

4.9 LAND USE, RECREATION, AND VISUAL RESOURCES

4.9.1 Introduction

This section describes potential impacts to land use, land ownership, recreation, and visual resources associated with the construction and operation of the proposed Project and connected actions and discusses potential mitigation measures that would avoid or minimize the potential impacts. The information, data, methods, and/or analyses used in this discussion are based on information provided in the 2011 Final Environmental Impact Statement (Final EIS) as well as new circumstances or information relevant to environmental concerns that have become available since the publication of the Final EIS, including the proposed reroute in Nebraska. The information that is provided here builds on the information provided in the Final EIS and, in many instances, replicates that information with relatively minor changes and updates. Other information is entirely new or substantially altered from that presented in the Final EIS. Specifically, impacts to land use, land ownership, and recreation and special interest area acreages have changed since the Final EIS due to the revised pipeline route. Specifically, the following item has been substantially updated from the 2011 document related to impacts to land use, recreation, and visual resources:

- A new section (Section 4.9.2, Impact Assessment Methodology) was added to explain the assessment methodology used to evaluate potential land use, recreation, and visual resources impacts associated with the proposed Project.

4.9.2 Impact Assessment Methodology

The impacts of the proposed Project, connected actions, and alternatives on land ownership, land use, recreation, and visual resources are evaluated using a combination of quantitative and qualitative methods, including the following:

- Calculation of changes in land ownership acreage, by type;
- Calculation of changes in allowable and feasible land use, by type and phase (e.g., agriculture may be allowed on top of the pipeline, but construction activities or access requirements may limit such activity);
- Evaluation of the relationship between proposed activities and relevant land use policies and initiatives;
- Calculation of acres of designated recreational areas that would be affected by proposed activities and alternatives;
- Evaluation of indirect impacts of the proposed Project on recreational activity (e.g., recreational facilities that are not within the proposed Project's right-of-way (ROW), but that are close enough to be affected by noise or other disturbances); and
- Qualitative evaluation of changes to the visual environment caused by construction and operation of the proposed Project, connected actions, and alternatives, especially those resulting from proposed/modified aboveground facilities.

4.9.3 Potential Impacts

4.9.3.1 Land Ownership

The proposed Project would require the acquisition of temporary and permanent easements from landowners and land managers along the pipeline ROW and at the locations of proposed ancillary facilities. Table 4.9-1 shows the land ownerships that would be affected by the proposed Project. Most affected lands are owned privately, with some federal, state, and local government ownership.

Table 4.9-1 Land Ownership Affected by the Proposed Project (acres)

State	Easement Acquired (Ownership Type), Construction (Temporary) ^a				Total ^d
	Federal	State ^b	Local ^c	Private	
Montana	779.8	488.6	89.6	4,108.0	5,466.1
South Dakota	0.0	398.1	47.3	5,315.2	5,760.5
North Dakota ^c	0.0	2.0	0.0	54.1	56.1
Nebraska ^f	0.0	56.2	0.7	3,877.9	3,934.8
Kansas	0.0	0.0	0.0	15.2	15.2
Total	779.8	944.9	137.5	13,355.9	15,232.6
Percent of Total	5.1%	6.2%	0.9%	87.7%	100%

State	Easement Acquired (Ownership Type), Operations (Permanent)				Total
	Federal	State ^b	Local ^c	Private	
Montana	287.6	200.2	4.7	1,348.5	1,841.0
South Dakota	0.0	164.6	30.8	1,801.4	1,996.8
North Dakota	0.0	0.0	0.0	0.0	0.0
Nebraska	0.0	24.9	0.3	1,638.4	1,663.7
Kansas	0.0	0.0	0.0	15.2	15.2
Total	287.6	389.7	35.8	4,803.5	5,516.6
Percent of Total	5.2%	7.1%	0.6%	87.1%	100%

Source: exp Energy Services, Inc. 2012b, exp Energy Services, Inc. 2012c.

^a All acreages assume a 110-foot-wide construction ROW and do not include access roads; rail sidings, the worker camp, or permanent easements on federal- or state-owned road ROWs.

^b Includes state highway ROWs.

^c May not include all county road ROWs.

^d Totals may not match due to rounding. Totals for water bodies are incorporated into other land use categories, and could not be segregated.

^e Includes pipe stockpile sites and contractor yards, but no pipeline ROWs.

^f Excludes ancillary facilities in Nebraska, where locations have not been identified.

4.9.3.2 Land Use

Table 4.9-2 summarizes the acreages affected by construction and operation of the proposed Project and by land use type. Most of the affected land is used for agriculture and rangeland. The remainder of this section describes land use impacts during construction and operations phases, and then discusses specific impacts (during both phases) for selected land use types.

Land Use Type Affected—Construction							
State	Agriculture	Developed	Forest	Rangeland	Water	Wetlands	Total^a
Montana	1,326.2	396.1	22.3	3,689.5	28.6	4.4	5,467.1
South Dakota	1,661.3	171.2	9.9	3,884.6	21.6	8.8	5,757.4
North Dakota ^a	0.0	56.1	0.0	0.0	0.0	0.0	56.1
Nebraska	2,854.6	62.5	57.3	931.5	14.8	14.1	3,934.8
Kansas	0.0	0.0	0.0	15.2	0.0	0.0	15.2
Total	5,842.1	685.9	89.5	8,520.8	65.0	27.3	15,230.6
Percent of Total	38.4%	4.5%	0.6%	55.9	0.4%	0.2%	100%

Land Use Type Affected—Operation							
State	Agriculture	Developed	Forest	Rangeland	Water	Wetlands	Total
Montana	443.0	51.0	5.6	1,321.7	13.6	3.0	1,837.9
North Dakota	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Dakota	508.5	25.0	6.2	1,440.5	10.6	6.0	1,996.8
Nebraska	1,198.3	28.2	25.3	395.2	8.6	11.1	1,666.7
Kansas	0.0	0.0	0.0	15.2	0.0	0.0	15.2
Total	2,149.8	104.2	37.1	3,172.6	32.8	20.1	5,516.6
Percent of Total	39.1%	1.9%	0.7%	57.5	0.6%	0.4%	100%

Sources: exp Energy Services, Inc. 2012b, exp Energy Services, Inc. 2012c.

^a Totals may not match due to rounding.

Construction

Construction of the proposed 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; and
- Increased dust and noise to neighboring residential and commercial areas.

The duration of the construction phase would affect the degree of land use impact.

In the currently proposed schedule, the proposed Project would be constructed in 10 separate spreads. As stated in the Final EIS, it is anticipated that each spread would require from 6 to 8 months for construction and that all pump stations would be completed in 18 to 24 months.

A 110-foot-wide construction ROW would be required for installation of the 36-inch-diameter pipeline (see Section 2.1.2, Land Requirements), including a 60-foot-wide temporary easement—secured through a temporary use permit—and a 50-foot-wide permanent easement.

The construction ROW width could be reduced to 85 feet to avoid or reduce impacts in some areas, including wetlands, cultural sites, and residential and commercial/industrial areas. Construction of the proposed Project would affect approximately 15,217 acres.

Changes in land use due to construction would for the most part be temporary, and would include loss of agricultural productivity, potential damage to drain tiles 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 temporary workspaces would be restored to preconstruction levels.

Temporary and permanent changes in vegetation due to the clearing of trees and shrubs, pipeline excavation, and general construction activity are expected within the ROW. It is estimated that disturbed pastures, croplands, and grassy rangelands may take 1 to 5 years to recover to preconstruction levels. Herbaceous vegetation, prairie grasses, low shrubs, and forest lands are estimated to take from 1 to 20 or more years to recover, depending upon the species. The permanent pipeline ROW would require occasional trimming to remove woody vegetation and trees from the permanent easement/ROW to facilitate aerial inspection. Landowners would be permitted to cultivate crops in the permanent easement. Easement agreements would typically include monetary compensation to landowners for long-term land use losses (e.g., property use during construction, operation, and maintenance), and for temporary land use losses (e.g., crop production impairment and private road damage or obstruction). Easements would also address restoration of land or compensation to landowners for any unavoidable construction-related damage to property.

Temporary Workspace Areas

Temporary workspace areas (TWAs) would necessitate negotiation of temporary ROW easements. Operation and maintenance of the pipeline and ancillary facilities would require permanent ROW easements for the proposed Project lifetime. For some areas such as water crossings, road/railroad crossings, and steep or rocky slopes, additional TWAs may be needed. In some cases, land would likely be purchased rather than controlled through easements. TWAs outside of the pipeline construction ROW would affect approximately 1,205 acres during construction (exp Energy Services, Inc. 2012b).

Access Roads

The construction ROW would be accessed by public and existing private roads. State transportation agencies would be consulted prior to construction to assess road infrastructure (e.g., bridges) to determine if it is suitable for potential construction loads. If infrastructure is insufficient to transport projected loads, a plan would be developed to avoid or reinforce the infrastructure. No improvement or maintenance is likely to be required for paved roads before or during construction, although gravel and dirt roads may require maintenance during that time. Private roads and temporary access roads would only be used with the permission of the affected landowner or land management agency. In the event that oversized or overweight loads would be needed to transport construction materials to the proposed Project work spreads, separate permit applications would be submitted to the appropriate state regulatory agencies.

Operations

Operation of the proposed Project would affect approximately 5,501 acres. As described in Section 2.1.1, Pipeline Route, this land consists of permanent easements for the pipeline ROW itself, pump stations, and other aboveground facilities, and permanent access roads.

Specific Land Uses Impacted

This section provides additional details on the proposed Project's impacts on selected land uses.

Agricultural Land, Rangeland and Prime Farmland

Agricultural land and rangeland together would comprise approximately 90 percent of the land affected by construction and operation of the proposed Project (Table 4.9-2). Prior to construction, agricultural land (where crops are present) would be disked or mowed to ground level to provide clear, safe, and efficient access for construction. Timber shelterbelts within the proposed construction ROW would be removed to the minimum extent practicable for pipeline construction. Additional construction impacts could include:

- Soil profile disturbance
- Irrigation system damage
- Drainage system damage

Impacts to soil profiles could include topsoil degradation, soil compaction, and rock introduction or redistribution. According to the proposed Project Construction, Mitigation, and Reclamation Plan (CMRP) (Appendix G), pipeline construction would not stop or obstruct active irrigation ditches except during the short (typically 1 day or less) time period needed to install the pipeline beneath the ditch. Additionally, drain tiles and fences would be repaired or restored using either original material or high quality new material, and farm terraces would be restored to their preconstruction functions. Construction could also cause temporary loss of crops and/or forage on affected lands.

Impacts to crops from operation of the proposed Project would be less than for construction because the ROW width would be reduced from 110 feet to 50 feet for the permanent ROW. Since the proposed pipeline would be buried to a nominal depth of 42 to 48 inches and maintained at a depth of 42 to 48 inches in cultivated agricultural areas pursuant to Special Condition 19 (the Special Conditions are presented in Appendix B, PHMSA Special Conditions), agricultural land use would be able to continue for the most part across the permanent ROW.

Prime Farmland

The U.S. Department of Agriculture defines prime farmland as, "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses" (Natural Resources Conservation Service [NRCS] 2012). Prime farmland includes cultivated land, pastures, or forests that are not located on developed land or in water and wetlands. Not all prime farmland soils are used for agricultural purposes. Table 4.9-3 summarizes the amount of prime farmland that would be affected by construction and operation of the proposed Project.

Table 4.9-3 Prime Farmland Affected by the Proposed Project (Acres)

State^a	Construction	Operation
Montana	1,359.9	419.3
South Dakota	2,182.1	700.6
Nebraska	2,531.9	1,067.3
Total	6,073.9	2,187.2

Source: exp Energy Services, Inc. 2012a, exp Energy Services, Inc. 2012b

^a Ancillary facilities in Kansas would occupy rangeland. The ancillary facility in North Dakota would occupy previously developed land. These facilities are therefore not expected to impact Prime Farmland.

As described above, much of the area that would be impacted during operations could be used for agriculture following the completion of pipeline construction, and thus would not necessarily experience a long-term change in land use. Section 4.2, Soils Impacts, discusses the degree to which these affected areas would still retain prime farmland characteristics following pipeline construction.

Conservation Programs

Pipeline construction and operation would have no effect on landowner participation in the Conservation Reserve Program (CRP). Low level grasses and plants would be allowed to regrow on the ROW; however, moderate to large vegetation would continue to be cleared from the permanent ROW and would not be allowed to re-establish. Affected landowners would be required to contact their local Farm Service Agency (FSA) offices as part of their contractual agreement for participation in the program. FSA would require that landowners, prior to pipeline construction, notify the FSA of the planned construction activities. Assuming the disturbance would have a minimal effect on the CRP and land would be restored to its pre-construction condition (i.e., vegetated), and that construction would not occur during primary nesting season, landowners would not lose their eligibility for participation in the CRP. The proposed action may affect a number of existing NRCS financial assistance conservation program agreements. Depending on the type of conservation practice for which cost-share is received by the program participant, the location of the practice relative to the pipeline ROW, and the timing of construction, the conservation agreement may need to be modified and the landowner may need to refund some or all of the financial assistance received. NRCS program participants are responsible for filing a written request with NRCS and receiving the State Conservationist's approval before allowing disturbance of a conservation practice implemented or maintained with NRCS financial assistance. When approval is received, the land must be returned to its pre-construction condition, including restoration of any affected conservation practices.

Developed Land

Within existing developed areas, some current land uses would be converted to long-term utility use for the life of the proposed Project (typically 50 years). The long-term conversion would put constraints on development of private land. To facilitate maintenance or emergency access, improvements including landscaping, catch basins, leaching fields, garages, guy wires, houses, utility poles, septic tanks, sheds, swimming pools, or any other structures that are not easily removed would be prohibited from the permanent ROW.

The number and types of structures within 25 and 500 feet of the proposed Project's construction ROW are described in the Land Use Affected Environment discussion (Section 3.9). Homes and residences within 25 feet of the proposed ROW would likely experience many temporary inconveniences during the construction period (typically 7 to 30 days) including disruptions to privacy and property ingress or egress. Homes within 500 feet of the ROW could experience temporary inconveniences such as construction dust and noise during the construction period. However, local noise restrictions would apply and the CMRP (Appendix G) includes best management practices (BMPs) to address dust suppression.

Forest

During construction, trees would be removed from the ROW. Landowners would be consulted to determine if timber within the ROW has a commercial or salvage value, and landowners could at their discretion contract with TransCanada Keystone Pipeline, LP (Keystone) to clear and harvest trees prior to removal. Tree removal and disposal would be accomplished consistent with all local, state, and federal permit requirements. Trees would be allowed to regrow only in the temporary ROW after construction, consistent with U.S. Department of Transportation pipeline safety standards and Keystone requirements for aerial pipeline safety inspections. Trees would not be allowed to regrow within the 50-foot permanent ROW.

Mitigation

To mitigate potential impacts, Keystone has committed to implement the procedures included in the CMRP (Appendix G) to reduce potential construction and operation impacts on land use. Procedures relevant to overall land use impacts include:

- General BMP measures, including worksite appearance, maintenance, and noise and dust control;
- Specific procedures that would be followed during construction within agricultural, forest, pasture, rangeland, grasslands, wetland crossings, waterbodies, and riparian lands; and
- Measures to avoid or minimize potential damage to drain tile systems.

As detailed in the CMRP, specific landowner requirements could occasionally supersede the procedures in the CMRP. However, the conditions of applicable federal, state, and local permits would apply in all cases. The remainder of this section describes mitigation measures that are applicable to specific land uses.

Agricultural Land, Rangeland, and Prime Farmland

Keystone would take reasonable steps to identify organic farms along the proposed Project route. Where Keystone is made aware of the presence of certified organic farms along the proposed Project route prior to construction, Keystone would work with those organic farm operations to ensure that pipeline construction does not impair the farm's organic status. If the proposed Project would cross an organic farm, Keystone would work with the landowner to take reasonable steps to avoid mixing organic soil and non-organic soil.

Construction could cause the temporary loss of crop production or forage on affected lands. According to the CMRP, landowners would be compensated for any construction-related crop or

forage loss. To minimize potential impacts to agricultural lands (including prime farmland), the CMRP commits Keystone to measures that would protect the soil profile, including:

- Segregating the upper 12 inches of topsoil during construction and replacing it during site restoration (Section 4.2, Soils Impacts, describes the topsoil segregation methods that would be used);
- Using soil ripping or chiseling to alleviate soil compaction and to return the soil to pre-construction conditions;
- Plowing wood chips, manure, or other organic matter into the soil to further enhance soil aeration, if required; and
- Removing excess rock that is greater than 3 inches in diameter from the top 12 inches of soil in all active agricultural fields, pastures, and hayfields.

If pipeline construction crosses active irrigation ditches, the ditches would not be stopped or obstructed except during the typical one day or less time period needed to install the pipeline beneath the ditch. Drain tiles and fences would be repaired or restored using either original material or high quality new material, and farm terraces would be restored to their preconstruction functions.

To minimize potential impacts to rangelands, the CMRP includes measures that would reduce impacts, including:

- Restoring disturbed areas with custom seed mixes (approved by landowners and/or land managers) to match the native foliage;
- Providing access to rangeland during construction 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 minimally compacted material) 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 or wildlife;
- 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 from escaping;
- 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.

Forest Land

Potential adverse impacts to forest land would be reduced through protection, restoration, and remediation measures in the CMRP. Examples of protective or restorative measures on forest lands would include:

- Routing the proposed pipeline along existing ROWs in forest lands, when practicable;
- Felling trees toward the pipeline centerline to minimize additional tree disturbance;
- Recovering all trees and slash that fall outside of the ROW;
- Depositing all tree materials according to specific protection measures and in accordance with landowner, land manager and/or permit requirements;
- Removing stumps using equipment that helps to preserve organic matter; and
- Reversing effects on windbreaks, shelterbelts, and living snow fences to the degree practicable.

Developed Land

To minimize potential impacts to developed lands, the CMRP includes the following measures:

- Prior to construction, surveys would be conducted to confirm the locations of buildings near or within the proposed ROW and to ascertain whether the buildings are occupied residences or businesses;
- Site-specific protective constructions plans would be developed for residential and commercial/industrial structures within 25 feet of the construction ROW;
- Noise levels would be controlled around residential and commercial/industrial areas during non-daylight hours, consistent with applicable noise regulations;
- If noise levels are expected to exceed regulatory limits, advance notice would be provided to all residences within 500 feet of the construction ROW;
- High noise level activities would be limited in duration and coordinated to expedite the construction work through the area, reducing the length of time that receptors are exposed to noise;
- Siting of permanent components of the proposed Project that could generate noise (e.g., pump stations) would be based upon negotiations with landowners;
- Construction shielding would be provided for certain land improvements (e.g., fences and sheds) and to preserve landscaping and mature trees;
- Workspaces would be fenced off from residential areas;
- Traffic and vehicle access control would be provided in construction areas;
- Trash and debris would be removed and disposed from the construction site each day;
- Plating would be used to cover open trenches during non-construction times in developed areas;

- “In livestock grazing areas, unexcavated—or excavated and backfilled—sections of the trench [would] be maintained to allow the passage of livestock. Gaps would be left in the spoil piles and breaks would be left in the strung pipe at these locations to facilitate passage of livestock across the ROW” (exp Energy Services, Inc. 2012d);
- For areas in which the pipeline is within 25 feet of a residential structure, excavation of the pipeline trench would be delayed until the pipe was ready to be installed, then the trench would be quickly backfilled after installation;
- Following installation of the pipeline and backfilling, all fences, landscaping improvements, shrubs, lawn areas, and other structures would be restored to pre-construction conditions (or as otherwise negotiated with the landowner); and
- Knowledgeable individuals, such as local landscape restoration contractors, and consultants with “specialty expertise in restoration and revegetation” (exp Energy Services, Inc. 2012d) would be retained to assist in landscape restoration.

Public Services

To minimize potential impacts to public services Keystone would implement the following mitigation measures.

- Prior to construction, Keystone’s contractors would develop detailed traffic plans that address all applicable laws, regulations, and ordinances. Keystone would take into account minimizing impacts to school bus routes in developing these traffic plans;
- Keystone would ensure that underground and overhead utilities are located and that Keystone avoids contact and damage during construction;
- Keystone would ensure that contactors have Site Specific Safety Plans in place before commencing work that will address locating, avoiding, and protecting utilities; and
- Keystone would dispose of construction camp trash (solid waste) by hauling to a licensed disposal facility.

Compensation

Agricultural Land, Rangeland, and Prime Farmland

Disturbed agricultural land and rangeland would be returned to approximate pre-construction use and capability. For agricultural land and rangeland requiring reseeding, an inspection after the first growing season would determine if additional revegetation would be required. If the landowner performs the required reseeding, monetary compensation would be provided. Revegetation would be considered successful when crop yields or vegetation are similar to those in adjacent undisturbed portions of the same field.

Landowners would be compensated for crop yields less than those on unaffected lands, where it can be demonstrated that the lesser yields are a result of the proposed Project. For the purpose of determining compensation for lesser yields, crop values would be assessed based upon the values of the affected crops in the specific area, as well as local crop prices at grain elevators. Landowners would be compensated for proposed Project-related crop yield effects over three years as follows: During the year of construction, 100 percent of calculated losses would be

compensated. In the second year, 75 percent of calculated losses would be compensated. In the third year, 50 percent of calculated losses would be compensated. If landowners demonstrate that proposed Project-related crop yield losses persist beyond three years, additional compensation would be negotiated.

Should CRP participants be required by the U.S. Department of Agriculture to leave the CRP because of the proposed Project, they would be compensated by Keystone. Compensation would be for any lost CRP payments, including retroactive forfeit payments.

Developed Land

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 or the owner would be compensated for the damage.

4.9.3.3 Recreation and Special Interest Areas

Construction activities would temporarily affect recreational traffic and use patterns in special management and recreational areas. Sightseers, hikers, wildlife viewers, fishers and hunters, and other recreationists would be temporarily dislocated. In some cases, construction of the proposed pipeline could cause disrupted or delayed recreational use of private lands. Construction scheduling would be coordinated with local, state, and federal agencies to reduce the conflicts with recreational users. Impacts are expected to be short term. Noise impacts from operating pump stations are expected to be minor and would be within appropriate regulatory levels. Recreational use access would not be affected by proposed Project operations within special management areas.

The proposed Project route would not cross rivers within any reaches that have been designated by federal, state, or local authorities as wild and/or scenic. It would cross the Niobrara River approximately 12 miles downstream from the end of the National Scenic River designation. Waterbodies with recreationally and/or commercially valuable fish species would be crossed using site specific waterbody crossing plans designed to reduce impacts to these important resources.

As described in the CMRP (Appendix G), compensation for damages associated with disruptions to recreational use, activity, and revenue would be negotiated with affected landowners.

4.9.3.4 Visual Resources

Construction and operation of the proposed Project would have some visual impacts, although most would be temporary. Temporary impacts associated with construction would include impacts within the construction ROW (e.g., clearing and removal of existing vegetation, exposure of bare soils, earthwork and grading scars, trenching, and rock formation alteration) and the presence of ancillary facilities such as machinery and pipe storage yards, new aboveground structures such as pump stations, pipeline markers, and construction worker camps. Given their size (50-100 acres) and population (approximately 600 workers), the camps may be the most visible evidence of the proposed Project, particularly for camps sited amid agricultural or rangeland areas.

Some of these visual effects, particularly those associated with ROW disturbance in agricultural areas, would endure beyond the construction period. Most of these longer-term effects would likely be substantially reduced with the first crop growth. Over the long term, perceptible changes resulting from construction and operation would largely be visible to travelers along the major transportation corridors in the vicinity of the proposed Project. Their views would typically be limited to short periods of time and small portions of the ROW.

Although recreational travelers are generally more sensitive to changes in scenic quality, there are no major recreation areas in the vicinity of the proposed route, and few recreationists would be affected. During the final stages of construction, backfilling and grading would restore the construction ROW to its approximate previous contours and restoration and revegetation would ultimately return the ROW to its approximate previous condition except in currently forested areas along the permanent ROW. In addition, vegetative buffers would be planted around pump stations to reduce the visual impacts of the facilities. No pump stations would be situated on federal lands or in visually sensitive lands.

Most of the landscape changes caused by the proposed Project would be visible as linear changes to vegetation patterns. The proposed Project route has been selected to reduce adverse aesthetic impacts where possible, and measures to reduce long-term visual impacts to insignificant levels would be implemented as described in the CMRP (Appendix G). Aboveground facilities would be painted in accordance with standard industry painting practices to further reduce visual impacts. Landowners would be consulted to address visual aesthetic issues that arise as a result of construction activities. Where restoration and revegetation result in returning the ROW to visual conditions similar to existing conditions, there would be either no impact or only minor impacts to visual resources during operation. For those segments of the proposed Project route on Bureau of Land Management (BLM)-managed lands in Montana, consistency with the CMRP would require that the Project remains consistent with the respective Visual Resource Management Class Objectives and applicable Resource Management Plans for BLM and other federal lands.

Mitigation measures in the CMRP (Appendix G) associated with visual resources are included along with those applicable to land use (see also Section 4.9.3.2, Land Use).

4.9.4 Recommended Additional Mitigation

Keystone has committed to the mitigation measures discussed in Section 4.9.3, Potential Impacts, and contained in the CMRP (Appendix G). No additional mitigation measures are recommended.

4.9.5 Connected Actions

4.9.5.1 Bakken Marketlink Project

The Bakken Marketlink pipeline would affect approximately 68 acres of private land, including the land use types shown in Table 4.9-4. This analysis assumed the same 110 foot buffer as for the proposed Project. No public land would be affected (exp Energy Services, Inc. 2012d). The permit applications for this project would be reviewed and acted on by other agencies. Those agencies would conduct more detailed environmental reviews of the Bakken Marketlink project. Potential impacts to land use, recreation, or visual resources of the Bakken Marketlink project

would be evaluated and avoided, minimized, or mitigated in accordance with applicable regulations during the environmental reviews for these projects. The potential impacts associated with the Bakken Marketlink project are likely to be similar to those described above for the proposed Project pump station and pipeline ROW in that area.

Table 4.9-4 Land Use Affected by the Bakken Marketlink Project^{a,b}

Land Use (acres)					
Agriculture	Developed	Forest	Rangeland	Water/Wetland	Total ^c
13.2	0.5	0	54.0	0	67.8

Source: exp Energy Services, Inc. 2012e, U.S. Geological Survey (USGS) 2006

^a Includes state highway ROWs.

^b May not include all county road ROWs.

^c Totals may not match due to rounding.

4.9.5.2 *Big Bend to Witten 230-Kilovolt (kV) Transmission Line*

Land Ownership

Except for a very small area of permanent disturbance associated with each transmission tower (approximately 8.7 square feet), ownership of land within the transmission line ROW would not be affected by this connected action. However, a permanent 125-foot-wide easement, similar to a pipeline, would need to be established for the entire length of the alignment, and would cover approximately 1,150 acres.

Land Use

Table 4.9-5 shows the acreages of each land type within the ROW that would be affected by the transmission line.

Table 4.9-5 Land Use Affected by Construction of the Big Bend to Witten 230-kV Transmission Line, Applicant Preferred Route

Land Use (acres)						
	Agriculture	Developed	Forest	Rangeland	Water/Wetland	Total ^a
Length	368.9	111.5	2.2	662.3	5.2	1,150.1
Percent of Total	32.1%	9.7%	0.2%	57.6%	0.5%	100%

Source: BEPC Routing Report (Appendix J), USGS 2006.

^a Totals may not match due to rounding.

Construction Impacts

Construction related land disturbances would be confined to a relatively small area needed for site access and equipment operations. The 75-mile transmission line would have a 125-foot-wide ROW; therefore, approximately 1,150 acres of land would be impacted by construction (Appendix J, Basin Electric Power Cooperative [BEPC] Routing Report). Of that total, approximately 145 acres would be disturbed by construction activity. 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 could be located within the ROW, although angles in the route would require temporary use of an additional 1.8 acres outside of the ROW. Most construction impacts on land use would be temporary and may include short term disruptions to local traffic, land access, and agricultural practices. A small amount of land clearing would likely be required at support structure locations and other construction staging areas.

Operation Impacts

Operation of the transmission lines would permanently affect a relatively small amount of land. An average of 6.6 support structures per mile would be required. The average height of the structures would be 110 feet, and each would span an average of 800 feet. Permanent land disturbance would be approximately 8.7 square feet (0.0002 acre) per structure (BEPC 2009).

Impacts to land use are primarily based on surface disturbance areas. Operation of the 230-kV transmission line could lead to some impacts to vegetation within and outside of the ROW due to the need for tree trimming to reduce hazards to power line operations. However, the route would cross primarily agricultural land and rangeland; therefore, tree and brush removal would only be undertaken to avoid interference with the safe operation of the transmission line. Such cases would be infrequent and sporadic along the ROW. Forested land use areas associated with drainages were avoided during the preliminary routing process. Agricultural and rangeland activities would continue in the transmission line easement where permanent structures were not present. All operations-related impacts on land use would likely last through the useful lifetime of the 230-kV transmission line. Impacts associated with permanent access roads for use during transmission line operations are not estimated since the number and location of these roads are not currently known.

Mitigation

Mitigation for potential impacts from 230-kV transmission line construction, operation, and maintenance would include BMPs appropriate for transmission line activities, disturbed soil preservation and restoration, ROW revegetation, and repair of any roads, trails, fences, or other improvements affected by transmission line construction, operations, and maintenance.

Recreation and Special Interest Areas

Recreationists within the Lower Brule Reservation may be affected temporarily during construction activities. Impacts to recreation areas would result from both construction activities and the presence of workers, equipment, and vehicles along the construction route. However, disturbed land would be restored to pre-construction conditions. Western and BEPC would communicate with appropriate personnel from the Lower Brule Indian Reservation and relevant state and federal resource agencies to schedule construction work to reduce, to the extent practicable, disturbance to recreational uses.

Visual Resources

The analysis of environmental effects associated with the proposed 230-kV transmission line would be handled under a separate environmental review, likely conducted by the U.S. Department of Agriculture's Rural Utility Service and/or Western. Based on currently available information, it is likely that 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 during construction would result from both construction activities and the presence of workers, equipment, and vehicles along the construction route. Visual impacts would also result from the 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 230-kV transmission line project during construction and operation would be travelers along the transportation corridors in the vicinity of the transmission line. Their views would typically be limited to short periods of time and small portions of the route. In addition, residents and recreationists using recreation areas within the Lower Brule Reservation could be affected by the addition of power poles and lines. Some individuals viewing the route from residences within 0.75 mile of the route might be able to observe portions of the construction activities throughout the construction period.

Potential mitigation measures to address any environmental impacts identified for the proposed 230-kV transmission line project would be identified in a separate environmental review, likely conducted by either or both Rural Utility Service and Western.

4.9.5.3 Electrical Distribution Lines and Substations

This section assesses impacts to land ownership, land use, recreation, and visual resources from the proposed power distribution lines. The pipe storage yard and rail siding in North Dakota would not require construction of electrical distribution lines or substations. At this time, the locations of transmission lines in Nebraska and Kansas have not been determined. Therefore, impacts related to distribution lines to Nebraska and Kansas pump stations are not discussed herein.

Land Ownership

Impacts on land ownership along electrical distribution lines are similar to, but likely less intense than those for the Big Bend to Witten 230-kV transmission line (Section 4.9.5.2). Permanent easements would be required to operate these facilities. The amount of land affected by these easements is summarized in Table 4.9-6.

Table 4.9-6 Land Ownership Affected by the Electrical Distribution Lines (Acres)

State ^a	Permanent Easement Acquired (Ownership Type)			Total ^c
	Federal	State/Local ^b	Private	
Montana	662.4	306.2	3,750.8	4,719.4
South Dakota	0.2	375.8	4,834.9	5,210.9

Source: exp Energy Services, Inc. 2012b; exp Energy Services, Inc. 2012c.; USGS 2006, USGS 2011.

^a The locations of electrical distribution lines in Nebraska and Kansas have not been determined.

^b Includes state highway ROWs, but may not include all county road ROWs.

^c Totals may not match due to rounding.

Land Use

Areas of land disturbance associated with this set of connected actions are estimated based upon the number and type of proposed distribution line support structures. Table 4.9-7 shows the assumptions used to estimate temporary impacts. Table 4.9-8 shows the land use affected by construction and operation of the distribution lines, by land use category.

Table 4.9-7 Assumptions for Power Distribution Line Land Use Impact Estimates

Transmission Structure	Maximum Structure Height (feet)	Spacing Between Structures (feet)	Average Structure Span (feet)	Typical Disturbance (square feet)	
				Construction ^a	Operation
69-kV	40-60	350	300-400	11,300	12
115-kV	50-70	550	500-600	15,400	12
138-kV	60-80	650	600-700	20,100	12
H-frame	70-90	800	700-900	25,400	24

^a Construction disturbance area estimated based on disturbance radii of 60, 70, 80, and 90 feet, respectively for 69 kV, 115 kV, 138 kV, and H-frame structures.

Table 4.9-8 Land Use Affected by Construction and Operation of Power Distribution Lines (Acres)

State ^a	Construction					Total ^b
	Agriculture	Developed	Rangeland	Forest	Water/Wetland	
Montana	81.7	8.8	343.0	1.1	8.5	443.1
South Dakota	137.4	53.9	314.8	1.0	13.7	520.8
Operations						
Montana	6.5	60.5	253.4	4.1	6.6	331.1
South Dakota	40.0	101.8	233.2	3.6	10.7	389.3

Source: exp Energy Services, Inc. 2012b; exp Energy Services, Inc. 2012c; USGS 2006

^a The locations of electrical distribution lines in Nebraska and Kansas have not been determined.

^b Totals may not match due to rounding.

Construction Impacts

The ROW would be cleared to prepare for construction. Limited clearing would be required along existing roads in native and improved rangelands and agricultural lands. Some trees could require removal to provide adequate clearance between conductors and underlying vegetation. Where possible, trees would be trimmed to avoid removal.

Power distribution line construction would also require the development of temporary access roads, which would occupy a 20-foot-wide area within the ROW for all of the 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. Construction staging areas would require one acre every 25 miles. Most of the affected land is either agricultural or rangeland (Table 4.9-8).

Aerial interpretation and field surveys were used to identify the number of buildings within 50 feet of the proposed power distribution lines. An estimated 14 structures in Montana and 48 structures in South Dakota are located within 50 feet of the proposed power distribution line ROWs.

Most construction impacts on land use would be temporary and may include short term disruptions to local traffic, land access, and agricultural practices. A small amount of land clearing would likely be required at support structure locations and other construction staging areas described previously. Short term noise and dust impacts may occur at one or more of the structures identified within 50 feet of the construction ROWs.

Operation Impacts

In forest lands, during power distribution line operations, each power provider would maintain a ROW free of woody vegetation. All operations-related impacts on land use would likely last through the useful lifetime of the power distribution lines. Impacts associated with permanent access roads for use during power distribution line operations are not estimated since the number and locations of these roads are not currently known.

Due to the need for a cleared power distribution line ROW, operational impacts in forested lands are greater than for other land uses (i.e., the disturbance areas in Table 4.9-7). ROW widths in forest lands for various types of power distribution line structures are provided in Table 4.9-9. As with construction, agriculture and rangeland make up most of the land use affected by operation. Actual impacted acreage may vary from the estimates based upon power distribution line designs to be developed by each power provider.

Table 4.9-9 Typical Disturbance Areas for Power Line Operation in Forested Areas

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

Operation of the power distribution lines could lead to some impacts to vegetation external to the construction ROW due to the need for tree trimming to reduce hazards to power line operations. Impacts to land use are primarily based on surface disturbance areas. Agricultural and rangeland activities would continue in the transmission line easement where permanent structures were not present. Impacts associated with service drops (electrical lines running from a utility pole to a pump station) from adjacent distribution lines are expected to be minimal and comparable to those associated with supplying electricity to the average home or farm.

Mitigation

Once the power distribution poles are in place and the conductor wires are strung between poles, the construction ROW would be restored pursuant to each power provider's requirements as specified in easement agreements with landowners. This may include soil reshaping and contouring and reseeding, as specified by landowners. All remaining materials and litter would be removed from the construction area and properly disposed of.

Preliminary power line locations 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 land uses. Upon completion, power providers would restore the work area around each new service drop as specified by applicable permit conditions.

Recreation and Special Interest Areas

Power distribution lines would cross a number of recreational and special interest areas (see Table 3.9-12). To the extent that the power distribution lines would change the character, general use, and/or recreation opportunities provided on special interest lands, this connected action would cause adverse impacts. Final design of the power distribution lines would likely include locational criteria to reduce potential impacts on recreation and special interest areas.

Visual Resources

It is possible that the proposed power distribution lines on BLM and U.S. Bureau of Reclamation land in Montana may not be consistent with Visual Resource Management Class Objectives, or that proposed power distribution lines on U.S. Forest Service land in South Dakota may not be consistent with Scenery Management System Scenic Integrity Objectives. In such cases, proposed power distribution lines could generate adverse impacts to visual resources due to their high visibility—although other power distribution lines are assumed to be present in the general area of the distribution lines. The assessment of visual impacts of the proposed power distribution lines would be included in the analysis conducted by BLM and U.S. Forest Service as part of the review of the electrical power providers BLM ROW grant applications.

Because potential impacts from the proposed power distribution lines have not been identified for visual resources, no mitigation measures are recommended at this time. Determination of any necessary mitigation measures for power distribution lines would be part of the environmental reviews required by applicable federal, state, and local regulations.

4.9.6 References

Basin Electric Power Cooperative (BEPC). 2009. Lower Brule to Witten 230-kV Transmission Project provided to ENTRIX August 2009.

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_____. 2012d. TransCanada Keystone XL Pipeline Project, Response to Department of State Data Request 2.0, October 1, 2012.

_____. 2012e. TransCanada Keystone XL Pipeline Project, Map of Proposed Bakken Marketlink Pipeline, October 11, 2012.

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