Private Lands are the difference in length from total transmission line, federal land, and state land.

Land Use

The proposed Lower Brule to Witten Transmission Project would be located on lands in varied uses. For this analysis, land uses considered include barren, agricultural, developed, forested, rangeland, and wetlands as well as open water. The acreages for each land use type for each alternative corridor and route option are summarized in Tables 3.9.10-12 and 3.9.10-13.

Within alternative corridor A, BEPC-D affects more land than the other route options at 1,091.6 acres and the Western Route affects the least amount of land among route options at 1,018.5 acres.

Alternatives	Developed	Agriculture	Rangeland	Forest	Water/ Wetland	Total²
Western ¹	40.1	501.5	458.9	1.6	15.9	1,018.5
BEPC-A	27.4	389.5	627.0	0.7	11.8	1,056.4
BEPC-B	27.3	404.3	620.5	0.7	8.7	1,061.5
BEPC-C	69.3	427.7	576.6	0.7	12.0	1,086.3
BEPC-D ³	76.9	398.6	608.2	0.7	7.2	1,091.6

¹ Western route includes an additional 0.5 acres of barren land.

² Totals may not sum due to rounding.

Source: Land use from National Land Cover Database, 2001. Acres based off (125-foot ROW x lines miles x 5280 feet) divided by (43560 feet/acre).

Within alternative corridor B, BEPC-H affects more land than the other route options at 1,139.0 acres and the BEPC-E affects the least amount of land among route options at 1,119.3 acres.

Alternatives	Developed	Agriculture	Rangeland	Forest	Water/ Wetland	Total¹
BEPC-E	66.9	346.4	692.7	2.4	10.9	1,119.3
BEPC-F	61.5	348.8	712.3	0.6	7.5	1,130.7
BEPC-G	66.5	433.5	611.8	1.8	14.7	1,128.3
BEPC-H ²	107.1	374.7	645.8	2.6	8.8	1,139.0

¹ Western route includes an additional 0.5 acres of barren land.

² Totals may not sum due to rounding.

Source: Land use from National Land Cover Database, 2001. Acres based off (125-foot ROW x lines miles x 5280 feet) divided by (43560 feet/acre).

Assumptions on Land Use Disturbance

Construction Assumptions

Land disturbance would be confined to a relatively small area needed for site access and equipment operations. Tables 3.9.10-14 and 3.9.10-15 show the assumptions on temporary, construction-related land disturbances for each alternative corridor and route option. As shown, pre-construction surveys and geotechnical analyses would require an additional 0.001 acres, and temporary contractor yards and workspaces would require ten-acre areas. Land disturbance from construction is estimated to be 0.29 acres per structure, and 129 to 144 structures would be required depending upon the alternative corridor and route option chosen.

Pulling and tensioning of the conductor wires would be required every 10,000 feet, resulting in approximately 35 to 40 pulling and tensioning sites, depending upon the alternative corridor and route option chosen. Each tensioning site can be located within the ROW, although angles in the route will require an additional 1.8 acres outside of the ROW.

TABLE 3.9.10-14 Estimated Lower Brule to Witten 230-kV Transmission Line Construction Impacts for Corridor A (Acres)										
Alternative	Pre-Construction Surveys (acres)	Additional Temp Work-spaces (acres)	Number of Pulling Tensioning Sites	(1) Temp Disturbances per Structure (acres)	(2) Number of Structures	(1) x (2) Temp Disturbances (acres)	Route Length (miles)	ROW (acres)	Estimated Total (acres)¹	
Western ¹	0.001	10	35	0.29	444	129	67.2	1,018.5	1,157.5	
BEPC-A	0.001	10	37	0.29	460	133	69.7	1,056.4	1,199.4	
BEPC-B	0.001	10	37	0.29	463	134	70.1	1,061.5	1,205.5	
BEPC-C	0.001	10	38	0.29	473	137	71.7	1,086.3	1,233.3	
BEPC-D	0.001	10	38	0.29	475	138	72.0	1,091.6	1,239.6	

Source: BEPC 2009.

¹ Totals may not sum due to rounding.

TABLE 3.9.10-15 Estimated Lower Brule to Witten 230-kV Transmission Line Construction Impacts for Corridor B (Acres)										
Alternative	Pre-Construction Surveys (acres)	Additional Temp Work-spaces (acres)	Number of Pulling Tensioning Sites	(1) Temp Disturbances per Structure (acres)	(2) Number of Structures	(1) x (2) Temp Disturbances (acres)	Route Length (miles)	ROW (acres)	Estimated Total (acres)¹	
BEPC-E	0.001	10	39	0.29	488	142	73.9	1,119.3	1,271.3	
BEPC-F	0.001	10	39	0.29	492	143	74.6	1,130.7	1,283.7	
BEPC-G	0.001	10	39	0.29	492	143	74.5	1,128.3	1,281.3	
BEPC-H	0.001	10	40	0.29	496	144	75.2	1,139.0	1,293.0	

Source: BEPC 2009.

¹ Totals may not sum due to rounding.

Operations Assumptions

Operation of the transmission lines would cause a relatively small amount of permanent land disturbance. Depending on the alternative route chosen, 10 to 11 permanent structures would be required. The average height of the structures would be 110 feet, and each would span approximately 800 feet (Table 3.9.10-16). Permanent land disturbance would be 8.7 square feet (0.0002 acres) per structure.

TABLE 3.9.10-16 Lower Brule to Witten 230-kV Transmission Line Operation Impact Assumptions for Corridors A and B			
Average Number of Structures Per Mile	Average Structure Height (feet)	Average Structure Span (feet)	Permanent Disturbance per Structure Pole (square feet)
6.6	110	800	8.7

Source: BEPC 2009.

Agricultural Land and Rangeland

Agricultural and rangeland would be the most impacted land use types among the alternatives (see Tables 3.9.10.12 and 3.9.10-13). With alternative corridor A, Impacted agricultural land ranges from 342.7 acres for the BEPC-A route option, to 441.3 acres for the Western alternative. Route option BEPC-A would impact the greatest number of rangeland acres at 551.7 acres, and the Western alternative would impact the fewest with 403.8 acres.

With alternative corridor B, Impacted agricultural land ranges from 304.8 acres for the BEPC-E route option, to 381.5 acres for the BEPC-G route option. Route option BEPC-F would impact the greatest number of rangeland acres at 626.9 acres, and the BEPC-G option would impact the fewest with 538.4 acres.

Forest Land

Forest land acres impacted among route alternatives are very similar and are the least impacted land use type. As shown in Table 3.9.10.12, under alternative corridor A, the Western route would impact 1.4 acres of forestland, while routes BEPC-A, BEPC-B, BEPC-C, BEPC-D, would each impact 0.7 acres. Under alternative corridor B, as shown in Table 3.9.10-13, route option BEPC-F would impact the least amount of forest land at 0.5 acres, whilst BEPC-H would impact the most at 2.3 acres.

Water and Wetlands

Water and wetland acres impacted among route alternatives are displayed in Tables 3.9.10.12 and 3.9.10-13. As shown, under alternative corridor A, route option BEPC-D would impact the least amount of water and wetlands at 6.4 acres, and the Western route would impact the greatest number at 14.0 acres. Alternative routes BEPC-A, BEPC-B, BEPC-C would impact 10.4, 7.7, and 10.5 acres, respectively. Under alternative corridor B, route option BEPC-F would impact the least number of water and wetlands at 6.6 acres, whilst BEPC-G would impacts the most at 12.9 acres.

The Lower Brule to Witten Transmission line would cross several perennial and intermittent streams/rivers. As shown in Table 3.9.10-17, under alternative corridor A, the BEPC-D route would cross the least number of streams, four perennial and 26 intermittent streams. All other routes would cross between one and four perennial stream/rivers and between 33 and 36 intermittent streams. As shown in Table 3.9.10-18, under alternative corridor B, route option BEPC-E would cross the least number of streams, three perennial and 23 intermittent streams. All other routes would cross between four and seven perennial stream/rivers and 20 to 31 intermittent streams.

TABLE 3.9.10-17 Streams/River Crossings along the Lower Brule to Witten 230-kV Transmission Line Corridor A Alternatives for the Project					
	Western	BEPC-A	BEPC-B	BEPC-C	BEPC-D
Perennial	1	4	4	4	4
Intermittent	33	34	36	35	26
Total	34	38	40	39	30

Source: Streams/Rivers from ESRI.

TABLE 3.9.10-18 Streams/River Crossings along the Lower Brule to Witten 230-kV Transmission Line Corridor B Alternatives for the Project				
	BEPC-E	BEPC-F	BEPC-G	BEPC-H
Perennial	3	4	7	7
Intermittent	23	25	31	20
Total	26	29	38	27

Source: Streams/Rivers from ESRI.

Developed Land – Residential, Commercial, and Industrial

Developed land acres impacted among route alternatives are displayed in Tables 3.9.10.12 and 3.9.10-13. As shown, under alternative corridor A, route option BEPC-D would impact the greatest area of developed lands, at 67.6 acres, while routes BEPC-A and BEPC-B would impact the smallest areas at 24.1 and 24.0 acres respectively. Under alternative corridor B, BEPC-H route option would impact the most developed land at 94.2 acres, whilst BEPC-F would impact the least at 54.1 acres.

Recreation and Special Interest Areas

The proposed route from the Lower Brule Substation to Fort Thompson would be located within eyesight of three identified recreation areas managed by The Lower Brule Indian Reservation; the Trailwaters Recreation Area, the Tailwaters Recreation Area, and the Good Soldier Creek Recreation Area. Recreation opportunities year-round include shore fishing, hiking, picnicking, camping, boat launching, horseback riding, ATV, snowmobile and dirt bike riding, cross-country skiing, wildlife viewing and photography. Recreational access permits are required for all non-tribal members using these recreation areas and all other tribal lands.

Potential Impacts

Impacts on Land Use

Land Use Impacts during Construction and Operations

Existing roads and trails would be left in comparable or better condition than what existed before construction. Gates would be installed where fences cross the ROW and locks would be installed at the landowner's request. Each route alternatives consists largely of agricultural land and rangeland, and therefore tree and brush removal in the ROW is anticipated to be minimal. Trees and brush will not be

removed unless they interfere with construction activities or the safe operation of the transmission line. Woodlands associated with drainages were avoided during the preliminary routing process.

Construction of transmission structures would require some ground leveling. Blading would be confined to the ROW, and any soil removed would be saved and reused for reclamation. Temporary workspace areas would be reshaped to closely match the original contour. Agricultural land and rangeland would also be revegetated or tilled upon completion of structure construction.

Access for construction would be from existing public roads and section line trails within the ROW. Existing roads and section line trails are not expected to require grading. All existing roads and trails would be left in equal or improved conditions.

Impacts on Visual Resources

Changes to visual resources would be both temporary (e.g., digging the foundations for power poles) and permanent (e.g., erection of power poles and lines). Impacts to visual resources would result from both construction activities and the presence of workers, equipment, and vehicles along the construction route. Visual impacts would result from clearing and removal of existing vegetation, exposure of bare soils, and the presence of machinery and new aboveground structures.

The majority of viewers of the Project during construction and operation would be travelers along the transportation corridors in the vicinity of the Project. Their views would typically be limited to short periods of time and small portions of the route. In addition, recreationists using recreation areas within the Lower Brule Reservation may be affected by the addition of power poles and lines. Some individuals viewing the route from residences within 0.75 mile of the route may be able to observe portions of the construction activities throughout the construction period.

Keystone proposes to incorporate measures into the Project that would minimize the visual effects of the Project as described in the CMR Plan (Appendix B).

3.9.11 References

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