

## MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

\*\*\*\*\*

In the Matter of the Application of  
TransCanada Keystone Pipeline, LP (Keystone) for a  
Certificate of Compliance under the  
Major Facility Siting Act.

Findings Necessary for  
Certification and Determination

\*\*\*\*\*

On December 22, 2008, TransCanada Keystone Pipeline, LP (Keystone) submitted an application to the Montana Department of Environmental Quality (DEQ) under the Major Facility Siting Act (MFSA), Section 75-20-101, *et seq.*, MCA, for a Certificate of Compliance for the TransCanada Keystone Pipeline, L.P. The Certificate of Compliance would authorize the construction, operation, and maintenance of the Montana portion of the Keystone XL Pipeline, a 36-inch-diameter crude oil pipeline and associated facilities having a total capacity of 830,000 barrels per day (bpd)<sup>1</sup>. The pipeline would enter Montana at the United States-Canada border crossing near the Port of Morgan, Montana, and extend southeast, crossing into South Dakota about 35 miles southeast of Baker, Montana. In Montana, the length of the pipeline is approximately 285 miles. In Montana, the associated facilities include but are not limited to: six pump stations, three transmission lines, valves and associated power supplies, temporary pipe storage areas, off right-of-way access roads, contractor yards, and temporary work areas. On April 23, 2010, DEQ determined that Keystone's MFSA application was complete.

In addition to certification by the State of Montana under MFSA, Keystone also must obtain a Presidential Permit from the U.S. Department of State (DOS) before constructing the pipeline across the border between the U.S. and Canada, and a right-of-way grant from the U.S. Bureau of Land Management (BLM) before constructing the pipeline and associated facilities on BLM lands. The Montana Department of Natural Resources and Conservation (DNRC) must grant an easement for the operational right-of-way, with the approval of the Board of Land Commissioners, and issue a land use license for the construction right-of-way and other activities on state lands and waterways.

---

<sup>1</sup> On October 4, 2010 Keystone modified its application to DEQ indicating that the nominal capacity of the pipeline had been reduced to 830,000 bpd from 900,000 bpd and that maximum operating pressure had been reduced from 1,600 psig to 1,300 psig.

On April 16, 2010, DOS issued the Draft Environmental Impact Statement (DEIS). DEQ participated in the DEIS's preparation as a cooperating agency. A 78-day comment period followed. Based on comments received on the DEIS, DOS decided to prepare a Supplemental Environmental Impact Statement (SDEIS). The SDEIS was issued on April 22, 2011, and a 45-day comment period followed. The Final Environmental Impact Statement (FEIS) regarding the proposed pipeline was issued on August 26, 2011. These environmental review documents as well as Keystone's application provide the basis for the following findings.

## **I. Findings Required by 75-20-301, MCA**

### **A. The Basis of the Need for the Facility:**

The primary purpose and need for the Keystone XL Pipeline is to provide infrastructure necessary to transport Western Canadian Sedimentary Basin (WCSB) heavy crude oil to delivery points in Petroleum Administration for Defense District (PADD) III in response to the market demand of refineries in PADD III for heavy crude oil. The WCSB is widely accepted as having one of the largest crude oil reserves in the world. It is estimated that Canada's oil sands contain 170 to 175 billion barrels of proven oil reserves. It is projected that production of heavy crude oil in the WCSB will increase from its 2008 level of 0.9 million bpd to 2.1 million bpd by 2015 and could reach 4.4 million bpd by 2030. It is further estimated that cross-border WCSB deliveries will more than double from the current 1.2 million bpd to between 2.6 and 3.6 million bpd by 2030.

Refineries in PADD III have the capacity to refine over 5 million bpd of crude oil from more than 40 countries. The top four suppliers are Mexico (21 percent), Venezuela (17 percent), Saudi Arabia (12 percent), and Nigeria (11 percent). PADD III refinery runs are projected to grow by at least 500,000 bpd by 2020. However, crude oil imports from Mexico and Venezuela have been in steady decline and are projected to continue to drop over the next several years, from 2.9 million bpd in 2005 to about 0.8 million bpd by 2020. While the supply of crude oil from Saudi Arabia appears to be fairly stable, the remaining major PADD III suppliers face declining or uncertain production horizons. The Keystone XL Project would provide an initial capacity to transport 700,000 bpd of WCSB crude oil, with the ability to increase capacity to 830,000 bpd by

increasing pumping capacity. Increasing U.S. imports of Canadian crude oil would reduce U.S. imports of foreign oil from sources outside of North America.

The only existing pipeline that provides PADD III refineries access to WCSB crude oil is the ExxonMobil Pegasus Pipeline. This pipeline has a maximum capacity of 96,000 bpd. Thus, limited pipeline capacity continues to constrain the supply of WCSB crude oil to PADD III.

Enbridge has recently announced plans to expand its existing pipeline network to provide some capacity to carry crude oil produced in Canada to the Gulf Coast refining complex in PADD III. Enbridge's proposed Gulf Coast Access project would ship crude produced in Canada and North Dakota from Flanagan, Illinois (which is connected to Canadian crude), through a new pipeline to Cushing, Oklahoma. This line is expected to be in service by mid-2014.

From Cushing, this crude oil would then move to Houston, Texas, on the Seaway Pipeline system, in which Enbridge recently acquired a 50% interest. Enbridge proposes to reverse the flow of crude in this pipeline to carry crude from Cushing, Oklahoma, to Houston, Texas. Initial flow rates would be 150,000 bpd, rising to up to 400,000 bpd by the first quarter of 2013.

An additional purpose of the Keystone XL Pipeline is to transport WCSB heavy crude oil to the proposed tank farm in Cushing, Oklahoma, in response to the marked demand of refineries in PADD II for heavy crude oil. Keystone had firm contracts to transport 155,000 bpd of WCSB crude oil to Cushing, Oklahoma, in the existing Keystone Oil Pipeline. Keystone will transfer shipment of crude oil under those contracts to the Keystone XL Pipeline.

Finally, Keystone will be providing shippers with the opportunity to access the Keystone XL Pipeline to transport crude oil from the Williston Basin (including the Bakken field) and from PADD II to delivery points in PADDs II and III. Shippers in Montana and North Dakota have committed to transport 65,000 bpd of crude oil on the Keystone XL Pipeline using a proposed interconnection or "on-ramp" north of Baker, Montana.

## **B. Nature of the Probable Environmental Impacts**

The environmental review documents for the Keystone XL Pipeline describe the nature of the probable environmental impacts, including cumulative effects, that would result from construction, operation, and decommissioning of the pipeline. The additional environmental analysis required by the Montana Environmental Policy Act (MEPA) was provided in the Appendix I of these documents. A summary of these impacts follows.

### *Greenhouse Gas Emissions*

A detailed study of greenhouse gas life-cycle emissions that compared Canadian oil sands crude with other selected reference crudes was presented in the DEIS. This study included a review of recent scientific literature on greenhouse gas life-cycle emissions for Canadian oil sands crude, including extraction, upgrading, transportation, refining, and combustion.

The study's major conclusion was that, throughout its life cycle, oil sands crude, on average, produces more greenhouse gas than the crude oil it would replace in the U.S. However, the relative greenhouse gas intensity varies depending on (1) study design factors, such as the reference crudes (e.g., 2005 U.S. average crude oil, Venezuelan Bachaquero, Middle East Sour, and Mexican Heavy) selected for comparison with Canadian oil sands crudes, and the timeframe selected; and (2) study assumptions, such as the extraction method and the mix of crudes that would be transported by the pipeline.

The Keystone XL Pipeline is not likely to impact the amount of crude oil produced from the oil sands. However, for illustrative purposes, the study estimated that life-cycle U.S. greenhouse gas emissions from displacing reference crude oils with Canadian oil sands crude oils imported through the Keystone XL Pipeline would be between 3 and 21 million metric tons of carbon dioxide emissions annually. This range is equivalent to annual greenhouse gas emissions from the combustion of fuels in 588,000 to 4,061,000 passenger vehicles.

In addition, current projections suggest that the amount of energy required to extract all crude

oils is projected to increase over time due to the need to extract oil from ever deeper reservoirs using more energy intensive techniques. However, while the greenhouse gas intensity of reference crude oils may trend upward, the projections for the greenhouse gas intensity of Canadian oil sands crude oils suggests that they may stay relatively constant. Although there is some uncertainty in the trends for both reference crude oils and oil sands-derived crude oils, on balance it appears that the gap in greenhouse gas intensity may decrease over time.

### *Geology and Soils*

**Geologic Hazards:** Potential geologic hazards assessed in the EIS include seismic hazards (earthquakes), landslides, or subsidence (sink holes). The route extends through relatively flat and stable areas and the potential for these events is low. The pipeline and its terminal north of Baker will not cross any known active faults with confirmed surface offsets. A system of older faults (Brockton-Froid fault system) will be crossed between the Missouri River and Circle, Montana. Some seismic activity has been recorded along this system or possibly another unrelated system northeast of the Project. During construction, land clearing could increase the risk of landslides and erosion. In Montana, landslide risk is likely to be highest between the Missouri River and the top of the bluff south of the river. Alternative routing has reduced the distance over which the pipeline will cross this area of landslide topography.

**Soils and Sediments:** Potential impacts to soils include soil erosion, loss of topsoil, soil compaction, soil contamination, damage to existing tile drainage systems, subsidence of soils over the trench, and permanent increases in the proportion of large rocks in the topsoil. Keystone will use construction procedures, including topsoil segregation methods, that reduce the likelihood and severity of impacts to soils and sediments and mitigate impacts to the extent practicable. In addition, DEQ will hold a reclamation and revegetation bond to ensure reclamation of the Project area. Keystone will also be required to submit and implement a Storm Water Pollution Prevention Plan pursuant to the Montana Water Quality Act, to minimize the amount of soil erosion and sediment delivery from the Project. Implementation of provisions in Keystone's Construction, Mitigation, & Reclamation Plan (CMRP) and DEQ's Environmental Specifications will reduce the amount of settling, subsidence, and piping where the pipeline crosses irrigated land. Keystone will repair damage to drainage tile systems, and will implement

measures to alleviate soil compaction in agricultural areas.

Keystone will be responsible for cleaning up spills during construction. During operation Keystone will be responsible for cleaning up spills under an Emergency Response Plan (ERP) approved by the U.S. Department of Transportation, Pipeline Hazardous Materials and Safety Administration (PHMSA) and DEQ guidance.

During reclamation, rock larger than 3 inches will be removed from the surface to approximate the number of rocks larger than 3 inches in similar settings off the construction right(s)-of-way, access roads, pipe yards, and contractor yards. Subsurface rocks may work their way to the surface of the ground at a later date.

With regard to soil temperature, heat will be transferred from the pipeline to surrounding soils. Modeling of soil temperature increases was conducted assuming a pipeline throughput of 900,000 bpd, a higher flow rate than 830,000 bpd now planned. Consequently, the results of the modeling may slightly overestimate the changes in soil temperature. The modeled increase in soil temperature is greatest near the pipeline, and the increase in soil temperature will be less at the ground surface. Predicted soil temperatures near Glasgow at the ground surface indicate that surficial soils may warm above freezing about a month earlier than if the pipeline were not present. In the fall freezing of surficial soils could be delayed by about a week. Surficial soil temperatures are not expected to vary substantially from baseline conditions from mid May through the end of October.

Along the pipeline centerline, model results for the Glasgow area indicate that, at a depth of six inches below the ground surface, soils normally frozen from mid December through mid February will remain at or above freezing. Increases in soil temperature six inches below the ground surface will diminish with distance away from the centerline with soil temperatures reaching background temperatures about 80 feet from the pipeline. This effect may be slightly more pronounced farther south in Montana.

#### *Water Resources*

Groundwater: Many of the aquifers along the route are isolated from the surface due to soil types

and rock layers above the aquifers that prevent or slow downward migration of water, and should not be affected by the Project. However, shallow or near-surface aquifers are also present along the route. Construction of the Project may result in temporary to short-term increases in suspended solids in the shallow aquifers. The risk of dewatering shallow groundwater aquifers during construction or reducing groundwater quality due to increased sediments in the water will be localized and temporary to short term.

**River and Stream Crossings:** In Montana surface water bodies will be crossed using one of two methods: the dry-cut method, or the horizontal directional drilling (HDD) method. The method selected will be based on the site-specific characteristics of the crossing location and the requirements of the permitting agencies as indicated in Appendix L of the Environmental Specifications.

The dry-cut method, which may involve diverting stream flow around the construction site, will result in lower increases in turbidity than the open-cut wet method proposed by Keystone.

HDD will be used by Keystone at crossings of the Milk, Missouri, and Yellowstone rivers. HDD minimizes impacts to the stream or river. Because drilling is performed below the streambed, the streambed and stream flow are not disturbed. HDD also reduces the potential that deep scour during flooding would danger pipeline integrity. However, because of the extra equipment involved, it will increase the amount of ground disturbance in upland areas adjacent to the stream or river. The risk that drilling fluids could be released into a water body during the drilling process is small. Keystone is performing additional core drilling at several of the larger stream crossings to determine if directional drilling is feasible at these crossings. Following completion of feasibility studies, DEQ will allow directional drilling in place of the dry-cut method if geologic conditions are favorable.

At all water crossings, Keystone will use vegetative buffer strips, drainage diversion structures, and sediment barriers, and will limit vegetation clearing to reduce siltation and erosion. After construction, the right-of-way will be restored and revegetated to reduce the potential for erosion of the stream bank.

**Hydrostatic Test Water:** Water used to pressure test the pipeline during construction will be

discharged to upland areas within the same drainage and the quality of water being discharged will be tested to verify that impacts are minimized. Keystone must obtain necessary permits from DNRC prior to diverting water for hydrostatic testing and must not harm the holders of existing water rights or the use of water reservations.

### *Wetlands*

The Project route crosses emergent, scrub/shrub, and forested wetlands that are under the jurisdiction of U.S. Army Corps of Engineers (USACE) and applicable state agencies under the purview of the EPA (the U.S. Environmental Protection Agency) through Sections 401 and 404 of the federal Clean Water Act and the Montana Water Quality Act. Specific plans regarding wetland avoidance and minimization of impacts at selected stream crossings are included in DEQ's Environmental Specifications. The development of mitigation to compensate for the temporary or permanent wetland loss or conversion of forested to emergent wetlands and may be further developed during the 404/401 permitting process. Construction of the pipeline will affect wetlands and their functions primarily during and immediately after construction activities but permanent changes also may be possible.

Wetland vegetation communities would, in general, eventually transition back into communities that are functionally similar to those of the wetlands prior to construction. In emergent wetlands, the vegetation would typically regenerate quickly. The impact of construction on emergent wetlands would range from short term to long term in duration and be of minor magnitude. The impact during operation would be minor. In forested and scrub-shrub wetlands the effects of construction would be longer because of the period needed to regenerate a mature forest or shrub community. Trees and shrubs would not be allowed to grow in the right of way, resulting in minor to moderate impacts to those wetlands for the life of the Project. Keystone is working with each USACE district to identify wetlands and develop mitigation and compensation for conversion of forested wetlands to herbaceous wetlands.

Keystone will use construction methods that avoid or minimize impacts to wetlands. These measures include installing trench breakers and/or sealing the trench to maintain the original wetland hydrology to avoid draining wetlands, using timber mats to protect wetlands during

construction, and restoring wetland areas to a level consistent with the requirements of the applicable permits.

### *Terrestrial Vegetation*

The Project crosses primarily grasslands and rangelands, croplands, a few riparian forest areas, developed lands, and wetlands. After construction, Keystone will restore topsoil, slopes, contours, and drainage patterns to preconstruction conditions as practicable and will reseed disturbed areas to restore vegetation cover, prevent erosion, and control noxious weeds. Keystone will control the introduction and spread of noxious weeds and pests by adhering to construction and restoration procedures recommended by local, state, and federal agencies.

**Native Grasslands and Rangelands:** Native mixed shrub rangelands and some grasslands will be crossed by the Project in Montana. Impacts on native rangeland would range from short to long-term. Vegetation would be established one to five years after construction and may differ from adjacent plant communities. Keystone has developed specific construction and reclamation methods for the Project in consultation with local, state, and federal agencies and local experts to ensure that sagebrush and native grasses are restored.

**Upland and Riparian Forests:** Clearing trees in upland and riparian forest communities will result in long-term impacts for the life of the Project, because of the length of time needed for the communities to mature and because trees would not be allowed to re-establish in the 30 foot upland permanent right-of-way. As indicated in Appendix L of the Environmental Specifications, near certain stream crossings DEQ will require that forested areas within the construction right-of-way but outside the operational right-of-way be restocked with cottonwoods. In several of these areas, the landowners have agreed to temporary fencing to help speed establishment of the newly planted cottonwoods.

Due to increased soil temperatures, enhanced emergence and initial plant growth may be detected over the pipe centerline in early to mid-spring at northern latitudes, since some plants are sensitive to increased soil temperatures during this stage of plant development. Positive or negative effects are unlikely to be measurable later in the growing season, since post-emergent plant growth is more influenced by air temperature, day length, and soil moisture than soil

temperature. While it is theoretically possible that heat from the pipeline may dehydrate soil directly above the trench, the heated trench may absorb water more rapidly than adjacent soils. The additional water in the trench soil profile will likely cool the soil more rapidly than in adjacent areas. Ultimately, the thermal effect of the pipeline on plant growth will be secondary to other environmental conditions. Although heat generated by the pipeline will affect nearby soils and potentially vegetation, land management practices will greatly influence any measurable effect of the pipeline. Those practices resulting in greater soil shading from plant cover may moderate pipeline-generated soil temperature increases.

### *Wildlife*

Big game animals, small game animals and furbearers, waterfowl and game birds, and other nongame animals use habitats in and around the area crossed by the Keystone XL Pipeline. Construction will result in the temporary and permanent loss and alteration of habitats that provide foraging, cover, and breeding habitats for wildlife. Most habitat loss will be temporary as vegetation cover will be re-established after construction and will be a small percentage of the habitats available throughout the region crossed by the Project. Loss of shrublands and wooded habitats could be long term (from 5 to 20 years or more); however, and trees and tall shrubs will not be allowed to re-establish over the pipeline for inspection and integrity purposes.

Aboveground facilities will result in some permanent habitat loss. Power lines to pump stations can provide vantage perches for raptors that lead to increased predation on ground nesting birds and small mammals.

Construction will produce short-term barriers to wildlife movement, direct and indirect mortality, and reduced survival and reproduction. Habitat alteration and fragmentation caused by construction of the pipeline and its right-of-way may reduce habitat suitability and use by wildlife. With the measures identified in DEQ's Environmental Specifications and Keystone's CMRP, disturbance from construction activities may have moderate local effects on wildlife, if important remnant habitats are crossed or if sensitive breeding or overwintering periods are not avoided.

Keystone is working with DEQ, Montana Fish, Wildlife and Parks (FWP), and BLM to

minimize impacts to wildlife during sensitive breeding periods. Measures developed to minimize impacts to wildlife include development of a Migratory Bird Conservation Plan in consultation with the U.S. Fish and Wildlife Service (USFWS), removal of litter and garbage that could attract wildlife, control of unauthorized off-road vehicle access to the construction right-of-way, and reclamation of native range with native seed mixes. DEQ's Environmental Specifications contain measures to protect wintering big game animals, sage-grouse and sharp-tailed grouse during sensitive wintering breeding periods, and species of special concern to the state. Keystone will provide compensatory mitigation when construction of the pipeline will occur near greater sage-grouse leks and important greater sage-grouse habitat. Overall, the impact of construction to wildlife is expected to be minor and will be primarily temporary to short term. Normal Project operation will result in negligible effects to wildlife.

#### *Fisheries Resources*

The route will cross rivers and streams, including perennial and intermittent streams that support recreational fisheries. Most potential impacts to fisheries resources will occur during construction and will be temporary to short term. Impacts resulting from construction of stream crossings include siltation, sedimentation, bank erosion, sediment deposition, short-term delays in movements of fish, and transport and spread of aquatic invasive animals and plants. Keystone will minimize vehicle contact with surface waters and clean equipment to prevent transportation of aquatic invasive animals and plants on equipment.

In Montana, smaller streams will be crossed using dry trenching methods, HDD, or horizontal boring if water is present. Using these methods will reduce sedimentation and turbidity impacts normally associated with working in streams when water is still flowing through the stream bed. Construction at stream crossings can result in destruction of fish that do not avoid the construction area and can release fine sediments during construction through flowing waters or after the flow is returned to the stream bed. Sediment will be transported downstream and could affect fish, other aquatic life, and aquatic habitats through either direct exposure or smothering. Most stream crossings will be completed in less than two days. Grading and disturbance to waterbody banks will be minimized such that resulting stream bed disturbance and sediment impacts will be temporary and minor.

The Milk, Missouri, and Yellowstone rivers will be crossed using the HDD method, which would install the pipeline well below the active riverbed. As a result, direct disturbance to the riverbed, fish, aquatic animals and plants, and river banks will be avoided. Keystone has developed site-specific plans for HDD crossings and will develop site-specific contingency plans, including preventative measures and a spill response plan, to address unintended releases of drilling fluids. Additional geotechnical work is ongoing at several other smaller streams, where it may be more cost effective and less impacting to use this crossing method.

### *Threatened and Endangered Species*

The United States Fish and Wildlife Service (USFWS) is responsible for protecting threatened and endangered species under the Endangered Species Act (ESA). Federally protected threatened or endangered species that are known or thought to be in the vicinity of the Project in Montana include pallid sturgeon, interior least tern, piping plover, and possibly black-footed ferret, and whooping crane.

Pallid sturgeon in Montana are found in the Missouri River between the Marias River and Ft. Peck Reservoir; between Ft. Peck Dam and the North Dakota state line; and below Intake on the Yellowstone River. Critical habitat has not been designated for the pallid sturgeon, but sections of rivers relatively unchanged by dam construction and operation that maintain large, turbid, free-flowing river characteristics are important in maintaining residual populations of this species. Suitable habitat within the Missouri and Yellowstone rivers would be crossed by using HDD; therefore, no direct impacts to pallid sturgeon habitat are expected to occur as a result of Project construction. Assuming there would be no accidental discharge of drilling mud to the rivers during the drilling process, there will be no direct effect on habitat for pallid sturgeon. The intake end of the pump used to divert water for hydrostatic testing will be screened using an appropriate mesh size to prevent entrainment or entrapment of larval fish or other aquatic organisms. In the unlikely event of a spill that would enter a river, exposure to crude oil could result in adverse toxicological effects to pallid sturgeon. However, adverse effects to pallid sturgeon are unlikely due to: 1) the low probability of a spill, 2) the low probability of a spill in a river reach where pallid sturgeon are present, and 3) the low probability of the spill reaching a river with pallid sturgeon in sufficient amounts to cause toxic effects.

Interior least terns may occur at the Yellowstone River crossing and downstream of the crossing of the Missouri River. However, none was detected during surveys for the pipeline in Montana. No critical habitat has been designated for this species. The crossings of these rivers will be constructed with the horizontal directional drilling method, reducing the direct impacts of construction on favored gravel bar habitat. There is a slight chance that drilling fluids could escape during the drilling process and temporarily muddy the gravel bar habitat. Habitat loss or alteration or oiling of individual birds resulting from a crude oil spill from the pipeline is highly improbable due to: 1) the low probability of a spill, and 2) the low probability of a spill coinciding with the presence of least tern individuals. Additional valves are required at the Yellowstone and Missouri rivers to reduce the volume of oil potentially spilling into these rivers. Habitat may be altered should there be spills of fuel during diversion of hydrostatic test water. Additional survey work and restrictions on the timing of construction activities during nesting and fledging periods, if least terns are found within 0.25 mile of the crossings, should mitigate impacts due to disturbance from construction. Associated transmission lines for pump stations will not cross the Yellowstone or Missouri rivers.

Piping plovers may occur near the Yellowstone and Missouri river crossings where suitable habitat exists. However, no plovers were detected during surveys for the pipeline in Montana. Critical habitat has been designated for this species at the crossing of the Missouri River. The crossings of the rivers will be constructed with the HDD method, reducing the direct impacts of construction on favored gravel bar habitat. There is a slight chance that drilling fluids could escape during the drilling process and temporarily muddy the gravel bar habitat. Habitat loss or alteration or oiling of individual birds resulting from a crude oil spill from the pipeline is highly improbable due to: 1) the low probability of a spill, and 2) the low probability of a spill coinciding with the presence of piping plover individuals. Additional valves are required at the Yellowstone and Missouri rivers to reduce the volume of oil potentially spilling into these rivers. Habitat may be altered should there be spills of fuel during diversion of hydrostatic test water. Additional survey work and restrictions on the timing of construction activities during nesting and fledging periods, if piping plovers are found within 0.25 mile of the crossings, should mitigate impacts due to disturbance from construction. Associated transmission lines for pump stations will not cross the Yellowstone or Missouri rivers.

The Project in Montana is west of the primary whooping crane migration pathway. However, individual birds can be found outside the primary movement corridor and could possibly occur within the Project area in Montana during spring and fall migration. No critical habitat has been identified for whooping cranes near the pipeline in Montana. Possible areas used by whooping cranes during migration would include major river systems and their associated wetlands and shallow areas of reservoirs and other lacustrine wetlands. The Yellowstone River may be a stopping-over point during migration. The crossing of the Yellowstone River will be constructed with the HDD method reducing the direct impacts of construction. There is a slight chance that drilling fluids could escape during the drilling process and temporarily muddy habitat. There is only a remote chance that a whooping crane would collide with one of the associated transmission lines, because of the low number of birds, and because the associated transmission lines avoid preferred habitats. Habitat loss or alteration resulting from a crude oil spill from the pipeline is unlikely due to: 1) the low probability of a spill, and 2) the low probability of a spill coinciding with the presence of individual whooping cranes. Habitat may be altered should there be spills of fuel during diversion of hydrostatic test water. Additional survey work and restrictions on the timing of construction activities during spring and fall migration periods, should whooping cranes be found, would mitigate disturbance related impacts. If whooping cranes are found during this period, equipment will not be started until whooping cranes leave the area by mid-morning.

The pipeline will not cross areas in Montana inhabited by non-essential experimental populations of black-footed ferrets. Black-footed ferrets are mostly dependent on prairie dogs for food and use their burrows for shelter. The one prairie dog colony near the project in Montana is too small to support black-footed ferrets. Should a black-footed ferret exist near the project, adverse effects could include habitat loss, habitat alteration, habitat fragmentation, and mortality. There is a slight chance that heat from the pipeline could affect vegetation. Habitat loss or alteration resulting from a crude oil spill from the pipeline is unlikely due to: 1) the low probability of a spill, 2) the low probability of a spill coinciding with the presence of black-footed ferrets, and 3) the low probability of a ferret contacting the spilled product.

### *Cultural Resources*

DOS, in coordination with consulting parties, has minimized the potential for adverse effects to historic properties along the Area of Potential Effect (APE) of the Project by the development of avoidance and mitigation measures. Since 2008, DOS has consulted with Indian tribes, State Historic Preservation Officers (SHPO), federal agencies, state agencies, and local agencies under Section 106 of the National Historic Preservation Act. As part of this effort, DOS initially contacted over 95 Indian tribes to find out their level of interest in becoming consulting parties. DOS also conducted Section 106 government-to-government consultation with the consulting parties for the Project. DOS also invited the consulting tribes to prepare Traditional Cultural Property studies as part of the lead agency responsibilities for the identification, evaluation, and mitigation of historic properties.

A Programmatic Agreement has been executed by DOS in consultation with the parties and DEQ. The Programmatic Agreement establishes a procedure for the further identification, evaluation, mitigation, and treatment of historic properties. The Advisory Council on Historic Preservation participated in the development of this agreement with DOS and the other consulting parties. As part of this agreement, a Tribal Monitoring Plan, a Historic Trails and Archaeological Monitoring Plan, and an Open Trench Monitoring Plan were also developed. If previously unidentified archaeological sites are encountered during construction of the Project, Keystone, DOS, and the consulting parties will follow the procedures described in the Unanticipated Discovery Plans.

### *Paleontological Resources*

DEQ, in coordination with the DOS, BLM, SHPO, DNRC, and Keystone, has minimized the potential for impacts to paleontological resources along the APE of the Project by the development of avoidance and mitigation measures.

A Paleontological Memorandum of Understanding (MOU) was developed by DEQ in consultation with the parties. The MOU establishes procedures for the further identification, evaluation, mitigation, and treatment of paleontological resources. As part of this agreement, a Paleontological Resource Mitigation Plan has been developed. The mitigation plan specifies the

precise locations within the Project APE where monitoring is required and will describe procedures for fossil salvage and paleontological data recordation for non-extensive, isolated, scientifically significant fossil discoveries. The mitigation plan includes agency or land owner notification procedures, as appropriate, and procedures that construction personnel should follow in the event that an unexpected fossil discovery is made in an area that is not monitored by a paleontologist. The mitigation plan also includes procedures to be followed in the event of an extensive paleontological discovery. The MOU will be fully executed by the DOS upon a final decision on the Project Presidential permit.

### *Air Quality and Noise*

**Air Quality:** Air quality impacts from construction will include emissions from construction equipment, temporary fuel transfer systems, fuel storage tanks, and dust and smoke from open burning. Most of these emissions will occur only intermittently, will be limited to active construction areas, and will be controlled to the extent required by state and local agencies.

All pump stations will be electrically powered by local utility providers. During normal operation there will be minor emissions from valves and pumping equipment at the pump stations. There will also be low levels of emissions from mobile sources and low levels of emissions from tanks at the interconnection point planned north of Baker. The Project will not cause or contribute to a violation of any federal, state, or local air quality standards, and it will not require a Clean Air Act Title V operating permit.

**Noise:** During construction, there will be intermittent, temporary, and localized increases in sound levels, as construction activities move through an area. To reduce construction noise impacts, Keystone will limit the hours during which activities with high-decibel noise levels are conducted in residential areas. Noise impacts associated with construction will be minor and temporary.

During operation, sound levels within 2,300 feet of pump stations will increase. Outside of this distance, noise levels will remain at existing sound levels. DEQ's Environmental Specifications place limits on sound levels near pump stations, unless the affected landowner waives this requirement.

### *Land Use, Recreation, and Visual Resources*

Land use: Of the 285 miles of land crossed in Montana, 208 miles of privately owned lands will be affected during construction of the pipeline. Approximately 404 acres of state lands will be impacted during construction, along with about 47 miles of federal lands.

After construction, nearly all agricultural land and rangeland along the right-of-way will be returned to production with little impact on production levels in the long term. However, there will be restrictions on growing woody vegetation and installing structures within the 50-foot-wide right-of-way. Keystone has agreed to compensate landowners for crop losses on a case-by-case basis.

About 10 miles of the pipeline will cross lands that are part of the Conservation Reserve Program. The Project is not expected to affect landowner ability to participate in that program.

Keystone will use construction measures designed to reduce impacts to existing land uses, such as topsoil protection, avoiding interference with irrigation systems except when necessary, reducing construction time in irrigated areas, repairing or restoring drain tiles, restoring disturbed areas with custom seed mixes to approximate existing vegetation, providing access to rangeland during construction, installing temporary fences in some areas as needed with gates around construction areas to prevent injury to livestock or workers, providing trench crossing areas to allow livestock and wildlife to cross the trench safely, and controlling noise and dust.

Recreation: Operation of the Project will not affect recreational resources, national or state parks, or users of those resources. Keystone will cooperate with private landowners and with federal, state, and local agencies, to reduce the conflict between recreational users and Project construction.

Visual Resources: During construction, there will be visual impacts associated with activities along the right-of-way, such as clearing, trenching, pipe storage, and installing above-ground structures. Most of the visual impacts of the pipeline corridor in agricultural and rangeland areas will be substantially reduced with restoration and revegetation. Long-term visual impacts will occur in a few riparian zones, where tall vegetation is not allowed to grow over the trench, where

above ground structures, such as valves, transmission lines, power supplies, and pump stations, will remain visible after reclamation. Keystone will install vegetative buffers around the pump stations to reduce the visual impacts of those facilities. Overall, the visual impacts of the Project will be minor to moderate.

### *Socioeconomics*

The Project will generate direct and indirect economic benefits for Montana. During construction, local employment, taxes on worker income, spending by construction workers, and spending on construction goods and services will result in temporary, positive socioeconomic impacts. Construction of the Project in Montana will occur in four construction spreads. Each spread will require six to nine months to complete, including mobilization and demobilization. The Project will require construction of six pump stations in Montana, with each pump station anticipated to be constructed in 18 to 24 months. Keystone anticipates a maximum construction workforce of 500 to 600 personnel for each spread and 20 to 30 for each pump station.

Keystone will attempt to hire local construction workers to the extent practicable. If a sufficient number of qualified workers were available, Keystone estimates that approximately 10 to 15 percent of the workforce might be hired from the local pool of construction workers for each pipeline spread (about 50 to 90 workers per spread) and each pump station (about two to four workers per pump station). If this is correct, approximately 210 to 380 Montana workers could work on the line during the construction phase. These will be short-term jobs that would end after construction of the pipeline and pump stations. Local hires from Montana could be fewer than 210 workers due to labor shortages caused by the current oil boom in northeastern Montana and western North Dakota.

Operation of the Project will require approximately four to eight permanent employees in Montana. During operation, activities associated with maintenance, monitoring, and repair of the Project will generate a demand for goods and services, including electrical power, that will result in a long-term economic benefit to the region. This benefit will likely be very small compared to the entire economic activity in the region.

Once constructed, the Project will generate long-term property tax revenues for the counties traversed by the pipeline that will last for the life of the Project. The Project will generate approximately \$63 million in annual property tax revenues in Montana, or about 151 percent of the property taxes collected in 2006 in the six counties crossed. The magnitude of the impact will vary from county to county. In some counties, property tax revenue collected will more than double as a result of the line.

Adverse socio-economic impacts during construction could include temporary increases in the need for public services, disruption of local transportation corridors, stresses on local populations, and reduced availability of transient housing. Keystone anticipates constructing two temporary work camps in Montana to minimize impacts to transient housing and public services in those areas.

#### *Cumulative Impacts*

The analysis of cumulative impacts combined the potential impacts of the Project with the impacts of past, present, and related future actions in the vicinity of the route. This assessment included consideration of the many existing pipelines, electrical transmission lines, and roadways, as well as other linear projects that are under construction, planned, or proposed near the route. The analysis also included existing and likely energy development projects.

During construction, the Project will contribute to cumulative dust and noise generation, loss of vegetation or crop cover, and minor localized traffic disruptions where other linear projects are under construction at the same time and are in the vicinity of the route.

One of the primary contributions to cumulative effects during operation will be emissions from storage tanks. However, the Project and all other petroleum storage projects will have to comply with the emissions limitations of air quality permits. Where Project-related aboveground facilities and visible rights-of-way are present along with those of other projects, there will be cumulative effects to visual resources. Other cumulative impacts associated with operation include changes in land use, terrestrial vegetation, wetland function, and wildlife habitat, as well as increases in tax revenues and employment. Where the pump stations or compressor stations of other pipeline systems are in the vicinity of the pump stations for the Project, there will also

be cumulative noise impacts.

An increase in the development of wind power projects in the central plains region, as well as increased need for electrical power, is likely to increase the number of electrical transmission lines in the vicinity of the route. If the construction of power distribution or transmission lines in the vicinity of the route overlaps with construction of the Project, short-term cumulative impacts associated with noise, dust, and general construction activity could occur. Likely cumulative impacts of the Project and operation of new transmission lines include viewshed degradation, changes to land uses and vegetation, and impacts to birds.

The probable impacts to all resources (including land use, geology, soils, safety, water, wetlands, vegetation, wildlife, fish, special status species, air quality, noise, socioeconomics, paleontological resources, cultural resources, transportation, utilities, and visual resources) are described in detail in Section 3.14 of the Final EIS.

### **C. Minimization of Adverse Environmental Impacts:**

Construction and operation of the pipeline as proposed in the Construction, Mitigation, and Reclamation Plan (CMR) with modifications made by DEQ in the environmental specifications minimize adverse environmental impacts considering the state of available technology and the nature and economics of the various alternatives. See Table 1.

In addition to the measures described below, measures to minimize impacts include development of a Migratory Bird Conservation Plan in consultation with the USFWS and removal of litter and garbage that could attract wildlife.

For listed threatened or endangered species, development and implementation of a spill containment and contingency plan is required by federal pipeline safety agencies. For interior least terns and piping plovers, if they are found nesting during surveys, timing restrictions would apply during the nesting season until young have fledged. Similarly, construction timing restrictions would be applied if whooping cranes are detected during surveys.

**Table 1. Summary of measures to minimize impacts.**

| Type of Impact                | Measures to Minimize Impacts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | Measure Number in CMRP and brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Measure Number or Appendix in DEQ Environmental Specifications and brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Geology and Soils</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Soil erosion and topsoil loss | <p>2.7 Indicates that construction vehicles shall be confined to designated roads.</p> <p>2.15 addresses off road vehicle control.</p> <p>4.4 and 4.5 address temporary erosion control measures and slope breakers.</p> <p>4.11.5.1 describes how trench breakers will be used on steep slopes to limit trenchline erosion. Water bars are described in 4.11.5.2. Mulching would be used on all areas with high erosion potential and on slopes greater than 8 percent unless otherwise approved based on site-specific conditions. Erosion control matting will be used in some areas as indicated in 4.11.5.4.</p> | <p>1.1.1 Construction timing is to be planned to minimize impacts.</p> <p>2.1.7 Requires special soil handling in areas susceptible to erosion.</p> <p>2.7.1, 2.7.2, 2.7.3, 2.7.4 Indicate that construction of off ROW access roads will be minimized.</p> <p>2.7.5 and 2.7.6 Require erosion control on access roads.</p> <p>2.7.7 Requires preservation of soil during any construction related snow removal.</p> <p>2.8.2 Prohibits unauthorized cross country travel.</p> <p>2.9.2, 2.9.3, and 2.9.4 Indicate that vegetation clearing is to be minimized where grading is not required.</p> <p>2.9.6 Requires that the amount of soil in burn piles be minimized.</p> <p>2.10.1 Requires that the Storm Water Pollution Prevention Plan be followed.</p> <p>3.1.1 and 3.1.2 Specify timelines for backfilling and installation of erosion control structures.</p> <p>3.2.1 Indicates that restoration, reclamation, and revegetation are required to meet vegetative cover standards.</p> <p>3.2.2 Requires that temporary roads be closed and, unless requested by the landowner, these roads shall be revegetated.</p> <p>3.2.3 Requires that streambanks be restored at a stable angle of repose.</p> <p>3.2.4 Contains restrictions on side-casting of waste from access roads.</p> <p>Section 3.3 addresses follow-up reclamation monitoring.</p> <p>4.2.1 Requires correction of erosion problems during maintenance.</p> <p>4.1 Addresses repair of areas subject to settling and related post-construction maladies.</p> <p>Section 5 addresses decommissioning and abandonment.</p> |
| Soil                          | 2.7 Construction vehicles shall be                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.3.2 Restricts construction to times when soil                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| compaction and rutting      | <p>confined to designated roads. 2.15 addresses off road vehicle control.</p> <p>2.18 addresses restrictions for wet conditions in cultivated agricultural areas when rutting and compaction may occur and 4.4 requires use of matting in certain instances. 4.6 indicates additional methods to reduce compaction on the working side of the trench during pipeline stringing. 4.11.1 indicates that compaction will typically be relieved in subsoils that have received substantial construction traffic and methods to accomplish this end are described.</p> | <p>rutting will be less than 4" outside of areas that have been stripped of topsoil.</p> <p>3.2.8 through 3.2.10 address required alleviation of soil compaction.</p> <p>4.2.1 Requires that operation and maintenance inspections be completed using ground vehicles during dry or frozen conditions if possible.</p>                                                                                                                                                                                                                                                                                                                                                                                               |
| Soil mixing                 | <p>4.3 addresses topsoil removal and storage to reduce mixing of soil horizons. 4.7 provides further guidance on preventing mixing of soil horizons during trenching. 4.10 indicates that subsoil should not be permanently placed on topsoil.</p>                                                                                                                                                                                                                                                                                                                | <p>2.1.4 and 2.1.8 Require topsoil to be segregated from subsoil.</p> <p>2.1.8 Addresses the width of topsoil stripping.</p> <p>2.1.5, 2.1.6, and 2.1.7 Address alternative soil handling of sensitive soils.</p> <p>2.3.2 Restricts construction when ruts greater than 4" are causing soil mixing outside of areas where soil has been stripped.</p> <p>3.2.4 Restricts side-casting of waste from access roads on very steep slopes.</p>                                                                                                                                                                                                                                                                          |
| Alteration of topography    | <p>4.4 indicates that grading will be undertaken with the understanding that original contours and drainage patterns shall be re-established to the extent practicable. 4.10 indicates that cleanup activities would be to prepare the ROW and other disturbed areas to approximate pre-activity ground contours and that surface drainage patterns shall be restored. 4.11.2 addresses rock removal prior to and after topsoil replacement.</p>                                                                                                                  | <p>2.1.1 Requires preservation of landscape contours.</p> <p>3.1.4 Requires reclamation of temporary work areas blend with existing topography.</p> <p>3.1.5 Requires repairs of subsidence.</p> <p>3.2.6 Restricts rocks and boulders greater than 3 inches from being left on the ROW.</p> <p>4.1 Requires repair of areas subject to settling and related post-construction impacts.</p> <p>In Appendix J a winterization plan is required if reclamation cannot be completed until the spring following a construction season. To ensure that backfilled materials are adequately compacted, construction will not occur when spoils and soils are frozen unless otherwise permitted by the state inspector.</p> |
| Increased soil temperatures | <p>Maximum pressures and throughput have been reduced which should slightly reduce expected temperature increases.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Contamination               | <p>Section 3.0 addresses spill</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Appendix M contains a required Hazardous</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| from spills                                | prevention and containment during both construction and operations. Federal agencies require a spill plan during pipeline operations.                                                                                                                                                                                                                                                                                                | Materials Management Plan for construction and a Spill Prevention, Control and Countermeasure Plan for construction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Water Resources</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Sedimentation                              | 2.7 Construction vehicles shall be confined to designated roads.<br>2.15 addresses off road vehicle control. Section 7 describes construction methods to reduce impacts in and near waterbodies.                                                                                                                                                                                                                                     | 2.10.2 Prohibits open-cut stream crossings if water is present.<br>2.10.3 Requires inspections and special measures at perennial streams.<br>2.10.5 Requires temporary bridges, fords, and culverts to reduce stream bank damage. Culverts or other methods and proper culvert sizing must be used on permanent roads where fill may wash out during project life.<br>2.10.6 Restricts streambed materials from being used for backfill or road surfacing.<br>2.10.8 Restricts in-stream blasting.<br>2.10.16 Prohibits point discharges to state waters and trenching dewatering without permits. Section 5 addresses decommissioning and/or abandonment.<br>Appendix L addresses special requirements at selected stream crossings.<br>Note that DEQ requires the Project to file required storm water pollution prevention plans. |
| Alteration of groundwater flow and quality | 4.5.3 indicates that trench plugs will be used at waterbody and wetland crossings. Impacts to underground drainage tiles, if they are encountered, are described in section 5.1.                                                                                                                                                                                                                                                     | 2.10.7 Requires trench breakers to control the flow of water within the trench. Section 5 addresses decommissioning or abandonment.<br>Appendix D requires implementation of a groundwater monitoring plan for wells and springs within 100 feet of the ROW. It also requires restoration or compensation measures for any wells or springs affected by pipeline construction.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Alteration of surface flow                 | 4.10 indicates that cleanup activities would be to prepare the ROW and other disturbed areas to approximate pre-activity ground contours and that surface drainage patterns shall be restored. 4.11.5.1 describes how trench breakers will be used on steep slopes to limit trenchline erosion. Water bars are described in 4.11.5.2. Section 8 addresses methods to be used during hydrostatic testing which will minimize impacts. | 2.10.12 Requires that instream flows be maintained at required rates on selected water courses.<br>2.10.13 Requires DEQ approval of hydrostatic test discharge plan and Appendix F will contain this plan.<br>2.10.19 Prohibits alteration of flow patterns after final reclamation except for erosion control.<br>4.1 Requires repair of areas subject to settling and related post-construction impacts. Section 5 addresses decommissioning or abandonment.                                                                                                                                                                                                                                                                                                                                                                       |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Spills and water quality alteration | 2.10 and 2.11 address waste and hazardous waste handling and disposal.<br>4.7.1 contains measures to reduce impacts from trench dewatering and use of well points while 4.9 contains measures to pump water from the trench.                                                                                                                                                                              | 2.10.14 Requires spill reporting and cleanup.<br>2.10.18 Prohibits addition of biocides and chemicals to hydrostatic test waters and requires testing of hydrostatic test water being discharged.<br>2.13.1 through 2.13.7 Contain requirements for proper disposal of wastes.<br>Appendix M contains a Hazardous Materials Management Plan for construction and Spill Prevention, Control and Countermeasure Plan for construction.                            |
| <b>Wetlands</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                     | 4.5.3 indicates that trench plugs will be used at waterbody and wetland crossings. Section 6 describes methods to minimize impacts to wetlands and section 7 identifies methods to reduce impacts to riparian areas.                                                                                                                                                                                      | Appendix A contains measures to reduce the spread of aquatic nuisance species in streams and other wetlands.<br>Appendix A requires that monitoring occur at depressional wetlands of Prairie Potholes Region and mitigation or compensation be provided to the landowner or land managing agency for wetlands that no longer pond water after pipeline construction.<br>Appendix L contains site specific measures for selected streams and adjacent wetlands. |
| <b>Terrestrial Vegetation</b>       |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Clearing and alteration             | 2.7 Construction vehicles shall be confined to designated roads.<br>2.15 addresses off road vehicle control. Tree and brush clearing would be required in a few riparian areas and 4.13 describes methods that would be used so that construction has a minimal impact. Section 6 describes methods to minimize impacts to wetlands and section 7 identifies methods to reduce impacts to riparian areas. | 1.1.1 Construction timing is to be planned to minimize impacts.<br>2.7.1, 2.7.2, 2.7.3, and 2.7.4 Indicate that construction of Off ROW access roads will be minimized.<br>4.2.2 During operation, shrubs up to three feet tall shall be allowed except for an area 10 feet wide directly over the trench. Landowners may request that shrubs be removed.                                                                                                       |
| Fire                                | 2.16 addresses fire prevention and control.                                                                                                                                                                                                                                                                                                                                                               | 2.12.1 Compliance with a Fire Prevention and Suppression Plan is required.<br>Appendix N contains a Fire Prevention and Suppression Plan.<br>Appendix O DEQ must approve a Burning Plan and Fire Plan.                                                                                                                                                                                                                                                          |
| Weeds                               | 2.13 addresses weed control. 2.7 indicates that construction vehicles shall be confined to designated roads.<br>2.15 addresses off road vehicle                                                                                                                                                                                                                                                           | 4.4.1 Weeds shall be controlled as directed by local weed control boards.<br>In addition, 4.4.2 through 4.4.7 address weed control and monitoring.<br>Appendix K will include the required Noxious                                                                                                                                                                                                                                                              |

|                                            |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | control.                                                                                                                                                                                                                                                                                            | Weed Management Plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Revegetation                               | 4.11 indicates that the objectives of reclamation and revegetation are to return the disturbed areas to approximately pre-construction use and capacity and provides details on seed mix selection criteria, seed viability, timing and conditions for seeding, and acceptable methods for seeding. | 3.2.1 Restoration, reclamation, and revegetation are required to meet vegetative cover standards.<br>3.2.2 Temporary roads shall be closed unless requested by the landowner. These roads shall be revegetated.<br>3.2.7 Specific seed mixes are required for challenging soil conditions.<br>Section 3.3 addresses follow-up monitoring.<br>4.1 Requires repair of areas subject to settling and related post-construction impacts.<br>Appendix I will contain a rehabilitation plan addressing erosion control, reclamation, and revegetation.<br>Section 5 addresses decommissioning and/or abandonment.                                                                                                      |
| <b>Wildlife</b>                            |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Sage and sharp-tailed grouse               |                                                                                                                                                                                                                                                                                                     | Appendix A requires surveys for sage grouse and sharp-tailed grouse, construction timing restrictions near leks and special measures for any lek found within the construction ROW, as well as measures to reduce the mound over the trench which may increase predation of these species. It also requires a compensatory mitigation package, and a follow-up monitoring study for sage grouse. During operations inspection overflights are restricted to afternoons during the sage grouse breeding and rearing season as practicable. Unless otherwise requested by landowners, revegetation efforts would favor the establishment of silver sagebrush and big sagebrush as compatible with other land uses. |
| Wintering mule deer and Pronghorn antelope |                                                                                                                                                                                                                                                                                                     | Construction timing restrictions would apply to winter ranges for mule deer and pronghorn antelope.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Species of special concern in Montana      |                                                                                                                                                                                                                                                                                                     | In Appendix A, surveys and construction timing restrictions are required to protect Sprague's pipit, construction timing restrictions would be required near mountain plover nests and breeding mountain plovers, den surveys would be required for swift fox and when found, construction timing restrictions would apply, likewise surveys and timing restrictions would apply to nesting bald eagles, golden eagles, ferruginous hawks, and other raptor species. Great blue heron rookeries should be avoided by 500 feet. Construction                                                                                                                                                                      |

|                                          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          |  | <p>timing restrictions would apply if a hog-nosed snake or milksnake hibernaculum is found. Opening size of erosion control netting is restricted to not less than 2 inches to protect small animals, native vegetation mixes are favored and growth of non-native species such as cheatgrass and noxious weeds is discouraged in revegetation efforts. Surveys of suitable habitat are required to detect maternity roosts for fringed myotis, long-eared myotis, and Townsend's big-eared bat (species of bats) roost trees. Roost trees would be avoided if possible.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Fisheries</b>                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Fish                                     |  | <p>Special requirements at stream crossings are listed in Appendix L.</p> <p>2.10.2 Open-cut stream crossings prohibited if water is present.</p> <p>2.10.3 Requires on-site inspections and special requirements at perennial streams.</p> <p>2.10.5 Requires temporary bridges, fords, and culverts to reduce stream bank damage. Permanent roads are to use culverts or other methods where fill may wash out during project life, and proper culvert sizing.</p> <p>2.10.6 Streambed materials will not be used for backfill or road surfacing.</p> <p>2.10.8 Requires restrictions on in-stream blasting.</p> <p>2.10.12 Instream flows to be maintained at required rates on selected water courses.</p> <p>2.10.13 Approval of hydrostatic test plan required.</p> <p>2.10.16 Point discharges to state waters and trenching dewatering prohibited without permits.</p> <p>2.10.12 Instream flows to be maintained at required rates on selected water courses.</p> <p>2.10.13 Approval of hydrostatic test plan required</p> <p>Section 5 addresses decommissioning or abandonment.</p> <p>Appendix A contains measures to reduce the spread of aquatic nuisance species.</p> <p>Appendix F will contain a Hydrostatic Test Discharge Plan.</p> <p>Appendix L includes special requirements at selected stream crossings.</p> |
| <b>Threatened and endangered species</b> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                          |  | <p>Appendix A requires surveys for interior least terns and construction timing restrictions are required if they are found. Horizontal directionally drilled crossings are required on the Milk, Missouri, and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                                                                       |                                                                                                                                             |                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                       |                                                                                                                                             | Yellowstone rivers to protect pallid sturgeon, interior least tern, and piping plover habitats.                                                                                                                                                                                              |
| <b>Cultural Resources</b>                                             |                                                                                                                                             |                                                                                                                                                                                                                                                                                              |
|                                                                       | 2.19-Cultural Resources                                                                                                                     | 2.11.1 All construction activities shall be conducted in accordance with the PA in Appendix G for Historic Properties and inadvertent discoveries. For Historic Properties where impacts cannot be avoided, plans shall be developed per the PA in consultation with all interested parties. |
| <b>Paleontological Resources</b>                                      |                                                                                                                                             |                                                                                                                                                                                                                                                                                              |
|                                                                       |                                                                                                                                             | 2.11.2 Prior to and during construction activities, the OWNER shall handle paleontological resources in accordance with the MOU and Paleontological Treatment Plan set forth in Appendix H.                                                                                                  |
| <b>Air Quality and Noise</b>                                          |                                                                                                                                             |                                                                                                                                                                                                                                                                                              |
| Air Quality                                                           | 2.16 Addresses fire prevention and control measures.                                                                                        | 2.12.1 Requires compliance with Fire Prevention and Suppression Plan.<br>2.12.3 Requires a permit for refuse burning.                                                                                                                                                                        |
| Noise                                                                 | 2.12 Addresses minimization of noise during non-daylight hours and within 1 mile of residences.                                             | 2.4.1 Noise levels near pump stations shall not exceed 60 decibels during operation unless waived by the landowner.                                                                                                                                                                          |
| <b>Land Use, Recreation, and Visual Resources</b>                     |                                                                                                                                             |                                                                                                                                                                                                                                                                                              |
| Existing property protections                                         | 2.5 Addresses compensation of landowners for construction related damage and any potential future damage.                                   | 2.5.3 Construction is to be conducted to limit damage to existing property.<br>2.5.5 Requires notification of potential damage to property.                                                                                                                                                  |
| Livestock                                                             | 2.7 and 4.12 Describe methods for controlling livestock during construction and seeding rangeland.                                          | 2.5.4 through 2.5.8 Address minimizing impacts to livestock.                                                                                                                                                                                                                                 |
| Traffic controls, Dust control, Garbage                               | 2.7 Roadways are to be marked for project use.<br>2.14 and 4.14.1 Address minimization of dust.<br>4.12 – Litter and garbage removed daily. | 2.6 and 2.8.5 Requirements for managing traffic during construction.<br>Appendix Q contains dust control requirements.<br>2.1.3 Requires trash and debris to be regularly removed.                                                                                                           |
| Interference with radio, TV or other stationary communication systems |                                                                                                                                             | 4.3.1 Interference will be corrected.                                                                                                                                                                                                                                                        |
| Agriculture                                                           | 2.8 – Aboveground facilities shall be placed as reasonably possible to not                                                                  | 3.2.6 Rocks greater than 3 inches on the surface of the ROW will removed following construction or                                                                                                                                                                                           |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                        |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>hinder ongoing agricultural activities</p> <p>2.18 – Restrict certain activities in cultivated land during excessively wet soil conditions</p> <p>4.1 – Interference with irrigation systems</p> <ul style="list-style-type: none"> <li>• If feasible, temporary measure shall be implemented to allow for irrigation during construction.</li> <li>• If construction interrupts an operational irrigation system, the landowner and KXL shall develop an acceptable amount of time the system may be out of service.</li> <li>• If stopping irrigation results in crop damages, the landowner will be compensated for those damages.</li> <li>• If irrigation ditches need to be stopped, the length of time of the stoppage will be the time to install the pipe.</li> </ul> <p>4.16 – KXL will be responsible for irrigation system repairs that fail.</p> <p>4.2 – If crops are present, they will be mowed to ground level unless a landowner agreement differs.</p> <p>4.2 – Burning is prohibited on cultivated land.</p> <p>4.4 and 4.11.7– Agricultural area with terraces will be surveyed and the survey information will be used for minimizing impacts and reclaiming terraces.</p> <p>4.16 – Trench depressions will be repaired expeditiously as practicable</p> <p>4.16 – When requested, KXL will monitor yield of land impacted by construction with help of an agricultural specialist. If reduced yields are found, KXL will compensate and implement</p> | <p>be similar what is present on adjacent undisturbed land.</p> <p>Appendix A If existing water lines need to be relocated, KXL will be responsible for the relocation and cost.</p> <p>Appendix A If requested, KXL will bore irrigation ditch and canal crossings.</p> <p>Appendix A – Irrigated fields, ditches, canals and dikes to be restored to a state that existed prior to construction.</p> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                  |                                                                                                                                                             |                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                  | procedures to return the land to equivalent capability.<br>5.0 to 5.6 – Procedures to minimize impacts to drain tiles.                                      |                                                                                                                                                                                                                    |
| Residential and Commercial/Industrial Areas                                      | 4.14 – Procedures to minimize impacts to residential and commercial areas.                                                                                  |                                                                                                                                                                                                                    |
| Recreation                                                                       |                                                                                                                                                             |                                                                                                                                                                                                                    |
| Recreational lands                                                               | 2.3 – Coordinate with managers of public lands to reduce conflicts between construction and recreational uses.                                              |                                                                                                                                                                                                                    |
| Visual Resources                                                                 | 4.14.1 Preservation of mature trees and landscaping in existing residential and commercial areas.                                                           | 2.1.1 Preservation of the natural landscape.<br>2.1.9 Preservation of vegetation adjacent to the right-of-way.<br>4.1.4 Painting or treating permanent above-ground facilities to blend with natural surroundings. |
| <b>Socioeconomics</b>                                                            |                                                                                                                                                             |                                                                                                                                                                                                                    |
| Reduced availability of transient housing and increased need for public services | FEIS page 3.10-56 Construction of temporary work camps in rural areas within Montana and South Dakota to meet housing needs of the construction work force. |                                                                                                                                                                                                                    |
| Disruption of local transportation corridors                                     | 4.14.1 Maintaining access and traffic flow during construction                                                                                              | 2.6 Traffic Control                                                                                                                                                                                                |
| Stresses on local populations                                                    |                                                                                                                                                             | Appendix A Sensitive Areas – Public liaison officer to resolve complaints or problems of landowners, local communities and residents.                                                                              |

**C. Minimization of adverse environmental impacts (continued)**

1. The expected net present value of costs, including monetary costs of construction to the applicant, external monetary costs, and the value of reasonably quantifiable environmental impacts is lower for the Project than for any other available alternative that could meet the finding of need. Other available non-construction alternatives considered include: existing or expanding pipeline systems, pipeline systems that have been proposed or announced, and non-pipeline systems such as tank trucks, railroad tank cars, and barges and marine tankers to transport Canadian heavy crude oil to Gulf Coast refineries.

None of the pipeline systems considered would be capable of transporting Canadian crude oil to Gulf Coast delivery points and also provide an on-ramp for domestic crude production from Montana and North Dakota. Therefore, they would not meet the purpose of the Project. A combination of the pipeline systems considered could, over time, deliver Canadian oil sands crude oil in volumes similar to the volumes that will be transported by the Project. However, that would not meet the near-term need for heavy crude oil at the Gulf Coast refineries. Expanding the pipeline systems that were considered to meet the purpose of the Project or construction of new components or a combination of those systems would result in impacts similar to those of the Project.

The trucking alternative would add substantial congestion to highways in all states along the route selected, particularly at and near the border crossing and in the vicinity of the delivery points. At those locations, it is likely that there would be significant impacts to the existing transportation systems. Trucking would also result in substantially higher greenhouse gas emissions and a higher risk of accidents than transport by pipeline. Development of a rail system to transport the volume of crude oil that would be transported by the Project would likely produce less impact from construction than would the Project, because it could be done using existing tracks. However, there would be greater safety concerns and greater impacts during operation, including higher energy use and greenhouse emissions, greater noise impacts, and greater direct and indirect effects on many more communities than the Project.

2. Environmental impacts that could not be quantified in monetary terms were considered.

These impacts were not adverse enough to alter DEQ's determination that the selected location and design for the pipeline minimizes the net present value of costs among alternatives.

3. Measures proposed by Keystone to minimize adverse environmental impacts are set forth in Attachment 1A (revised CMRP) that is incorporated by reference as enforceable provisions of this Certificate of Compliance. Environmental specifications developed by DEQ to minimize adverse environmental impacts are set forth in Attachment 1B, which is incorporated by reference as enforceable provisions of this Certificate of Compliance. Should there be a conflict between the measures developed by Keystone, measures required by federal agencies, and the

environmental specifications developed by DEQ, the more environmentally protective provision will apply. The costs associated with the mitigation measures included in the environmental specifications (Attachment 1B) for the project were considered in DEQ's determination that the selected location and design for the pipeline minimize the net present value of costs among alternatives.

4. Keystone is required to construct the pipeline in the location described in Final Location Selection, and as depicted in Attachment 2. The selected location represents the best balance among the preferred location criteria listed in Circular MFSA-2, section 3.1, considering 1) environmental impact and economic costs; 2) the requirement that public lands be considered and used whenever the use of public lands is as economically practicable as the use of private lands; 3) avoidance of impacts to farmland; 4) cost considerations; 5) avoidance of houses; 6) public acceptance; 7) paralleling existing corridors; and 8) avoidance of impacts to other resources.

5. The location of the pipeline selected by DEQ does not cross national wilderness areas or national primitive areas in Montana.

6. Reasonable alternative locations for the pipeline were considered in selecting the final location in Montana.

7. The final location for the pipeline facility will result in less cumulative adverse environmental impact and economic cost than siting the facility in any other reasonable location, based on identification of any probable significant adverse environmental impacts, identification of reasonable mitigation for these significant adverse environmental impacts, and adoption of acceptable mitigation and monitoring plans set forth in the environmental specifications included as Attachment 1B.

In Montana, the selected location does not cross: national wildlife refuges and ranges; state wildlife management areas; wildlife habitat protection areas; national parks and monuments; state parks; national recreation areas; corridors of rivers in the National Wild and Scenic Rivers system and rivers eligible for inclusion in the system; roadless areas of 5,000 acres or greater in size managed by federal or state agencies to retain their roadless character; specially managed

buffer areas surrounding national wilderness areas; national primitive areas; state or federal waterfowl production areas; National Natural Landmarks; Natural Areas; Research Natural Areas; Areas of Critical Environmental Concern; special interest areas; Research Botanical Areas; Outstanding Natural Areas; municipal watersheds; major elk summer security areas; habitats occupied at least seasonally by bighorn sheep and mountain goats; surface supplies of potable water; any undeveloped land or water areas that contain known natural features of unusual scientific, educational or recreational significance; areas with high waterfowl population densities including prime waterfowl habitat identified through consultation with FWP and other areas identified by FWP or the US Fish and Wildlife Service as waterfowl concentration areas or low-level feeding flight paths; winter ranges for elk; winter ranges for moose; winter ranges for mountain goat; or winter ranges for bighorn sheep. The pipeline will not cross any standing water body greater than 20 acres in size.

8. The pipeline will cross areas with rugged topography on slopes greater than 15 and 30 percent. Vegetation will be destroyed during the construction process, and soil will be exposed to erosion on these steep slopes. Keystone has proposed a plan to control erosion during project construction and will be required to implement a Storm Water Pollution Prevention Plan under the Montana Water Quality Act. Keystone shall submit to DEQ the bond(s) identified in the environmental specifications to ensure that areas disturbed during construction are reclaimed and revegetated.

Federally protected threatened or endangered species that are known or thought to be in the vicinity of the Project in Montana include pallid sturgeon, interior least tern, piping plover, black-footed ferret, and whooping crane. No state listed threatened or endangered species have been designated in Montana.

Since 1980, reports of most frequent occurrence of pallid sturgeon are from the Missouri River between the Marias River and Ft. Peck Reservoir and between Ft. Peck Dam and Lake Sakakawea (in North Dakota); and from the lower 70 miles of the Yellowstone River. Critical habitat has not been designated for the pallid sturgeon, but sections of rivers relatively unchanged by dam construction and operation that maintain large, turbid, free-flowing river characteristics are important in maintaining residual populations of this species. Although pallid

sturgeon may be present at the crossings of the Missouri and Yellowstone Rivers, these river crossings would be crossed using the HDD method. Assuming there would be no frac-outs (unintentional release of drilling fluid and cuttings) reaching the rivers during the drilling process there would be no direct effect on potential river bottom habitat for pallid sturgeon (USFWS 2008). The intake end of the pump used to divert water for hydrostatic testing would be screened using an appropriate mesh size to prevent entrainment or entrapment of larval fish or other aquatic organisms. In the unlikely event of a spill that would enter a river, exposure to crude oil could result in adverse toxicological effects to pallid sturgeon. However, the probability of adverse effects to pallid sturgeon are unlikely due to: 1) the low probability of a spill, 2) the low probability of a spill in a river reach where pallid sturgeon are present, and 3) the low probability of the spill reaching a river with pallid sturgeon in sufficient amounts to cause toxic effects.

Interior least terns may occur at the Yellowstone River crossing in Montana and downstream of the crossing of the Missouri River. However none has been detected during surveys for the proposed pipeline in Montana. No critical habitat has been designated for this species. The crossings of these rivers would be constructed with the horizontal directional drilling method reducing the direct impacts of construction on favored gravel bar habitat. There is a slight chance that drilling fluids could escape during the drilling process and temporarily muddy the gravel bar habitat. Habitat loss or alteration resulting from a crude oil spill from the pipeline is highly improbable due to: 1) the low probability of a spill, 2) the low probability of a spill coinciding with the presence of least tern individuals. Habitat may be altered should there be spills of fuel during diversion of hydrostatic test water. Additional survey work and restrictions on the timing of construction activities during nesting and fledging periods if least terns are found within 0.25 mile of the crossings will mitigate impacts due to disturbance from construction. Associated transmission lines are not expected to cross the Yellowstone or Missouri rivers.

Piping plovers may occur near the Yellowstone and Missouri river crossing where suitable habitat exists. However, no plovers were detected during surveys for the pipeline in Montana. Critical habitat has been designated for this species at the crossing of the Missouri River. The crossings of the rivers will be constructed with the HDD method, reducing the direct impacts of construction on favored gravel bar habitat. There is a slight chance that drilling fluids could

escape during the drilling process and temporarily muddy the gravel bar habitat. Habitat loss or alteration or oiling of individual birds resulting from a crude oil spill from the pipeline is highly improbable due to: 1) the low probability of a spill, and 2) the low probability of a spill coinciding with the presence of piping plover individuals. Additional valves are required at the Yellowstone and Missouri rivers to reduce the volume of oil potentially spilling into these rivers. Habitat may be altered should there be spills of fuel during diversion of hydrostatic test water. Additional survey work and restrictions on the timing of construction activities during nesting and fledging periods, if piping plovers are found within 0.25 mile of the crossings, should mitigate impacts due to disturbance from construction. Associated transmission lines for pump stations will not cross the Yellowstone or Missouri rivers.

The Project in Montana is west of the primary whooping crane migration pathway. However, individual birds can be found outside the primary movement corridor and could possibly occur within the Project area in Montana during spring and fall migration. No critical habitat has been identified near the proposed pipeline in Montana. Possible areas used by whooping cranes during migration would include major river systems and their associated wetlands, as well as palustrine wetlands and shallow areas of reservoirs and other lacustrine wetlands. The Yellowstone River may be a stopping over point during migration. The crossing of the Yellowstone River would be constructed with the HDD method reducing the direct impacts of construction. There is a slight chance that drilling fluids could escape during the drilling process and temporarily muddy habitat. There is only a remote chance that a whooping crane would collide with one of the associated transmission lines because of the low number of birds and because the associated transmission lines avoid preferred habitats. Habitat loss or alteration resulting from a crude oil spill from the pipeline is highly improbable due to: 1) the low probability of a spill, 2) the low probability of a spill coinciding with the presence of individual whooping cranes. Habitat may be altered should there be spills of fuel during diversion of hydrostatic test water. Additional survey work and restrictions on the timing of construction activities during spring and fall migration periods should whooping cranes be found would mitigate disturbance related impacts. If whooping cranes are found during this period equipment would not be started until whooping cranes leave the area by mid-morning.

The pipeline does not cross areas in Montana thought to be inhabited by non-essential experimental populations of black-footed ferrets. Black-footed ferrets are mostly dependent on prairie dogs for food and use their burrows for shelter. The one prairie dog colony near the project in Montana is too small to support black-footed ferrets. Should a black-footed ferret exist near the project, adverse effects could include habitat loss, habitat alteration, habitat fragmentation, and mortality. There is a slight chance that heat from the pipeline could affect vegetation. Raptors may perch on associated transmission lines and could conceivably gain a hunting advantage but this could be mitigated by installing anti-perching devices on the structures. Habitat loss or alteration resulting from a crude oil spill from the pipeline is highly improbable due to: 1) the low probability of a spill, 2) the low probability of a spill coinciding with the presence of black-footed ferrets, and 3) the low probability of a ferret contacting the spilled product.

The Keystone XL Pipeline will not cross any National Historic Landmarks or listed National Register of Historic Places districts or sites.

The Keystone XL pipeline will cross sites that have been determined eligible for listing on the National Register of Historic Places. These sites will be addressed as required by the Programmatic Agreement for the project.

The Keystone XL Pipeline will cross Class I or II streams or rivers, as classified by FWP, including the Milk, Yellowstone, and Missouri rivers. These rivers will be crossed using HDD, and pipeline burial will be well below calculated channel scour depths.

The pipeline will cross streams listed by DEQ as not attaining designated beneficial uses of water (Frenchman, Buggy, Cherry, Middle Fork Prairie Elk, East Fork Prairie Elk, Cabin, Pennel, and Sandstone creeks, as well as the Yellowstone, Milk, and Missouri rivers). Minor short-term adverse impacts to surface water quality will occur by temporarily increasing potential sources of sediment from the initiation of construction to successful revegetation of the disturbed areas. This impact will be mitigated by implementing a Storm Water Pollution Prevention Plan to reduce sediment transport, along with reclamation and revegetation of the disturbed areas. All streams with water present will be crossed using open-cut dry crossing

methods, and at least the Milk, Missouri, and Yellowstone rivers will be crossed with horizontal directional drilled crossings. Keystone is required to submit a bond to help ensure that areas disturbed during construction are reclaimed.

The Keystone XL Pipeline will cross highly erodible soils and areas with severe reclamation constraints. Vegetation will be destroyed during the construction process, and soil will be exposed to erosion on these steep slopes. Keystone will control erosion during project construction and will be required to implement a Storm Water Pollution Prevention Plan under the Montana Water Quality Act. Keystone shall submit to DEQ the bond(s) identified in the environmental specifications to ensure that areas disturbed during construction are reclaimed and revegetated.

The Keystone XL Pipeline will cross areas in Montana with BLM-designated Class II visual resource management, where the objective is to preserve the existing character of the landscape while keeping landscape changes at a minimum. Two of these areas are at the Missouri and Milk rivers, which will be crossed using the horizontal direction drilling method to minimize impacts in the river and adjacent areas. Use of this construction method will minimize or avoid visual changes in the vicinity of the river during operation of the Project. However, a fenced valve will be visible.

After completion of revegetation and reclamation in the remaining Class II areas (near Frenchman Creek, Rock Creek, East Fork Prairie Elk Creek, and U.S. Highway 12), terrain and surface conditions will be similar to those of surrounding areas (FEIS Appendix I page I-200). Keystone adjusted the pipeline route to minimize adverse aesthetic features where possible and will implement measures in their Construction, Mitigation, and Reclamation Plan to reduce long-term visual impacts to less than significant levels.

The Keystone XL Pipeline will cross winter range for mule deer, white-tailed deer, and pronghorn antelope, and wintering animals may be displaced or stressed by human activity associated with construction activities. A small amount of vegetation within these winter ranges will be lost until reclamation is successful. Mitigation of this impact is addressed in the

Environmental Specifications. In these areas, DEQ may impose timing restrictions, if construction activities extend beyond November 15. In these areas, DEQ will determine the need for restrictions based upon the severity of winter conditions and consultation with FWP biologists.

The USFWS has found that listing the greater sage-grouse (rangewide) under the Endangered Species Act is warranted, but precluded by higher priority listing actions. East of the continental divide, sharp-tailed grouse are not considered a state sensitive species. The pipeline will cross through or near both sage-grouse and sharp-tailed grouse breeding areas, and areas where they may concentrate during severe winters. Impacts to grouse on leks could result from construction disturbance during the breeding season in April and early May. Nesting hens could be disturbed during May and early June. Construction activity in the vicinity of grouse leks could reduce reproductive success. This impact is addressed by conditions listed in the DEQ Environmental Specifications for the project.

The Keystone XL Pipeline will cross areas with geologic units or formations that show a high probability of including significant paleontological resources. DEQ, in coordination with the DOS, BLM, SHPO, DNRC, and Keystone, has minimized the potential for impacts to paleontological resources along the area of potential effect of the proposed Project by the development of avoidance and mitigation measures in the form of a Paleontological Memorandum of Understanding, located in Appendix H of the Environmental Specifications.

The selected location is near sites that have or may have religious or heritage significance and value to Native Americans. In accordance with the Programmatic Agreement, included as a condition in the Environmental Specifications, tribal monitors will be present at these locations to minimize potential impacts.

The selected location crosses intermittent streams that are within 15 river miles of rivers or streams that are classified by FWP as a Class 1 fisheries resource and cross three Class 1 streams, the Milk, Missouri, and Yellowstone rivers. Keystone will use HDD crossings of the Milk, Missouri, and Yellowstone rivers. Additional valves are required at the Missouri and Yellowstone rivers to reduce the amount of oil that could enter these streams in the event of an

oil spill. Stream crossings will meet federal safety standards for pipeline burial. Keystone is required to file a spill response plan with the federal Office of Pipeline Safety and implement this plan as required by federal regulations.

#### **D. Portion of the pipeline to be located underground**

The pipeline will be located underground, except for pump stations and valves. None of the associated transmission lines will be located underground. A few powerlines providing power to valves may be located underground.

#### **E. Consistency with regional plans for expansion of the appropriate grid**

The associated transmission lines are consistent with regional plans for expansion of the Western transmission system.

#### **F. Utility System Economy and Reliability**

The associated transmission lines will serve the interest of utility system economy and reliability.

#### **G. Conformance with state and local laws and regulations**

Construction of the pipeline in the location discussed below conforms to applicable state and local laws and regulations.

#### **H. Public Interest, Convenience and Necessity**

##### *The Basis of the Need of the Facility*

The basis of the need of the facility is discussed above.

##### *The Nature of the Probable Environmental Impacts*

The nature of the probable environmental impacts is discussed above.

##### *The Benefits to the Applicant, the State, and Any Other Entities Resulting from the Facility*

Benefits to TransCanada will be the monetary profit earned from operating the pipeline. It is estimated that Keystone will incur capital costs in and outside of Montana, including mitigation costs, of approximately \$7,050,250,000 and levelized annual operating costs of \$771,000,000. It

is expected that TransCanada will set tariffs to cover its costs and to achieve a reasonable rate of return on its investment. Profits may be shared with its stockholders. Profits, once they are earned, may last the lifetime of the pipeline and will go to both in-state and out-of-state residents who are either employees or stockholders of TransCanada.

Benefits to the State of Montana include local tax revenues in the counties to which the pipeline is located. Combined, these counties will receive annual property taxes of approximately \$63 million. Broken down separately, Phillips County is expected to receive annual property taxes of \$4,367,060, which represents an increase in annual property taxes of 63.37% as a percent of property taxes levied in 2006. Valley County is expected to receive annual property taxes of \$14,860,604, which represents an increase in annual property taxes of 116.72% as a percent of property taxes levied in 2006. McCone County is expected to receive annual property taxes of \$18,038,389, which represents an increase in annual property taxes of 570.53% as a percent of property taxes levied in 2006. Dawson County is expected to receive annual property taxes of \$14,126,149, which represents an increase in annual property taxes of 116.35% as a percent of property taxes levied in 2006. Prairie County is expected to receive annual property taxes of \$5,869,630, which represents an increase in annual property taxes of 278.58% as a percent of property taxes levied in 2006. Finally, Fallon County is expected to receive annual property taxes of \$5,695,963, which represents an increase in annual property taxes of 122.14% as a percent of property taxes levied in 2006.

Benefits to the State of Montana include additional state-level tax revenues. It is expected that State General Fund taxes totaling \$16,324,764 will be collected annually in the counties.

Additionally, it is expected that university system taxes totaling \$1,031,038 will be collected annually in the counties. (Jon Schmidt, Trow: Keystone XL Pipeline Project, Response to US Dept. of State Data Request 2.0, June 25, 2009.) Increases in payroll taxes from additional income created by the Project will also accrue to the State of Montana.

An additional benefit would likely occur to Montana oil producers from construction of the on-ramp to the pipeline north of Baker. The benefits of this access may include a higher price obtained from Montana-produced oil, which is currently sold at a discount to the average U.S.

price due in part to inadequate oil transmission infrastructure. Construction of the pipeline would provide Montana producers with direct access to refineries in PADD III. The direct access may allow more Montana production to occur due to increased available transfer capacity (relieving bottlenecks) and easier refinery access. These benefits would also likely occur for North Dakota oil-producers that use the on-ramp. More oil production in Montana would lead to both benefits and costs in Montana. Benefits would include increased jobs and income over the current level of oil production, as well as increased natural resource taxes collected by the State.

The main costs from the pipeline, unlike the benefits, will be concentrated along the pipeline route. Costs will be experienced mostly by landowners on or near the pipeline route and small towns near the route. Costs to landowners will occur from the pipeline where it crosses farmland and rangeland in the form of lost productivity, inconvenience and costs in running equipment around the disturbed area, weed control, and other costs. Almost all of the land crossed in Montana is rangeland. Some other uses of land could be compromised with a pipeline on the property as well.

Some landowners have expressed concern over their personal uses of the land and property values. Specific economic costs to landowners will include temporary disruption of farming and ranching activities during construction of the pipeline, loss (although compensated for through the easement purchase) of potential future uses of the land occupied by the pipeline (such as a building site), the temporary disruption of water supplies as water supply pipelines or ditches are cut during trenching, and the temporary disruption of fencing during construction.

Keystone will compensate farmers for crop losses, reclaim the land in the construction ROW to preconstruction conditions as much as possible, and provide payments for easements along the route. As a result, the impact of the pipeline on farm income will likely be temporary. The significance of the impact to each landowner will depend on the terms of payment agreed to between the landowner and Keystone and the specific pipeline route on the affected land.

The pipeline would not have a major impact on residential and agricultural property values. While studies have shown that residential and agricultural properties located on or adjacent to

pipeline easements could have property values worth more or less than comparable nearby properties that were not encumbered by pipeline easements, the differences generally were statistically insignificant and the absolute dollars involved were not significant relative to the overall property value and sales prices.

Spill risk assessments were conducted during the environmental review to assess the likelihood of operational releases from the pipeline. Using a Pipeline and Hazardous Materials Safety Administration database, a spill frequency of 1.83 incidents per year for crude oil spills greater than 50 bbl was estimated. Using a National Response Center database, a spill frequency ranging from 1.38 incidents per year to 0.68 incidents per year for crude oil spills up to 50 bbl was estimated. The estimate of the incident frequency for crude oil spills of any size, using both the Pipeline and Hazardous Materials Safety Administration significant spill database for spills greater than 50 bbl and the National Response Center database for spills up to 50 bbl, was 2.51 crude oil spills of any size per year. These spill risk assessments are for the entire 1,682-mile length of the Project. The spill risk assessment for the 285.5-mile length in Montana would be correspondingly lower.

Federal approval of the pipeline will include processes, procedures and systems to prevent, detect, and mitigate potential oil spills that could occur during operation of the proposed pipeline. TransCanada will also be liable for all costs associated with cleanup and restoration as well as other compensations. TransCanada will also submit reclamation and revegetation bonds to the State of Montana, and purchase insurance to ensure satisfaction of TransCanada's obligations arising after the pipeline is put into operation, including cleanup obligations associated with an oil spill.

Costs associated with some environmental impacts cannot be easily assigned a monetary value. These include visual impacts, loss of wildlife habitat, soil erosion, and cultural resource impacts. As discussed above, these impacts are minimized under this Certificate.

National benefits from this pipeline may positively affect Montanans in terms of their consumption of petroleum products. In PADD III, consumption of heavy crude is expected to

increase as production of lighter crude from current sources decreases. The increase in heavy crude consumption coupled with continued expected declines from Mexican and Venezuelan sources of heavy crude make increased access to Canadian crude desirable from both an economic and national security standpoint. Increasing development of and access to this large source of oil located in a stable country, with which the U.S. has free trade agreements, would tend to decrease price volatility and reduce the U.S. dependence on oil from countries with uncertain or declining production horizons, as well as from countries where political considerations reduce the reliability of beneficial trade relationships with the U.S. In addition, there would be several other potential benefits to obtaining oil from this source via the Keystone XL pipeline to PADD III:

- Reductions in the price of crude oil increase the level of output of the U.S. economy. Assuming that environmental externalities associated with crude oil consumption are appropriately addressed through regulation, projects such as the Keystone XL Project put downward pressure on the price of crude oil and benefit the U.S. economy.
- A reduction in oil shocks. Oil shocks (unanticipated supply reductions that result in price spikes) reduce the amount of goods and services the U.S. can produce given a fixed amount of other inputs and cause some inputs (e.g., land, labor, and capital) to be under-utilized. The likely cost of future oil shocks to the U.S. economy was estimated to be between \$2 and \$8 per barrel. Thus, projects that stabilize crude oil supply through supply diversification and increased access to politically stable regions, such as the Project, benefit the U.S. economy.

Benefits to the federal government include federal taxes paid by Keystone.

*Effects of Economic Activity; Public Health, Welfare and Safety*

Benefits to the State of Montana include a short-term boost to local economies from construction. Approximately 210-380 Montana workers could work on the pipeline for an average of 8 months if Keystone's estimate of 10-15% local hiring materializes. However, there

might not be a sufficient number of workers available in eastern Montana to achieve this goal, due in part to labor shortages in that part of the state from the current oil boom.

During construction, benefits will be derived from wages earned by local construction workers that are likely above the wages that might otherwise be earned at other jobs by those workers, from construction-related expenditures made at local businesses, from construction workers spending in local economies that would not occur without the Project, and from taxes on both wages and expenditures that will go to local and state governments.

Operation of the pipeline would require approximately four to eight permanent employees in Montana. During operation, activities associated with maintenance, monitoring, and repair of the pipeline will generate a demand for goods and services, including electrical power, that will result in long-term economic benefits to the region. The four electrical coops and one utility that will serve the pump stations have taken careful measures to insulate their customers from the risk of electricity cost increases due to service to the pipeline.

Adverse economic impacts during construction would include temporary and minor increases in the need for public services, disruption of local transportation corridors, and reduced availability of transient housing. TransCanada will establish temporary work camps during construction to minimize impacts to housing and public services in those areas. Most of the adverse effects on local services will occur on smaller towns during construction when workers will be in the area. There is a slight possibility that local workers could be lured from their existing jobs toward higher paying pipeline construction jobs, but that effect is likely insignificant in the long run. Social stresses from the line are likely to go away shortly after construction is done. During construction, there will be a temporary increase in population in each county along the route from the presence of construction workers. Population impacts in the region will depend on the composition of the local and non-local construction workforces and the existing population in the area. As described above, pipeline workers in Montana will be housed in work camps established by Keystone. This will reduce the effect of the temporary population increase on residents of rural areas.

With a relatively large construction workforce temporarily in the area, the primary increases in public service needs will include responses to emergencies and disturbances during construction. The majority of the construction workforce will be housed in the work camps, where there will be basic medical facilities and security staff to respond to minor emergencies and disturbances. The camps will also include water supplies and sanitary waste treatment facilities. As a result, construction impacts to existing public services in the vicinity of the pipeline, including the towns of Baker and Nashua, will be minor and temporary.

#### *Net Benefit Determination*

While the cost of construction and operation of the pipeline and the tax benefits and other economic benefits to counties and the State can be quantified, nonmonetary benefits derived from the pipeline and the other nonmonetary costs, including costs to the environment and Montana landowners, cannot. While the nonmonetary costs cannot be quantified, the selected location of the pipeline and conditions imposed by this Certificate minimize these adverse impacts on the environment, landowners and affected communities. The quantified and unquantified benefits to the State of Montana, other states, the public at large, and TransCanada outweigh the quantified costs and unquantified costs of the Project. The long-term tax benefits to counties, potential benefits to Montana oil producers, and potential long-term benefits to oil supply and prices nationwide, outweigh costs to landowners and towns along the pipeline route--most of which would occur in the short-term during construction.

The net benefits of the Project also outweigh the net benefits of other alternatives to the pipeline. Under the No Action Alternative, crude oil demand in PADD III would likely be met by one or more of the following options:

- Delivery by marine tankers from countries outside of North America (primarily from the Middle East);
- Delivery from the WCSB (Alberta) through the construction of alternative pipeline systems between the WCSB and PADD III;
- Delivery from the WCSB to PADD III via existing pipeline connections to PADD II and new onward pipeline connections to PADD III;

- Delivery of WCSB crude by other transportation methods (e.g., railroad tank cars, perhaps supported by barge transport); or
- Delivery from the WCSB through the construction of a pipeline to a port in Canada and subsequent shipment of the oil by marine tanker to PADD III.

No other currently proposed pipelines providing a route from Canada to PADD III with the capacity of Keystone XL are expected to be online before Keystone XL. Any alternative pipeline system constructed to move WCSB crude oil directly to PADD III refineries would likely have environmental impacts that are similar to those of the Project. Additional pipeline infrastructure constructed to provide greater pipeline capacity between PADD II and PADD III would likely produce environmental impacts similar to those of the Gulf Coast Segment of the Project.

Even if the United States, or countries around the world, adopt policies that would reduce the consumption of crude oil, there would still likely be a market demand for substantial increases in the volume in crude oil derived from the Canadian oil sands over the next 20 to 25 years. For this reason, use of alternative energy sources and energy conservation in meeting needs for transportation fuel is not considered an alternative to the Project.

Using trucking instead of Keystone XL would add substantial congestion to highways in all states along the route selected, particularly at and near the border crossing and in the vicinity of the delivery points. At those locations it is likely that there would be significant impacts to the existing transportation systems. The trucks would consume millions of gallons of fuel per year, with subsequent exhaust emissions (including greenhouse gases) and other negative environmental effects. The potential for human injury and death are much greater in trucking crude oil than for pipelines.

Development of a rail system to transport the volume of crude oil that would be transported by the Project would likely produce less impact from construction than would the Project. However, there would likely be greater safety concerns and greater impacts during operation,

including higher energy use and greenhouse gas emissions, greater noise impacts, and greater direct and indirect effects on many more communities than the Project.

Marine transport of WCSB crude oil would not meet the Project's objectives, would result in greater energy consumption and greenhouse gas emissions, would increase the cost of delivered crude oil to the Gulf Coast refineries, and would have greater safety concerns than the Project.

#### **H. Air and water quality decisions, opinions, orders, and certifications:**

Construction and operation of the pipeline and associated facilities do not require any air decision, opinion, order, certification, or permit. Keystone has obtained a 318 Authorization. If the start of construction is delayed more than one year, Keystone shall reapply for this Authorization. Construction will not take place in waters of the State without a valid 318 Authorization. Keystone shall file a Storm Water Pollution Prevention Plan with DEQ prior to the start of construction and shall maintain a valid Storm Water Pollution Prevention Plan until reclamation and revegetation is complete.

#### **Use of public lands**

DEQ evaluated the use of public lands for location of the pipeline. Keystone's proposed alignment is modified to make better use of land under the jurisdiction of the BLM and the DNRC as described below under Final Location Selection. State lands were considered and are used where the use of State lands results in less environmental impact than the use of private lands. However, in some cases, the pipeline will be located on private land rather than State land to reduce impacts to farming and increase distance from residences.

#### **II. Final Location Selection**

Under the No Action Alternative, the potential adverse and positive impacts associated with building and operating the Project would not occur. However, there is an existing market demand for heavy crude oil in the Gulf Coast area. The demand for crude oil in the Gulf Coast area is projected to increase, and refinery runs are projected to grow over the next 10 years.

Improved fuel efficiency and broader adoption of alternative fuels would not likely substantially alter the demand for Canadian crude oil.

At the same time, three of the four countries that are major crude oil suppliers to Gulf Coast refineries currently face declining or uncertain production horizons. If Canadian crude oil is not transported to PADD III refineries, the refineries would continue to be dependent on less reliable foreign oil supplies.

If the Project is not built and operated, Gulf Coast refineries would likely obtain Canadian crude oil transported through other new pipelines or by rail or truck transport. In addition, the Gulf Coast refineries could obtain crude oil transported by marine tanker from areas outside of North America. The impacts of other pipeline projects would likely be similar to the Project and the transportation of crude oil by tanker would likely result in greater greenhouse emissions.

In addition, under the No Action Alternative, the additional tax revenues by Montana counties and the State would not be generated, nor would the benefits derived from the Bakken on-ramp be realized. Based on these considerations, DEQ does not select the No Action Alternative.

#### *Major Alternatives*

In addition to the No Action Alternative, ten alternatives were developed for consideration in Montana: Express-Platte Alternative 1, Express-Platte Alternative 2, Alternative SCS-A1A, Alternative SCS-A, Alternative CND, Keystone corridor Alternative-1, Alternative SCS-B, Proposed Steel City Segment, Baker Alternative, Western Alternative, and Alternative CSD. These alternatives are shown in Figure 4.3.3-1 of the final EIS. In addition to the route alternatives assessed in Section 4.3 of the EIS and in the initial Keystone MFSA application, DEQ required that Keystone provide assessments of two additional routes using a route development model based upon geographic information system (GIS) databases. This resulted in the CSD (Canada to South Dakota Alternative) and CND (Canada to North Dakota Alternative). Seven of the Montana alternatives were eliminated early in the evaluation process by screening against the following criteria: would the alternative (1) meet the purpose of and need for the

Project, (2) be technically and economically practicable or feasible, 3) minimize environmental impact, and 4) or maximize the use of public land.

A) In addition to the No Action Alternative, three alternatives were considered in detail; the Canada to North Dakota Alternative (CND), the Canada to South Dakota Alternative (CSD), and Keystone's proposed location known as Alternative B. In addition, DEQ considered 98 local routing options, including 48 realignments advanced by Keystone.

DEQ did not select the Canada to North Dakota Alternative (CND). Although this route is considerably shorter in Montana, overall this alternative would be 65.5 miles longer than the Canada to South Dakota Alternative (CSD) and 73.1 miles longer than the Alternative B. As a result of the greater length, the area of construction impacts on Alternative CND would also be greater as compared to those of Alternative CSD and Alternative B. The estimated construction cost of Alternative CND is about \$67.1 million more than that of Alternative CSD due to its greater length and about \$284.1 million more than that of Alternative B. Alternative CND would cross more state and federal lands than the Project in Montana. Alternative CND would cross the Little Missouri National Grassland in North Dakota and the Missouri River National Recreation Area in South Dakota and Nebraska. Therefore, Alternative CND was eliminated from further consideration.

DEQ's review of Alternative CSD revealed many unusual angles along the alignment that appeared to be artifacts of the modeling effort. To develop a more realistic alternative pipeline route, DEQ straightened the Alternative CSD alignment where appropriate and also adjusted it to avoid the steepest terrain, multiple crossings of the same stream, residences, and irrigated lands. These adjustments resulted in slightly more private land being crossed, as compared to the originally modeled Alternative CSD.

Although the modified Alternative CSD would cross substantially more public land in Montana, its implementation would result in a longer construction ROW and a greater total area of construction impacts in Montana and along the Steele City Segment as compared to Alternative

B. In addition, the greater length of the modified Alternative CSD would result in about a nine percent increase in construction cost for the Steele City Segment of Alternative B. The modified Alternative CSD was not carried forward because of its additional impacts and costs compared to Alternative B. However, segments of the modified Alternative CSD would cross more public land as compared to the corresponding segments of Alternative B. As a result, DEQ considered these segments of the modified Alternative CSD as local routing options, described in the EIS as Montana Variations (MTVs).

Keystone also conducted their own additional studies of potential reroutes to the 2009 proposed Project route, as well as those suggested by landowners and MDEQ. This resulted in the creation of 48 Keystone realignments (identified as KEY-1, for example), ranging in length from about 0.2 mile to about 4.1 miles.

#### B. Selection of Approved Location

The approved location for the Keystone XL Pipeline is shown on Attachment 2. MTVs and Keystone realignments are indicated in Volume 6, Appendix I, of the final EIS.

The Project enters Montana at the Saskatchewan/Montana border near Morgan, Montana. Beginning at milepost 0 to 0.2, DEQ has selected KEY-1 to avoid going through the pump station of the Northern Border Pipeline. From milepost 0.2 to 16.6, DEQ selects Alternative B due to fewer impacts to cultural resources, and engineering concerns over the alternatives, MTV-1 and MTV1a. The engineering concerns include a hydraulic design review indicating that pump station 10 in Valley County would have to be moved at least 1.25 miles upstream. The additional length of MTV-1 and MTV-1A would reduce capacity to 800,000 bpd. Pump station 11 also might have to be moved to maintain a nominal capacity of 830,000 bpd. From milepost 16.6 to 19.22, DEQ selected KEY-2 over Alternative B because it better protects cultural resources, uses more public land, avoids more steep terrain, and crosses fewer streams.

From milepost 19.22 to milepost 22.55, MDEQ selects MTV-30 because it avoids crossing several streams, uses more public land, avoids more cultural resources, and uses flatter terrain than the corresponding segment of Alternative B and a portion of KEY-3. Between mileposts 22.55 and 23.46, DEQ selects the southwestern segment of KEY-3 to avoid cultural resources. From milepost 23.46 to 26.85, a combination of KEY-4 and Alternative B because this route location parallels an existing pipeline and provides a better crossing of Frenchman Creek. DEQ approves Alternative B from milepost 26.85 to 34.54. From milepost 34.54 to 36.47, DEQ approves a wider corridor to avoid a cultural resource concern. This wider approved corridor is indicated in Figure 1 of Appendix E of the attached Environmental Specifications (Attachment 1B). DEQ approves Alternative B from milepost 36.47 to 38.3.

From milepost 38.3 to 40.08, DEQ selects KEY-6 because it crosses less steep terrain and uses more public land than the corresponding Alternative B segment. KEY-6 crosses more public land than MTV-2. KEY-6 crosses fewer slopes over 30 percent and uses more public land than MTV-2a. DEQ approves Alternative B from milepost 40.08 to 40.67.

MTV-3 was compared to Alternative B from milepost 40.67 to 80.84. MTV-3 was not selected because the protection of greater sage-grouse habitat outweighed the use of more public land. Alternative B is approved from milepost 40.67 to 43.12. From milepost 43.12 to 46.03, DEQ selects KEY-8 because it crosses Lime Creek at a preferred perpendicular creek crossing and minimizes construction impacts to cultural resources when compared to Alternative B. Alternative B is approved from milepost 46.03 to 53.64.

DEQ approves a wider corridor from milepost 53.64 to 54.43 to avoid a cultural resource concern (see Attachment 1B). DEQ selects Alternative B from milepost 54.43 to 62.84. DEQ approves a wider corridor from milepost 54.95 to 55.02 to help facilitate location of the pipeline outside a drainage. While the pipeline will still be located within what would be the usual corridor width, TransCanada will be able to use an area outside what would be the usual corridor width for temporary construction work space. The area that lies outside the usual corridor width totals approved 0.16 acres. DEQ did not receive any adverse comments from the landowner

concerning Key-11 (see Attachment 1B, Figure 2 of Appendix E in the Environmental Specifications). From milepost 62.84 to 64.29, DEQ selects KEY-12 because it minimizes impacts to cultural resources. DEQ approves Alternative B from milepost 64.29 to 65.01. At this intersection, KEY-13 was not selected because MTV-20 was selected and will address this landowner's concern. DEQ approves Alternative B from milepost 65.01 to 65.39.

To avoid a residential concentration named Cherry Valley Estates and to use more public land, DEQ selects MTV-20 from milepost 65.39 to 73.08. DEQ did not select Alternative B, KEY-13, or KEY-14 because MTV-20 addressed concerns over proximity to the subdivision, wells, and homes while crossing more public land. The DEQ approves Alternative B from milepost 73.08 to 77.67. From milepost 77.67 to 79.62, DEQ selects KEY-15 to avoid two additional cultural resource sites potentially eligible for the National Historic Register.

DEQ approves Alternative B from milepost 79.62 to 85.38. To minimize impacts to the crossing of the Vandalia Canal, DEQ selects MTV-23 from milepost 85.38 to 86.4. DEQ approves Alternative B from milepost 86.4 to 88.55. At a landowner's request to minimize impacts to the crossing of irrigation canals, DEQ selects MTV-21 from milepost 88.55 to 89.05. DEQ approves Alternative B from milepost 89.05 to 90.34. After consideration of MTV-22, and the corresponding Alternative B and KEY-16 segments, DEQ selects a combination of MTV-22 and the southern end of KEY-16 from milepost 90.34 to 93.95. This location reduces the amount of old landslide area crossed.

DEQ selects Alternative B from milepost 93.95 to 97.82. From milepost 97.82 to 98.89, DEQ approves a wider corridor to avoid a cultural resource concern (see Attachment 1B, Figure 3, Appendix E in the Environmental Specifications). DEQ selects Alternative B from milepost 98.89 to 112.74. DEQ selects a combination of KEY-21 and KEY-48 from milepost 112.74 to 116.9. When compared to the corresponding Alternative B and northern portion of KEY-21, this route more effectively avoids steep terrain. DEQ selects Alternative B from milepost 116.9 to 124.41. DEQ approves a wider corridor from milepost 121.24 to 121.33 to help facilitate locating the pipeline around a small butte. While the pipeline will still be located within what would be the usual corridor width, TransCanada will be able to use an area outside what would

be the usual corridor width for temporary construction work space. The area that lies outside the usual corridor width totals approved 0.81 acres. DEQ did not receive any adverse comments from the landowner concerning Key-22 (see Attachment 1B, Figure 6 of Appendix E in the Environmental Specifications).

From milepost 124.41 to 126.6, DEQ selects KEY-24 to avoid a well and a pond. DEQ selects Alternative B from 126.6 to 128.55. From milepost 128.55 to 129.33, four alternatives were under consideration. DEQ selects a combination of alternatives consisting of KEY-25 from milepost 128.55 to 128.88, MTV-5a from milepost 128.88 to 129, and Alternative B from milepost 129 to 129.33. This location results in the least amount of environmental impact in a channel migration zone and avoids a stream pool and intermittent stream channel. DEQ approves Alternative B from milepost 129.33 to 131.37.

DEQ selects MTV-6, from milepost 131.37 to 162.54 as modified by MTV-6a, MTV-6b, and MTV-6c. The route will cross substantially more public land without increasing construction costs, as compared to Alternative B, MTV-7, KEY-26, KEY-27, and KEY-28. DEQ selects MTV-6a from milepost 145.3 to 146.8 to avoid excessive stream crossings, increase the distance between the pipeline and a house, and avoid cultural resource impacts. DEQ selects MTV-6b from milepost 147.8 to 150.3 to avoid the construction difficulties associated with the cliff on the south side of the Redwater River. DEQ selects MTV-6c from milepost 150.9 to 151.9 to provide a better approach to pump station 12.

DEQ selects Alternative B from milepost 162.54 to 163. From milepost 163 to 166.13, DEQ approves a wider corridor to allow for a better stream crossing and to avoid a well as requested by a landowner (see Attachment 1B, Figure 4 of Appendix E in the Environmental Specifications). DEQ selects Alternative B from milepost 166.13 to 167.46.

From milepost 167.46 to 190.91, DEQ analyzed eight route variations in addition to Alternative B. DEQ selects a combination of Alternative B, MTV-9g, MTV-10, KEY-30, and the southern 1.5 miles of MTV-9e. DEQ selects MTV-9g from milepost 183.97 to 186.3 because it avoids a developed spring and deep pool in Clear Creek. DEQ selects MTV-10 from milepost 179.45 to

180.9 to satisfy a landowner's request to avoid a stock pond. DEQ selects KEY-30 to avoid grain bins at a landowner's request. DEQ selects MTV-9e from milepost 189.33 to 190.91 because it crosses more state land than Alternative B.

DEQ approves Alternative B from milepost 190.91 to 191.94. From milepost 191.94 to 193.9, DEQ selects MTV-29. MTV-29 avoids crossing wind breaks as requested by a landowner and avoids constructing the pipeline near a transmission line structure. DEQ approves Alternative B from milepost 193.9 to 195.05. On the south side of Interstate 94, DEQ selects MTV-25 from milepost 195.05 to 196.5 because it avoids an irrigated field.

DEQ approves Alternative B from 196.5 to 198.1. On the south side of the Yellowstone River, from milepost 198.1 to 199, DEQ selects KEY-31 to minimize impacts associated with construction across rough terrain just south of the Yellowstone River. From milepost 199 to 201.53, DEQ selects KEY-32 to avoid pivot irrigation areas. DEQ approves Alternative B from milepost 201.53 to 202.74. Between mileposts 202.74 and 205.05, DEQ selects MTV-11a to avoid crossing dikes and streams around Cabin Creek.

DEQ approves Alternative B from milepost 205.05 to 206.2. From milepost 206.2 to 207.1, DEQ selects Alternative B over MTV-12 because MTV-12 crosses the heads of draws and would result in greater impacts from erosion. Revegetation along Alternative B should be less problematic than on MTV-12. DEQ approves Alternative B from milepost 207.1 to 214.9

From milepost 214.9 to 216.9, DEQ selects a combination of alternatives consisting of a wider corridor: from 214.9 to 216.23 to minimize ground disturbance and DEQ selects MTV-26 from milepost 216.23 to 216.9 to avoid corrals and a cut bank at a creek crossing. DEQ approves Alternative B from milepost 216.9 to 225.7.

Between mileposts 225.7 and 245.18, DEQ does not select MTV-13 because of potential impacts to greater sage-grouse habitat. For the evaluation of the corresponding segment of Alternative B, four variations were considered. Between mileposts 226.73 and 229.3, DEQ selects KEY-36 to avoid a reservoir used as a water supply at a landowner's request. Between mileposts 230.6 and

234.7, DEQ selects KEY-37 to avoid a road used in transporting farm equipment to pastures, rough terrain, and crossing a reservoir. South of Pennel Creek, from milepost 234.75 to 238.68, DEQ selects MTV-27 to avoid crossing flood-irrigated land and to address a landowner's concerns about proximity to his residence and a nearby well. From milepost 238.87 to 239.44, DEQ selects KEY-39 to improve the approach to pump station 14 to accommodate the proposed Bakken Marketlink Project.

From milepost 245.19 to 253.7, DEQ selects Alternative B as modified by MTV-15 to reduce impacts to greater sage-grouse habitat and a greater sage-grouse lek, and to respond to a request by a landowner to avoid construction in the vicinity of two residences and a water well. DEQ does not select MTV-14 because the corresponding segment of Alternative B together with MTV-15 better avoids residences.

From milepost 253.7 to 261.1, DEQ selects Alternative B combined with KEY-40 from milepost 254.75 to 258.38 to avoid steep terrain, use more public land, and address concerns about potential impacts to greater sage-grouse habitat. This segment of KEY-40 is shorter, addresses concerns about road and stream crossings, and better avoids cultural resources that would have been encountered on MTV-16 (milepost 253.7 to 261.1). Between mileposts 261.1 and 263.2, DEQ selects MTV-17 because it uses more public land than Alternative B.

DEQ approves Alternative B is approved from milepost 263.2 to 265.64. DEQ selects KEY-41 from milepost 265.64 to 269.44 to avoid construction through a pond. DEQ did not select MTV-18 because of its added construction cost due to the additional 1.1 miles of length.

Alternative B is approved from milepost 269.44 to 277.02. Between mileposts 277.02 and 278.92, DEQ selects KEY-45 to avoid construction near springs. DEQ approves Alternative B from milepost 278.92 to 280.91.

Between mileposts 280.9 and 284.67, DEQ selects MTV-19a because it avoids an unstable valley wall, avoids a cultivated field, buried water lines, and it is further from a residence. DEQ did not select corresponding segments of KEY-46, MTV-19, or Alternative B as the landowner concerns were addressed by MTV-19a.

DEQ approves Alternative B is approved from milepost 284.67 to 284.88. DEQ selects KEY-47 from milepost 284.88 to 285.45 to shorten the route and to move the crossing of the tributary to Box Elder Creek to a location without steep banks in South Dakota.

### **III. Conditions**

A. Keystone shall comply with all applicable U.S. Department of Transportation pipeline standards.

B. Unless extended pursuant to Section 75-20-303, MCA, construction of the pipeline must be completed within ten years of the date of this Certificate.

C. Pursuant to Section 75-20-402, MCA, Keystone shall pay all expenses related to the monitoring plan contained in the Environmental Specifications.

D. Keystone shall construct and operate the pump stations so that average annual noise levels, as expressed by an A-weighted day-night scale ( $L_{DN}$ ), do not exceed 60 decibels at the fence line or Keystone's property boundary, whichever is farther from the pumps, unless the affected landowner waives this condition.

E. Transmission lines less than 10 miles in length, considered as associated facilities, must be constructed and operated so that average annual noise levels, as expressed by an A-weighted day-night scale ( $L_{DN}$ ), will not exceed 50 decibels at the edge of the right-of-way in residential and subdivided areas, unless the affected landowner(s) waives this condition.

F. Keystone shall correct unacceptable interference with stationary radio, television, and other communication systems as identified in Section 4.3 of Environmental Specifications for the project.

G. Keystone shall adhere to the National Electrical Safety Code regarding the associated transmission lines.

H. Environmental specifications developed by DEQ to minimize adverse environmental impacts are set forth in Attachment 1B, which is incorporated by reference as enforceable provisions of this Certificate of Compliance. Should there be a conflict between the measures developed by Keystone, measures required by federal agencies, and the environmental specifications developed by DEQ, the more environmentally protective provision will apply.

I. Keystone shall ensure that construction and operation of the associated transmission lines meets the following standards: a) the electrical field at the edge of the right-of-way does not exceed one kV per meter measured one meter above the ground in residential or subdivided areas, unless the affected landowner waives this consideration and b) the electric field at road crossings under the facility does not exceed seven kV per meter measured one meter above the ground.

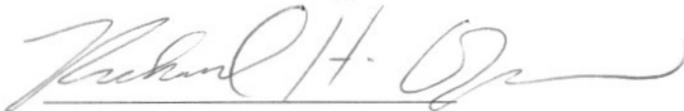
J. Keystone shall consult with the Federal Aviation Administration (FAA), after final design is completed, and comply with the identification and marking standards established by the FAA for above ground associated facilities.

K. Keystone shall not commence to construct the pipeline in Montana prior to issuance of a Presidential Permit by the U.S. Department of State without including the 57 Project-Specific Special Conditions in its procedural manual for operations, maintenance and emergencies submitted to the Pipeline and Hazardous Materials Safety Administration under 49 CFR 195.402.

Certificate of Compliance

Pursuant to Section 75-20-301, MCA, DEQ certifies that the design, location, construction, operation, maintenance, and decommissioning of the Keystone XL pipeline, in conformance with the provisions set forth herein, complies with the requirements of the Major Facility Siting Act. All terms, conditions, and modifications set forth above are enforceable provisions of the certificate.

Dated this 30<sup>th</sup> day of March, 2012.

A handwritten signature in cursive script, appearing to read "Richard H. Opper", written over a horizontal line.

Richard H. Opper

Director

Montana Department of Environmental Quality

**AGREEMENT TO COMPLY**

We, the undersigned Applicants for a Certificate of Compliance for the TransCanada Keystone Pipeline, LP for the Montana portion of the Keystone XL Pipeline, a 36-inch-diameter crude oil pipeline and associated facilities, agree, as a condition subsequent to the issuance of the Certificate, to comply fully and completely with the requirements of the Major Facility Siting Act set forth in Section 75-20-101, *et seq.*, MCA, and the conditions of the Certificate of Compliance.

**TRANSCANADA KEYSTONE PIPELINE GP, LLC**  
in its own capacity and in its capacity as general partner  
for and on behalf of **TRANSCANADA KEYSTONE**  
**PIPELINE, LP**

By: \_\_\_\_\_



Name:

**PAUL E. MILLER**

Title:

**President**

Dated:

By: \_\_\_\_\_



Name:

**Lee G. Hobbs**

Title:

**Vice President**

Dated: