

TransCanada Keystone XL Pipeline Project

Environmental Report

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List of Abbreviations and Acronyms

°F	degrees Fahrenheit
ABB	American Burying Beetle
ARG	American Research Group, Ltd
ARPA	Archeological Resources Protection Act
ATWA	Additional Temporary Workspace Area
BA	Biological Assessment
bbl	Barrel
bgs	below ground surface
BLM	Bureau of Land Management
BMP	Best Management Practice
CAR	Construction Access Road
CFR	Code of Federal Regulations
CL	Centerline
CMRP	Construction, Mitigation, and Reclamation Plan
CSD	Conservation and Survey Well Database
CRP	Conservation Reserve Program
CWA	Clean Water Act
dBA	Decibels on the A-Weighted Scale
DEQ	Department of Environmental Quality
DNR	Department of Natural Resources
DOH	Department of Health
DOS	Department of State
DPHHS	Department of Public Health and Human Services
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Emergency Response Plan
FBE	Fusion-Bonded Epoxy
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHA	Federal Highway Administration
FSA	Farm Service Agency
HCA	High Consequence Area
HDD	Horizontal Directional Drill

IMLV	Intermediate Main Line Valve
IMP	Integrity Management Plan
LB 4	Legislative Bill 4
LB 1161	Legislative Bill 1161
Ldn	Day-Night Sound Level
Leq	Equivalent Sound Level
LUCL	Land Use/Land Cover
LRP	Low Revegetation Potential
M	Meter
MAC	Montana Annotated Code
MBCB	Montana Building Code Bureau
MCS	Motor Carrier Services
MDEQ	Montana Department of Environmental Quality
MDNRC	Montana Department of Natural Resources and Conservation
MDT	Montana Department of Transportation
MFSA	Montana Facility Sting Act
mg/l	Milligrams Per Liter
MLA	Mineral Leasing Act
MLV	Main Line Valve
MOU	Memorandum of Understanding
MP	Mile Post
MPDES	Montana Pollutant Discharge Elimination System
NAGPRA	Native America Graves Protection and Repatriation Act
NDHHS	Nebraska Department of Health and Human Services
NE	Nebraska
NEDEQ/NDEQ	Nebraska Department of Environmental Quality
NEDNR or DNR	Nebraska Department of Natural Resources
NeHBS	Nebraska Historic Building Survey
NEPA	National Environmental Policy Act
NESFM	Nebraska State Fire Marshal
NFO	Non-Significant Fossil Occurrences
NGPC	Nebraska Game and Parks Commission
NHPA	National Historic Preservation Act of 1986
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
NSHS	Nebraska State Historical Society
OCC	Operations Control Center
OPS	Office of Pipeline Safety
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
PHMSA	Pipeline and Hazardous Materials Safety Administration
PI	Point of Inflection
PMP	Pipeline Maintenance Program
POD	Plan of Development
PS	Pump Station
PSRP	Pipeline Spill Response Plan
PSS	Palustrine Scrub Shrub Wetland
PUC	Public Utility Commission
PWS	Public Water Supply
R-EMAP	Regional Environmental Monitoring and Assessment Program
ROW	Right-of-Way
RWBC	Rainwater Basin Complex
RV	Recreational Vehicle
SCADA	Supervisory Control and Data Acquisition
SDCL	South Dakota Codified Laws
SDDOT	South Dakota Department of Transportation
SDPUC	South Dakota Public Utilities Commission
SEIS	Supplemental Environmental Impact Statement
SER	Supplemental Environmental Report
SFL	Significant Fossil Locations
SHPO	State Historic Preservation Officer
SPCC	Spill Prevention, Control, and Countermeasure
SSURGO	Soil Survey Geographic Database
SWPA	Source Water Protection Area
TBD	To Be Determined
TCP	Traditional Cultural Property
T&E	Threatened and Endangered Species
TSS	Total Suspended Solids
TWAs	Temporary Workspace Areas
USACE	U.S. Army Corps of Engineers

USDOT/DOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WA	Work Area
WEG	Wind Erodibility Group
WHPA	Well Head Protection Area
WRP	Wetland Reserve Program

1.0 Introduction

TransCanada Keystone Pipeline, LP (Keystone) submits this Environmental Report to the Department of State (DOS) in support of its May 4, 2012 application for a Presidential Permit for the Keystone XL Pipeline Project (Project). The Environmental Report provides an update of the environmental impacts of the Project since the Final Environmental Impact Statement (FEIS) for the original Keystone XL Project was published August 2011. The background and history of the Project are summarized in Section 1.1 below.

This Environmental Report presents only circumstances where proposed modifications have resulted in environmental baseline and impacts and consequences which differ from those presented in the FEIS. The Environmental Report references the FEIS for those areas of the Project that are unchanged or where the change is so minor that the description of environmental resources or the impacts or consequences of the Project on those resources remains as presented in the FEIS. The modifications that Keystone has implemented subsequent to issuance of the FEIS involve route refinements to minimize environmental and landowner impacts and to improve constructability. These modifications also include changes made in response to input from agencies and landowners. The modifications are summarized in Section 1.2 below.

1.1 Background and History

On September 19, 2008, Keystone submitted a Presidential Permit application to the DOS. The DOS considered all environmental data submitted by Keystone and issued a FEIS on August 26, 2011. However, in November 2011 the DOS announced that it was delaying its decision on the Presidential Permit to allow additional time to gather information regarding potential alternative routing in Nebraska. In December 2011, Congress imposed a 60-day time limit on the DOS's decision on whether to grant a Presidential Permit. In January 2012, the DOS determined that the project, as presented and analyzed at that time, did not serve the national interest. This determination was based on the rationale that the time provided by Congress for the decision was not adequate to complete the national interest review of the project, including, specifically, the assessment of potential alternative routes that would avoid the Sandhills region in Nebraska.

On February 27, 2012, Keystone advised the DOS that it had concluded that the portion of the previously proposed Project that will directly serve the Gulf Coast has its own independent utility as the stand-alone Gulf Coast Project and that construction of the Gulf Coast Project would begin as soon as the necessary permits for the specific construction activities were in place. Construction of the Gulf Coast Project commenced on August 6, 2012. Keystone also noted that it intended to file a Presidential Permit application for the more limited Keystone XL Project, which would include the former "Steele City Segment," and to supplement that application with an alternative route in Nebraska as soon as that route was approved by the State of Nebraska.

On May 4, 2012, Keystone filed a Presidential Permit application along with all required non-environmental information for the more limited Keystone XL Project and included a commitment to incorporate the new route in Nebraska, when selected. Keystone incorporated by reference the FEIS prepared by the DOS for the original proposed Keystone XL Project.

Keystone submitted an initial report presenting the studies for six alternative routes and a preferred alternative route to the Nebraska Department of Environmental Quality (NDEQ) on April 18, 2012. A Supplemental Environmental Report (SER) was submitted to the NDEQ on September 5, 2012; the Nebraska SER is included as Appendix A of this Environmental Report. The SER includes the results of all engineering and environmental studies to date for the preferred alternative route in Nebraska. The NDEQ will review all findings, consider agency and public comments, and provide a Supplemental Environmental Impact Statement (SEIS) to the Nebraska Governor who will determine whether the preferred alternative route is acceptable to be provided to the DOS. The Nebraska SEIS, along with information included in the FEIS, and this Environmental Report will provide the DOS with the necessary information to complete its National Environmental Policy Act (NEPA) analysis with respect to Keystone's Presidential Permit application. Figure 1-1 depicts the current Keystone XL Pipeline route, including the most recent preferred alternative route in Nebraska as presented in the Nebraska SER. Appendices B and C depict the current Project route on aerial route sheets and USGS route sheets, respectively.

1.2 Ongoing Work Subsequent to Issuance of the FEIS

Since the time the FEIS was issued, Keystone has incorporated the Montana Department of Environmental Quality (MDEQ) route variations recommended in the FEIS. In addition, Keystone has continued to work with agencies and landowners to refine and adjust the route to minimize environmental and landowner impacts and to improve constructability. Most of the route changes were minor, less than 200 feet from the centerline studied in the FEIS and are still within the 300 foot survey corridor used for the development of information studied in the FEIS. Within this Environmental Report, those route changes greater than 200 feet from the FEIS centerline are analyzed and reported. Impacts associated with those route changes less than 200 feet from the FEIS centerline are already addressed in the analysis presented in the FEIS.

After the FEIS was issued, the Montana Department of Environmental Quality (MDEQ) issued its Montana Major Facility Siting Act (MFSA) Certificate (March 30, 2012) requiring Keystone to utilize the Montana route variations identified in the FEIS. Since adopting those route variations, Keystone has worked with landowners to follow the MFSA-designated corridor (500 feet) as well as minimize landowner and environmental impact. A total of 64 route changes were implemented. None of the Montana route changes are outside of the 500 foot corridor; all are compliant with the requirements of MDEQs environmental specifications (Attachment 1 of

Appendix I of the FEIS). Table 1.1-1 presents the 2 route changes in Montana that are greater than 200 feet from the FEIS centerline¹. Appendix D includes figures of those route changes.

Since the South Dakota Public Utilities Commission (SDPUC) issued its approval of the Keystone XL Project under the Energy Conservation and Transmission Facilities Act (March 12, 2010), Keystone has continued to work with the landowners and agencies to refine the route to address issues brought up during the post-FEIS surveys and easement negotiations. The SDPUC allows route changes after certification if those changes are not material. Since the issuance of the FEIS, 51 route changes have been developed in South Dakota, all of which remain on the same landowners as the FEIS route. Table 1.1-2 presents 29 of these route changes in South Dakota that are greater than 200 feet from the FEIS centerline or outside the original FEIS survey corridor. Appendix D includes figures of those route changes.

The Nebraska Supplemental Environmental Report (SER) presented in Appendix A of this Environmental Report describes the routing process that has occurred in Nebraska since the beginning of 2012. Since the issuance of the FEIS, 16 route changes have been developed in Nebraska. Table 1.1-3 presents the 11 of these route changes that are greater than 200 feet from the FEIS centerline. These route changes document the level of effort Keystone has undertaken with NDEQ, the public, and other agencies to develop a preferred alternative route in Nebraska. Appendix D includes figures of those route changes.

Following issuance of the FEIS, the Bureau of Land Management (BLM) passed guidance requiring Sage Grouse consultation with each state for projects impacting Sage Grouse habitat. As part of the FEIS effort, Keystone prepared a Sage Grouse mitigation plan for BLM, USFWS, DOS, and MFWP review and concurrence. That mitigation plan is provided in Appendix T of the FEIS. BLM sent a letter to MFWP requesting their concurrence with the mitigation measures as per BLM Guidance Instruction Memorandum No. 2012-043. MFWP responded to BLM that they agreed with the mitigation plan.

1.3 Purpose and Need

The Project will transport crude oil production from the Western Canadian Sedimentary Basin and the Bakken supply basin in Montana and North Dakota to a point located on the existing Keystone Pipeline system at Steele City, Nebraska. This will allow for the delivery of that production to existing refinery markets on the Texas Gulf Coast. A comprehensive discussion of the Project's purpose and need can be found in Keystone's May 4, 2012, application to DOS for a Presidential Permit.

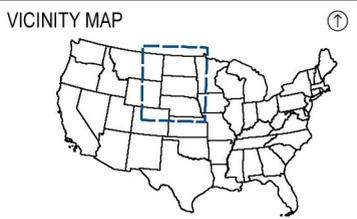
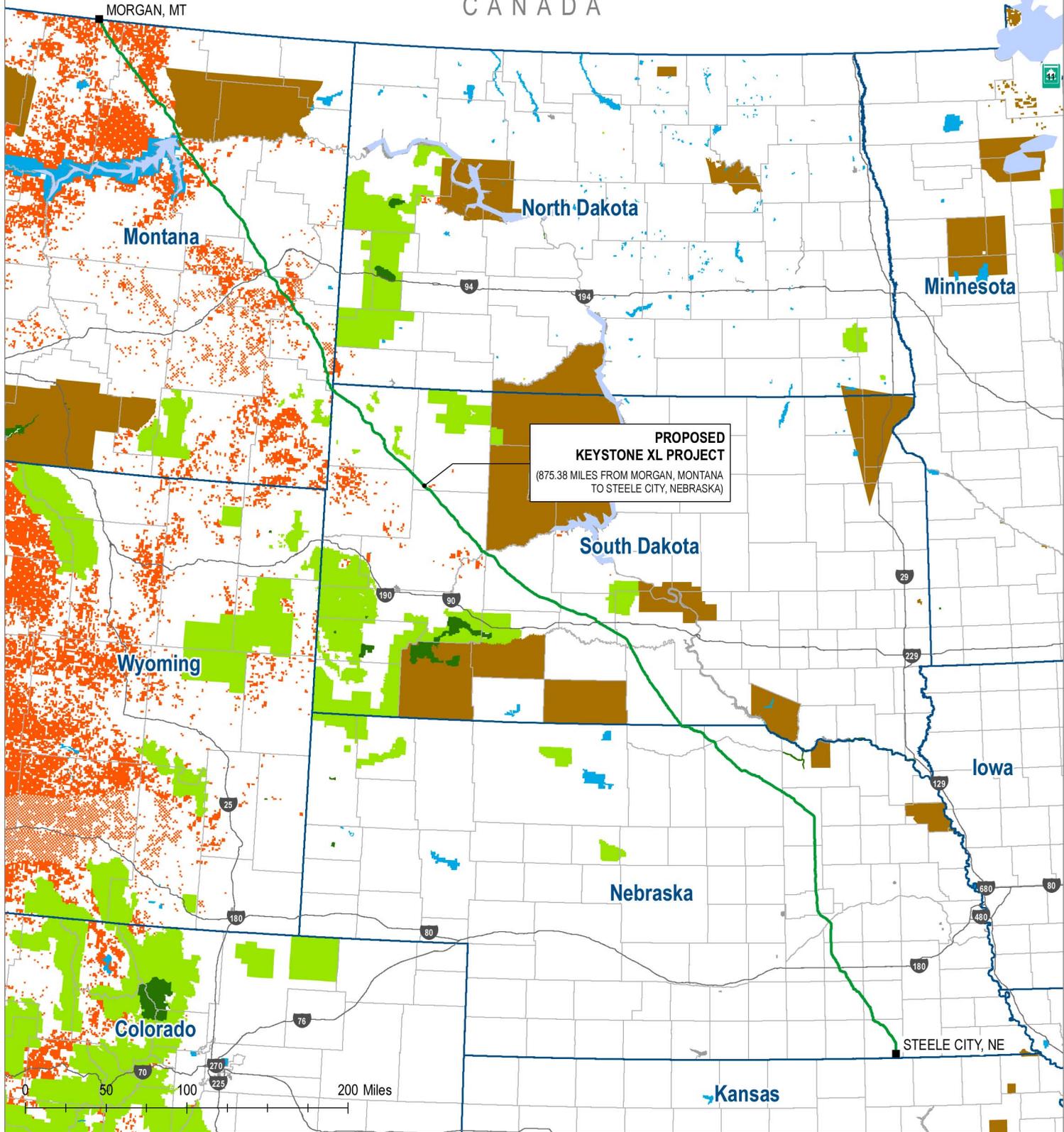
¹ Changes to the MSFA certificated route less than 250 feet from the centerline do not require an amendment.

Table 1.1-1 Montana Route Changes Between FEIS Route and August 15, 2012 Centerline

Figure Number	County	Begin MP	End MP	Base Route Length (Miles)	Reroute Length (Miles)	Maximum Perpendicular Distance from Center Line (Feet)	Reason for Route Change
1001	Phillips	25.17	25.67	0.54	0.51	229	To accommodate an HDD through Frenchman Creek as opposed to the original open cut method.
1003	McCone	108.10	110.31	2.19	2.21	209	To avoid paralleling a creek and eliminate two creek crossings

HDD - Horizontal Directional Drill

CANADA



LEGEND

PROPOSED KEYSTONE XL PROJECT	FEDERAL LANDS
STATE BOUNDARY	DEPARTMENT OF DEFENSE
COUNTY BOUNDARY	BUREAU OF LAND MANAGEMENT
	FISH AND WILDLIFE SERVICE
	NATIONAL PARK SERVICE
	BUREAU OF INDIAN AFFAIRS

KEYSTONE XL PROJECT

FIGURE 1-1

PROPOSED KEYSTONE XL PROJECT

Table 1.1-2 South Dakota Route Changes Between FEIS Route and August 15, 2012 Centerline

Figure Number	County	Begin MP	End MP	Base Route Length (Miles)	Reroute Length (Miles)	Maximum Perpendicular Distance from Center Line (Feet)	Reason for Route Change
1004	Harding	296.22	297.72	1.46	1.49	2,307	To avoid constructability issues (rough terrain, large hill, multiple drop-offs, side hill construction, etc.) and future pipeline integrity issues. Landowner prefers this more southerly route.
1005	Harding	315.09	315.75	0.66	0.67	260	To shift CL and TWA away from a side slope and avoid difficult construction and restoration.
1006	Harding	331.94	332.92	0.97	0.99	356	To avoid crossing drainage multiple times, to avoid paralleling drainage, and to avoid one drainage entirely.
1007	Harding	350.84	351.58	0.73	0.74	370	To shift CL and TWA away from a pond.
1008	Harding	354.62	355.27	0.64	0.65	313	To avoid ~350 ft. of difficult terrain features.
1009	Butte / Perkins	361.76	362.44	0.67	0.68	251	To avoid a hill finger that would require additional soil handling and TWA.
1010	Perkins	366.31	366.82	0.49	0.51	234	To avoid multiple creek crossings. Will also eliminate two of the three current creek crossings.
1011	Perkins	370.18	370.82	0.59	0.64	701	To shift CL and TWA to a more constructible creek crossing locale.
1012	Meade	380.56	381.20	0.64	0.65	214	To avoid laying pipeline along a drainage feature and eliminate one of the two current creek crossings.

Table 1.1-2 South Dakota Route Changes Between FEIS Route and August 15, 2012 Centerline

Figure Number	County	Begin MP	End MP	Base Route Length (Miles)	Reroute Length (Miles)	Maximum Perpendicular Distance from Center Line (Feet)	Reason for Route Change
1013	Meade	388.26	388.90	0.62	0.64	244	To avoid a well and levee.
1014	Meade	398.24	400.78	2.55	2.54	733	To avoid multiple stream crossings and more difficult construction.
1015	Meade	424.03	426.52	2.44	2.50	2,225	To shift CL and TWA to avoid ridgelines, rough terrain and drop-offs and eliminate the one HDD.
1016	Meade / Haakon	426.83	436.12	9.00	9.29	1,980	To avoid ridgelines, rough terrain and drop-offs and eliminate two HDDs. Also to improve the current HDD crossing location of the Cheyenne River and straighten the route to allow the use of HDD at two locations south of the Cheyenne River crossing.
1017	Haakon	447.16	448.77	1.59	1.61	788	To avoid a creek crossing that is too close to a road and would impact a wetland area and tree removal.
1018	Haakon	449.61	450.13	0.51	0.52	270	To avoid laying pipeline along a drainage feature.
1019	Haakon	452.01	453.00	0.98	0.99	343	To relocate the CL crossing at HWY 73 to a narrower area of state road ROW, reduce the crossing length, and avoid steep slopes at highway's edge. Also relocates the pipeline away from the side slope of a meandering waterbody.
1020	Haakon	455.22	456.75	1.56	1.53	635	To eliminate a PI and straighten the route.

Table 1.1-2 South Dakota Route Changes Between FEIS Route and August 15, 2012 Centerline

Figure Number	County	Begin MP	End MP	Base Route Length (Miles)	Reroute Length (Miles)	Maximum Perpendicular Distance from Center Line (Feet)	Reason for Route Change
1021	Haakon	461.83	462.26	0.45	0.43	315	To eliminate a PI and straighten the line, place MLV-19A on higher ground, and move CL/WA away from an existing culvert south of current CL.
1022	Haakon	475.48	477.77	2.27	2.29	630	To avoid difficult construction and save cost of reclamation by avoiding routing along a drainage feature and have a better crossing location at a creek. Also avoids three creek crossings and moves CL away from a pond.
1023	Haakon	484.38	486.13	1.76	1.75	498	To avoid a drop-off and eliminate ~80 ft. of wetland crossing, relocate CL to a first ridge where landowner has already excavated some portions, avoid elevation, terrain, and slope changes, and straightens alignment to accommodate a HDD crossing of the Bad River, the Bad River road and a railroad.
1024	Jones	493.54	494.98	1.45	1.44	550	To shorten the route.
1025	Jones	501.75	503.60	1.87	1.85	442	To shorten the route through this area and remove one PI.
1026	Jones	506.33	507.63	1.26	1.30	329	To avoid CL and TWA crossing a pond and a levee, avoid terrain issues such as a side slope/side hill, and eliminate reclamation issues at the pond/levee.

Table 1.1-2 South Dakota Route Changes Between FEIS Route and August 15, 2012 Centerline

Figure Number	County	Begin MP	End MP	Base Route Length (Miles)	Reroute Length (Miles)	Maximum Perpendicular Distance from Center Line (Feet)	Reason for Route Change
1027	Lyman	534.03	535.07	1.01	1.04	253	To avoid a drainage feature, straighten a road crossing, and move MLV-22 to suitable ground.
1028	Lyman	540.23	541.06	0.95	0.82	1,142	To move CL and TWA off a side slope. Will impact the entry/exit point at the White River HDD.
1029	Tripp	542.62	545.21	2.54	2.59	810	To shift the CL off a side hill, avoid CL running under field road by shifting it out of field road, and eliminate ~5,626 ft. of side slope construction.
1030	Tripp	547.33	549.23	1.87	1.90	555	To avoid difficult terrain (side slopes, bluffs) and having TWA inside a drainage/creek.
1031	Tripp	578.31	579.00	0.65	0.69	550	To accommodate two requests from landowners: avoid locating the pipeline on tract ML-SD-TR-11345 and avoid a row of trees.
1032	Tripp	599.41	599.88	0.47	0.47	415	To avoid a drainage crossing, straighten a road crossing, and eliminate reclamation issues at the drainage crossing.

CL = Centerline

WA = Work Area

HDD = Horizontal Directional Drill

PI = Point of Inflection (angle)

Table 1.1-3 Nebraska Preferred Alternative Route Changes between April and August 2012

Figure Number	County	Begin MP	End MP	Base Route Length (Miles)	Reroute Length (Miles)	Maximum Perpendicular Distance from Center Line (Feet)	Reason for Route Change
1033	Keya Paha, Boyd, Holt	601.76	637.42	34.57	35.67	41,951	See Section 2.3-1 of Nebraska SER (Appendix A). Approximately, 74 tracts, 36 new landowners and one State Land tract (Board of Education Lands, School Lands) are impacted. Additionally, eight new CARs will be added for the reroute; one Mainline Valve will be impacted (CK-MLV-25);
1034	Holt	657.93	658.43	0.49	0.50	279	The proposed route variation accommodates landowner's (tract ML-NE-HT-30345.000) request to avoid a newly planted (3 years) shelter belt on the property as well as a cattle feed lot by shifting the CL and TWAs further south.
1035	Holt	659.08	660.83	1.68	1.75	1,481	Landowner preference
1036	Holt	661.82	663.75	1.77	1.94	1,796	The primary reason for this proposed reroute is to avoid landowner's row of trees located in tract ML-NE-HT-30405.000 by shifting the CL and TWAs east.
1037	Holt	665.44	667.47	1.85	2.03	1,845	Landowner preference

Table 1.1-3 Nebraska Preferred Alternative Route Changes between April and August 2012

Figure Number	County	Begin MP	End MP	Base Route Length (Miles)	Reroute Length (Miles)	Maximum Perpendicular Distance from Center Line (Feet)	Reason for Route Change
1038	Boone	740.05	741.02	0.93	0.98	457	Landowner preference
1039	Boone	745.45	746.88	1.47	1.44	1,344	Landowner preference
1040	Boone	749.98	750.94	0.96	0.96	201	The primary reason for this proposed reroute is to avoid a large drain that is located next to a road and to allow the drainage feature and road be crossed separately by shifting the centerline and work spaces further west.
1041	Nance, Merrick, York, Polk	764.99	796.31	31.49	31.33	50,938	See Section 2.3-2 of Nebraska SER (Appendix A).
1042	Saline, Jefferson	840.95	855.03	13.49	14.08	18,546	See Section 2.3-3 of Nebraska SER (Appendix A).
1043	Jefferson	873.29	874.50	1.29	1.20	275	The primary reason for this proposed reroute is to shift CL and TWAs away from fence that runs parallel to the current CL.

CL = Centerline

CAR = Construction Access Road

HDD = Horizontal Directional Drill

TWA = Temporary Work Areas

WHPA - Well Head Protection Area

1.4 Update to Permitting

Table 1.4-1 presents the major permits, licenses, approvals, authorizations, and consultation requirements for the Project that would be required by federal, state, and local agencies prior to implementation of the Project.

Table 1.4-1 Permits, Licenses, Approvals, and Consultation Requirements for the Project ^a		
Agency	Permit or Consultation/Authority	Agency Action
Federal		
U.S. Department of State (DOS)	Presidential Permit, Executive Order 13337 of April 30, 2004 (69 Federal Register [FR]. 25299, et seq.)	Considers approval of cross-border facilities.
	National Environmental Policy Act (NEPA)	Lead federal agency for the environmental review in connection with consideration of Presidential Permit application
	Section 106 of the National Historic Preservation Act (NHPA)	Supervises and coordinates compliance with Section 106 of NHPA and consultation with interested Tribal agencies
	Section 7 of the Endangered Species Act (ESA)	Coordinates ESA consultation with the United States Fish and Wildlife Service (USFWS)
Bureau of Land Management (BLM)	Right-of-way (ROW) grant(s) and short-term ROWs under the Federal Land Policy and Management Act of 1976 as amended (FLPMA) and Temporary Use Permit under Section 28 of the Mineral Leasing Act (MLA)	Considers approval of ROW grant and temporary use permits for the portions of the Project that would encroach on public lands
	Archeological Resources Protection Act (ARPA) Permit	Considers issuance of cultural resource use permit to survey, excavate or remove cultural resources on federal lands
	Notice to Proceed	Following issuance of a ROW grant and approval of the Project's Plan of Development (POD), considers the issuance of a Notice to Proceed with Project development and mitigation activities for federal lands
	Section 106 (NHPA)	Responsible for compliance with Section 106 of NHPA and consultation with interested Tribal agencies

Table 1.4-1 Permits, Licenses, Approvals, and Consultation Requirements for the Project ^a		
Agency	Permit or Consultation/Authority	Agency Action
U.S. Corps of Engineers (USACE) – Omaha District	Section 404, Clean Water Act (CWA)	Considers issuance of Section 404 permits for the placement of dredge or fill material in Waters of the U.S., including wetlands
	Section 10 Permit (Rivers and Harbors Act of 1899)	Considers issuance of Section 10 permits for pipeline crossings of navigable waters
	Section 106 (NHPA)	Responsible for compliance with Section 106 of NHPA and consultation with interested Tribal agencies
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act (ESA) Section 7 Consultation, Biological Opinion	Considers lead agency findings of an impact of federally-listed or proposed species; provide Biological Opinion if the Project is likely to adversely affect federally-listed or proposed species or their habitats
U.S. Bureau of Reclamation (Reclamation)	ROW Grant and Temporary Use Permit under Section 28 of the MLA	Determines if ROW grant issued under MLA by BLM is in compliance with Reclamation standards
	Section 106 (NHPA)	Responsible for compliance with Section 106 of NHPA and consultation with interested Tribal agencies
Federal Highway Administration (FHA)	Crossing Permit	Considers issuance of permits for the crossing of federally funded highways
U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety	49 CFR Part 195 – Transportation of Hazardous Liquids by Pipeline	Reviews design, construction, operations, maintenance, and emergency operations plan (termed Emergency Response Plan [ERP]), inspection of pipeline projects, including Integrity Management Programs and identifying high consequence areas prior to installation
	49 CFR Part 194 – Response Plans for Onshore Pipelines	Reviews Response Plans (termed Pipeline Spill Response Plan [PSRP]) prior to initiation of operation and within 2 years of startup approves the PSRP.
U.S. Environmental Protection Agency, Regions 6, 7, and 8	Section 401, CWA, Water Quality Certification	Considers approval of water use and crossing permits for non-jurisdictional waters (implemented through each state's Water Quality

Table 1.4-1 Permits, Licenses, Approvals, and Consultation Requirements for the Project ^a		
Agency	Permit or Consultation/Authority	Agency Action
		Certification Program)
	Section 402, CWA, National Pollutant Discharge Elimination System (NPDES)	Reviews and issues NPDES permit for the discharge of hydrostatic test water (implemented through each state's Water Quality Certification Program, where required)
U.S. Department of Agriculture – Natural Resources Conservation Service	Section 106 (NHPA)	Responsible for compliance with Section 106 of NHPA and consultation with interested Tribal agencies
U.S. Department of Agriculture – Farm Service Agency	Section 106 (NHPA)	Responsible for compliance with Section 106 of NHPA and consultation with interested Tribal agencies
U.S. Department of Agriculture – Rural Utilities Services (RUS)	Section 106 (NHPA)	Responsible for compliance with Section 106 of NHPA and consultation with interested Tribal agencies
Western Area Power Administration (Western)	Section 106 (NHPA)	Responsible for compliance with Section 106 of NHPA and consultation with interested Tribal agencies
Advisory Council on Historic Preservation	Consultation	Advises federal agencies during the Section 106 consultation process; signator to the Programmatic Agreement
U.S. Department of Treasury – Bureau of Alcohol, Tobacco, and Firearms	Treasury Department Order No. 120-1 (former No. 221), effective 1 July 1972	Considers issuance of permit to purchase, store, and use explosives should blasting be required
Montana		
Montana State Historic Preservation Office (SHPO)– Montana Historical Society ^c	Section 106 consultation regarding National Register of Historic Places (NRHP) eligibility of cultural resources and potential Project effects on historic properties, Compliance with Montana State Antiquities Act	Reviews and comments on activities potentially affecting cultural resources
Montana Department of Environmental Quality (MDEQ)	Certificate of Compliance under the state Major Facility Siting Act (MFSA)	A MFSA Certificate was issued in March 2012
MDEQ – Permitting and Compliance Division – Water Protection Bureau	Montana Ground Water Pollution Control System and Non-degradation Review (three levels of water	Considers issuance of permit for stream and wetland crossings; provides Section 401 certification consults for Section

Table 1.4-1 Permits, Licenses, Approvals, and Consultation Requirements for the Project ^a		
Agency	Permit or Consultation/Authority	Agency Action
	protection based on water classification, i.e., outstanding resource waters etc.), Standard 318 (Permitting conditions for Pipeline Crossings at Watercourses – short term turbidity)	404 process
	Montana Pollutant Discharge Elimination System (MPDES)	Considers issuance of permit for hydrostatic test water discharge into surface water, trench dewatering, and stormwater discharge
MDEQ – Permitting and Compliance Division – Waste and Underground Tank Management Bureau	Septic Tank, Cesspool, and Privy Cleaner New License Application Form (for work camps)	Reviews and licenses Cesspool, Septic Tank and Privy Cleaners, inspects disposal sites for septic tank, grease trap and sump wastes
MDEQ – Permitting and Compliance Division – Air Resources Bureau	Air Quality Permit Application for Portable Sources; Air Quality Permit Application for Stationary Sources	Considers issuance of air quality permit(s) for work camps dependent on source of power such as portable diesel generator or use of non-electrical equipment is used during construction or operation of the pipeline (i.e., diesel powered pumps during hydrostatic testing)
MDEQ – Permitting and Compliance Division – Public Water Supply Bureau	Water and Wastewater Operator Certification (for work camps)	Reviews and licenses operators of certain public drinking water and wastewater treatment facilities; issues approval to construct, alter or extend public water or sewer systems (including hauling, storage and distribution of water)
Montana Department of Natural Resources and Conservation (DNRC) – Water Resources Division (General)	Water Appropriation Permit (Beneficial Water use Permit) and/or Water Wells Drilling/Alteration	Considers issuance of permit for water use for hydrostatic testing or waters for dust control
Montana DNRC State Board of Land	Management of timber, surface, and mineral resources for the benefit of the common schools and the other endowed institutions in Montana	Considers approval of permanent easements across state land
Montana DNRC State Board of Land and, Real Estate Management Division	Administers all activities on lands classified as "Other" and all secondary activities on lands classified as grazing, agriculture, or timber	Considers issuance of license to use state land

Table 1.4-1 Permits, Licenses, Approvals, and Consultation Requirements for the Project ^a		
Agency	Permit or Consultation/Authority	Agency Action
Montana DNRC Trust Land Management Division	Navigable Rivers/Land use License/Easement	Consults on and considers issuance of permits for projects in, on, over, and under navigable waters
Montana DNRC, Conservation Districts	Natural Streambed and Land Preservation Act (also known as the 310 Law)	Consider issuance of permits for construction in perennial streams, rivers, or designated reservoirs on private land
Montana Fish, Wildlife and Parks	Natural Streambed and Land Preservation Act (also known as the 310 Law)	Provide technical oversight to DNRC Conservation Districts in review of applications for 310 permits
Department of Transportation – Glendive District	State and Highway Crossing Permit for pipeline and access roads that encroach state highway ROW, with traffic control based on the Manual on Uniform Traffic Control Devices	Considers issuance of permits for crossings of state highways
Department of Transportation – Helena Motor Carrier Services (MCS) Division Office	Oversize/Overweight Load Permits, where required	Considers issuance of permit for oversize/overweight loads on state maintained roadways
Montana Public Service Commission	Grant Common Carrier Status	Considers whether or not an applicant qualifies as a common carrier under Montana Annotated Code (MAC) 69-13-101; as Keystone has been determined to be a common carrier, the commission would supervise and regulate operations under MCA Title 69 allowing Keystone to cross state highways and state streams.
County Road Departments	Crossing Permits	Considers issuance of permits for crossing of state highways
County Floodplain Departments	County Floodplain permitting	Considers issuance of permits and review of work in floodplains
County and Local Authorities	Pump Station Zoning Approvals, where required	Reviews under county approval process
	Special or Conditional Use Permits, where required	Reviews under county approval process (Note: These permits are not required after a Certificate of Compliance under MFSAs is issued)

Table 1.4-1 Permits, Licenses, Approvals, and Consultation Requirements for the Project ^a		
Agency	Permit or Consultation/Authority	Agency Action
County Weed Control Boards	Approval of reclamation plan	Considers approval of a reclamation/weed control plan (Note: These approvals still required after Certificate of Compliance under MFSA is issued)
South Dakota^b		
South Dakota Historical Society ^c	Consultation under Section 106, NHPA	Reviews and comments on activities potentially affecting cultural resources
South Dakota Public Utilities Commission	Energy Conversion and Transmission Facilities Act	A PUC Certificate was issued in March 2010.
Department of Environment and Natural Resources, Surface Water Quality Program	Section 401, CWA, Water Quality Certification	Considers issuance of permit for stream and wetland crossings; consult for Section 404 process
	Hydrostatic Testing/Dewatering & Temporary Water Use Permit (SDG070000)	Considers issuance of General Permit regulating hydrostatic test water discharge, construction dewatering to waters of the state, and Temporary Water use Permit
	SDCL 34A-18 (oil spill response plans).	Review and consider approving crude oil pipeline spill response plans.
Department of Game, Fish, and Parks	Consultation	Consults regarding natural resources
Department of Transportation	Crossing Permits	Considers issuance of permits for crossing of state highways
County Road Departments	Crossing Permits	Considers issuance of permits for crossing of county roads
County and Local Authorities	Pump Station Zoning Approvals, where required	Reviews under county approval process
	Special or Conditional Use Permits, where required	Reviews under county approval process
Nebraska		
Nebraska State Historic Preservation Office (SHPO) ^c	Consultation under Section 106, NHPA	Reviews and comments on activities potentially affecting cultural resources
Department of Environmental Quality (DEQ)	Nebraska Legislative Bills 4 and 1161	Complete a Supplemental Environmental Impact Statement for review by the Nebraska Governor
DEQ, Division of Water Resources	Section 401, CWA, Water Quality Certification	Considers issuance of permit for stream and wetland crossings; consult for Section 404 process

Table 1.4-1 Permits, Licenses, Approvals, and Consultation Requirements for the Project ^a		
Agency	Permit or Consultation/Authority	Agency Action
	Excavation Dewatering and Hydrostatic Testing Permit Form NEG6720000 Dewatering Form NEG6721000 Relocation	Considers issuance of permit regulating hydrostatic test water discharge and construction dewatering to waters of the state
Department of Natural Resources	Water Appropriations – Groundwater and Surface Water	Considers issuance of permit to use Public Waters (for hydrostatic test water or dust control)
Game and Parks Commission	Consultation	Consults regarding natural resources
Department of Transportation	Crossing Permits	Considers issuance of permits for crossing of state highways
County Road Departments	Crossing Permits	Considers issuance of permits for crossing of county roads
County and Local Authorities	Pump Station Zoning Approvals, where required	Reviews under county approval process
	Special or Conditional Use Permits, where required	Reviews under county approval process

^a All permits are considered attainable and consistent with existing land use plans based on consultation with the relevant agencies listed in the table.

^b Permits associated with construction camps are described in the FEIS Section 2.2.7.4.

^c The SHPO has the opportunity to review federal agency decisions under Section 106 of the National Historic Preservation Act, but this is not a legal obligation

2.0 Proposed Action and Alternatives

2.1 Update to Proposed Action

Keystone proposes to construct a crude oil transmission system from an oil supply hub near Hardisty, Alberta, Canada to Steele City, Nebraska. The Project will enter the U.S. near Morgan, Montana, traverse Montana, South Dakota, and Nebraska, and terminate at a delivery point at Steele City, Nebraska. This route includes approximately 875.4 miles of new pipeline. Table 2.1-1 presents the miles of pipeline in each of the three states traversed by the Project. Two pump stations will be constructed in Kansas.

Table 2.1-1 Miles of New Pipe by State	
State	Miles
Montana	285.65
South Dakota	315.30
Nebraska	274.44
Total Length	875.39

2.1.1 Project Description and Location Update

The Project footprint within Montana and South Dakota is largely unchanged from that presented in the FEIS. Tables 1.1-1 and 1.1-2 present the reroutes that are greater than 200 feet from the FEIS centerline that have been developed in Montana and South Dakota since the issuance of the FEIS. The Nebraska SER, presented in Appendix A, depicts and discusses the recently developed preferred alternative route for the pipeline in that state. The locations of the 2 pump stations to be constructed in Kansas are unchanged from the FEIS.

2.1.2 Pipeline Construction Update

Construction of the Project would begin when Keystone obtains all necessary permits, approvals, and authorizations. Based on the current permitting schedule, the Project is planned to be placed into service sometime in 2015. The actual date is dependent on receipt of all necessary permits, approvals, and authorizations.

As currently planned, the Project would be constructed using ten spreads as presented in Table 2.1-2. The construction schedule may affect the final spread configuration which may result in the need for additional but shorter spreads or different spread configurations.

Table 2.1-2 Pipeline Construction Spreads

State	Miles by State	County	Spread Number	Location (Mile Post)	Approximate Length of Construction Spread (Miles)
Montana	285.65	Phillips, Valley	Spread 1	0 - 90	90
		Valley, McCone	Spread 2	90 - 151.48	61.48
		McCone, Dawson	Spread 3	151.48 - 197.68	46.2
		Dawson, Prairie, Fallon	Spread 4	197.68 - 288.63	90.95
South Dakota	315.29	Harding	Spread 5	288.63 - 410.75	122.12
		Harding, Butte, Perkins, Meade	Spread 6	410.75 - 500.44	89.69
		Meade, Pennington	Spread 7	500.44 - 598.86	98.42
		Haakon, Jones			
		Jones, Lyman, Tripp	Spread 8	598.86 - 691.78	92.92
		Tripp			
Nebraska	274.44	Tripp, Keya Paha, Boyd, Holt, Antelope	Spread 9	691.78 - 775.67	83.89
		Antelope, Boone, Nance, Merrick, Polk	Spread 10	775.67 - 875.38	99.71
		Polk, York, Fillmore, Saline, Jefferson			

2.1.3 Ancillary Facility Update

Table 2.1-3 presents the updated numbers of ancillary facilities by state. As discussed in the Nebraska SER (Appendix A), the number and location of valves and access roads for the reroute portion of the preferred alternative route in Nebraska have yet to be determined. While there will be 5 pump stations in Nebraska, the locations of 4 of those stations have not yet been finally determined.

Table 2.1-3 Ancillary Facilities by State		
Keystone XL	State	Ancillary Facilities
	Montana	6 Pump Stations
		84 Access Roads
		25 IMLVs
	South Dakota	7 Pump Stations
		59 Access Roads
		15 IMLVs
	Nebraska	5 Pump Stations
		48 Access Roads
		4 IMLVs*
Kansas	2 Pump Stations	

*FEIS portion of the Nebraska preferred alternative route

2.1.4 Land Affected Update

Table 2.1-4 presents an up-dated state-by-state summary of lands affected in Montana, South Dakota, and Nebraska for all facilities during the construction and operation of the Project. As discussed in the Nebraska SER (Appendix A), the number and location of pipe stockpile sites and contractor yards, the potential construction camp, and rail sidings have not yet been finally determined for Nebraska.

Table 2.1-4 Summary of Lands Affected

		Areas Affected (Acres)	
State	Facility	Construction	Operation
Montana	Pipeline ROW	3784.42	1727.75
	Additional Temporary Workspace Areas	518.64	0.00
	Pipe Stockpile Sites, and Contractor Yards	517.28	0.00
	Construction Camp	242.88	0.00
	Pump Stations and Delivery Facilities	65.79	65.79
	Access Roads	337.03	47.41
	Rail Sidings* (3 Sites)	60.00	0.00
	Montana Subtotal	5526.04	1840.95
South Dakota	Pipeline ROW	4153.37	1906.83
	Additional Temporary Workspace Areas	460.37	0.00
	Pipe Stockpile Sites, and Contractor Yards	605.07	0.00
	Construction Camp	250.04	0.00
	Pump Stations and Delivery Facilities	65.63	65.63
	Access Roads	222.96	24.34
	Rail Sidings* (3 Sites)	60.00	0.00
	South Dakota Subtotal	5817.44	1996.80
North Dakota	Pipeline ROW	0.00	0.00
	Additional Temporary Workspace Areas	0.00	0.00
	Pipe Stockpile Sites, and Contractor Yards	56.05	0.00
	Construction Camp	0.00	0.00
	Pump Stations and Delivery Facilities	0.00	0.00
	Access Roads	0.00	0.00
	Rail Sidings* (1 Site)	20.00	0.00
	Pipe Yard	56.05	0.00
North Dakota Subtotal	132.10	0.00	

Table 2.1-4 Summary of Lands Affected			
		Areas Affected (Acres)	
State	Facility	Construction	Operation
Nebraska	<i>Pipeline ROW</i>	3637.41	1663.68
	<i>Additional Temporary Workspace Areas</i>	226.88	0.00
	<i>Pipe Stockpile Sites, and Contractor Yards</i>	TBD	TBD
	<i>Construction Camp</i>	TBD	TBD
	<i>Pump Stations and Delivery Facilities</i>	67.12	67.12
	<i>Access Roads</i>	70.50	0.00
	<i>Rail Sidings*</i>	TBD	TBD
	Nebraska Subtotal		4001.91
Kansas	<i>Pump Stations</i>	15.15	15.15
	Kansas Subtotal		15.15
Total		15492.64	5583.70

* Rail Siding Acreage Represents 20 acres per site.

2.1.5 Additional Temporary Workspace Areas Update

The description of additional temporary workspace areas (ATWA) and typical configurations and acreages of ATWAs as described in the FEIS Section 2.2.7.1 and Table 2.2.7-2 (pp. 2-17 and 2-18) remains accurate. Appendix F provides the locations of all ATWA added to the Project since the FEIS.

2.1.6 Pipe Stockpile Site, Railroad Sidings, and Contractor Yards Update

Table 2.1-5 presents an update of the locations and acreages of pipe stockpile sites, railroad sidings, and contractor yards for all states, except Nebraska. This information updates Table 2.2.7-2 included in the FEIS Section 2.2.7.2 on pp. 2-17 and 2-18. Existing public or private roads would be used to access the sites. Pipe storage sites and contractor yards would be used on a temporary basis and would be reclaimed, as appropriate, upon completion of construction. While the Project does not impact the state of North Dakota, a single pipe stockpile site is located in Bowman County, North Dakota to serve construction spreads four and five in southeast Montana and northwest South Dakota. This pipe yard is a pre-existing industrial site.

Table 2.1-5 Locations and Acreages of Proposed Pipe Stockpile Sites, Railroad Sidings, and Contractor Yards

State	County	Type(s) of Yards	Number of Yards	Combined Acreage
Montana	Dawson, McCone, Valley, Fallon	Contractor Yards	5	161.35
	Roosevelt, Sheridan, Prairie	Rail Sidings*	3	60.00
	Phillips, Dawson, McCone, Valley, Fallon	Pipe Yard Stockpile Sites	9	283.23
South Dakota	Tripp, Haakon, Jones	Contractor Yards	7	258.25
	Hughes, Lyman, Pennington	Rail Sidings*	3	60.00
	Tripp, Haakon, Jones	Pipe Yard Stockpile Sites	11	346.82
North Dakota	Bowman	Pipe Yard Stockpile Sites	1	56.05
Nebraska	TBD	Contractor Yards	TBD	TBD
	TBD	Rail Sidings	TBD	TBD
	TBD	Pipe Yard Stockpile Sites	TBD	TBD

* Nominal Acreage of 20 acres each assigned to rail sidings

TBD - To be determined

2.1.7 Construction Camps Update

The FEIS Section 2.2.7.4 (pp. 2-19 through 2-21) presents information regarding the locations of, purposes of, typical designs for, and decommissioning of construction camps. This information remains accurate. As of the issuance of the FEIS, no camp was planned for Nebraska; however, as discussed in the Nebraska SER (Appendix A), Keystone is considering the potential construction of a construction camp in Nebraska. The location has not been determined. Table 2.1-6 presents permits that would be required for camps for each state.

Table 2.1-6 Summary of Potential Construction Camp Permits and Approvals by State			
State	Permit Or Approval	Agency**	Submitted By
Montana	Water Main Certified Checklist	MDEQ	Keystone
	Sewer Main Certified Checklist	MDEQ	Keystone
	NOI & SWPPP	MDEQ	Keystone
	Building Permits	MBCB	Camp Contractor
	Driveway Approach Permit	MDT	Camp Contractor
	Work Camp Establishment Plan Review	DPHHS	Camp Contractor
South Dakota	Application for Permit to Discharge Wastewater	DENR	Keystone
	Notice of Intent	DENR	Keystone
	SWPPP	DENR	Keystone
	Temporary Permit to Use Public Waters	DENR	Keystone
	Food License Application	DOH	Camp Contractor
	Application for Highway Access Permit	SD DOT	Keystone
Nebraska	Public Water Supply & Distribution System*	NDEQ	Keystone
	Wastewater Collection & Treatment System*	NDEQ	Keystone
	NOI & SWPPP	NDEQ	Keystone
	Food License Application	NDHHS	Camp Contractor
	Building Permits	Local	Camp Contractor
	State Fire Marshal	NE SFM	Camp Contractor

*Submittal for Approval requires the submission of a Design Report, Plans and Specifications certified by a Professional Engineer.

**MDEQ = Montana Department of Environmental Quality, MBCB = Montana Building Code Bureau, MDT = Montana Department of Transportation, DPHHS = Department of Public Health and Human Services; SD DOT = South Dakota Department of Transportation; NDEQ = Nebraska Department of Environmental Quality; NDHHS = Nebraska Department of Health and Human Services; NE SFM = Nebraska State Fire Marshal
DNR = Department of Natural Resources; DOH = Department of Health;

2.1.8 Access Roads Update

The need for access roads and the process of developing and maintaining access roads is discussed in the FEIS Section 2.2.7.5 on pp. 2-21 through 2-23. Table 2.1-7 presents the acreage affected by access roads that were not included in the FEIS in all states. Table 2.1-8 presents all access roads, by county and state, identified since the FEIS.

Table 2.1-7 Lands Affected by Access Roads (Acres) Not part of FEIS Route		
<i>Keystone XL</i>		
State	Construction (Temporary)	Operation (Permanent)
Montana	15.11	0.00
South Dakota	132.74	20.26
Nebraska	70.50	0.00

Table 2.1-8 Access Roads Not Included in the FEIS

Access Road ID	Class	Mile Post	Length (mi)	Footprint Impact (Acres)	Type	County	State
CAR-303	Aux. Site	68.17	3.63	13.21	Temporary	Valley	MT
VAR-07	Valve Access	91.75	0.04	Part of Permanent ROW	Permanent	McCone	MT
CAR-292	Construction	197.71	0.51	1.90	Temporary	Dawson	MT
VAR-14	Valve Access	272.24	0.03	Part of Permanent ROW	Permanent	Fallon	MT
CAR-163	Construction / PS Access	288.67	2.22	12.32	Permanent	Harding	SD
CAR-170	Construction	302.56	0.60	2.13	Temporary	Harding	SD
CAR-173	Construction	306.47	5.01	18.15	Temporary	Harding	SD
CAR-230	Construction	313.13	2.16	7.80	Temporary	Harding	SD
CAR-172	Construction	322.67	0.07	0.20	Temporary	Harding	SD
CAR-171	Construction	322.71	0.06	0.15	Temporary	Harding	SD
CAR-231	Construction	327.94	3.08	11.15	Temporary	Harding	SD
CAR-232	Construction	341.93	5.08	18.44	Temporary	Harding	SD
CAR-233	Construction	345.3	4.13	14.97	Temporary	Harding	SD
CAR-169	Construction	356.97	1.29	4.64	Temporary	Harding	SD
CAR-234	Construction	362.34	2.14	7.68	Temporary	Perkins	SD
CAR-164	Construction / Valve Access	373.86	2.28	7.94	Permanent	Perkins	SD
CAR-177	Construction	379.64	0.55	1.59	Temporary	Meade	SD
CAR-168	Construction	391.32	0.16	0.52	Temporary	Meade	SD
CAR-167	Construction	404.32	4.44	16.08	Temporary	Meade	SD
CAR-175	Construction	413.13	0.54	1.96	Temporary	Meade	SD
CAR-174	Construction	415.93	1.21	4.30	Temporary	Meade	SD
CAR-166	Construction	419.86	0.12	0.42	Temporary	Meade	SD
CAR-190	Construction	438.6	0.03	0.10	Temporary	Haakon	SD

Table 2.1-8 Access Roads Not Included in the FEIS

Access Road ID	Class	Mile Post	Length (mi)	Footprint Impact (Acres)	Type	County	State
CAR-189	Construction	439.19	0.03	0.08	Temporary	Haakon	SD
CAR-191	Construction	439.67	0.03	0.07	Temporary	Haakon	SD
CAR-192	Construction	440.65	0.02	0.06	Temporary	Haakon	SD
CAR-193	Construction	441.14	0.03	0.07	Temporary	Haakon	SD
CAR-194	Construction	441.88	0.03	0.09	Temporary	Haakon	SD
VAR-19A	Valve Access	462.07	0.02	Part of Permanent ROW	Permanent	Haakon	SD
CAR-184	Construction	483.76	0.62	2.16	Temporary	Haakon	SD
CAR-195	Construction	484.34	0.27	0.93	Temporary	Haakon	SD
CAR-196	Construction	485.7	0.03	0.10	Temporary	Haakon	SD
CAR-235	Construction	486.1	1.50	5.35	Temporary	Haakon	SD
VAR-22	Valve Access	534.1	0.02	Part of Permanent ROW	Permanent	Lyman	SD
CAR-237	Construction	541.69	0.55	1.85	Temporary	Tripp	SD
CAR-238	Construction	542.19	0.47	1.35	Temporary	Tripp	SD
CAR-236	Construction	542.62	2.65	9.36	Temporary	Tripp	SD
CAR-198	Construction	550.54	0.23	0.82	Temporary	Tripp	SD
CAR-199	Construction	567.09	0.09	0.20	Temporary	Tripp	SD
VAR-23A	Valve Access	587.13	0.03	Part of Permanent ROW	Permanent	Tripp	SD
CAR-304	Construction	608.88	2.04	7.38	Temporary	Keya Paha	NE
CAR-305	Construction	610.71	0.20	0.71	Temporary	Keya Paha	NE
CAR-306	Construction	617.73	3.74	13.55	Temporary	Boyd	NE
CAR-307	Construction	618.16	0.22	0.77	Temporary	Boyd	NE
CAR-308	Construction	618.58	0.13	0.43	Temporary	Boyd	NE
CAR-309	Construction	627.22	0.30	1.07	Temporary	Boyd	NE
CAR-310	Construction	629.11	0.10	0.30	Temporary	Boyd	NE

Table 2.1-8 Access Roads Not Included in the FEIS

Access Road ID	Class	Mile Post	Length (mi)	Footprint Impact (Acres)	Type	County	State
CAR-311	Construction	635.79	1.35	4.87	Temporary	Boyd	NE
CAR-293	Construction	658.47	0.25	0.88	Temporary	Holt	NE
CAR-246	Construction	664.32	0.58	2.04	Temporary	Holt	NE
CAR-294	Construction	666.54	0.12	0.38	Temporary	Holt	NE
CAR-295	Construction	667.49	0.27	0.94	Temporary	Holt	NE
CAR-296	Construction	680.7	0.08	0.24	Temporary	Holt	NE
CAR-248	Construction	689.68	0.80	2.84	Temporary	Antelope	NE
CAR-249	Construction	690.33	0.61	2.19	Temporary	Antelope	NE
CAR-297	Construction	693.5	0.03	0.09	Temporary	Antelope	NE
CAR-298	Construction	705.17	0.31	1.06	Temporary	Antelope	NE
CAR-250	Construction	707.07	0.51	1.84	Temporary	Antelope	NE
CAR-251	Construction	710.09	0.48	1.69	Temporary	Antelope	NE
CAR-252	Construction	711.09	0.45	1.58	Temporary	Antelope	NE
CAR-253	Construction	713.18	0.42	1.52	Temporary	Antelope	NE
CAR-286	Construction	713.19	0.47	1.70	Temporary	Antelope	NE
CAR-254	Construction	713.52	0.20	0.70	Temporary	Antelope	NE
CAR-255	Construction	714.12	0.31	1.09	Temporary	Antelope	NE
CAR-256	Construction	715.64	0.26	0.89	Temporary	Antelope	NE
CAR-257	Construction	720.12	0.49	1.72	Temporary	Antelope	NE
CAR-258	Construction	743.5	0.38	1.36	Temporary	Boone	NE
CAR-259	Construction	745.42	0.43	1.53	Temporary	Boone	NE
CAR-260	Construction	757.7	0.02	0.03	Temporary	Nance	NE
CAR-261	Construction	758.22	0.10	0.32	Temporary	Nance	NE
CAR-264	Construction	761.38	0.25	0.87	Temporary	Nance	NE

Table 2.1-8 Access Roads Not Included in the FEIS

Access Road ID	Class	Mile Post	Length (mi)	Footprint Impact (Acres)	Type	County	State
CAR-268	Construction	762.28	0.53	1.91	Temporary	Nance	NE
CAR-273	Construction	797.8	0.32	1.11	Temporary	York	NE
CAR-274	Construction	801.33	0.31	1.08	Temporary	York	NE
CAR-218	Construction	801.36	0.31	1.07	Temporary	York	NE
CAR-219	Construction	806.14	0.12	0.36	Temporary	York	NE
CAR-220	Construction	810.56	0.24	0.80	Temporary	York	NE
CAR-275	Construction	810.63	0.06	0.16	Temporary	York	NE
CAR-276	Construction	811.19	0.52	1.87	Temporary	York	NE
CAR-221	Construction	822.14	0.39	1.39	Temporary	Fillmore	NE
CAR-278	Construction	822.34	0.22	0.75	Temporary	Fillmore	NE
CAR-277	Construction	822.37	0.16	0.55	Temporary	Fillmore	NE
CAR-279	Construction	834.85	0.13	0.47	Temporary	Saline	NE
CAR-280	Construction	838.53	0.38	1.29	Temporary	Saline	NE
CAR-285	Construction	858.84	0.32	1.10	Temporary	Jefferson	NE

2.1.9 Aboveground Facilities Update

The Project will require approximately 272.3 acres of land (IMLV site acreages for the reroute portion of the Nebraska preferred alternative route are not included) in Montana, South Dakota, Nebraska, and Kansas for above ground facilities including pump stations and delivery facilities, a densitometer, IMLV sites, and permanent access roads. As presented in Tables 2.1-3 and 2.1-4 above, eighteen pump stations requiring approximately 198.54 acres will be constructed for the Project. A single densitometer will be included on the Project. It will be located within the footprint for Pump Station 26 in Nebraska; therefore, no additional acreage will be required. Table 2.1-9 depicts the updated locations and acreages (2.02 acres) for the IMLVs for the Project. IMLV locations and acreages for the reroute portion of the preferred alternative route in Nebraska are not yet determined. Permanent access road (access roads needed for operation of the Project) acreage for the Project totals 71.8 acres (Table 2.1-4).

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2.2 Pipeline Route Alternatives Update

For a tabular presentation of route changes that are greater than 200 feet from the FEIS centerline, including the locations of and reasons for the post-FEIS changes, in Montana, South Dakota, and Nebraska; see Tables 1.1-1, 1.1-2, and 1.1-3. Appendix D includes figures of each route change.

To address concerns regarding potential impacts to the Sandhills ecological region in Nebraska, Keystone submitted an initial report to the Nebraska DEQ in April 2012. The report presented the studies for six alternative route corridors and a preferred alternative corridor that avoided the Sandhills region. NDEQ conducted an extensive public input process on the April 2012 report. In response to comments from the NDEQ and the public on the April 2012 report, Keystone conducted further studies to develop a revised preferred alternative route in Nebraska. A detailed discussion of that analysis is provided in Section 2.3 of Appendix A. An analysis of pertinent environmental and construction-related features of these alternatives, compared with the comparable segment of the FEIS route, is presented in Table 2.2-1. Table 2.2-2 presents the Nebraska preferred alternative route changes between April and August 2012.

Table 2.2-1 Nebraska Alternative Routes/FEIS Route Comparisons								
Feature	Sub-Categories	Comparison	Comparison ¹		Comparison ²		Comparison ³	
		Route ID	FEIS A	Northern Alternative	FEIS B	Clarks Alternative	FEIS C	Western Alternative
		Total Length	34.46 Miles	35.67 Miles	33.54 Miles	31.35 Miles	13.39 Miles	14.05 Miles
Critical Habitat	Topeka Shiner	Crossing Length	-	-	-	-	-	-
Threatened and Endangered Species Habitat and Ranges	American Burying Beetle		34.46	35.67				
	Finescale Dace		-	-	-	-	-	-
	Interior Least Tern		12.18	8.66	11.61	12.75	-	-
	Lake Sturgeon		-	-	-	-	-	-
	Massasauga		-	-	-	-	-	-
	Northern Redbelly Dace		19.45	15.89	-	-	-	-
	Pallid Sturgeon		-	-	-	-	-	-
	Piping Plover		12.18	8.66	11.61	12.75	-	-
	River Otter		-	-	5.62	5.62	-	-
	Small White Lady's Slipper		16.88	13.19	3.56	3.00	-	-

Table 2.2-1 Nebraska Alternative Routes/FEIS Route Comparisons								
Feature	Sub-Categories	Comparison	Comparison ¹		Comparison ²		Comparison ³	
		Route ID	FEIS A	Northern Alternative	FEIS B	Clarks Alternative	FEIS C	Western Alternative
		Total Length	34.46 Miles	35.67 Miles	33.54 Miles	31.35 Miles	13.39 Miles	14.05 Miles
	Sturgeon Chub		-	-	-	-	-	-
	Western Prairie Fringed Orchid		-	-	-	-	-	-
	Whooping Crane		34.46	35.67	33.54	31.35	9.33	10.71
Ownership	Federal		-	-	-	-	-	-
	State		2.54	-	0.13	-	0.02	-
	Local Government		-	0.04	-	-	0.01	-
	Private		31.92	35.40	33.41	30.99	13.37	14.05
	Water		-	0.23	-	0.36	-	-
HCA--Ecological Unusually Sensitive Areas (USA)			2.57	2.22	-	-	-	-
HCA--Wellhead Protection Areas		Distance To Closest (Mi.)	9.40	6.60	1.70	3.50	0.0	0.70
Depth	to 0 - 5 ft	Crossing	-	-	-	-	-	-

Table 2.2-1 Nebraska Alternative Routes/FEIS Route Comparisons

Feature	Sub-Categories	Comparison	Comparison ¹		Comparison ²		Comparison ³	
		Route ID	FEIS A	Northern Alternative	FEIS B	Clarks Alternative	FEIS C	Western Alternative
		Total Length	34.46 Miles	35.67 Miles	33.54 Miles	31.35 Miles	13.39 Miles	14.05 Miles
Groundwater From CSD Well Data	5 - 10 ft	Length	-	-	11.50	4.54	-	-
	10 - 15 ft		-	0.91	4.54	-	-	-
	15 - 20 ft		1.89	0.68	1.04	-	-	-
	> 20 ft		32.40	32.54	16.46	20.83	13.39	14.05
NHD	Artificial Path	Number Of Crossings	2	3	2	3	-	-
NHD	Intermittent Stream/River		9	20	32	27	12	12
NHD	Perennial Stream/River		7	3	1	1	1	-
NHD	Subtotal		18	26	35	31	13	12
Severe Water Erodible Soils		Crossing Length	13.01	15.35	0.41	1.42	-	-
Severe Wind Erodible Soils			25.10	13.04	5.51	0.89	-	-
Valentine Soils			14.61	5.59	-	-	-	-
Water Wells		Number Within 500 Ft	4	4	57	29	5	7
Residences			-	-	-	2	2	1

Table 2.2-1 Nebraska Alternative Routes/FEIS Route Comparisons								
Feature	Sub-Categories	Comparison	Comparison ¹		Comparison ²		Comparison ³	
		Route ID	FEIS A	Northern Alternative	FEIS B	Clarks Alternative	FEIS C	Western Alternative
		Total Length	34.46 Miles	35.67 Miles	33.54 Miles	31.35 Miles	13.39 Miles	14.05 Miles
Profile Class	0 - 10 (Deg)		78	158	135	79	80	53
Profile Class	> 20 (Deg)		1	3	-	-	-	-
Land Use	Agriculture / Cropland	Crossing Length	5.41	7.03	27.13	26.35	11.07	12.57
	Developed		0.24	0.24	0.87	0.51	0.23	0.21
	Forest Land		2.00	0.56	0.66	0.55	0.38	0.18
	Rangeland / Grassland		26.17	26.92	4.40	3.11	1.67	1.07
	Water		0.33	0.38	0.25	0.20	0.03	0.03
	Wetland		0.30	0.53	0.23	0.64	-	-
Pivot Irrigation Crop Crossings	Number Of Crossings	4	5	37	42	7	13	

2.2.1 Northern Alternative

The northern section of the preferred route corridor included in Keystone's April 2012 report avoided the area that NDEQ has identified as the "Sandhills" region. Nonetheless, numerous comments from the public indicated that there are areas along that section of the April 2012 preferred route corridor that exhibit similar characteristics to the Sandhills, although they are not identified as part of the Sandhills in existing literature or agency databases. These areas include topographic features similar to sand dunes and areas with sandy, erodible soils, with a thin organic layer of topsoil.

The NDEQ Feedback Report directed Keystone to strongly consider avoiding these areas to the extent possible. In response to this direction, Keystone plotted highly wind erodible and Valentine soils and examined recent aerial imagery to identify sand dune features. Using this data, Keystone developed a more easterly alternative route – the "Northern Alternative" -- to avoid these features. The Northern Alternative traverses Keya Paha, Boyd and Holt counties. The Northern Alternative is depicted in Figure 2.2-1, as compared to the April, 2012 preferred alternative route corridor. An analysis of pertinent environmental and construction-related features is presented in Table 2.2-1.

The Northern Alternative has more changes in elevation (indicative of up and down or choppy terrain), more side slopes, less total miles of threatened and endangered species habitat, no crossings of state land, fewer perennial stream/river crossings, and considerably fewer miles of severely wind erodible and valentine soils. As such, and specifically to accommodate the NDEQ Feedback Report, Keystone is including the Northern Alternative in its preferred alternative route in Nebraska.

While Keystone is indicating that the Northern Alternative is now part of its preferred route, it should be noted that the April 2012 preferred route corridor, which more closely follows the original FEIS route, is also constructible using the techniques commonly and successfully used by the pipeline industry for construction in sandy soils and areas of shallow groundwater tables which are discussed further herein.

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2.2.2 Clarks Alternative

During the public comment period, and through NDEQ review, commenters expressed concern that the April 2012 preferred route corridor would cross an area up-gradient of the Clarks Well head Protection Area (WHPA) and where the depth to groundwater is shallow. The well within the WHPA is the source of the town's water supply. This section of the April 2012 preferred alternative route corridor incorporated the route that was included in the 2011 FEIS. The NDEQ Feedback Report suggested that Keystone consider routing the pipeline down-gradient of the town of Clarks. These comments were made notwithstanding that the WHPA is modeled to provide a 20 year protection buffer around the well intake, and that the FEIS route was approximately 1.70 miles from the well intake.

In response to the feedback received, Keystone developed an alternative route – the “Clarks Alternative” -- to the east of the town of Clarks in order to locate the pipeline down-gradient of the WHPA. The Clarks Alternative lies 3.50 miles down-gradient (east) of the WHPA.

Figure 2.2-2 depicts this section of the April 2012 preferred route corridor and the Clarks Alternative. Table 2.2-1 provides a comparison of the environmental and construction related resources that may be impacted by each route. As can be seen in Figure 2.2-2 and Table 2.2-1, the routes are similar in terms of potential impacts to sensitive species, potential impacts to ground and surface waters, and potential impacts to land uses. However, the Clarks alternative will encounter fewer areas of wind erodible soils and traverse fewer sloped areas. Keystone is incorporating the Clarks Alternative in its preferred alternative route in Nebraska.

Table 2.2-2 Nebraska Preferred Alternative Route Changes Between April and August 2012

Figure Number	County	Begin MP	End MP	Base Route Length (miles)	Reroute Length (miles)	Maximum Perpendicular Distance from Center Line (feet)	Reason for Route Change
1033— Northern Alternative	Keya Paha, Boyd, Holt	601.76	637.42	34.57	35.67	41,951	See Section 2.2.1. Approximately, 74 tracts, 36 new landowners and 1 State Land tract (Board of Education Lands, School Lands) are impacted. Additionally, 8 new construction access roads will be added for the reroute; 1 Mainline Valve will be relocated (CK-MLV-25).
1034	Holt	657.93	658.43	0.49	0.50	279	The proposed route variation was developed to accommodate a landowner's (tract ML-NE-HT-30345.000) request to avoid a newly planted (3 years) shelter belt on the property as well as a cattle feed lot by shifting the centerline and work areas further south.
1035	Holt	659.08	660.83	1.68	1.75	1,481	Landowner preference
1036	Holt	661.82	663.75	1.77	1.94	1,796	The primary reason for this proposed reroute is to avoid landowner's row of trees located in tract ML-NE-HT-30405.000 by shifting the centerline and work areas east.
1037	Holt	665.44	667.47	1.85	2.03	1,845	Landowner preference
1038	Boone	740.05	741.02	0.93	0.98	457	Landowner preference

Table 2.2-2 Nebraska Preferred Alternative Route Changes Between April and August 2012

Figure Number	County	Begin MP	End MP	Base Route Length (miles)	Reroute Length (miles)	Maximum Perpendicular Distance from Center Line (feet)	Reason for Route Change
1039	Boone	745.45	746.88	1.47	1.44	1,344	Landowner preference
1040	Boone	749.98	750.94	0.96	0.96	201	The primary reason for this proposed reroute is to avoid a large drain that is located next to a road and to allow the drainage feature and road be crossed separately by shifting the centerline and workspaces further west.
1041—Clarks Alternative	Nance, Merrick, York, Polk	764.99	796.31	31.49	31.33	50,938	See Section 2.2.2, Clarks Alternative
1042—Western Alternative	Saline, Jefferson	840.95	855.03	13.49	14.08	18,546	See Section 2.2.3, Western Alternative
1043	Jefferson	873.29	874.50	1.29	1.20	275	The primary reason for this proposed reroute is to shift CL and WAs away from fence that runs parallel to the current CL.

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2.2.3 Western Alternative

After the FEIS was published in August, 2011, a new WHPA was established for the city of Western that extended further west, overlapping onto the FEIS route. For this reason, Keystone examined an alternative – the “Western Alternative” which would move the route west, out of the newly established WHPA. It lies 0.70 miles west of the Western WHPA. The alternative is depicted in Figure 2.2-3. The analysis of the alternative and the FEIS route in this location is provided in Table 2.2-1. The results of the analysis indicate that potential impacts to sensitive species, ground and surface water, and land use are very similar between the two routes. Keystone is incorporating the Western Alternative in its preferred alternative route in Nebraska.

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3.0 Affected Environment

Section 3.0 of the FEIS (p. 3-1) regarding environmental consequences of constructing and operating the proposed Keystone XL Project indicates that impacts of varying duration and significance will occur. Four levels of impact duration were considered: temporary, short term, long term, and permanent. Temporary impacts would generally occur during construction, with the resources returning to pre-construction conditions almost immediately afterward. Short-term impacts would continue for approximately three years following construction. Impacts were considered long term if the resources would require more than three years to recover. Permanent impacts would occur as a result of activities that modify resources to the extent that they would not return to pre-construction conditions during the life of the Project, such as with construction of aboveground structures. An impact resulting in a substantial adverse change in the environment would be considered significant.

Because the route in Montana and South Dakota has already been reviewed, analyzed, and approved by the respective states and the changes proposed since the FEIS were made to address landowner and environmental requirements identified in the FEIS, this Environmental Report mainly focuses on the significant changes in Nebraska from the FEIS route. Where appropriate, post-FEIS changes for South Dakota and Montana are addressed and identified. .

This section discusses the affected environment, construction and operational impacts, and associated mitigation for each affected resource for the Project. The Project would incorporate measures to reduce environmental impacts during construction as outlined in the CMRP (Appendix E) and would implement mitigation measures that may be necessary to further reduce impacts as required or recommended by resource agencies.

Conclusions in this Environmental Report are based on the analysis of environmental impacts and the following assumptions:

- Keystone would comply with all applicable laws and regulations;
- Keystone would incorporate the 57 Project-specific Special Conditions developed by PHMSA into the Project and into its manual for operations, maintenance, and emergencies that is required by 49 CFR 195.402;
- Keystone would incorporate the mitigation measures required in permits issued by environmental permitting agencies into the construction, operation and maintenance of the Project;
- Keystone would construct, operate, and maintain the Project as described in this Environmental Report and the FEIS; and
- Keystone would implement the measures designed to avoid or reduce impacts described in its application for a Presidential Permit and supplemental filings with DOS, the CMRP (Appendix E), and the construction methods described in Appendix H in the FEIS.

3.1 Climate and Air Quality

FEIS Sections 3.12.1 and 3.12.1.1 (pp. 3.12-1 through 3.12-6) provide baseline information regarding the regional climate and ambient air quality for the Project area. This information remains accurate. FEIS Section 3.12.1.2 (pp. 3.12-7 through 3.12-16) provides a detailed discussion of all regulatory requirements for the Project; that information remains applicable. FEIS Section 3.12.13 (pp. 3.12-16 through pp. 3.12-22) presents a discussion of potential types of air impacts for the Project. The information remains accurate and indicates that Project impacts to air will be temporary in nature and would potentially consist of fugitive dust resulting from construction activities, combustion emissions from diesel or gasoline burning construction equipment, possible slash material burning, and possible extremely low Volatile Organic Compound (VOC) emissions at fuel transfer system locations. FEIS Table 3.12.1-9 on p. 3.12-19 provides a summary of estimated construction emissions for the Project.

3.1.1 Power Generation at IMLV/MVL

PHMSA Special Condition 32 (Appendix U of the FEIS) requires Keystone to install backup generators at all motorized MLV/IMLVs. The diesel powered backup generators located at motorized IMLVs and the MLVs at pump stations are considered as minor sources of emissions and do not trigger air quality permitting or regulations. Backup generators will not be used to power the pumps at pump stations. Table 2.1-7 identifies the locations for all current IMLVs. The locations of IMLVs for the reroute portion of the preferred alternative route in Nebraska are not yet determined. All Main Line Valves will be located within pump station facilities.

3.2 Geology, Mineral Resources, and Paleontology

3.2.1 Paleontological Surveys since FEIS

The potential for disturbance of paleontological resources during pipeline construction was evaluated, and the approach undertaken was dependent upon the individual state regulatory bodies. Montana and South Dakota had specific regulatory requirements involving paleontological resources and required field surveys were conducted in 2008, 2010 utilizing the BLM guidelines (BLM 2007, 2008).

Paleontological Surveys were conducted and recorded in the FEIS, Section 3.1.2, and Table 3.1.2-1 on p. 3.1-14. The last surveys were conducted in the field in early July 2010, and the report was published on September 3, 2010. The criteria and methodology for the survey results and how the Project corridor definition is defined:

- Significant Fossil Localities (SFL) are those localities containing fossils that are rare or previously unknown, are well-preserved, preserve a previously undocumented feature, provide new information or have educational, recreational or economic value.

- Non-significant Fossil Occurrences (NFO) are those localities that typically consist of highly weathered or unidentifiable bone or tooth fragments, unidentifiable plant fossils, fossils of common occurrence that are redundant to museum collections, and fragments of silicified wood.

Since the previous surveys, subsequent surveys were conducted. Table 3.2-1 reflects the status of the surveys and associated reports. Reports not previously filed with the DOS are included in Appendix K. Field surveys for Nebraska are proposed and are tentatively scheduled to begin Fall 2012 / Spring 2013. The Keystone XL FEIS identified 47.5 miles on the original Project route in Montana, South Dakota and Nebraska that had a very high potential for finding fossils (Section 3.1-2, p. 2.1-12). Subsequent fine grain analysis using the current Project route has identified more potential area containing fossiliferous material for a net increase of 76.8 miles.

Table 3.2-1 Paleontological Surveys Dates and Associated Reports

Date of Report	Date(s) of Survey	State	Title
March 2, 2012	June 9-23; July 7-12; October 4-13	MT	Paleontological Survey Report: Federal Lands along the Keystone XL Project, Montana.
March 2, 2012	June 9-23; July 7-12; October 4-13	MT	Paleontological Survey Report: Private Lands along the Keystone XL Project, Montana: Addendum 1
March 2, 2012	June 9-23; July 7-12; October 4-13	MT	Paleontological Survey Report: State and County Lands along the Keystone XL Project, Montana
TBD	June 28, 2012 – August 8, 2012	MT	<i>Titles Pending Report Completion</i>
November 22, 2010	August 5-November 6, 2010	SD	Paleontological Survey Report Addendum: State and Harding Lands along the Keystone XL Project, South Dakota.
November 22, 2010	August 5-November 6, 2010	SD	Paleontological Survey Report Addendum: Private Lands along the Keystone XL Project, South Dakota.
March 2, 2012	June 20, 2011	SD	Paleontological Survey Report: BLM Lands along the Keystone XL Project, South Dakota: Addendum 1
March 2, 2012	June 7-20, 2011; October 15-26, 2011	SD	Paleontological Survey Report: Private Lands along the Keystone XL Project, South Dakota: Addendum 3
March 2, 2012	June 7-20, 2011; October 15-16, 2011	SD	Paleontological Survey Report: State and County Lands along the Keystone XL Project, South Dakota: Addendum 2
TBD	June 28, 2012 – July 31, 2012	SD	<i>Titles Pending Report Completion</i>

Record Search Results

According to the paleontological record searches conducted for Montana and South Dakota portions of the Project, prior to and during field surveys, currently there are no previously recorded fossil localities present within the Project area. In South Dakota, four previously recorded localities occur within the same sections as the Project route (i.e. are located within one-mile or less of it), but are avoided by the Project. Record searches for Nebraska are ongoing and these results will be incorporated into the final Paleontological Survey Report and final Nebraska Mitigation Plan.

Field Survey Results

As of August 2012, paleontological surveys on route changes since the FEIS in Montana resulted in the documentation of 28 SFLs and 63 NFOs. In South Dakota the surveys resulted in the documentation of 16 SFLs and 54 NFOs (Table 3.2-2 and Appendix K). Paleontological surveys are ongoing on route changes in Nebraska.

Table 3.2-2 Paleontological Resources Identified During Project Field Surveys in Montana through August 2012.

Locality No.	SMITH No.	State	Ownership	Fossil Type	SFL/NFO	Geology	Within Right-of-Way*
080720-GEK-01	24PE0735	MT	BLM	Vertebrate	SFL	Fort Union	Yes
100602-MHM-01	24MC0650	MT	Private	Plant, Vertebrate	SFL	Hell Creek	Yes
100602-SLJ-01	24MC0650	MT	Private	Vertebrate	SFL	Hell Creek	Yes
100605-WLS-01	24MC0652	MT	State of Montana	Plant	SFL	Fort Union	Yes
100607-WLS-01	24MC0653	MT	Private	Plant	SFL	Fort Union	Yes
100609-AMS-01	24FA0413	MT	Private	Vertebrate	SFL	Fort Union	Yes
100824-AMS-02	NA	MT	BLM	Invertebrate	NFO	Bearpaw	Yes
F1-100602-01	NA	MT	Private	Plant	NFO	Hell Creek	Yes
F1-100603-01	NA	MT	Private	Vertebrate	NFO	Hell Creek	Yes
F1-100603-02	NA	MT	Private	Plant	NFO	Hell Creek	Yes
F1-100604-01	NA	MT	BLM	Vertebrate	NFO	Hell Creek	Yes
F1-100715-01	NA	MT	Private	Plant	NFO	Fort Union	Yes
F13-090826-01	NA	MT	BLM	Invertebrate	NFO	Claggett	Yes
F2-080714-01	NA	MT	BLM	Invertebrate	NFO	Bearpaw	Yes
F2-080714-03	NA	MT	BLM	Invertebrate	NFO	Bearpaw	Yes
F2-080716-01	NA	MT	BLM	Invertebrate	NFO	Bearpaw	Yes
F2-080716-02	NA	MT	BLM	Invertebrate	NFO	Bearpaw	Yes
F2-080716-03	NA	MT	BLM	Invertebrate	NFO	Bearpaw	Yes
F5-110609-01	NA	MT	Private	Plant	NFO	Fort Union	Yes

Table 3.2-2 Paleontological Resources Identified During Project Field Surveys in Montana through August 2012.

Locality No.	SMITH No.	State	Ownership	Fossil Type	SFL/NFO	Geology	Within Right-of-Way*
F5-110610-01	NA	MT	Private	Plant	NFO	Fort Union	Yes
F5-120706-01	NA	MT	Private	Plant	NFO	Fort Union	Yes
F5-120731-01	NA	MT	Private	Invertebrate	NFO	Pierre	Yes
F5-120731-02	NA	MT	Private	Invertebrate	NFO	Pierre	Yes
F5-120801-01	NA	MT	Private	Invertebrate	NFO	Pierre	Yes
090910-BHIA-006	NA	SD	Private	Vertebrate	NFO	Hell Creek	Yes
090910-BHIA-007	NA	SD	Private	Plant, Vertebrate	NFO	Hell Creek	Yes
090910-BHIB-002	NA	SD	Private	Plant, Vertebrate	NFO	Hell Creek	Yes
090917-BHIB-001	NA	SD	Private	Vertebrate	SFL	Hell Creek	Yes
100526-SML-01	NA	SD	Private	Vertebrate	SFL	Hell Creek	Yes
F0-100514-01	NA	SD	Private	Vertebrate	NFO	Hell Creek	Yes
F0-100526-04	NA	SD	South Dakota School and Public Lands	Vertebrate	NFO	Hell Creek	Yes
F0-101028-01	NA	SD	Harding County	Vertebrate	NFO	Hell Creek	Yes
F0-101101-01	NA	SD	Private	Vertebrate	NFO	Hell Creek	Yes
F0-101101-02	NA	SD	State of South Dakota	Vertebrate	NFO	Hell Creek	Yes
F1-090922-01	NA	SD	State of South Dakota	Vertebrate	NFO	Hell Creek	Yes
F4-110617-01	NA	SD	Private	Vertebrate	NFO	Hell Creek	Yes
F6-120712-01	NA	SD	Private	Vertebrate, Plant	NFO	Hell Creek	Yes
F6-120712-02	NA	SD	Private	Vertebrate, Plant	NFO	Hell Creek	Yes
080715-GEK-01	24VL1979	MT	BLM	Vertebrate	SFL	Judith River	No
080717-GEK-01	24MC0643	MT	BLM	Invertebrate	SFL	Bearpaw	No
080718-GEK-01	24MC0644	MT	BLM	Vertebrate	SFL	Hell Creek	No
080718-GEK-02	24MC0645	MT	BLM	Vertebrate	SFL	Hell Creek	No
080718-GEK-03	24MC0645	MT	BLM	Vertebrate	SFL	Hell Creek	No
080718-GEK-04	24MC0645	MT	BLM	Vertebrate	SFL	Hell Creek	No
080718-LSB-01	24MC0645	MT	BLM	Vertebrate	SFL	Hell Creek	No
080718-PCM-01	24MC0644	MT	BLM	Vertebrate	SFL	Hell Creek	No

Table 3.2-2 Paleontological Resources Identified During Project Field Surveys in Montana through August 2012.

Locality No.	SMITH No.	State	Ownership	Fossil Type	SFL/NFO	Geology	Within Right-of-Way*
080718-PCM-02	24MC0645	MT	BLM	Vertebrate	SFL	Hell Creek	No
080718-PCM-03	24MC0645	MT	BLM	Vertebrate	SFL	Hell Creek	No
080719-LSB-01	24MC0646	MT	BLM	Vertebrate	SFL	Hell Creek	No
080722-GEK-01	24MC0645	MT	BLM	Vertebrate	SFL	Hell Creek	No
080722-GEK-02	24MC0645	MT	BLM	Vertebrate	SFL	Hell Creek	No
080818-GEK-01	24MC0647	MT	BLM	Plant, Vertebrate	SFL	Hell Creek	No
080818-GEK-02	24MC0648	MT	BLM	Vertebrate	SFL	Hell Creek	No
080821-PCM-01	24VL1980	MT	BLM	Invertebrate	SFL	Bearpaw	No
090508-WLS-01	24MC0649	MT	BLM	Invertebrate	SFL	Bearpaw	No
090826-PCM-01	24PH1064	MT	BLM	Vertebrate	SFL	Judith River	No
100522-GEK-01	24VL1981	MT	State of Montana	Invertebrate, Vertebrate	SFL	Claggett	No
100602-SLJ-02	24MC0650	MT	Private	Vertebrate	SFL	Hell Creek	No
100605-SLJ-01	24MC0651	MT	Private	Vertebrate	SFL	Hell Creek	No
100609-AMS-02	24FA0414	MT	Private	Vertebrate	SFL	Hell Creek	No
F1-100519-01	NA	MT	Private	Vertebrate	NFO	Judith River	No
F1-100521-01	NA	MT	Private	Invertebrate	NFO	Claggett	No
F1-100521-02	NA	MT	Private	Trace	NFO	Judith River	No
F1-100528-01	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F1-100528-02	NA	MT	Private	Invertebrate	NFO	Bearpaw	No
F1-100529-01	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F1-100603-03	NA	MT	Private	Vertebrate	NFO	Hell Creek	No
F1-100720-01	NA	MT	Private	Vertebrate	NFO	Hell Creek	No
F1-100720-02	NA	MT	Private	Vertebrate	NFO	Hell Creek	No
F1-100819-01	NA	MT	Private	Plant	NFO	Fort Union	No
F1-100824-01	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F1-111006-01	NA	MT	USDI Bureau of Land Management	Invertebrate	NFO	Bearpaw	No
F1-111006-02	NA	MT	USDI Fish and Wildlife Service	Invertebrate	NFO	Bearpaw	No

Table 3.2-2 Paleontological Resources Identified During Project Field Surveys in Montana through August 2012.

Locality No.	SMITH No.	State	Ownership	Fossil Type	SFL/NFO	Geology	Within Right-of-Way*
F1-111006-03	NA	MT	USDI Fish and Wildlife Service	Vertebrate	NFO	Bearpaw	No
F1-111013-01	NA	MT	Fallon County	Invertebrate	NFO	Fort Union	No
F13-090827-01	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F2-080714-02	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F2-080715-01	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F2-080715-02	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F2-080715-03	NA	MT	BLM	Invertebrate	NFO	Judith River	No
F2-080715-04	NA	MT	BLM	Plant	NFO	Judith River	No
F2-080717-01	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F2-080717-02	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F2-080717-03	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F2-080717-04	NA	MT	BLM	Invertebrate	NFO	Bearpaw	No
F2-080718-01	NA	MT	BLM	Vertebrate	NFO	Hell Creek	No
F2-080718-02	NA	MT	BLM	Vertebrate	NFO	Hell Creek	No
F2-080718-03	NA	MT	BLM	Vertebrate	NFO	Hell Creek	No
F2-080719-01	NA	MT	BLM	Vertebrate	NFO	Fort Union	No
F2-080719-02	NA	MT	BLM	Vertebrate	NFO	Hell Creek	No
F2-080722-01	NA	MT	BLM	Vertebrate	NFO	Hell Creek	No
F2-080818-01	NA	MT	BLM	Plant	NFO	Hell Creek	No
F2-080818-02	NA	MT	BLM	Vertebrate	NFO	Hell Creek	No
F2-080818-03	NA	MT	BLM	Vertebrate	NFO	Hell Creek	No
F3-080816-01	NA	MT	BLM	Vertebrate	NFO	Judith River	No
F3-080816-02	NA	MT	BLM	Vertebrate	NFO	Judith River	No
F3-080816-03	NA	MT	BLM	Vertebrate	NFO	Judith River	No
F3-080816-04	NA	MT	BLM	Vertebrate	NFO	Judith River	No
F3-080817-01	NA	MT	BLM	Invertebrate	NFO	Claggett	No
F5-120629-01	NA	MT	Private	Invertebrate	NFO	Judith River	No
F5-120728-01	NA	MT	Private	Invertebrate	NFO	Fort Union	No
F5-120801-02	NA	MT	Private	Invertebrate	NFO	Pierre	No

Table 3.2-2 Paleontological Resources Identified During Project Field Surveys in Montana through August 2012.

Locality No.	SMITH No.	State	Ownership	Fossil Type	SFL/NFO	Geology	Within Right-of-Way*
F9-090507-01	NA	MT	BLM	Vertebrate	NFO	Bearpaw	No
090909-BHIA-001	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
090909-BHIA-002	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
090909-BHIB-001	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
090909-BHIB-002	NA	SD	Private	Vertebrate	NFO	Quaternary	No
090909-BHIB-003	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
090910-BHIB-003	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
090910-BHIB-004	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
090911-BHIB-001	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
090911-BHIB-002	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
090912-BHIA-011	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
090912-BHIA-012	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
090912-BHIA-013	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
090930-LSB-01	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
090930-LSB-02	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
090930-LSB-03	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
100515-DAH-01	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
101104-TWT-01	NA	SD	Private	Plant, Vertebrate	SFL	Hell Creek	No
101105-TWT-01	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
101105-TWT-02	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
F0-100514-02	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F0-100515-01	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F0-100517-01	NA	SD	Harding County	Plant	NFO	Hell Creek	No
F0-100518-01	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F0-100519-03	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F0-100519-04	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F0-100522-01	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F0-100605-01	NA	SD	Private	Invertebrate	NFO	Pierre	No
F0-100607-01	NA	SD	Private	Invertebrate	NFO	Pierre	No
F0-100622-01	NA	SD	Private	Vertebrate	NFO	Ogallala	No
F0-101103-01	NA	SD	Private	Plant	NFO	Hell Creek	No
F3-090930-01	NA	SD	Private	Plant, Vertebrate	NFO	Hell Creek	No

Table 3.2-2 Paleontological Resources Identified During Project Field Surveys in Montana through August 2012.

Locality No.	SMITH No.	State	Ownership	Fossil Type	SFL/NFO	Geology	Within Right-of-Way*
F3-090930-02	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F3-090930-03	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F3-090930-04	NA	SD	Private	Vertebrate	NFO	Hell Creek	No
F3-090930-05	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
F4-110617-02	NA	SD	Private	Plant	NFO	Hell Creek	No
F4-110712-01	NA	SD	Private	Vertebrate	SFL	Hell Creek	No
F6-120629-01	NA	SD	Private	Invertebrate	NFO	Pierre	No
F6-120629-02	NA	SD	Private	Invertebrate	NFO	Pierre	No
F6-120705-01	NA	SD	Private	Invertebrate	NFO	Pierre	No
F6-120705-02	NA	SD	Private	Invertebrate	NFO	Pierre	No
F6-120713-01	NA	SD	Private	Plant	NFO	Hell Creek	No
090912-BHIA-014	NA	SD	Private	Vertebrate	SFL	Hell Creek	NA

* Significant localities within the Project right-of-way (August 15, 2012 dataset) have already been mitigated by collection or avoidance, and/or consultation with land owners; or are in the process of being removed from the ROW.
 Source: See reports in Appendix K

3.2.2 Geology and Mineral Resources

The change in location of the preferred alternative route from the FEIS route in Montana and South Dakota has resulted in very limited changes or impacts. The sand, gravel and bentonite mineral resources have not changed appreciably, and neither have the reroutes placed the work areas into gas production fields, coal mines or other known mineral extraction locations.

The number of oil and gas wells on the reroute sections are the same as those listed in the FEIS, Appendix F. With the fairly minor route changes made in these states, the number of well sites that dropped out was fairly equal number to those drawn within 1,320 ft. from the centerline that was used as the metric for a potential impact. The reroutes in Nebraska were similarly inconsequential as far as changes in geology, mineral resources or impacts on extraction activities. Before the reroutes, there were no oil or gas production wells within the 1,320 ft. possible impact zone, and after the current preferred alternative route was identified, one well site moved into this zone, but it is an expired well site. In aggregate, there are no significant impacts to the geology and mineral resources caused by the current reroutes.

3.3 Soils

The description and types of soils crossed by the Project in Montana and South Dakota has not materially changed. Appendix G provides the soil series crossed by each of the route changes discussed in Section 2.1. A summary of the net difference of the major soil criteria is provided in Table 3.3-1. The text provided below discusses the changes in soils and physiography that are impacted by the preferred alternative route in Nebraska.

The Project's footprint from north to south within Nebraska passes through a series of different soils and features that are the result of a number of mechanisms the landforms have gone through, from deep sediment deposition in shallow seas, volcanic eruptions and ash fall, to glaciation action and climates from dry to humid. For soil formation, the latter activity of glaciation has had a significant effect on current structures.

Table 3.3-1 Changes in Soil Characteristics between the FEIS route and the current Project(miles)

Montana									
Row Labels	Sum of Shallow Bedrock	Sum of Drought Prone	Sum of Compaction Prone	Sum of Severe Wind Erodible	Sum of Severe Water Erodible	Sum of Stony or Rocky	Sum of Prime Farmland	Sum of Hydric	Totals
FEIS	4.10	20.90	233.50	5.60	109.78	29.60	67.80	1.60	472.88
FEIS + Reroutes	3.95	20.95	235.89	5.16	111.79	32.11	63.11	1.49	474.45
Change in Impact =	0.15	-0.05	-2.39	0.44	-2.01	-2.51	4.69	0.11	-1.57
South Dakota									
Row Labels	Sum of Shallow Bedrock	Sum of Drought Prone	Sum of Compaction Prone	Sum of Severe Wind Erodible	Sum of Severe Water Erodible	Sum of Stony or Rocky	Sum of Prime Farmland	Sum of Hydric	Totals
FEIS	1.10	65.60	251.80	16.60	107.60	9.00	106.30	5.20	563.20
FEIS + Reroutes	1.04	65.89	253.43	16.71	104.82	9.03	110.17	5.08	566.17
Change in Impact =	0.06	-0.29	-1.63	-0.11	2.78	-0.03	-3.87	0.12	-2.97
Nebraska									
Row Labels	Sum of Shallow Bedrock	Sum of Drought Prone	Sum of Compaction Prone	Sum of Severe Wind Erodible	Sum of Severe Water Erodible	Sum of Stony or Rocky	Sum of Prime Farmland	Sum of Hydric	Totals
FEIS	0.30	73.80	118.60	93.70	81.50	13.20	99.60	21.70	502.40
FEIS + Reroutes	0.27	81.95	190.94	48.42	57.61	41.26	12.59	0.04	433.08
Change in Impact =	0.03	-8.15	-72.34	45.28	23.89	-28.06	87.01	21.66	69.32

Tracking from north to the south along the preferred alternative route in Nebraska, the soils are largely derived from the effects of glaciation. Much of the glaciation has been in successive waves, with periods long enough between the glaciation of the northern plains that result in till formation, loess deposition in uplands and strong winds along the glacial margins that swept up soils and created field of dunes. (Wayne, William J., Encyclopedia of the Great Plains, <http://plainshumanities.unl.edu/encyclopedia/doc/egp.pe.029>, extracted 29 August 2012)

This area of the preferred alternative route in Nebraska is part of the Central Great Plains Winter Wheat and Range Regions. The landforms are nearly level tablelands to gently rolling fluvial plains. These soils are similar to the Western Great Plains Range in the north of the state, with deep calcareous loess deposits. Sensitive soils in the vicinity of the preferred alternative route are encountered along the northern reaches of the study area. From the northern state line to the Niobrara River are soils that have a high percentage of silty loams, with some clayey loams and mixed sands. Valentine soils are found in some areas along this route. With the sandy, excessively drained nature of these soils, their handling and restoration requirements discussed below in this section are critical to regrowth of adequate vegetation and soil stabilization. Portions of the route through Keya Paha, Boyd and Holt Counties lie within the Dakota-Nebraska Eroded Tableland Resource area. The soils along this northern portion of the preferred alternative route are of a more mixed, but less sensitive, nature than those soils traversed in the original alignment. Sensitive soils along the preferred alternative route in Nebraska are presented in Table 3.3-1, using the centerline of the pipe as the reference in measuring the linear distance along the centerline. To provide a more thorough picture of what the impacts might be to soils during construction and operation, Table 3.3-2 provides the net change in impacts between the FEIS route and the current preferred alternative route in Nebraska.

Table 3.3-2 Potential Soil Impacts by Category Comparing FEIS Route to the Project route in Nebraska (Acres)

Nebraska	Comparison	Total Acres Affected	Shallow Bedrock	Drought Prone	Compaction Prone	Severe Wind Erodible	Severe Water Erodible	Stony or Rocky	Prime Farmland	Hydric
	FEIS	3,734.00	5.00	1,181.00	1,668.00	1,465.00	1,291.00	187.00	1,389.00	305.00
	Project Route	3,934.77	4.62	1,165.65	2,762.32	678.49	829.68	578.56	2,531.93	113.23
	Total diff=	(200.77)	0.38	15.35	(1,094.32)	786.51	461.32	(391.56)	(1,142.93)	191.77

Note: A parenthesis, ex. (242) indicates the number is negative, or the Reroute number is larger than the FEIS.

Route Comparisons

The route selection process in Nebraska was undertaken to address NDEQ's concern of the Project route crossing the Sandhills. An initial proposed route corridor moved the route out of the defined limits of the Sandhills, however, this route corridor did not completely move the Project out of certain sensitive soils, although it did reduce them dramatically. The current preferred alternative route was developed to reduce the impact on fragile soils. This preferred alternative route results in a net reduction in the number of miles of highly wind erodible and Valentine soils crossed. Specifically there is a reduction in soils crossed that are highly susceptible to wind erosion, from 25.10 miles to 13.04 miles; the number of miles crossing Valentine soils was drastically reduced from 14.61 mi. to 5.59 mi., a reduction of over 50%.

For the Clarks Alternative the amount of highly wind erodible soils was significantly reduced by the latest route adjustment, from 5.5 miles. to 9 miles.

From a technical standpoint, the latest adjustment to the preferred alternative route in Nebraska is an overall net reduction in fragile soils crossed by the Project.

3.4 Water Resources

3.4.1 Net change to water body crossings

Water body crossing locations by state for the Project impacted by the route changes have been updated and included in Appendix H for Montana and South Dakota, and in Appendix F of the Nebraska SER (Appendix A) for Nebraska.

The net difference in water body crossings in Montana since issuance of the FEIS is 82 more crossings (Section 3.3.1.2, p. 3.3-14), 8 water body crossings are associated with three different route changes in Montana as identified by route location in Appendix H. No new impaired, contaminated, or sensitive waterbodies have been identified in Montana since issuance of the FEIS (Section 3.3.1.2, p. 3.3-15).

There are 50 water body crossings associated with route changes identified in South Dakota and a net difference in crossings since the FEIS of 73 fewer crossings (Section 3.3.1.2, p. 3.3-16). One new impaired water body has been identified along the Project in Harding County, South Dakota since issuance of the FEIS (Section 3.3.1.2, Table 3.3.1.2-3, p. 3.3-17). The Little Missouri River is listed as impaired for total suspended solids / turbidity by the US EPA. The Little Missouri River crossing is proposed to be crossed utilizing the HDD construction method.

As presented in Appendix A, an additional 44 water body crossings with the reroute portion of the preferred alternative route are found in Nebraska. There is one new impaired water body, Beaver Creek, crossings along the reroute portion of the preferred alternative route in Nebraska (FEIS Section 3.3.1.2, p. 3.3-19).

Waterbodies within 10-miles downstream of water body crossings associated with the Project reroutes are listed in Appendix H. In Montana 3 additional downstream waterbodies have been

identified, in South Dakota there are 30 fewer waterbodies since issuance of the FEIS (FEIS Appendix E-4). Nebraska has 24 fewer waterbodies within 10-miles downstream of Project water body crossings of the reroute portion of the preferred alternative route in Nebraska (Appendix A).

Levee and water control structure crossing locations identified along the Project route were identified in the FEIS (FEIS Appendix E-5). Due to the incorporation of the reroutes, Montana has 8 fewer crossings, South Dakota, 2 fewer crossings, and Nebraska 1 more levee or water control structure crossing (Appendix H). Keystone will continue to work with levee and water control structure managing entities, as appropriate, for these crossings.

3.4.2 Net change to wetland crossings

Wetland crossing locations along the reroutes have been updated and included in Appendix H. Estimated wetland impacts by state for right-of-way construction and operation activities along these reroutes are summarized below in Table 3.4-1.

No new “Wetland Areas of Special Concern or Value” have been identified in Montana or South Dakota. Montana route changes resulted in 19 fewer wetland crossings compared with the FEIS (Section 3.4.3, Table 3.4.3-1, p. 3.4-6). Wetland area construction impacts decreased from 38-acres to 4.36-acres, and wetland areas affected by operation of the pipeline have decreased from 8-acres to 3.02-acres.

In South Dakota, 25 fewer wetlands are crossed by the Project route changes compared with the FEIS (Section 3.4.3, Table 3.4.3-1, p. 3.4-6). Wetland area construction impacts decreased from 12-acres to 8.81-acres, and wetland areas affected by operation of the pipeline have decreased from 8-acres to 5.99-acres along these reroutes.

In Nebraska, 66 fewer wetlands are crossed with the reroute portion of the preferred alternative route since issuance of the FEIS (Section 3.4.3, Table 3.4.3-1, p. 3.4-6). Wetland area construction impacts decreased from 85-acres to 14.09-acres, and wetland areas affected by operation of the pipeline have decreased from 43-acres to 8.15-acres along the reroute portion of the preferred alternative route in Nebraska. Updated information for Nebraska wetland crossings is included in Appendix F of the SER (Appendix A).

Table 3.4-1 Construction and Operation Right-of-Way Wetlands Estimated Impact Summary by State for the Route Changes

Wetland Classification	Length of Wetlands Crossed (miles)	Wetland Area Affected during Construction (acres) ¹	Wetland Area Affected by Operations (acres) ¹	Number of Wetland Crossings
Montana				
Palustrine emergent wetland	0.44	3.98	2.64	20
Palustrine scrub-shrub wetland	0.06	0.38	0.38	2
<i>Montana Total</i>	0.50	4.36	3.02	22
South Dakota				
Palustrine emergent wetland	0.93	8.60	5.78	49
Palustrine forested wetland	0.00	0.00	0.00	0
Palustrine scrub-shrub wetland	0.03	0.21	0.21	2
<i>South Dakota Total</i>	0.96	8.8.8142	5.5.9992	5511
Nebraska				
Palustrine emergent wetland	0.70	9.01	4.25	33
Palustrine forested wetland	0.61	4.75	3.57	12
Palustrine scrub-shrub wetland	0.05	0.33	0.33	2
Nebraska Total	1.36	14.09	8.15	47

¹ Acres disturbed on a temporary basis (permanent right-of-way width plus temporary workspace) during construction and acres disturbed (maintained) on a permanent basis during operation of the Project. Wetland areas for emergent and scrub-shrub wetlands disturbed during construction are generally considered temporary with no impact remaining during operations.

Notes: HDD wetland impact avoidance not deducted. Mileage impact only includes Wetland impact with Centerline of route.

Source: See Appendix H for Montana and South Dakota and Appendix A for Nebraska.

Ancillary facility wetland impact summary data by state is listed in the FEIS, Section 3.4.3, Table 3.4.4-4, p. 3.4-8. Updated Project ancillary facility locations and their associated wetland impacts are summarized below by state in Table 3.4-2. Temporary construction impacts to herbaceous wetlands have increased by 0.4-acres in Montana, 0.3-acres in South Dakota New wetland impact determinations in Nebraska for ancillary facilities is pending.

Table 3.4-2 Ancillary Facility Wetlands Impacts by State for Project Reroutes

Wetland Classification	Length of Wetlands Crossed (miles) ¹	Wetland Area Affected during Construction (acres) ²	Wetland Area Affected by Operations (acres) ²
Montana			
Palustrine emergent wetland	0.00	0.39	0.02
Palustrine scrub-shrub wetland	N/A	0.00	0.00
<i>Montana Total</i>	0.00	0.39	0.02
South Dakota			
Palustrine emergent wetland	0.00	0.39	0.06
Palustrine forested wetland	N/A	0.00	0.00
Palustrine scrub-shrub wetland	N/A	0.00	0.00
<i>South Dakota Total</i>	0.00	0.39	0.06
Nebraska			
Palustrine emergent wetland	TBD	TBD	TBD
Palustrine forested wetland	TBD	TBD	TBD
Palustrine scrub-shrub wetland	TBD	TBD	TBD
<i>Nebraska Total</i>	TBD	TBD	TBD

¹ Length of wetlands across ancillary facilities is included with ROW impact summary table.

² Some data are based on desktop analysis in SD and NE, and have not been verified. Access road acreage is based upon a 30-foot wide corridor centered on the existing road bed. Data does not include rail sidings.

Notes: Ancillary facilities located outside of the ROW include: access roads, pump stations, pipe yards, contractor yards, rail sidings, and construction camps.

Source: See Appendix H for MT and SD, Appendix A for NE.

3.4.3 Net change to Water Supplies and Wells

Private water wells within 100 feet of the Project reroutes have been updated in Table 3.4-3. Since issuance of the FEIS (Section 3.3.1, pp. 3.3-7 to 3.3-9), the reroutes in Montana result in three fewer wells, two new water wells in South Dakota, and six new private water wells within 100 feet of the reroutes in Nebraska.

Table 3.4-3 Private Wells within 100 Feet of the Project Reroutes		
State/County	Approximate Milepost	Distance from Centerline (ft)
Montana		
Phillips	20.3	18.4
Prairie	216.7	31.4
Fallon	224.1	5.1
Fallon	228.5	96.5
Fallon	228.9	55.9
South Dakota		
Harding	297.5	94.6
Haakon	452.6	98.3
Nebraska		
Antelope	681.0	63.7
Antelope	682.8	93.8
Antelope	687.7	97.5
Antelope	688.3	18.9
Antelope	708.6	84.8
Polk	776.5	94.0
Jefferson	857.7	50.9

Source: USGS, MT-DNR, SD-DENR

Well Head Protection Areas (WHPAs) within 1 mile of the Project reroutes are listed by state in Table 3.4-4. No WHPAs occur within 1 mile of the Project reroutes in Montana. The Project reroutes in South Dakota are within 1 mile of two WHPAs (Section 3.3.3, pp. 3.3-7 to 3.3-9), and the reroute in Nebraska are within 1-mile of nine WHPAs.

Table 3.4-4 Wellhead Protection Areas within 1-mile of Project Reroutes			
County/State	Approximate Milepost	Distance from Centerline (miles)	Direction from Centerline
Montana			
	None		
South Dakota			
Harding	320.76	0.17	W of CL
Tripp	576.62	0.55	W of CL
Tripp	579.31	0.03	SW of CL
Nebraska			
Boone	748.50	0.40	E of CL
York	796.32	0.52	W of CL
York	809.84	0.65	NE of CL
York	812.96	0.95	W of CL
Fillmore	823.90	0.60	E of CL

Table 3.4-4 Wellhead Protection Areas within 1-mile of Project Reroutes

County/State	Approximate Milepost	Distance from Centerline (miles)	Direction from Centerline
Saline	848.33	0.70	E of CL
Jefferson	862.17	0.67	W of CL
Jefferson	866.84	0.68	W of CL
Jefferson	874.72	On CL	On CL

Note: SWPA = Surface Water Protection Area, PWS = Public Water Supply

Source: MT-DEQ, SD-DENR

3.5 Terrestrial Vegetation

The vegetative resources that may occur along the proposed route are discussed in FEIS Section 3.5 (Terrestrial Vegetation) (FEIS p 3.5-1). Terrestrial vegetation was evaluated using information found in the FEIS and recent field work to identify habitat and plant communities occurring along the reroutes as it relates to the multiple land use categories crossed in Montana, South Dakota, and Nebraska. The results are shown in Table 3.5-1.

Forest Communities

In the FEIS, Section 3.9 Table 3.9.1-2 p. 3.9-2, forested lands that would be affected by the FEIS pipeline are discussed. The FEIS summarizes the number and mileage of forested lands crossed by region as opposed to a listing of each individual forested land crossed (Appendix O of the FEIS). Appendix I of this document contains a listing of each forest land tract crossed by the reroutes. The reroutes in Montana do not cross any forested land. In South Dakota, the reroutes cross a total of 0.33 miles of upland forest. In Nebraska the reroutes cross a total of 3.6 miles of upland forest and palustrine forested wetlands.

3.5.1 Net Change to Vegetation Types

Vegetative communities impacted include prairies, forest, wetlands, rangeland and croplands. These vegetative community types are not the same as the land use categories discussed in Section 3.7. Cropland and irrigated cropland primarily include crop species, which provide forage and grain for livestock and human consumption.

Impacts associated with construction and operations were discussed in the FEIS (Section 3.5, pp. 3.5-36 to 3.5-33) Table 3.5.5-1 (p. 28) details the vegetation communities crossed by state. Table 3.5-1 indicates the vegetation communities crossed by state by the Project changes. The net changes are: Montana reroutes increased Project length by 2.95 miles, resulting in construction impacts increasing by acres, and for operation an increase of 80.94 acres. For South Dakota the reroutes increased Project length by 1.3 miles, resulting in an increase of construction acres of 1,219.40 acres, and for operation an increase of 37.80 acres. In Nebraska reroutes increased the Project length by 19.64 miles, resulting in an increase in the construction acreage by 163.78 acres, and for operation an increase of 80.67 acres.

Project route acreages for NE do not include pump stations, auxiliary facilities, or permanent access roads.

Noxious Weeds

Noxious weeds are invasive plants that are non-native, undesirable native, or introduced species that are able to exclude and out-compete desirable native species, thereby decreasing overall species diversity. The term “noxious weed” is legally defined under both federal and state laws. Under the Federal Plant Protection Act of 2000 (formerly the Noxious Weed Act of 1974 [7 USC SS 2801–2814]), a noxious weed is defined as “any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.” The Federal Plant Protection Act contains a list of 137 federally restricted and regulated noxious weeds, as per CFR Title 7, Chapter III, Part 360, including 19 aquatic and wetland weeds, 62 parasitic weeds, and 56 terrestrial weeds. Each state is federally mandated to uphold the rules and regulations set forth by the Federal Plant Protection Act and to manage its lands accordingly. In total, 50 noxious weed species were identified as existing in Montana, South Dakota, and Nebraska. Of these, 46 occur in Montana, 32 occur in South Dakota, and 29 occur in Nebraska.

Weed distributions (USDA NRCS 2009) in the counties along the proposed FEIS pipeline corridor are discussed in Section 3.5.4 (p. 3.5-20) of the FEIS. Table 3.5-4 presents the noxious weeds occurring along the Project reroutes. The noxious weeds list was derived from Federal, State, and County lists and surveys where access was granted.

In FEIS Section 3.5, Table 3.5.5-4 (pp. 3.5-38) noxious weed sources occurring along the project route were identified by length of the occurrence and number of weed species identified. In Table 3.5-4 the occurrences of weeds is reported for both the FEIS route and Project reroutes as the number of times it occurs in the counties crossed, as well as mileage of weed infested areas crossed. In Montana the net change is an increase of 13.32 miles and 50 weed locations. In South Dakota the net change is an increase of 1.78 miles and 7 weed locations. In Nebraska the net change is an increase of 15 miles and 80 weed locations.

Table 3.5-1 Summary of Vegetation Communities by for the Project

	FEIS Route- Length of Community Crossed (miles)	Project Route- Length of Community Crossed (miles)	FEIS Route- Community Area Affected during Construction (acres) ^a	Project Route- Community Area Affected during Construction (acres) ^{ab}	FEIS Route- Community Area Affected during Operation (acres) ^a	Project Route- Community Area Affected during Operation (acres) ^{ab}
Montana						
Cropland	70.2	68.12	1005.00	1326.31	448.00	443.03
Developed Land	2.8	2.57	41.00	396.05	19.00	51.03
Upland Forest	0.6	1.40	8.00	22.25	4.00	8.57
Grassland/rangeland	204.4	210.86	3010.00	3689.52	1261.00	1321.71
Riverine/Open Water	3.5	2.19	48.00	28.64	21.00	13.58
Emergent Wetlands	1.2	0.44	0.00	3.98	7.00	2.64
Shrub-scrub Wetlands	0	0.06	1.00	0.38	0.00	0.38
Forested Wetlands	0	0.00	0.00	0.00	0.00	0.00
Total by State	282.7	285.65	4128.00	5467.13	1760.00	1840.94
South Dakota						
Cropland	80.9	79.31	1152.00	1661.34	510.00	508.46
Developed Land	3	2.96	48.00	171.19	20.00	25.00
Upland Forest	0.9	0.93	15.00	9.85	6.00	6.19
Grassland/rangeland	223.7	229.43	3255.00	3884.61	1389.00	1440.52
Riverine/Open Water	3.6	1.70	45.00	21.60	22.00	10.64
Emergent Wetlands	1.9	0.93	23.00	8.60	12.00	5.78
Shrub-scrub Wetlands	0	0.03	0.00	0.21	0.00	0.21
Forested Wetlands	0	0.00	0.00	0.00	0.00	0.00
Total by State	314	315.30	4538.00	5757.40	1959.00	1996.80
Nebraska^b						
Cropland	112.8	197.61	1578.00	2798.55	693.00	1198.26

Table 3.5-1 Summary of Vegetation Communities by for the Project

	FEIS Route- Length of Community Crossed (miles)	Project Route- Length of Community Crossed (miles)	FEIS Route- Community Area Affected during Construction (acres) ^a	Project Route- Community Area Affected during Construction (acres) ^{ab}	FEIS Route- Community Area Affected during Operation (acres) ^a	Project Route- Community Area Affected during Operation (acres) ^{ab}
Developed Land	3.9	4.64	60.00	90.42		28.16
Upland Forest	4.5	4.16	67.00	60.72	29.00	25.32
Grassland/rangeland	126.1	65.25	1955.00	955.96	780.00	395.20
Riverine/Open Water	1.9	1.42	22.00	15.04	11.00	8.58
Emergent Wetlands	5.5	0.70	88.00	9.01	43.00	4.25
Shrub-scrub Wetlands	0	0.05	0.00	0.33	0.00	0.33
Forested Wetlands	0.1	0.61	1.00	4.75	1.00	3.57
Total by State	254.8	274.44	3771.00	3934.78	1583.00	1663.67
Total	851.5	875.38	12437.00	15159.310	5302.000	5501.41

^a Includes acres disturbed on a temporary basis (permanent ROW width plus temporary workspace) during construction, and acres disturbed (maintained) on a permanent basis during operation of the proposed Project. ^b Nebraska Project Route acreage does not include disturbance associated with access roads, pump stations, auxiliary facility, operational acreage for pump stations, and permanent access roads.

*Keystone Vegetation Communities by State for the Proposed Project based on field survey and vegetative 2012

3.5.2 Net change to biological unique landscapes or ecoregions

Impacts on unique landscapes/ecoregions are shown in Table 3.5-2 for Project changes. There is a net increase in the amount of grasslands and sagebrush habitat crossed in Montana, grasslands and sagebrush grasslands in South Dakota, and grasslands and forests in Nebraska. Since there was an overall decrease in the amount of wetlands impacted, the increase in upland communities crossed is not surprising.

Table 3.5-2 Federal, State, and County Noxious Weeds Occurring along the Project Inclusive of Reroutes*

Table 3.5-2 Federal, State, and County Noxious Weeds Occurring along the Project Inclusive of Reroutes*						
Number of Counties weed species found within			Pipeline Length		Number of locations where species found	
FEIS Route	Project Reroutes	Weed Species	FEIS Route	Project Reroutes	FEIS Route	Project Reroutes
Keystone XL Pipeline						
Montana						
Three	Four	Field bindweed	0.98	12.43	5	48
One	One	Common Burdock	0.01	0.02	1	1
Two	One	Perennial Sowthistle	0.04	0.03	2	1
One	Zero	Gypsyflower	0.88	0	3	0
One	One	Meadow hawkweed	<0.01	0.01	1	1
Two	Two	Spotted knapweed	0.62	0.03	15	2
Two	Three	Leafy Spurge	1.31	3.42	13	21
Two	Zero	Plumeless Thistles	0.13	0	3	0
Zero	One	Houndstongue	0	1.23	0	12
One	Five	Canada thistle	0.79	0.91	8	15
Montana total			4.76	18.08	51	101
South Dakota						
Two	Two	Field bindweed	0.1	0.1	2	2

Table 3.5-2 Federal, State, and County Noxious Weeds Occurring along the Project Inclusive of Reroutes*

Number of Counties weed species found within		Weed Species	Pipeline Length		Number of locations where species found	
FEIS Route	Project Reroutes		FEIS Route	Project Reroutes	FEIS Route	Project Reroutes
One	One	Common Burdock	0.03	0.05	1	1
Four	Five	Canada thistle	1.25	0.99	11	12
Zero	Two	Leafy Spurge	0	0.02	0	2
Zero	One	Musk thistle	0	2	0	4
South Dakota total			1.38	3.16	14	21
Nebraska						
One	Four	Leafy Spurge	0.56	0.93	11	13
Three	Zero	Plumeless Thistles	3.09	0	21	0
One	Zero	Tamarisk – Saltcedar	0.05	0	1	0
One	One	Canada thistle	0.05	0.05	1	1
Zero	Four	Musk thistle	0	1.96	0	30
Zero	One	Spotted knapweed	0	0.68	0	13
Nebraska total			3.75	3.62	34	57
Total For Noxious Weeds			9.89	24.86	99	179

*Survey data incomplete due to recent reroutes

3.5.3 Vegetative Communities of Conservation Concern

Vegetative communities of concern are identified in the FEIS Section 3.5.2.1, p. 3.5-17. Field verification of these communities and the breakdown of the identified communities are shown in Table 3.5-1 for the reroutes in each state.

Evaluation was conducted by trained environmental scientists to verify historical ranges and habitat requirements along the route. Habitat analyses and field surveys were conducted for these species from 2008 through 2012 as discussed in the Biological Assessment (BA) in Appendix J.

The species identified as potentially occurring along the reroutes are Blowout Penstemon, Small White Lady's Slipper, Western Prairie Fringed Orchid, Bractless Blazing star, Narrow leaf Penstemon, Persistent Sepal Yellow-Cress, and Prairie Phlox.

Because the preferred route evaluated no longer crosses the Sandhills or similar habitat, the Blowout Penstemon will no longer be impacted.

Additional surveys for areas where access was denied or were not completed during the proper survey window will be completed in early 2013. Results of surveys to date are presented in Table 3.5-4 and Appendix J.

Table 3.5-4 Special-Status Vegetative Species Surveys Status

Common Name	Scientific Name	Federal Status	State Status	Surveys
Plants				
Blowout penstemon	<i>Penstemonhaydenii</i>	Endangered	Endangered (NE)	Surveys were completed along the original route for blowout penstemon in 2009 and 2011, none were found. Suitable habitat was not identified through aerial photo interpretation or on-the-ground botanical surveys along portions of the route in Nebraska route in 2012. Because no suitable habitat is found, no further blowout penstemon surveys are proposed.
Small white lady's slipper	<i>Cypripedium candidum</i>	None	Threatened (NE)	Surveys were completed along the original route for small white lady's slipper in June 2009 and 2011, none were found. Suitable habitat was identified through aerial photo interpretation and on-the-ground botanical surveys along the current Nebraska route. Surveys for the species were completed at the end of May through early June, 2012. No plants were located although access was denied to some tracts with potentially suitable habitat.
Western prairie fringed orchid	<i>Platantherapraeclarae</i>	Threatened	Threatened (NE)	Surveys were completed along the original route for western prairie fringed orchid in June 2009 and 2011, one plant was located in 2009 and two plants were located at the same site in 2011. This area is many miles west of the current route. Suitable habitat was identified through aerial photo interpretation and on-the-ground botanical surveys along the current Nebraska route. Surveys for the species were completed at the end of May through early June, 2012. No plants were located although access was denied to some tracts with potentially suitable habitat.
Bractless blazingstar	<i>Mentzelianuda</i>	BLM Sensitive	None	Surveys for Bractless blazing star were completed on BLM land in 2008 and 2009, no plants or populations were located.

Table 3.5-4 Special-Status Vegetative Species Surveys Status

Common Name	Scientific Name	Federal Status	State Status	Surveys
Narrowleafpenstemon	<i>Penstemonangustifolius</i>	BLM Sensitive	None	Surveys for Narrow leaf penstemon were completed on BLM land in 2008 and 2009, no plants or populations were located.
Persistent-sepal yellow-cress	<i>Rorippacalcina</i>	BLM Sensitive	None	Surveys for Persistent-sepal yellow-cress were completed on BLM land in 2008 and 2009, no plants or populations were located.
Prairie phlox	<i>Phlox andicola</i>	BLM Sensitive	None	Surveys for Prairie phlox were completed on BLM land in 2008 and 2009, no plants or populations were located.

3.6 Wildlife and Fisheries

The Project crosses three states with a diversity of wildlife, including big game animals, small game animals and furbearers, waterfowl and game birds, and many other nongame animals. Wildlife habitats along the Project ROW include croplands, grasslands/rangelands (short-grass prairie, mixed-grass prairie, tall-grass prairie, and shrublands), upland forests and wetlands. These vegetation communities provide foraging, cover, and breeding habitats for wildlife. Surveys have been conducted for the Project in relation to special status species that have the possibility of occurring along the Project for Montana, South Dakota, and Nebraska (See FEIS Sections 3.6 and 3.7 for a full description of the species and habitats found in each state)

Numerous surveys for federally- and state-protected species have been conducted along the Project route since 2008, including the summer of 2012 (see Appendix J). Suitable habitat for protected species was determined from a review of aerial photography, existing agency habitat mapping or species range mapping, and on-the-ground pedestrian surveys. Species surveys were completed along the reroutes during appropriate flowering or breeding/nesting seasonal time periods. A summary of federally- and state-protected species, their suitable habitat, and survey results is presented in Tables 3.5-3 and 3.6-1. Further discussion and evaluations of species of concern can be found in the Biological Assessment (BA) attached in Appendix J

Table 3.6-1 Special-Status Wildlife Species Surveys Status

Common Name	Scientific Name	Federal Status	State Status	Surveys
Mammals				
Black-footed ferret	<i>Mustelanigripes</i>	Endangered	Threatened (NE, SD)	Aerial and pedestrian surveys were completed in 2008, 2009, 2010, 2011, and 2012 to identify black-tailed prairie dog colonies along the Project. Only Montana requires black-footed ferret surveys if prairie dog colonies of at least 80 acres occur along the Project. Although there are several prairie dog colonies along the Project in South Dakota, there are none along the Project in Montana. The previous colony that was identified near MP 65.6 in Valley County, Montana is comprised of Richardson's ground squirrels and is much less than 80 acres in extent.
River Otter	<i>Lutracanadensis</i>	None	Threatened (NE, SD)	Surveys for river otter were completed in 2012 at the crossings of the Niobrara, Elkhorn, Loup, and Platte rivers. Suitable habitat for this species was located but no river otters were observed.
Swift Fox	<i>Vulpesvelox</i>	BLM Sensitive	Endangered (NE) Threatened (SD)	Surveys for swift fox were completed in 2009 to identify potential habitat and den sites in Montana and South Dakota. Forty potential den sites were reported. Subsequent surveys were completed in 2010 at these 40 sites; neither swift fox nor swift fox sign were observed at any of these locations. Surveys for swift fox will be completed in suitable habitat in Montana in 2013 prior to construction per the MFSA Certificate and FEIS.

Table 3.6-1 Special-Status Wildlife Species Surveys Status

Common Name	Scientific Name	Federal Status	State Status	Surveys
Birds				
Burrowing owl	<i>Athenecunicularia</i>	BLM Sensitive	None	Ground surveys for burrowing owl were completed at prairie dog colonies along the Project in 2012. Four burrowing owl burrows were located in Montana and South Dakota. Surveys for nesting burrowing owls will be completed in suitable habitat in Montana if construction occurs between April 15 and August 1 per the MFSA Certificate and FEIS.
Greater Sage Grouse	<i>Centrocercus urophasianus</i>	BLM Sensitive	None	Aerial surveys for greater sage-grouse were completed in 2009, 2010, 2011, and 2012 within suitable habitat in Montana and South Dakota. The 2012 work included surveys of 50 known or potential lek sites in Montana and South Dakota as well as a survey of suitable habitat within a four mile radius of the Project. Displaying male sage grouse were observed at 21 of these 50 sites. Three new leks were located in South Dakota. Aerial surveys for greater sage-grouse will be completed in 2013 prior to construction per the MFSA Certificate and FEIS.
Interior least tern	<i>Sternula antillarum</i>	Endangered	Threatened (NE)	Keystone completed surveys for interior least tern at the original crossings of the Niobrara, Loup, and Platte rivers in 2008 and 2011, at the Yellowstone and Cheyenne river crossings in 2008 and 2011, and at the Missouri River crossing in 2011. One bird was observed at the Niobrara River crossing in 2011. Surveys for the species were completed in 2012 at the current crossings of the Elkhorn, Loup, and Platte

Table 3.6-1 Special-Status Wildlife Species Surveys Status

Common Name	Scientific Name	Federal Status	State Status	Surveys
				<p>rivers. Surveys were also completed at the previous Niobrara River crossing. Several interior least tern were observed over multiple days at the Niobrara River crossing. Two interior least tern were observed over multiple days at the Loup River crossing. No birds were observed at the Elkhorn or Platte river crossings although suitable habitat was present. All of these rivers will be crossed using HDD. If construction activity is within 0.25 miles of the river banks during the breeding season, surveys for interior least tern will be completed at each of these rivers per the FEIS.</p>
Piping plover	<i>Charadriusmelodus</i>	Threatened	Threatened (NE)	<p>Surveys for piping plover were completed at the Cheyenne, Niobrara, Loup, and Platte river crossings in 2008. Subsequent surveys were completed at these river crossings in 2011. One piping plover was observed at the Niobrara River crossing in 2008. Surveys for piping plover were completed at the Niobrara, Loup, and Platte river crossings in 2012. Suitable habitat was present but no birds were observed.</p> <p>All of these rivers will be crossed using HDD. If construction activity is within 0.25 miles of the river banks during the breeding season, surveys for piping plover will be completed at each of these rivers per the FEIS.</p>

Table 3.6-1 Special-Status Wildlife Species Surveys Status

Common Name	Scientific Name	Federal Status	State Status	Surveys
Mountain plover	<i>Charadrius montanus</i>	BLM Sensitive	Threatened (NE)	Surveys for mountain plover were completed in suitable habitat in northern Montana and south-eastern Montana in 2011, no birds were observed. Pre-construction nest surveys are required for mountain plover in 2013 using the USFWS methodology per the MFSA Certificate in Montana and FEIS.
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	None	None	Surveys for sharp-tailed grouse are required per the MFSA Certificate and the SDPUC conditions. Aerial surveys for sharp-tailed grouse were completed in 2012, 15 leks were located in Montana and 13 leks were located in South Dakota. Aerial lek surveys will be repeated in 2013 prior to construction per the MFSA Certificate in Montana and FEIS.
Raptors, including Bald and Golden eagle	Various	Various	Various	Aerial surveys for active and inactive raptor nests have been completed within a one mile radius of the Project in 2010, 2011, and 2012. Raptor surveys will be completed in 2013 prior to construction per the FEIS and MFSA Certificate.
Sprague's pipit	<i>Anthus spragueii</i>	Candidate	None	Surveys for Sprague's pipit will be completed in suitable habitat in Montana if construction will occur between April 15 and July 15 per the MFSA certificate and FEIS.

Table 3.6-1 Special-Status Wildlife Species Surveys Status

Common Name	Scientific Name	Federal Status	State Status	Surveys
Whooping crane	<i>Grusamericana</i>	Endangered	Endangered (NE)	Due to the migratory, transient use of the Project area by whooping cranes no formal surveys have been completed or are proposed. The FEIS requires that Environmental Monitors survey wetlands and rivers that may be used by whooping cranes each morning prior to the start of work. If birds are present construction will temporarily cease and the USFWS will be contacted. Additional details of this monitoring effort are described in the FEIS.
Invertebrates				
American burying beetle	<i>Nicrophorusamericanus</i>	Endangered	Endangered	<p>Will affect not likely to jeopardize continued existence of species</p> <p>Areas of pasture and hay meadow with mesic soils and relatively low human disturbance from agriculture and development.</p> <p>Surveys have been conducted between 2008 and present to identify the range occupied by American burying beetle. Approximately 50 miles in northern area of the 2012 Nebraska route contain habitat occupied by American burying beetle. Conservation measures will be developed in association with USFWS and the NGPC.</p>
Fish				
Blacknose	<i>Notropisheterolepis</i>	None	Endangered (NE, SD)	Surveys were completed along the original route in 2009 for blacknose shiner, no fish were located and

Table 3.6-1 Special-Status Wildlife Species Surveys Status

Common Name	Scientific Name	Federal Status	State Status	Surveys
shiner				suitable habitat was not present. Surveys are planned in 2012 along tributaries to the Niobrara and Elkhorn River pending receipt of a scientific sampling permit from the NGPC.
Finescale dace	<i>Phoxinusneogaeus</i>	None	Endangered (SD) Threatened (NE)	Surveys were completed along the original route in 2009 for finescale dace, no fish were located and suitable habitat was not present. Surveys are planned in 2012 along tributaries to the Niobrara or Elkhorn River pending receipt of a scientific sampling permit from the NGPC.
Northern redbelly dace	<i>Phoxinuseos</i>	None	Threatened (NE, SD)	Surveys were completed along the original route in 2009 for northern redbelly dace, no fish were located and suitable habitat was not present. Surveys are planned in 2012 along tributaries to the Niobrara or Elkhorn River pending receipt of a scientific sampling permit from the NGPC.
Reptiles				
Massassauga	<i>Sistruruscatenatus</i>	None	Threatened (NE)	No surveys for massassauga have been completed on the Project within Nebraska. Per the FEIS, pre-construction surveys will be completed in areas of suitable habitat in Jefferson County. The NGPC will be consulted if the species is encountered.

3.6.1 Update to Wildlife, Big Game, Small Game, Non Game Species

No changes have been identified for wildlife (section 3.6, p. 3.6-1), big game (Section 3.6.1.1, p. 3.6-1), small game (Section 3.6.1.2, p. 3.6-1), and non-game species (Section 3.6.1.4, p. 3.6-12) along the reroutes from the FEIS.

3.6.2 Update to Aquatic Resources

Fisheries information presented in Tables 3.7.1-1 and 3.7.1-2 of the FEIS remains accurate for the Project, including reroutes. The discussion of fisheries resources, including commercially and recreationally important species in Section 3.7.2.1 through 3.7.2.2 is still accurate for the Project, including reroutes. Listed fish species are addressed in Table 3.6-1 above.

For the reroute portion of the preferred alternative route in Nebraska, 14 Class A warm water fisheries, 8 Class B warm water fisheries, and 9 Class B cold water fisheries will be crossed. Common game fish include catfish, sturgeon, and carp. In addition, forage fish species important to special status species (e.g. interior least tern) are found in the Platte, Niobrara, and Loup Rivers.

3.7 Land Use

3.7.1 Update to Land Ownership and Use

The updated Project length is 875.4 miles (Table 3.7-1) The FEIS, Section 2.1 (2-2) reports the pipeline length of 853.8 miles for a net change of 21.6 miles since the FEIS. Table 3.7-2 presents updated land ownership potentially impacted by the Project in acres. Approximately 780 acres of federally-owned land and 945 acres of state-owned land would potentially be impacted by construction and/or operation of the Project, a net increase of 125 acres and 144.5 acres, respectively. Federal lands crossed increased 2.5 miles, all of which is in Montana. No federal lands are crossed or impacted in South Dakota and Nebraska. Across all states, State lands crossed increased by 9.4 miles, and private lands crossed increased by 7.69 miles.

Table 3.7-1 Land Ownership Crossed by the Project (Miles)			
State	Percent of Total Length	Miles Crossed ¹	Ownership Type
Montana	16.2%	46.29	Federal
	72.7%	207.59	Private
	10.7%	30.64	State*
	0.18%	0.52	Local
	0.2%	0.61	Waterbody**
South Dakota	90.0%	286.44	Private
	8.35%	26.3	State*
	0.6%	1.81	Local
	0.2%	0.51	Waterbody**
Nebraska	98.2%	269.76	Private
	1.5%	4.12	State*
	0.02%	0.05	Local
	0.3%	0.75	Waterbody**

* Includes Highway ROW

** Waterbody not located on a parcel under federal, state, or local ownership

¹ Provides the linear mileage crossed by the proposed route of the Project, categorized by surface ownership.

Table 3.7-2 Land Ownership Affected by Construction and/or Operation of the Project (Acres)							
State	Federal*	State*	Local	Private	Waterbody**	Total	% of Total
Montana	779.79	488.65	89.61	4,104.31	3.69	5,466.05	35.93
South Dakota	0.00	398.09	47.28	5,307.09	3.09	5,755.54	37.83
North Dakota	0.00	1.97	0.00	54.08	0.00	56.05	0.37*
Nebraska	0.00	56.23	0.65	3,875.26	4.53	3,936.67	25.87
Totals	779.79	944.94	137.54	13,340.74	11.31	15,214.31	100.00

* Includes Highway ROW

** Waterbody not located on a parcel under federal, state, or local ownership

Table 3.7-3 presents updated land uses crossed and acreages potentially impacted by the Project during construction and operation. Compared to Table 3.9.1-6 of the FEIS, there is a net increase of 1,207.5 acres of impact to agricultural land and a decrease of 698.8 acres of rangeland during construction.

Table 3.7-3 Summary of Estimated Impacts to Land Use for the Project			
	Land Use Crossed (miles)	Potential Construction Impacts (Acres)	Potential Operations Impacts (Acres)
Montana			
Agriculture/Cropland	68.12	1,326.31	443.03
Developed	2.57	396.10	51.03
Forest Land	1.40	22.25	8.57
Rangeland/Grassland	210.86	3,689.52	1,321.71
Water	2.19	28.64	13.58
PEM	0.44	3.98	2.64
PSS	0.06	0.38	0.38
South Dakota			
Agriculture/Cropland	79.31	1,661.34	508.46
Developed	2.96	171.19	25.00
Forest Land	0.93	9.85	6.19
Rangeland/Grassland	229.43	3,884.61	1,440.52
Water	1.70	21.60	10.64
PEM	0.93	8.60	5.78
PSS	0.03	0.21	0.21
Wetland - PFO	0.00	0.00	0.000
Nebraska			
Agriculture/Cropland	197.61	5,757.4	1,198.263

Table 3.7-3 Summary of Estimated Impacts to Land Use for the Project			
	Land Use Crossed (miles)	Potential Construction Impacts (Acres)	Potential Operations Impacts (Acres)
Developed	4.64	62.49	28.162
Forest Land	4.16	57.30	25.320
Rangeland/Grassland	65.25	931.45	395.203
Water	1.42	14.80	8.575
PEM	0.70	8.98	4.251
PFO	0.61	4.75	3.573
PSS	0.05	0.33	0.329
Total	875.38	12,781.04	5,298.244

3.7.2 Update to Developed Land, Commercial Properties, and Residential Properties

Construction of the Project would potentially affect a total of 141.8 acres of developed land (Table 3.7-3). Table 3.7-4 presents the updated numbers of structures, both residential and non-residential, within 25 and 500 feet of the construction ROW for the Project, including the reroutes. No residential structures and one non-residential structure lie within 25 feet of the construction ROW. The FEIS route (see Table 3.9.1-11) had 41 structures (not distinguished as residential or non-residential) within 25 feet. Thirty-four residences and 459 non-residential structures lie within 500 feet of the construction ROW for the Project, including reroutes. The FEIS route had 363 structures within 500 feet of the construction ROW.

Table 3.7-4 Number of Structures within 25 and 500 Feet of Construction ROW		
State	Within 25 ft	Within 500 ft
Montana		
Residence	0	6
Non-Residence	0	54
South Dakota		

Table 3.7-4 Number of Structures within 25 and 500 Feet of Construction ROW		
State	Within 25 ft	Within 500 ft
Residence	0	1
Non-Residence	1	87
Nebraska		
Residence	0	27
Non-Residence	0	318

NOTE: Non-Residence = outbuildings, commercial structures, windmills

3.7.3 Update to Grassland, Rangeland, and Agriculture

As shown in Table 3.7-3, approximately 12,463 acres of grassland, rangeland, and agricultural land will potentially be affected by the construction of the Project. This acreage comprises approximately 97.5 percent of the total potential construction acreage (12,781 acres). This represents a net increase of 508 acres of construction impact to these agricultural land uses as compared to the FEIS route. Table 3.7-5 presents the acreages of prime farmland (defined in FEIS Section 3.9.1.2, p. 3.9-8) potentially affected by the construction and operation of the Project. This represents a net increase of 2,216 acres of prime farmland soils impacted during construction as compared to the FEIS route.

Table 3.7-5 Prime Farmland Potentially Affected by the Project		
State	Type	Prime Farmland (Acres)
Montana	Construction	1,359.84
	Operation	419.30
South Dakota	Construction	2,182.12
	Operation	700.59
Nebraska	Construction	2,531.93
	Operation	1,067.32

3.7.4 Update to Wetlands and Waterbodies

As presented in Table 3.7-3 and as discussed in Section 3.4, the Project potentially crosses 8.13 miles of wetlands and waterbodies for a total potential construction impact of 89.8 acres. This is a net decrease of approximately 9.5 miles, resulting in a net decrease of 153.2 acres of wetland impacts during construction as compared to the FEIS route. Wetland and waterbody crossings comprise approximately 0.93 percent of the Project mileage and approximately 0.70 percent of the potential construction acreage impacts. Potential operational impacts to wetlands and waterbodies include approximately 49.71 acres or 0.94 percent of the total potential operations impacts. This represents a net decrease of 66.3 acres of wetland impacts during operations compared to the FEIS route.

3.7.5 Update to Recreation and Special Interest Areas

Areas that fall into the category of recreation and special interest areas include state and national parks and forests, wildlife management areas, wildlife refuges, camping grounds, RV parks, hiking and equestrian trails, and golf courses. Recreation and special interest areas crossed by the proposed pipeline are contained in the FEIS in Section 3.9.2, pp. 3.9-19 to 3.9-21.

Since the publication of the FEIS, there have been numerous reroutes in all three states which have changed some of the recreational areas crossed. Table 3.7-6 contains updated information for the reroutes for the Project. The Project reroutes results in 2.9 miles of CRP land, no change to the mileage of the Cromwell Ranch crossing, and 5.9 miles of special interest areas (Board of Education, School land, BLM land, and large rivers in South Dakota) crossed. Comparison with Tables 3.9.1-9 and 3.9.2-1 of the FEIS cannot be made because the FEIS does not list the features by milepost.

Table 3.7-5 USFWS, CRP, Other Easements and Recreation and Special interest Areas crossed by the Project

State	Acres	Special Interest/Recreation Area	FROM_MP	TO_MP	Miles Crossed
Montana		No Changes in FEIS Route	0.00	108.10	
Montana	2.00	CRP	108.10	108.24	0.13
Montana	1.33	CRP	108.29	108.40	0.11
Montana	4.66	State Of Montana	109.07	109.40	0.33
Montana	7.30	BLM	109.78	110.31	0.53
Montana		No Changes in FEIS Route	110.31	331.94	
South Dakota	1.98	State Of South Dakota	331.94	332.09	0.15
South Dakota		No Changes in FEIS Route	333.75	350.84	
South Dakota	8.75	State Of South Dakota	350.84	351.43	0.59
South Dakota		No Changes in FEIS Route	351.77	354.62	
South Dakota	5.59	State Of South Dakota	354.62	354.96	0.34
South Dakota		No Changes in FEIS Route	355.28	381.50	
South Dakota	0.36	Cheyenne River	429.83	429.89	0.06
South Dakota	0.31	Cheyenne River	429.97	430.02	0.05
South Dakota		No Changes in FEIS Route	442.35	485.66	
South Dakota	2.10	CRP	462.05	462.19	0.14
South Dakota	0.53	CRP	462.23	462.26	0.04
South Dakota		No Changes in FEIS Route	462.26	480.28	
South Dakota	2.94	CRP	502.02	502.24	0.22
South Dakota	1.76	CRP	502.41	502.55	0.14
South Dakota	2.98	CRP	503.15	503.34	0.19
South Dakota	0.36	CRP	503.35	503.37	0.02
South Dakota		No Changes in FEIS Route	503.67	583.68	
Nebraska	8.24	Board Of ED. Lands	654.98	655.59	0.61
Nebraska	0.70	CRP	664.78	664.84	0.05
Nebraska	0.49	CRP	665.20	665.25	0.04

Table 3.7-5 USFWS, CRP, Other Easements and Recreation and Special interest Areas crossed by the Project

State	Acres	Special Interest/Recreation Area	FROM_MP	TO_MP	Miles Crossed
Nebraska	0.70	CRP	667.96	668.00	0.05
Nebraska	16.13	Board Of ED. Lands	668.67	669.84	1.18
Nebraska	5.28	School Land	691.34	691.71	0.37
Nebraska	13.90	School Land	695.28	696.29	1.01
Nebraska	10.35	School Land	699.74	700.48	0.74
Nebraska	0.87	CRP	702.28	702.35	0.07
Nebraska	3.19	CRP	709.60	709.84	0.24
Nebraska	3.64	CRP	723.88	724.13	0.25
Nebraska	6.90	CRP	726.15	726.66	0.50
Nebraska	1.67	CRP	732.57	732.69	0.13
Nebraska	7.44	CRP	760.21	760.77	0.56
Nebraska		No Changes in FEIS Route	796.32	840.84	
Nebraska		No Changes in FEIS Route	856.43	862.89	
Nebraska	0.67	CRP	874.45	874.50	0.05
Nebraska		No Changes in FEIS Route	874.50	874.94	
TOTAL	123.14				8.87

3.8 Cultural Resources

The FEIS Sections 3.11 through 3.11.2.1 (p. 3.11-1 through 3.11-5) provides the definition of cultural resources and the regulations that require and guide cultural resource investigations. Since the FEIS was issued in August, 2011, Keystone has continued to conduct cultural resource investigations in Montana, South Dakota, and Nebraska. Table 3.8-1 presents an update to the area of potential effect for the Project. The survey corridor width was increased in Nebraska to accommodate the research and field work necessary in finding a new suitable preferred route in Nebraska for the NDEQ review process.

Table 3.8-1 Area of Potential Effect for the Project Corridor by State		
State	Counties	Corridor Area of Potential Effect
Nebraska	Keya Paha, Boyd, Holt, Antelope, Boone, Nance, Merrick, Polk, York, Fillmore, Saline, and Jefferson	500 feet (if existing pipeline is present then 500 feet from the centerline of outer most existing pipeline)

Montana Update

Within Montana, the Project would cross state lands including Dawson, Fallon, McCone, Phillips, Prairie, Roosevelt, Sheridan and Valley counties, in addition to lands managed by the Bureau of Reclamation and the USACE. Prior to the initiation of Montana fieldwork, literature searches were conducted for the Project route and route variations developed during MDEQ review and advanced engineering analysis.

Class I File Search Since Issuance of the FEIS

Since issuance of the FEIS, Keystone conducted an additional Class I file search on November 29, 2011, at the Montana State Historic Preservation Office (SHPO) using the Cultural Resources Annotated Bibliography System Report (CRABS) and the Cultural Resource Information Systems Report (CRIS) under SHPO Project Number 2010112303 to identify previously recorded cultural resources and previously completed cultural resource investigations within a 3.2 kilometer (km) wide (2 mile-wide) corridor centered on the proposed centerline, rail siding improvements, and associated access roads. This file search identified 91 sites or segments of sites within the 2 mile corridor. Of these sites, 25 were within the 2 miles of the Project centerline, 11 were within 2 miles of the proposed rail siding improvement areas, and 54 sites were within the 2-mile files search corridor related to access roads.

Twenty-five previously recorded sites were recorded within the 2-mile file search corridor related to the Project centerline. Of the 25 sites, 19 are prehistoric and six are historic. Fourteen of the prehistoric sites (24PH1751, 24PH1773, 24PH1774, 24PH1775, 24PH1777, 24PH1782, 24PH1783, 24PH1784, 24PH1785, 24PH1786, 24PH1787, 24PH1788, 24PH1789, and 24PH1799) consist of stone features, stone circles, cairns, stone alignments, or combinations all these features. One site, 24MC0411, is a traditional cultural property (TCP). Three sites

(24PH1776, 24PH1807, and 24VL1572) have both stone features and lithic scatters. The remaining prehistoric site is a lithic scatter (24MC0274). The historic sites include a canal (24PH1194), three historic homesteads (24PH1805, 24VL1573, and 24VL1829), a town site (24MC0219), and a bridge (24VL1833). Three historic sites (24MC0219, 24VL1194, and 24VL1833) are eligible for nomination to the NRHP. One prehistoric site (24MC0274) and one historic site (24VL1573) are recommended not eligible for NRHP nomination. The eligibility of the other 20 sites within the 2-mile file search corridor is undetermined. Nine of the sites, eight prehistoric and one historic, are located within the current centerline survey corridor. These sites include stone feature, stone circle, and rock cairn sites, and an historic canal.

In total, 11 historic sites were previously recorded within the 2-mile file search corridor related to the two rail sidings. The historic sites include grain elevators, railroads, and commercial and energy developments. The eligibility of eight of the sites within the 2-mile file search corridor is undetermined (24RV0698, 24SH0766, 24SH0768, 24SH0769, 24SH0770, 24SH0771, 24SH0772, 24SH0773) and three have been recommended as eligible (24RV0132, 24SH0775, and 24SH1222). Six sites are located within the survey corridor and include historic commercial development sites, railroads, and grain elevators.

Fifty-four sites were previously recorded within the 2-mile file search corridor related to proposed access roads. Forty-one of the sites are prehistoric including 28 sites consisting of stone circles or a combination of stone circles, cairns, or rock alignments. Ten prehistoric sites have a combination of stone features and lithic scatters, and two are lithic scatters. The remaining prehistoric site is a TCP. Eleven of the sites are historic and include an irrigation system, a railroad, a town-site, a trading post, six homesteads, and one historic rock cairn, rock alignment, ditch, and dam site. Two sites are multi-component and consist of a prehistoric lithic scatter and an historic rock cairn and a prehistoric stone circle and an historic rock cairn, respectively. Three historic sites (24DW0289, 24DW0419, and 24MC0219) are eligible for nomination to the NRHP and two prehistoric sites (24MC0274 and 24VL1614) are recommended not eligible for NRHP. The eligibility for the remaining 49 sites is undetermined. Three sites are located within the survey corridor and include a railroad site (24DW0419), a homestead (24PH1131), and a stone feature and lithic scatter site (24PH1802).

Results of Investigations in Montana since the Issuance of the FEIS

Surveys conducted since the issuance of the FEIS inventoried an additional 34 miles of pipeline centerline, 36 miles of proposed route variations, 43 miles of proposed access roads, and 1,424 acres of proposed ancillary facilities. During this fieldwork SWCA newly recorded 12 sites and four isolated finds, and revisited four previously recorded sites. Of the newly recorded sites, 9 are prehistoric and three are historic. Two previously recorded historic sites and two prehistoric sites were revisited and updated. The results of this recent survey effort, recommendations of eligibility by the Applicant, determinations of eligibility by DOS, and concurrence from SHPO are shown in Table 3.8-2. To date, a total of 330 cultural resources have been identified during the cultural resources inventories in Montana, including 206 archaeological sites, 53 historic structures, and 71 isolated finds.

A report documenting the aforementioned Class I results and Class III fieldwork in Montana conducted in 2011 for the Project titled *Class III Cultural Resources Survey for the Keystone XL Project, Dawson, Fallon, McCone, Phillips, Prairie, Roosevelt, Sheridan and Valley Counties, Montana: Addendum6: Additional Fieldwork Results* (Johnson et al. 2011) was submitted to the Department of State (DOS) for review in June 2012 and is included in Appendix K (Confidential).

As of December 2011, 2.3 miles of the Project centerline in Montana remain to be surveyed for historic properties due to a lack of owner permission to access the property. Once owner permission is obtained, the remaining areas will be surveyed and documented in future reports. The cultural resource surveys for Project route variations, gap analysis, and extra work spaces will be documented in future reports. Upon receipt, DOS will review these reports consistent with 36 CFR Part 800 and the Project's Programmatic Agreement (PA) included in Appendix S of the FEIS.

In August of 2012, Keystone conducted a cultural resource survey of the Saint Marie/Glasgow Air Force Base Pipe Yard in Valley County, Montana. Documentation of the survey, provided as a letter report, is included in Appendix K.

South Dakota Update

Within South Dakota, the Project would cross Butte, Haakon, Harding, Hughes, Jones, Lyman, Meade, Gregory, Perkins, and Tripp counties. Prior to the initiation of South Dakota fieldwork, literature searches were conducted for the Project route and for the Niemi route variation developed during landowner negotiations.

Table 3.8-2 Archaeological Sites and Historic Structures Identified in Montana within the Project APE Since the Issuance of the FEIS

Site#	Description	NRHP Eligibility Recommendation from Applicant	NRHP Determination by DOS	Action Recommended by Applicant	Montana SHPO/ THPO Concurrence with DOS Findings
24DW0555	Historic berm	Not Eligible	Pending	No Further Work	Pending
C277DA002	Precontact isolate	Not Eligible	Pending	No Further Work	Pending
24MC0485	Prehistoric open camp	Eligible	Pending	Avoided/ Fence and Monitor	Pending
24MC0486	Prehistoric open camp	Eligible	Pending	Avoided/ Fence and Monitor	Pending
C277MC001	Precontact isolate	Not Eligible	Not Eligible	No Further Work	Pending
24PH1785	Previously recorded precontact stone cairn	Potentially Eligible	Pending	Avoided	Pending
24PH1787	Previously recorded precontact stone cairn	Potentially Eligible	Pending	Avoided	Pending
24PH4367	Precontact stone feature	Potentially Eligible	Pending	Avoided	Pending
24PH4368	Precontact stone cairn	Potentially Eligible	Pending	Avoided	Pending
24PH4369	Precontact stone circle, artifact scatter	Potentially Eligible	Pending	Avoided	Pending

Table 3.8-2 Archaeological Sites and Historic Structures Identified in Montana within the Project APE Since the Issuance of the FEIS

Site#	Description	NRHP Eligibility Recommendation from Applicant	NRHP Determination by DOS	Action Recommended by Applicant	Montana SHPO/ THPO Concurrence with DOS Findings
24PH4370	Precontact stone cairn	Potentially Eligible	Pending	Avoided/ Fence and Monitor	Pending
24PH4371	Precontact stone cairn	Potentially Eligible	Pending	Avoided	Pending
24PH4372	Precontact stone cairns	Potentially Eligible	Pending	Avoidance	Pending
24PH4373	Precontact stone cairn	Potentially Eligible	Pending	Avoided/ Fence and Monitor	Pending
24PH4374	Historic irrigation ditch	Not Eligible	Pending	No Further Work	Pending
24RV0132	Previously recorded historic railroad	Eligible, contributing segment	Eligible, contributing segment	No Further Work	Pending
24SH1222	Previously recorded historic railroad	Eligible, contributing segment	Eligible, contributing segment	No Further Work	Pending
24VL1985	Historic road grade	Not Eligible	Pending	No Further Work	Pending
C512VA001	Historic isolate	Not Eligible	Pending	No Further Work	Pending
C512VA002	Historic isolate	Not Eligible	Pending	No Further Work	Pending

Class I File Search Since Issuance of the FEIS

Since the filing of the FEIS, Keystone conducted an additional Level I file search on May 26, 2011, to identify previously recorded cultural resources and previously completed cultural resource investigations within a 2 mile-wide corridor centered on the additions to the proposed pipeline centerline, access roads, and ancillary facilities. This file search identified 18 previous surveys, 21 archaeological sites, and two historic structures within the 2 mile-wide corridor. The previously recorded prehistoric archaeological sites include seven artifact and lithic scatters (39HK0102, 39HK0103, 39HN0384, 39HN0385, 39HN0388, 39HN0950, and 39LM0352), one faunal remains site (39TP005), one burial area (39HN0034), two open camp/quarry sites (39HN0386 and 39HN0387), and one isolated find (39PE0031). The historic sites identified include one artifact scatter and depression (39HU0271), two farmsteads (39MD0601 and 39TP0036), one foundation (39TP0038), one depression (39MD0309), one historic dump (39HK0104), and three historic railroad sites (39JN2007, 39HU0285, and 39HU02003). The historic structure/building sites include one bridge (HU00000629) and the Harrold School (HU00000591). Three historic sites (39HU0271, 39HU0285, and 39HU2003) and the two historic structure/building sites (HU00000629 and HU00000591) are located inside the survey corridor; the remaining sites are located outside of the survey corridor. Two prehistoric sites, three historic sites, and one historic structure (39HK0102, 39HK0104, 39HU0285, 39LM0352, 39MD0309, and HU00000269) are not eligible for nomination to the NRHP; two railroad sites (39JN2007 and 39HU02003) are eligible for NRHP nomination; and the remaining sites are unevaluated.

Results of Investigations in South Dakota Since the Issuance of the FEIS

Recent surveys conducted in 2011 inventoried an additional 31.13 miles of proposed centerline, 12.84 mile of proposed access roads, and 80.6 acres of proposed ancillary facilities to the pipeline. During this fieldwork, Keystone newly recorded five sites and eight isolated finds, as well as recording new segments of three previously recorded historic railroads and one historic road. One newly recorded site is prehistoric (39HN1175), and five are historic (HN003, 39HK0159, 39JN0064, HN003, MD00000339, and 39MD0894). The three segments of previously recorded historic railroad are all recommended as eligible. The previously recorded historic road (39HK2257) is recommended not eligible for nomination to the National Register of Historic Places (NRHP). Two of the newly recorded sites (HN003 and MD00000339) have been left unevaluated pending further historical research and avoidance is recommended for these sites. The four remaining newly recorded sites are recommended not eligible for NRHP nomination. By definition, isolated finds are considered not eligible for the NRHP. No further work is recommended for these resources. The findings of the field surveys and previously recorded cultural resources found only within the Project Area of Potential Effect (APE) are summarized in Table 3.8-3.

Table 3.8-3 Archaeological Sites and Historic Structures Identified in South Dakota within the Project APE Since the Issuance of the FEIS

Site#	Description	NRHP Eligibility Recommendation from Applicant	NRHP Determination by DOS	Action Recommended by Applicant	Montana SHPO / THPO Concurrence with DOS Findings
39HK0157	Historic isolate	Not Eligible	Pending	No further work	Pending
39HK0158	Historic isolate	Not Eligible	Pending	No further work	Pending
39HK0159	Historic well and artifact scatter	Not Eligible	Pending	No further work	Pending
39HK2257	Previously recorded historic road and artifact	Not Eligible	Pending	No further work	Pending
39HN1174	Precontact isolate	Not Eligible	Pending	No further work	Pending
39HN1175	Historic isolate	Not Eligible	Pending	No further work	Pending
HN003	Historic homestead	Unevaluated	Pending	Avoidance	Pending
39HU2003	Previously recorded railroad	Eligible	Pending	No further work	Pending
39JN0064	Historic artifact scatter	Not Eligible	Pending	No further work	Pending
39JN2007 (2 segments)	Previously recorded historic railroad	Eligible	Eligible	Avoidance by bore and fence	Concur
39LM0545	Precontact isolate	Not Eligible	Pending	No further work	Pending
39LM2007	Previously recorded historic	Eligible	Pending	No further work	Pending
MD00000339	Historic farmstead	Unevaluated	Pending	Avoidance	Pending
39MD0893	Historic isolate	Not Eligible	Pending	No further work	Pending
39MD0894	Historic trash dump	Not Eligible	Pending	No further work	Pending
39MD0895	Historic isolate	Not Eligible	Pending	No further work	Pending
39PE0475	Precontact isolate	Not Eligible	Pending	No further work	Pending

To date, 136 cultural resources have been identified during the cultural resource inventories in South Dakota, including 57 archaeological sites, 11 historic structures, and 68 isolated finds.

A report documenting the aforementioned Level I results and Level III fieldwork in South Dakota conducted in 2011 for the Project titled Level III Cultural Resources Survey for the Keystone XL Pipeline in South Dakota of the Keystone XL Project, Butte, Haakon, Harding, Hughes, Jones, Lyman, Meade, Perkins, and Tripp Counties, South Dakota: Addendum 7: Additional Fieldwork Results (Zietz et al. 2011) was submitted to the Department of State (DOS) for review in June 2012 and is included in Appendix K (Confidential).

As of December 2011, 1.8 miles of the Project centerline in South Dakota remain to be surveyed for historic properties due to a lack of owner permission to access the property. Once owner permission is obtained, the remaining areas will be surveyed and documented in future reports. The cultural resource surveys for Project route variations, gap analysis, and extra work spaces will be documented in future reports.

North Dakota Update

An existing industrial site has been identified for use by the Project as a rail siding and pipe storage location in Bowman County, North Dakota will be used for the Project. Since the issuance of the FEIS, a cultural resource survey has been conducted for that facility. The survey report, *A Class I and Class III Cultural Resources Survey of the Proposed Knife River Rail Siding Improvement for the Keystone XL Project, Bowman County, North Dakota*, is included in Appendix K.

Nebraska Update

For an update to the Nebraska cultural resource investigations, please see Section 3.9. of the Supplemental Environmental Report for the Nebraska Reroute included in Appendix A.

3.9 Social and Economic Conditions

3.9.1 Update to Socioeconomics

Section 3.10 of the FEIS (pp. 3.10-1 through 3.10-4) discusses potential socioeconomic impacts in the Project area. The Project crosses 27 counties. The current Project route affects the same counties in Montana (6 counties) and South Dakota (9 counties) as are depicted in the FEIS in Section 3.10, p. 3.10-2). Table 4.1-1 presents the 12 counties crossed by the preferred alternative route in Nebraska. Two counties, Boyd and Polk are now impacted by the Project.

Table 3.9-1 Counties Crossed by the Preferred Alternative Route in Nebraska	
County	Length (Miles)
Keya Paha	16.694
Boyd	8.446
Holt	54.707
Antelope	43.344

Table 3.9-1 Counties Crossed by the Preferred Alternative Route in Nebraska	
County	Length (Miles)
Boone	28.284
Nance	14.743
Merrick	7.923
Polk	13.862
York	28.796
Fillmore	14.651
Saline	14.851
Jefferson	28.136
12 Counties	274.437

Table 3.9-2 presents an updated list of communities within two miles of the Project. Compared to the FEIS Table 3.10.1-3, 1 community (Circle, Montana) is no longer within 2 miles in Montana, no changes are found in South Dakota, and 5 new communities in Nebraska are within 2 miles of the Project (while losing one community, Ericson).

Table 3.9-2 Communities within 2 Miles of the Project			
Community	County	State	Proximity to Project (miles)
Nashua	Valley County	Montana	1.5
Baker	Fallon County	Montana	2.3
Buffalo	Harding County	South Dakota	1.3
Midland	Haakon County	South Dakota	1.3
Draper	Jones County	South Dakota	1.9
Winner	Tripp County	South Dakota	2.5
Royal	Antelope County	Nebraska	1.8
Orchard	Antelope County	Nebraska	2.1
Oakdale	Antelope County	Nebraska	2.3
Polk	Polk County	Nebraska	2.1
McCool Junction	York County	Nebraska	1.7
Milligan	Fillmore County	Nebraska	2.4
Exeter	Fillmore County	Nebraska	1.8
Jansen	Jefferson County	Nebraska	1.9
Steele City	Jefferson County	Nebraska	1.2

3.9.2 Update to Population and Employment

FEIS Section 3.10 pp. 3.10-4 through 3.10-8, presents population information for Montana and South Dakota. FEIS Section 10, pp. 3.10-15 through 3.10-19 presents employment data for Montana and South Dakota. Table 3.9-3 provides updated 2010 population and employment data for the counties traversed by the preferred alternative route in Nebraska. The preferred alternative route traverses rural and sparsely populated counties with population densities ranging from approximately 2 to 25 people per square mile. Four counties, Boyd, Merrick, Polk, and Jefferson, exhibit unemployment rates higher than the Nebraska average.

Table 3.9-3 Socioeconomic Conditions in Affected Counties

County ^{1,2}	Population		Percent Change in Population 2000-2010	Population Density	Per Capita Personal Income (\$) 2010	Median Household Income (\$) 2010	Unemployment Rate (%) 2010
	2000	2010		(per square mile) 2010			
	2000	2010	2000-2010	2010	2010	2010	2010
Nebraska	1,711,263	1,826,341	6.7	23.8	\$25,229	\$49,342	3.6
Keya Paha	983	824	-16.2	1.1	\$20,691.00	\$32,000	0
Boyd	2,438	2,099	-1.6	3.9	\$21,003.00	\$34,906	5.6
Holt	11,551	10,435	-9.7	4.3	\$22,498.00	\$43,452	1.3
Antelope	7,452	6,685	-10.3	7.8	\$20,419.00	\$37,058	1.9
Boone	6,259	5,505	-12	8	\$22,790.00	\$40,703	1.8
Nance	4,038	3,735	-7.5	8.5	\$21,457.00	\$41,610	3.4
Merrick	8,204	7,845	-4.4	16.2	\$21,819.00	\$46,116	4.2
Polk	5,639	5,406	-4.1	12	\$23,831.00	\$48,444	4.8
York	14,598	13,665	-6.4	23.9	\$25,412.00	\$47,689	0.9
Fillmore	6,634	5,890	-11.2	10.2	\$21,990.00	\$43,167	1.4
Saline	13,843	14,200	2.6	24.7	\$20,431.00	\$45,469	3.1
Jefferson	8,333	7,547	-9.4	13.2	\$21,976.00	\$42,665	4.5

¹All data from US Census Bureau: Nebraska State and County Quick Facts. Accessed: 8/24/12

3.9.3 Update to Income

FEIS Section 3.10, pp. 3.10-15 through 3.10-19, presents income information for Montana and South Dakota. Table 3.9-3 provides income information for the counties traversed by the preferred alternative route in Nebraska. Along the preferred alternative route, only one county, York, has per capita personal income that exceeds the Nebraska state average. No Nebraska counties have median household incomes higher than the state average.

3.9.4 Update to Infrastructure

Housing availability across the Project is a function of the housing stock, recent economic population change, the inventory of short-term lodging accommodations, such as recreational vehicle (RV) parks and hotel and motel rooms, and demand for housing from other sources. Table 3.9-4 updates the base housing stock in Montana, South Dakota, and Nebraska counties crossed by the Project. Table 3.9-5 updates short-term housing information for Montana, South Dakota, and Nebraska.

Table 3.9-4 Housing Units for Counties along the Project			
Total Housing Units			
County	2010	Percent of State Total	Building Permits (2011)
Keystone XL Pipeline			
Montana			
Phillips	2,335	16	0
Valley	4,879	33.4	3
McCone	1,008	7	0
Dawson	4,233	29	2
Prairie	673	4.6	0
Fallon	1,470	10	5
<i>Subtotal Montana</i>	<i>14,598</i>		<i>10</i>
South Dakota			
Harding	731	1.1	0
Butte	4,621	7	19
Perkins	1,739	3	0
Meade	11,000	16	63
Pennington	44,949	65	349
Haakon	1,013	1.5	0
Jones	589	1	7
Lyman	1,704	2.5	3
Tripp	3,072	4.4	2
<i>Subtotal South Dakota</i>	<i>69,418</i>		<i>443</i>
Nebraska			
Keya Paha	550	1.4	0
Boyd	5,245	14	0
Holt	1,390	4	9
Antelope	3,284	9	10
Boone	2,668	7	3
Nance	1,791	5	15
Merrick	3,696	10	17

Table 3.9-4 Housing Units for Counties along the Project			
Total Housing Units			
County	2010	Percent of State Total	Building Permits (2011)
York	6,214	16.3	23
Fillmore	2,934	8	3
Saline	5,744	15	17
Jefferson	3,933	10.3	3
<i>Subtotal Nebraska</i>	<i>38,113</i>		<i>115</i>

Source - <http://quickfacts.census.gov/qfd/states/31/31095.html>

Table 3.9-5 Short-term Housing Assessment for Counties along the Project				
County	Rentals (2010)		Hotel/Motel	
	Units	Vacancy Rate (%)	Rooms (+/-)	RV Sites
Montana				
Phillips	439	4.4	100	3
Valley	771	16	332	4
McCone	155	15.2	14	5
Dawson	965	4.3	277	4
Prairie	65	29.3	26	6
Fallon	284	2.7	86	4
<i>Subtotal Montana</i>	<i>2,679</i>	<i>71.9</i>	<i>835</i>	<i>26</i>
South Dakota				
Harding	135	14	19	2
Butte	957	6.5	94	10
Perkins	419	6.7	22	6
Meade	2,662	12.5	262	10
Pennington	13,334	5	5000	10
Haakon	143	30.6	30	8
Jones	127	0	215	3
Lyman	572	6	420	10
Tripp	672	1.3	124	8
<i>Subtotal South Dakota</i>	<i>19,021</i>	<i>82.6</i>	<i>6186</i>	<i>67</i>
Nebraska				
Keya Paha	56	9.7	0	20
Holt	1033	8.8	243	11
Boyd	232	9.1	23	3

Table 3.9-5 Short-term Housing Assessment for Counties along the Project				
County	Rentals (2010)		Hotel/Motel	
	Units	Vacancy Rate (%)	Rooms (+/-)	RV Sites
Antelope	781	1.1	41	253
Boone	606	8.6	34	0
Nance	367	6.1	16	0
Merrick	841	4.7	33	0
York	1,374	8.5	535	0
Fillmore	584	3.4	26	0
Saline	1,665	11.8	77	483
Jefferson	654	9.3	209	0
<i>Subtotal Nebraska</i>	<i>8,990</i>	<i>81.3</i>	<i>1247</i>	<i>1226</i>

Source: US Census Bureau Fact Finder

3.9.5 Update to Public Services and Facilities

The FEIS Section 3.10.2.1, pp. 3.10-82 through 3.10-86 discusses public services along the Project route. Table 3.9-6 presents an update of the existing public services and facilities along the preferred alternative route in Nebraska.

Table 3.9-6 Existing Public Services and Facilities along Preferred Alternative Route

County	Police/Sheriff Departments	Fire Departments	Nearest Medical Facilities
Keya Paha	1	2	Brown County Hospital (Ainsworth)
Boyd	2	3	Niobrara Valley Hospital (Lynch)
Holt	5	2	Avera St. Anthony's Hospital (O'Neil)
Antelope	1	1	Antelope Memorial Hospital (Neligh)
Boone	4	3	Boone County Health Center (Albion)
Nance	1	2	Boone County Health Center (Albion)
Merrick	4	3	Litzenberg Memorial County Hospital (Central City)
Polk	1	2	Annie Jeffrey Memorial County Health Center (Osceola)
York	2	3	York General Hospital (York)
Fillmore	3	6	Fillmore County Hospital (Geneva)
Saline	4	5	Crete Area Medical Center (Crete); Warren Memorial Hospital (Friend)
Jefferson	3	5	Jefferson Community Health Center (Fairbury); Thayer County Health Services (Hebron)

3.9.6 Update to Financial Relationships

Table 3.9-7 presents the estimated property tax for each county traversed by the pipeline in Montana and South Dakota. These property tax estimates are based on the projected costs in each county as if valued by the Montana Department of Revenue's and the South Dakota Department of Revenue's current actual average tax rates in each county. The actual property taxes paid will be based on the final valuation determined by each state's department of revenue when the new pipeline goes into service with county tax rates based on their individual budget requirements.

Table 3.9-7 Estimated Property Taxes from Keystone XL Construction

Montana	Total County Project Costs	Percent of Total State Cost
Phillips County	\$122,485,460	10.61%
Valley County	\$249,716,873	21.48%
McCone County	\$299,276,501	25.54%
Dawson County	\$137,795,990	11.62%
Prairie County	\$108,023,437	9.29%
Fallon County	\$253,509,427	21.47%
Total	\$122,485,460	100.00%

Table 3.9-7 Estimated Property Taxes from Keystone XL Construction		
Montana	Total County Project Costs	Percent of Total State Cost
South Dakota		
Harding	\$316,816,585	0.82%
Butte	\$12,390,350	3.81%
Perkins	\$49,905,775	16.24%
Meade	\$211,552,593	0.25%
Pennington	\$2,508,036	17.83%
Haakon	\$231,355,813	12.80%
Jones	\$170,051,061	2.99%
Lyman	\$38,472,283	21.11%
Tripp	\$274,215,383	75.86%
Total	\$1,900,636,620	100%

3.9.6.1 **Update to Environmental Justice**

The FEIS Section 3.10.1.1, pp. 3.10-20 through 3.10-52, presents a definition of environmental justice and a detailed analysis of environmental justice for the Project including an explanation of the methodology used to identify and locate minority and low-income populations. The environmental justice analysis as presented in the pages referenced above remains accurate for Montana and South Dakota; however, the reroutes in Nebraska require that the analysis be redone for that state. That same methodology was used to update the environmental justice analysis for the preferred alternative route in Nebraska developed since the issuance of the FEIS. The term ‘meaningfully greater’ is defined in the FEIS

Table 3.9-8 presents minority and low-income populations as a percentage of the total county population for the 12 counties intersected by the four-mile-wide analysis area along the preferred alternative route in Nebraska. Table 3.9-9 presents minority and low-income populations as a percentage of census block group populations within the analysis area. Fifty-seven census blocks are intersected by the four-mile-wide analysis area. A census block was included in the analysis area if its boundaries are fully contained in the corridor or if any part of the census block group was contained in the area.

Table 3.9-8 Minority and Low-Income Populations as a Percentage of Total County Populations
 in Affected Counties within 4-Mile-Wide Analysis Area

State/ County	Total Population	Low-Income Populations	Minority Populations					
			African American	Native American or Alaskan Native	Asian or Pacific Islander	Two or More Races	Aggregate (Total) of Racial Minorities	Hispanic or Latino
Keya Paha	824	187 (22.7%)	0 (0.0%)	1 (0.1%)	0 (0%)	7 (0.9%)	8 (1.0%)	9 (1.2%)
Boyd	2099	174 (8.3%)	4 (0.2%)	16 (0.8%)	19 (0.9%)	10 (0.5%)	50 (2.4%)	36 (1.7%)
Holt	10435	814 (7.8%)	31 (0.3%)	52 (0.5%)	31 (0.3%)	42 (0.4%)	156 (1.5%)	323 (3.1%)
Antelope	6685	762 (11.4%)	26 (0.4%)	13 (0.2%)	33 (0.5%)	33 (0.5%)	107 (1.6%)	194 (2.9%)
Boone	5505	363 (6.6%)	22 (0.4%)	11 (0.2%)	16 (0.3%)	27 (0.5%)	77 (1.4%)	77 (1.4%)
Nance	3735	366 (9.8%)	19 (0.5%)	22 (0.6%)	4 (0.1%)	37 (1%)	82 (2.2%)	82 (2.2%)
Merrick	7845	839 (10.7%)	23 (0.3%)	39 (0.5%)	69 (0.9%)	78 (1%)	212 (2.7%)	267 (3.4%)
Polk	5406	373 (6.9%)	11 (0.2%)	16 (0.3%)	22 (0.4%)	54 (1%)	57 (1.9%)	110 (3.6%)
York	13665	96 (7%)	177 (1.3%)	68 (0.5%)	82 (0.6%)	150 (1.1%)	478 (3.5%)	560 (4.1%)
Fillmore	5890	689 (11.7%)	35 (0.6%)	35 (0.6%)	17 (0.3%)	35 (0.6%)	124 (2.1%)	200 (3.4%)
Saline	14200	1704 (12%)	184 (1.3%)	142 (1%)	298 (2.1%)	170 (1.2%)	795 (5.6%)	3025 (21.3%)
Jefferson	7547	943 (12.5%)	37 (0.5%)	37 (0.5%)	23 (0.3%)	75 (1%)	173 (2.3%)	230 (3%)
Nebraska	1,826,341	229,923 (12.6%)	85,838 (4.7%)	23,742 (1.3%)	36,527 (2%)	32,874 (1.8%)	178,434 (9.77%)	173,502 (9.5%)

All data from US Census Bureau: Nebraska State and County Quick Facts
 Accessed: 8/24/2012

Table 3.9-9 Minority and Low-Income Populations as a Percentage of Census Block Group Populations within 4-Mile-Wide Analysis Area

				Minority Populations						
County	Total Number of Census Block Groups	Total Census Block Population	Low-Income Populations	African American	Native American or Alaskan Native	Asian or Pacific Islander	Other	Two or More Races	Total of Racial Minorities	Hispanic
Keya Paha	1	824	168 (20.3%)	0 (0%)	1 (0.1%)	1 (.12%)	2 (0.2%)	3 (0.4%)	7 (.8%)	4 (0.5%)
Boyd	2	816	170 (20.8)	0 (0%)	5 (0.6%)	9 (1.10%)	7 (1%)	3 (0.4%)	24 (3%)	7 (1%)
Holt	6	4758	794 (16.7%)	5 (.11%)	8 (0.2%)	14 (0.29%)	13 (0.3%)	22 (1%)	62 (1.3%)	43 (1%)
Antelope	9	3183	458 (14.4%)	14 (0.44%)	7 (0.2%)	12 (0.38%)	17 (0.5%)	17 (1%)	67 (2%)	42 (1%)
Boone	9	2299	248 (10.8%)	12 (0.5%)	1 (0.04%)	7 (0.30%)	9 (0.4%)	5 (0.2%)	34 (1.5%)	21 (1%)
Nance	7	1328	346 (26.1%)	3 (.2%)	5 (0.4%)	0 (0%)	5 (0.4%)	7 (1%)	20 (2%)	14 (1%)
Merrick	3	1947	88 (4.5%)	1 (0.05%)	2 (0.1%)	5 (0.26%)	18 (1%)	12 (1%)	38 (2%)	49 (3%)
Polk	3	5403	375 (6.9%)	0 (0%)	13 (0.24%)	11 (0.2%)	36 (1%)	71 (1.3%)	131 (2.4%)	117 (2%)

Table 3.9-9 Minority and Low-Income Populations as a Percentage of Census Block Group Populations within 4-Mile-Wide Analysis Area

				Minority Populations						
County	Total Number of Census Block Groups	Total Census Block Population	Low-Income Populations	African American	Native American or Alaskan Native	Asian or Pacific Islander	Other	Two or More Races	Total of Racial Minorities	Hispanic
York	5	4424	644 (14.6%)	85 (2%)	28 (1%)	8 (0.18%)	122 (3%)	40 (1%)	283 (6%)	209 (5%)
Fillmore	3	2319	211 (9.1%)	1 (0.4%)	7 (0.3%)	2 (0.1%)	28 (1%)	14 (1%)	52 (2%)	72 (3%)
Saline	3	1496	112 (7.5%)	4 (0.3%)	2 (0.1%)	3 (0.2%)	22 (2%)	14 (1%)	45 (3%)	40 (3%)
Jefferson	6	3294	222 (6.7%)	10 (0.3%)	3 (0.1%)	5 (0.2%)	19 (0.6%)	22 (1%)	59 (2%)	69 (2%)

All data from US Census Bureau, Nebraska State and County Quick Facts. Accessed: 08/24/2012

Minority Populations within Counties

The percentages of minority populations by county within the analysis area are presented in Table 3.9-8. Figure 3.9-1 depicts the counties within the area of analysis which have minority populations that are meaningfully greater than the state-wide reference population.

50 Percent Criterion

The 2010 Census found no minority populations that exceed 50 percent of the total county population in any county within the analysis area in Nebraska.

Meaningfully Greater Criterion

A single county in the study area, Saline, has a minority population percentage that is meaningfully greater than the corresponding percentage for the Nebraska population. The Hispanic population of Saline County represents 21.3 percent of the county population while the Hispanic population of the state of Nebraska represents 9.5 percent of the state's population.

Minority Populations within Census Blocks

The percentages of minority populations by census block are presented in Table 3.9-9.

50 Percent Criterion

The 2010 Census showed that no minority populations in the census block groups in the area of analysis exceed 50 percent of the total census block population.

Meaningfully Greater Criterion

The 2010 Census showed that no census block group in the area of analysis has a minority population that is meaningfully greater than the corresponding Nebraska population.

Low-Income Populations within Counties

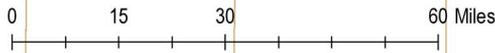
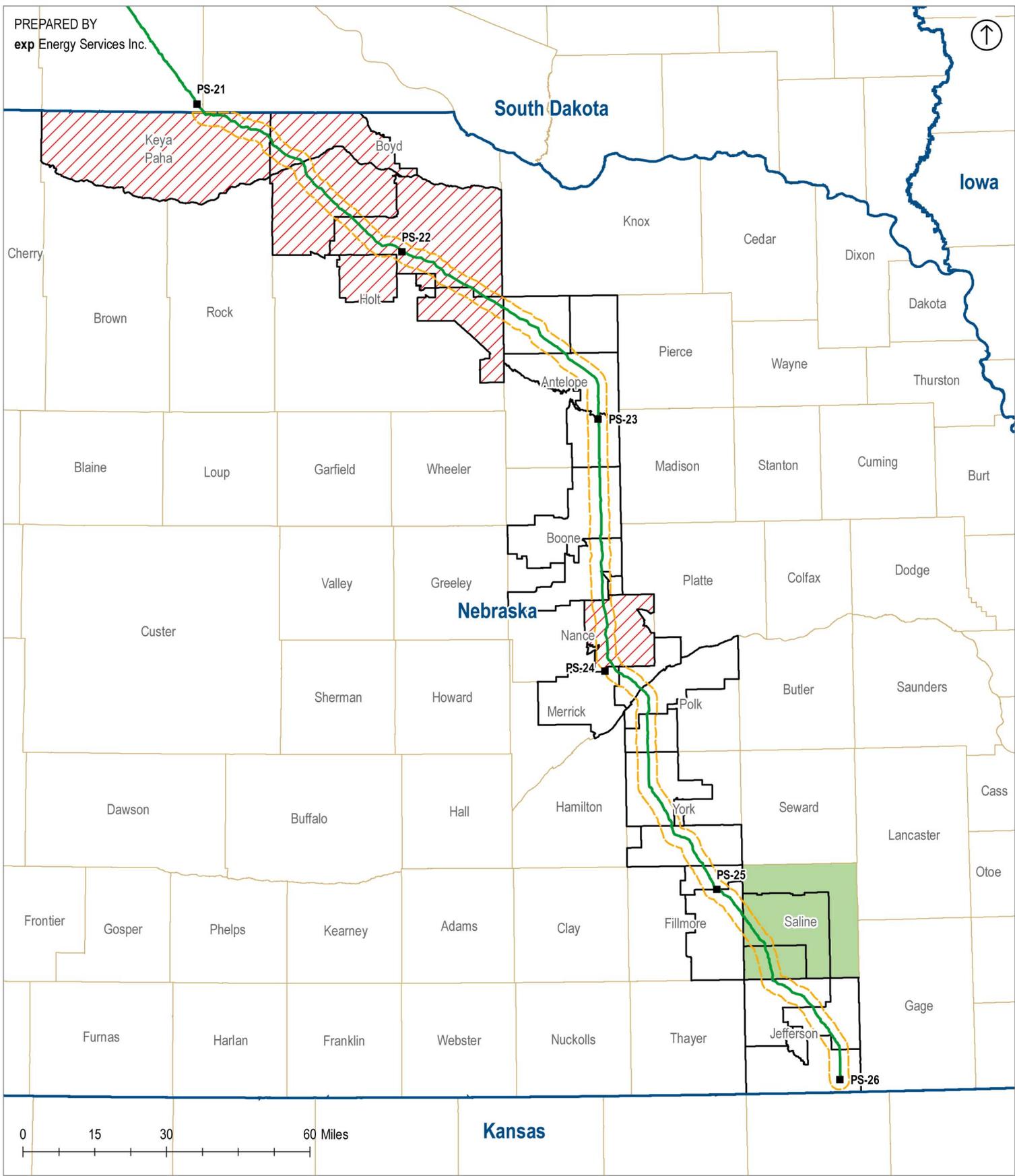
The percentages of low-income populations by county within the analysis area are presented in Table 3.9-8.

50 Percent Criterion

The 2010 Census found no low-income population in any county in the analysis area exceeds 50 percent of the total county population.

Meaningfully Greater Criterion

The 2010 Census found the low-income population in Keya Paha County is meaningfully greater than the low-income population percentage for the State of Nebraska.



LEGEND

- PROPOSED PUMP STATION
- PROPOSED KEYSTONE CENTERLINE
- COUNTY BOUNDARY
- FOUR-MILE-WIDE ANALYSIS AREA
- CENSUS BLOCK IN OR PARTIALLY IN ANALYSIS AREA
- ▨ LOW-INCOME POPULATION (MEANINGFULLY GREATER)
- ▨ MINORITY POPULATION (MEANINGFULLY GREATER)

SOURCE: CENSUS BLOCK GROUPS; 2010 U.S. CENSUS

KEYSTONE XL PROJEC

FIGURE 3.9 -1

ENVIRONMENTAL JUSTICE (NEBRASKA)

Low-Income Populations within Census Blocks

The percentages of low-income populations by census block are presented in Table 3.9-9. Figure 3.9-1 depicts all census blocks within the area of analysis that include low income populations that are meaningfully greater than the state-wide reference population.

50 Percent Criterion

The 2010 Census showed that no low-income populations in the census block groups in the analysis area exceeded 50 percent of the total census block population.

Meaningfully Greater Criterion

The 2010 Census found that the low-income populations of the census block groups within Key Paha, Boyd, Holt, and Nance counties are meaningfully greater than the low-income population percentage for the State of Nebraska.

3.10 Public Safety

The information presented in this section is also found in Section 3.13 of the FEIS. Prior to operations of the proposed Project, Keystone will prepare and submit an ERP to PHMSA for approval. The ERP is applicable during pipeline operations and maintenance activities. An ERP was previously developed by Keystone for the existing Keystone pipeline system and approved by PHMSA. The ERP for the proposed Project would have the same general approach as presented in the Keystone ERP but would have many Project-specific differences, such as the names and contact information for responders along the Project route and the Project-specific environmental and public health vulnerabilities. In addition, as required by 49 CFR §194.107, the ERP submitted to PHMSA would include "...procedures and a list of resources for responding, to the maximum extent practicable, to a worst case discharge, and to a substantive threat of such a discharge." Once the Project route is finalized, field work would commence to collect relevant information for incorporation into the Project ERP which would then be submitted to PHMSA for review and approval.

The crude oil being transported by Keystone will come from a variety of different sources and locations. The properties will range from a light crude oil, such as found in the Bakken formation, to a heavy crude oil, such as found in the Western Sedimentary Basin (WCSB). Table 3.10-1 provides the characteristics of a variety of crude oils for comparative purpose.

Moving heavy crude oil by pipeline requires producers to reduce the specific gravity of the bitumen, generally by diluting it with light, low-viscosity diluents. The most common diluents are condensate and synthetic oil. (Condensate is very light oil obtained from natural gas production, while synthetic oil is upgraded bitumen.) The resulting diluted bitumen, or "dilbit," is a blended oil that is comparable with other types of heavy crude oils, such as those already being transported and processed by other pipelines and refineries across the US, including those from Canada, California, Venezuela, Russia, and Nigeria. Keystone does not conduct the

blending; it is the shipper's responsibility to ensure the crude oil meets the pipeline specifications. The precise composition of diluted bitumen and synthetic crude oil will be determined by shippers and is considered proprietary information.

3.10.1 Operations and Maintenance

The proposed Project would be operated, maintained, monitored, and inspected in accordance with 49 CFR §194 and 195 and other applicable federal and state regulations (see FEIS Section 3.13.1). In addition to the requirements of 49 CFR 195, Keystone has agreed to incorporate 57 Special Conditions developed by PHMSA in consultation with DOS and listed in the FEIS (see Appendix U of the FEIS). The Special Conditions address proposed Project operation, inspection, and monitoring activities. The operational requirements of 49 CFR 195 and the Special Conditions related to operation of the proposed Project would be included in Keystone's operations, maintenance, and emergencies manual that is required by 49 CFR §195.402, and would also be incorporated into Keystone's existing Operations Control Center (OCC) in Calgary, Canada.

Normal Operations and Routine Maintenance

Keystone would prepare the manuals and written procedures for conducting normal operations, maintenance, inspection, and monitoring activities as required by the PHMSA regulations, and particularly as required by 49 CFR §195.402 and in the applicable PHMSA Special Conditions (see Appendix U of the FEIS). This would include development and implementation of an annual Pipeline Maintenance Program (PMP) to ensure the integrity of the pipeline. The PMP would include such activities as valve maintenance, periodic pipeline patrol, periodic inline inspections, and cathodic protection readings to ensure facilities are safe and operable.

The Keystone OCC is continuously staffed by experienced and highly trained personnel. The OCC personnel will undergo rigorous training and qualification, including but not limited to procedures for detecting leaks, simulator training, fatigue management, tabletop and field exercises, vision and hearing testing and training for responding to emergency calls into the OCC. In addition, a fully redundant backup OCC is available for use, remote from the main OCC. Primary and backup communications systems would provide real-time information from the pump stations to the OCC personnel. The control center would have multi-tiered pipeline monitoring systems that include a leak detection system capable of identifying abnormal conditions and initiating visual and audible alarms. In the event of an inadvertent valve closure, all pumps upstream would turn off automatically. All other pipeline situations would require the OCC to initiate a pipeline shutdown.

Table 3.10-1 Physicochemical Properties of Various Crude Oils

Parameter	Unit	Heavy								Light							
		Western Canadian Select ^{1,4}	Western Canadian Blend ¹	Lloyd Blend (Canada) ¹	Fosterton (Canada) ¹	Boscan (Venezuela) ²	California (API 15) ²	Hondo Monterey (California) ²	Maya (Mexico) ²	Suncor Synthetic A (Canada) ^{1,4}	Mixed Sweet Blend (Canada) ¹	Arabian Heavy (Saudi Arabia) ²	Iranian Heavy ²	Bakken Crude (North Dakota) ^{2,4}	Azeri Light (Azerbaijan) ³	Qua Iboe (Nigeria) ²	Ekofisk (Norway) ³
Density	g/ml	0.93	0.93	0.93	0.93	1	0.97	0.94	0.93	0.86	0.83	0.89	0.89	-	0.85	-	0.832
Gravity	API	20.6	20.6	20.8	20.5	10.9	13.2	18.3	20.2	33.1	39.5	27	30.0-31.0	42.1	34.8	35.8	38.42
Sulfur	wt%	3.49	3.17	3.52	3.24	4.6	5.5	4.7	-	0.19	0.44	-	1.20-1.65	-	0.15	0.12	0.22
MCR	wt%	9.61	8.59	9.57	9.66	-	-	-	-	ND	1.94	-	-	-	-	-	-
Sediment	ppmw	360	299	333	207	-	-	-	-	-	-	-	-	-	-	-	-
TAN	mgKOH/g	0.93	0.73	0.81	0.2	-	-	-	-	-	-	0.1	-	-	0.26	-	0.13
Benzene	vol%	0.16	0.1	0.2	0.02	0.012	0.036	0.093	0.075	0.05	0.29	0.36	0.083	0.28	0.1	-	0.12
Toluene	vol%	0.29	0.18	0.35	0.11	0.018	0.104	0.21	0.278	0.24	0.85	1.89	0.25	0.92	0.33	-	0.64
Ethyl Benzene	vol%	0.06	0.06	0.06	0.17	0.012	0.052	0.075	0.11	0.14	0.25	1.11	0.13	0.33	-	-	-
Xylenes	vol%	0.29	0.25	0.32	0.3	0.03	0.119	0.2323	0.374	0.51	1.1	3.46	0.51	1.4	-	-	-
Salt	ptb	49.1	74.3	56.8	13	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/L	57.4	45.5	58.5	47.8	117	111	-	45.5	ND	4.3	-	22.6	-	3	3.3	2.3
Vanadium	mg/L	137.7	98.6	130.7	109	1320	266	-	257	ND	8.3	-	81	-	0.7	0.3	2.1
Butanes	vol%	2.08	0.63	1.83	1.02	-	-	-	-	1.7	3.66	-	-	7.5	-	-	-
Pentanes	vol%	4.21	3.69	4.48	0.89	-	-	-	-	2.96	3.47	-	-	6.4	-	-	-
Hexanes	vol%	3.78	3.08	4.15	1.8	-	-	-	-	4.01	5.84	-	-	2.4	-	-	-
Heptanes	vol%	2.74	2.51	2.97	2.13	-	-	-	-	3.51	7.19	-	-	10	-	-	-
Octanes	vol%	2.13	2.16	2.12	3.05	-	-	-	-	4.47	7.24	-	-	8.9	-	-	-
Nonanes	vol%	1.52	1.85	1.48	3	-	-	-	-	3.8	5.58	-	-	3.7	-	-	-
Decanes	vol%	0.71	0.85	0.7	1.42	-	-	-	-	2.02	2.49	-	-	-	-	-	-

¹ 5-year Averages from CrudeMonitor.ca.

² Data from Environment Canada's Crude Oil Properties Database

³ Data from Statoil Crude Oil Assay

⁴ Western Canadian Select, Suncor Synthetic A and Bakken Crude Oils are representative types to be transported by the Keystone XL

ND indicates measurement below instrument threshold; MCR = Micro Carbon Residue; TAN = Total Acid Number; g/ml = grams per milliliter; API = American Petroleum Institute; wt% = weight percent; ppmw = parts per million weight; mgKOH/g = milligrams Potassium Hydroxide per gram; vol% = percent volume; ptb = pounds per thousand barrels; mg/L = milligrams per liter

The proposed Project would include a supervisory control and data acquisition (SCADA) system to constantly monitor the pipeline system. The SCADA system would be installed and operated in accordance with the requirements of 49 CFR §195 and PHMSA Project-specific special conditions 24 through 31. SCADA facilities would be located in the OCC and along the pipeline system at intermediate mainline valves, pump stations and delivery facilities. The SCADA system would allow the OCC personnel to remotely read intermediate MLV positions, pipeline temperature, pipeline pressure, flow and total volume. The OCC personnel would also be able to start and stop pump stations and open and close MLVs and IMLVs.

Pipeline ROW inspection would be accomplished via aerial and ground surveillance to provide prompt identification of possible encroachments or nearby construction activities, ROW erosion, or any other conditions that could result in damage to the pipeline. Aerial surveillance of the pipeline ROW (primary method) would be carried out at least 26 times per year at intervals not to exceed three weeks as required by 49 CFR §195.412. Landowners would be encouraged to report any pipeline integrity concerns to Keystone or to PHMSA. Intermediate MLVs and MLVs at pump stations would also be inspected as required by 49 CFR §195.420.

Permanent erosion control devices would be monitored to identify any areas requiring repair. The remainder of the ROW would be monitored to identify areas where additional erosion control measures may be necessary to prevent future degradation.

Operation and maintenance of the pipeline system would usually be accomplished by Keystone personnel. The permanent operational pipeline workforce would comprise about 20 U.S. employees strategically located along the length of the Keystone XL pipeline in the U.S.

3.10.2 Emergency Response

The August 2011 FEIS reviewed the Project and concluded that "...[a]s a result of incorporation of the current PHMSA regulations, current industry standards, and the set of 57 Project-specific Special Conditions developed by PHMSA and agreed to by Keystone, the proposed Project would have a degree of safety over any other typically constructed domestic oil pipeline system under current code and a degree of safety along the entire length of the pipeline system similar to that which is required in HCAs as defined in 49 CFR §195.450." Nonetheless, the NDEQ and other stakeholders have raised questions and concerns about ensuring that a proper response is available to minimize environmental or human resource damage in the event of a release of product from the pipeline. Keystone will establish additional procedures that will identify, communicate, and provide a proper response to potential spills. This is further described in the FEIS (Section 3.13).

Responses are predicated on a number of possible issues whose variables could include location, weather conditions, type of spill, containment options, accessibility, type of material, and the natural or human resource receptors that could possibly be affected. However, Keystone will identify emergency response resources, including personnel and equipment that will be stored in locations to allow them to respond within a maximum of six hours in high volume areas and twelve hours in all other areas as required by regulations.

Keystone will transport a wide range of crude oil types, including heavy and light crude oils. In the event of a spill, Keystone will provide emergency responders a MSDS for the specific product(s) in the batch(es) of crude oil involved in the spill. MSDS sheets are specific to the crude oil being transported, are proprietary to the individual producers, and will vary considerably. To illustrate the ends of the range of crude oils that may be transported on the pipeline, Keystone has provided in Appendix A (Appendix N of the Nebraska SER) crude oil fact sheets which reflect information similar to that provided in an MSDS, for representative light and heavy crude oils with diluent factored into these crude oils.

4.0 Environmental Consequences

4.1 Proposed Action

While the precise acres/numbers of resources updated by the changes to the Project footprint are somewhat different, as described in Chapter 3, the nature of the impacts are largely the same as described in the FEIS. Any significant changes in impact are described below.

4.1.1 Air Quality

Construction Phase

Potential construction impacts to air quality are unchanged and are discussed in the FEIS Section 3.12.1.3, pp. 3.12-16 through 3.12-19.

Operation Phase

Potential impacts to air quality during operation are unchanged since the issuance of the FEIS. A discussion of potential operations impacts to air quality can be found in Section 3.12.1.3, pp. 3.12-19 and 3.12-20 of that document. Fugitive emissions in each state will be limited to pump stations during operations and back-up generators that are required by PHMSA Special Condition 32 that will operate control equipment and motor operated IMLVs in the event electric power becomes unavailable. Back-up generators are not used to power the pumps at the pump stations, only valves and control equipment. Potential air impacts from an operational spill are discussed in FEIS Section 3.13.6.8 on pp. 3.13-100 and 3.13-101.

4.1.2 Geology, mineral resources, paleontology

Construction Phase

Potential construction phase impacts to geology, minerals, and paleontology have not changed since the issuance of the FEIS. Potential construction impacts to those resources are discussed in FEIS Section 3.1.2.2 (p. 3.1-18), Section 3.1.3.2 (pp. 3.1-21 and 3.1-22), and Section 3.1.4.2 (p. 3.1-28 and 3.1-29)

Operation Phase

Potential operations phase impacts to geology, minerals, and paleontology have not changed since the issuance of the FEIS. Potential operations impacts to those resources are discussed in the same FEIS Sections referenced above. Potential operational spill impacts to geological, mineral, or paleontological resources are discussed in FEIS Section 3.13.6.1, p. 3.13-85.

4.1.3 Soils

Potential construction phase impacts to soils remain the same as discussed in the FEIS, Section 3.2.2.1, p. 3.2-5 through p. 3.2-12. Potential construction spill impacts to soils and sediments are discussed in FEIS Section 3.13.6.2, p. 3.13-86.

Operation Phase

Potential operations phase impacts to soils remain the same as discussed in the FEIS Section 3.2.2.3, p. 3.2-12 through p. 3.2-14. Potential operational spill impacts to soils and sediments are discussed in FEIS Section 3.13.6.2, p. 3.13-86.

4.1.4 Water Resources

Construction Phase

Potential construction phase impacts to water resources remain the same as discussed in the FEIS, Section 3.3.2.1, p. 3.3-31 and p. 3.3-32 and Section 3.3.2.2, p. 3.3-32 through p. 3.3-35. Potential construction spill impacts to water resources are discussed in FEIS Section 3.13.6.3, pp. 3.13-88 through 3.13-91 and Section 3.13.6.3, pp. 3.13-86 through 3.13-91.

Operation Phase

Potential operations phase impacts to water resources remain the same as discussed in the FEIS Section 3.3.2.1, p. 3.3-32 and Section 3.3.2.2, p. 3.3-35. Potential operational spill impacts to groundwater and surface water are discussed in FEIS Section 3.13.6.3, pp. 3.13-86 through 3.13-88.

4.1.5 Vegetation

Impacts associated with construction and operation remains the same as discussed in the FEIS (Section 3.5, p. 3.5-35 to 3.5-38).

4.1.6 Wildlife, Aquatic Resources, and Sensitive Species

This analysis addresses 14 Federally-listed and Candidate species that were identified by the USFWS and state wildlife agencies as potentially occurring in the Project area are discussed and reviewed in the Biological Assessment in Appendix J. The BA summarizes these species and the preliminary impact determinations based on: 1) correspondence with the USFWS, BLM, and state wildlife agencies; 2) habitat requirements and the known distribution of these species within the Project area; and 3) habitat analyses and field surveys that were conducted for these species from 2008 through 2012. Potential impacts associated with electrical infrastructure required for the Project are based on the 2008, through 2011 biological surveys where available.

The Rural Utilities Service, an agency within the US Department of Agriculture; and Western Area Power Administration (Western), an agency of the US Department of Energy would consult with USFWS where potential impacts to federally protected species may occur under Section 7 of the ESA when final routing and construction procedures for electrical power lines have been determined. Keystone has not received any new information on the Western-funded powerline in South Dakota proposed by Basin Electric Power Cooperative.

Sage-Grouse were evaluated as species of concern with input from the Bureau of Land Management (BLM) and Montana Fish, Wildlife and Parks (MFWP) in relation to the Greater Sage-Grouse Interim Management Policies and Procedures. A monitoring and mitigation plan for sage grouse (Montana Sage-

Grouse Mitigation Plan, Appendix J) was developed with agency input in 2010 to address the concerns related to the Project and the species for possible impacts. Monitoring was conducted in 2011 and 2012 for sage grouse (2011, 2012 Sage Grouse Survey Reports – Appendix E) to evaluate presence along the corridor.

Surveys conducted prior to 2012 in 2011 showed active raptor and blue heron nests in Montana, South Dakota and Nebraska which are broken down by species in Table 3.6-1, Active raptor nests and great blue heron rookeries are reported within buffer distances prescribed in the FEIS (section 3.6, table 3.6.3-1, p. 24). A summary report for the April 2012 aerial searches for raptor nests can be found in Appendix E. Raptor surveys were conducted to identify nest locations along the route. In 2011, 8 active raptor nests were located within 0.50 miles of the reroute portion of the preferred alternative route in Nebraska. Keystone will work with USFWS and DOS to address MBTA compliance.

4.1.7 Land Use and Aesthetics

Construction Phase

Potential construction phase impacts to land use and aesthetics remain the same as discussed in the FEIS, Section 3.9.1.2, p. 3.9-5 to p. 3.9-7; Section 3.9.2.2, p. 3.9-21; Section 3.9.3.2, pp. 3.9-23 to 3.9-24. Potential construction spill impacts to land remains as discussed in FEIS Section 3.13.3, pp. 3.13-16 and 3.13-17.

Operation Phase

Potential operation phase impacts to land use and aesthetics remain the same as discussed in the FEIS Section 3.9.1.2, p. 3.9-13 to p. 3.9-16. Potential operation phase spill impacts to land remains as discussed in FEIS Section 3.13.4.1, pp. 3.13-17 and 3.13-18.

4.1.8 Cultural Resources

Construction Phase

Potential types of construction phase impacts to cultural resources remain the same as discussed in the FEIS, Section 3.11.3.1, and p. 3.11-15 through p. 3.11-45. Identification and documentation of cultural resources within and adjacent to project footprint is ongoing. The tables presented in Section 3.8 and in Appendix K provide the preliminary determinations of site eligibility (for listing in the NRHP). The tables presented in Section 3.8 and in Appendix A provide the preliminary determinations of site eligibility (for listing in the NRHP). If the DOS and the Montana, South Dakota, and Nebraska SHPOs agree with these determinations, then those sites determined to be ineligible will be traversed by the pipeline Project. If a site is determined to be eligible for listing on the NRHP, then Keystone will move the Project centerline to avoid impacts to that site or seek additional information to avoid the eligible portions of the site if a route change cannot avoid the site. Unanticipated Discovery Plans have been developed to provide guidance for treatment of any historic resources discovered during construction (FEIS 3.11.6, pp. 3.11-68 and 3.11-69). Potential construction spill impacts to cultural resources remain as discussed in FEIS Section 3.13.3, p. 3.13-16.

Operation Phase

Cultural resource studies that will result in the inventory, NRHP eligibility determination, and mitigation of cultural sites that could be impacted by construction of any facility will be completed for the Project prior to construction. Any sites identified as requiring mitigation will receive treatment prior to construction. Therefore, day-to-day operation of the pipeline should have no impact to cultural resources. Potential operational spill impacts to cultural resources are discussed in FEIS Section 3.13.6.6 on p. 3.13-98.

4.1.9 Socioeconomics

Construction Phase

Except for Nebraska, potential socioeconomic construction impacts that may result from the Project remain the same as discussed in the FEIS, Section 3.10.1.2, p. 3.10-53 through 3.10-79. The current Project affects the same counties in Montana and South Dakota as discussed in the FEIS in Section 3.10, p. 3.10-2. Nebraska county impacts along the preferred alternative route are discussed in Section 3.9 of this report.

Operation Phase

Except for Nebraska, potential socioeconomic operational impacts that may result from the Project remain the same as discussed in the FEIS, Section 3.10.1.2, p. 3.10-79 through 3.10-82. The current Project affects the same counties in Montana and South Dakota as discussed in the FEIS in Section 3.10, p. 3.10-2. Nebraska county impacts along the preferred alternative route are discussed in Section 3.9 of this report.

4.1.10 Public Health and Safety

Construction Phase

Potential construction impacts to public health and safety within the Project route are addressed in the FEIS (Section 3.18).

In summary, most construction-related spills would likely release minor quantities of refined products (e.g., gasoline, diesel, and lubricating and hydraulic fluids). These releases would be subject to the reporting requirements of 40 CFR Part 110, and would typically result from vehicle and construction equipment fueling and maintenance. Contractor construction staging and pipe storage areas would typically include skid-mounted, above-ground gasoline storage tanks (9,500-gallon [226-barrel (bbl.)] capacity) and diesel storage tanks (10,000-gallon [238-bbl] storage capacity). These fuel tanks would be installed within impermeable containment areas to prevent spilled material from reaching adjacent natural habitats. Consistent with one of the requirements of 40 CFR Part 112 for each staging area, oil storage tanks would have secondary means of containment (berms) for 110 percent of the capacity of the largest tank. In addition, portable oil storage containers would have berms that hold 110 percent of the total capacity of the containers inside the berm. Lubricating oil may also be stored in tanks in these areas.

Construction would also involve fuel delivery by tanker trucks to operating equipment along the construction ROW. The potential maximum spill volume from the failure of the maximum size fuel tank truck would be about 9,000 gallons (214 bbl.) for diesel or gasoline. Lubricating or hydraulic fluid would be stored in 55-gallon (1.3-bbl) drums, with up to six drums on a pallet. Thus, the potential maximum spill volume of lubricating oil or hydraulic fluid would be equal to the volume of six drums, or approximately 330 gallons (7.9 bbl.). Hydrostatic testing of the pipeline prior to operation would not result in release of oil to the environment as neither the water used in the testing nor the pipeline at this time would contain oil. Also, the discharged water would be required to meet NPDES discharge permit conditions.

Potential spills from construction activities would be addressed by specific preventive and mitigating measures included in the SPCC Plan described in more detail in FEIS Section 2.3, p 24; Section 2.3.3.5, pp. 2-40 and 2-41; Section 2.3.3.6, pp. 2-41 and 2-42; and Appendix C of the FEIS.

Operation Phase

Potential operations impacts to public health and safety within the Project route are addressed in the FEIS (Section 3.13.4 through 3.13.6, pp. p. 3.13-17 through 3.13-101).

In summary, Keystone will comply with all applicable federal regulations and codes, including the PHMSA regulations of 49 CFR Parts 194 and 195. In addition, a set of 57 Special Conditions was developed by PHMSA in consultation with DOS (Appendix U of the FEIS) and Keystone agreed that if the Presidential Permit is granted, it would incorporate those conditions into the proposed Project and in its manual for operations, maintenance, and emergencies that is required by 49 CFR §195.402. PHMSA has the legal authority to inspect and enforce any items contained in a pipeline operator's operations, maintenance, and emergencies manual, and would therefore have the legal authority to inspect and enforce the 57 Special Conditions if the proposed Project is approved. DOS, in consultation with PHMSA, has determined that incorporation of those conditions would result in a Project that would have a degree of safety over any other typically constructed domestic oil pipeline system under current code and a degree of safety along the entire length of the pipeline system similar to that which is required in HCAs as defined in 49 CFR §195.450.

4.1.10.1 Kalamazoo River Spill at Marshall, Michigan

Concerns have been raised in light of the Marshall, Michigan oil spill into the Kalamazoo River. Keystone has investigated this spill based on publically available information and has presented the results of that review with a comparison to the Keystone XL pipeline design.

On July 25, 2012, Enbridge's 6B pipeline failed near Marshall, Michigan and released over 20,000 barrels of oil into Talmadge Creek. Heavy rains had caused flood conditions, including overtopping of dams and downstream transport of crude oil. Crude oil from Talmadge Creek flowed into the Kalamazoo River and was transported approximately 30 miles downstream. The National Transportation Safety Board (NTSB) concluded that the cause of the pipeline failure was multiple corrosion cracks combined with "operational failures".

At the time of the accident, the pipeline was transporting diluted bitumen. The diluted bitumen has an API gravity greater than 10 and, therefore, was expected to float on the water's surface. According to the EPA, the oil did float initially, as expected. Over 85 miles of absorbent boom were deployed during the response to capture floating oil. The oil coated the riverbanks and some oil was deposited in flooded fields.

As the oil weathered with time (i.e., light end hydrocarbons evaporated), the remaining oil became heavier. Oil stranded on land formed tar-like tiles as the light end hydrocarbons evaporated. In water, the loss of the lightweight hydrocarbons made the residual oil heavier until the oil eventually began to sink. This weathering process is not unique and occurs with all types of crude oils, regardless of its origin. In some cases, turbulence along the Kalamazoo River caused sediment and water to become incorporated into the crude oil, forming a heavier-than-water emulsion. The resulting submerged oil formed globules that were transported downstream for miles. Submerged oils are more difficult to cleanup than floating oils. Federal regulations dictate that the costs incurred by the USEPA and the Michigan Department of Community Health will be recovered from the pipeline operator.

Several factors contributed to the severity of the incident including quality and maintenance of the pipe, operational failure, and flood conditions.

It has been suggested that the type of oil contributed to the severity of the spill and its impacts. However, a recent evaluation of diluted bitumen (Battelle 2012) found no significant differences in the physical or chemical properties of diluted bitumen and other heavy crude oils. The behavior of the crude oil in the Marshall, Michigan spill was not unique nor should have been unexpected. The flood conditions and emergency response times allowed time for the crude to weather prior to cleanup and sinking oils do pose a greater challenge for containment and cleanup compared to floating oils.

There are a number of reasons, discussed below, why a major pipeline failure comparable to the Marshall, Michigan spill is not anticipated for the Keystone XL Pipeline Project. Nevertheless, Keystone will be prepared to respond to a spill of a similar magnitude and extent of the Marshall, Michigan incident. Further, the lessons learned from the incident will be incorporated into industry recommendations and guidance.

Quality of Pipe and Maintenance

The pipeline involved in the Marshall, Michigan incident was constructed in the 1950's when there often were significant problems with both pipe material and manufacturing. Pipeline standards have evolved and improving technologies have resulted in improvements in pipeline safety performance. Pipelines are now constructed with much higher quality steel which is stronger and has better fracture resistant properties that helps reduce the impacts of external forces, such as flooding and excavation damage.

Improvements in external pipeline coatings, the use of cathodic protection, and mandatory in-line inspection tools have resulted in significant reductions in corrosion-related incidents. TransCanada has not experienced a corrosion-related failure on any of its pipelines that utilize modern fusion bonded epoxy coatings. Federal pipeline regulations have evolved over time and pipeline operators are now required to actively manage their pipelines to reduce the possibility of incidents. Operating procedures and leak

detection capabilities have improved to more quickly detect leaks, thereby minimizing the amount of crude oil released and reducing subsequent impacts.

The Keystone XL Pipeline will be constructed to standards that far exceed current federal regulatory requirements. In addition to company-specific standards that exceed current federal pipeline safety standards (e.g., burial depth of four feet of cover rather than the standard three feet depth of cover), Keystone has agreed to implement an additional 57 Special Conditions identified in the FEIS. The FEIS stated that the implementation of these additional conditions would result in a level of safety equal to or exceeding the current levels as required by federal regulations.

Operational Failures

While Keystone does not have sufficient information to comment on the conditions that led to operational failures on the pipeline involved in the Marshall, Michigan spill, Keystone has strict company standards and will implement the 57 Special Conditions, which include operational requirements. Pipeline conditions along the entire Keystone XL Pipeline will be continuously monitored 24 hours a day, 7 days a week. With over 16,000 sensors along its length and multiple, overlapping state-of-the-art leak detection systems, the Keystone XL Pipeline will be one of the most closely monitored pipelines in existence.

Flood Conditions

While flood conditions are not a leading cause of pipeline failures, they can be a threat to pipeline integrity in certain locations. Under federal regulations (49 CFR Part 195), Keystone's Integrity Management Program is required to monitor and reduce risks from various threats, such as outside forces due to flooding. Keystone has evaluated stream crossings to identify those locations where stream scour could affect pipeline integrity. Where there is potential for significant stream scour, Keystone has increased burial depth so stream scour does not pose a threat to pipeline integrity. Additionally, under Special Condition 19 Keystone is required to maintain depth of cover for the life of the Project.

Summary

The Keystone XL Pipeline is a modern pipeline built to much high standards than pipelines built in the 1950s. Further, there are a number of operational requirements for the Keystone XL Pipeline that exceed current regulations and, consequently, the pipeline is expected to operate at a higher level of safety than other pipelines currently in operation. Finally, Keystone is committed to the prevention of incidents and will utilize lessons learned from the entire industry to continue to improve its pipeline safety programs.

4.2 Environmental Consequences Summary

The FEIS (Section 3.15.1) reviewed the environmental impacts and consequences of the original Keystone XL Project and concluded that “[t]he analyses of potential impacts associated with construction and operation of the proposed Project suggest that there would be no significant impacts to most resources along the proposed Project corridor...”.

5.0 Cumulative Impacts

5.1 Power Lines

Impacts associated with power line construction, operation and mitigation have not changed from what was discussed in the FEIS submittal except for locations of proposed power lines in Nebraska and power line route revisions discussed in Section 7 of this ER. Proposed locations for pump stations and auxiliary sites and power lines associated with them have changed due the alternative routes discussed in the SER for Nebraska. The new locations will be determined with the approval of an alternative route. The impacts associated with the facilities will not change and will be evaluated and surveys conducted where needed prior to construction. Power distribution lines and substations and the impacts and mitigation associated with them are discussed in the FEIS section 3.6.5.1 starting on p. 3.6-25. Impacts associated with development and operation and mitigation/reduction of impacts is on p. 3.6-26.

5.2 ONEOK Pipeline

Tulsa-based ONEOK Partners is planning to construct approximately 525-mile NGLs pipeline that will transport raw, unfractionated NGLs from the prolific Bakken Shale play in North Dakota and Montana to the company's 50-percent owned Overland Pass Pipeline. The Bakken Pipeline will originate near Sidney, Montana, and will transport raw natural gas liquids (NGLs) south through eastern Montana/western North Dakota and Wyoming into northern Colorado, where it will connect to the existing Overland Pass Pipeline. The impacts associated with the ONEOK pipeline is under construction and is expected to be completed prior to the start of Keystone construction.

6.0 Electrical Power Lines

6.1 Power Line Update

Montana and South Dakota

Since the issuance of the FEIS, there have been minor route changes to power lines at four locations in Montana and at two locations in South Dakota. Tables 6.1-1 and 6.1-2 present a comparative view of the lengths and land uses of the six power lines between the FEIS issuance and current powerline routes. Table 7.1-1 shows lengths and land uses for the powerlines included in the FEIS. Table 7.1-2 provides that information updated for the current powerline routing. Tables 6.1-3 and 6.1-4 present a comparison of land ownership between the FEIS issuance and current powerline routes. Tables 6.1-5 and 6.1-6 present a comparison of the recreational and special interest areas crossed by the FEIS issuance and current powerline routes. Table 6.1-7 presents the number of buildings within 50 feet of both the FEIS and current route configurations. Figures 6.1-1 through 6.1-13 depict the revised power line routes. Detailed mapping is presented in Appendix L.

Table 6.1-1 Land Use – FEIS Power Line Data				
State	PS	LULC	Land Use	Length(mi)
Montana	PS-09	CROP	Agriculture/Cropland	5.74
		CROP	Rangeland/Grassland	0.34
		DROW	Developed	0.66
		EPH	Water	0.24
		GR	Rangeland/Grassland	54.05
		INT	Water	0.33
		MABO	Water	0.12
		MADI	Water	0.04
		PEM	Wetland	0.24
		PER	Water	0.03
	UF	Forest Land	0.04	
	PS-12	CROP	Agriculture/Cropland	0.57
		DCOM	Developed	0.09
		DROW	Developed	0.18
		GR	Rangeland/Grassland	2.37
		INT	Water	0.01
		PER	Water	0.01
	PS-13	CROP	Agriculture/Cropland	1.70
		DROW	Developed	0.23
		EPH	Water	0.10
		GR	Rangeland/Grassland	13.05

Table 6.1-1 Land Use - FEIS Power Line Data						
State	PS	LULC	Land Use	Length(mi)		
	PS	INT	Water	0.06		
		PEM	Wetland	0.07		
	PS-14	CROP	Agriculture/Cropland	0.16		
		DROW	Developed	0.03		
		EPH	Water	0.01		
		GR	Rangeland/Grassland	5.87		
		INT	Water	0.04		
		PEM	Wetland	0.22		
				Subtotal	86.6	
	South Dakota	PS-16	CROP	Agriculture/Cropland	6.24	
DROW			Developed	1.36		
GR			Rangeland/Grassland	32.17		
OW			Water	0.03		
PEM			Wetland	0.16		
PER			Water	0.15		
SP			Developed	0.02		
PS-21		CROP	Agriculture/Cropland	6.67		
		DIND	Developed	0.03		
		DRES	Developed	0.11		
		DROW	Developed	3.95		
		EPH	Water	0.067		
		GR	Rangeland/Grassland	8.92		
		INT	Water	0.06		
		MABO	Water	0.03		
		PEM	Wetland	0.12		
		PFO	Wetland	0.06		
		WB	Forest Land	0.08		
					Subtotal	233.427

Table 6.1-2 Land Use – Current Power Line Data

State	PS	LULC	Land Use	Length(mi)	
Montana	PS-09	CROP	Agriculture/Cropland	5.7588	
		CROP	Rangeland/Grassland	0.3373	
		DROW	Developed	1.029	
		EPH	Water	0.2346	
		GR	Rangeland/Grassland	54.3094	
		INT	Water	0.3282	
		MABO	Water	0.1177	
		PEM	Wetland	0.1436	
		PER	Water	0.0326	
		UF	Forest Land	0.0368	
		WB	Forest Land	0.0437	
	PS-12	CROP	Agriculture/Cropland	1.4649	
		DCOM	Developed	0.2868	
		DROW	Developed	0.0459	
		EPH	Water	0.0003	
		GR	Rangeland/Grassland	2.8581	
		PER	Water	0.01	
	PS-13	CROP	Agriculture/Cropland	1.3467	
		DROW	Developed	0.3354	
		EPH	Water	0.1103	
		GR	Rangeland/Grassland	13.3693	
		INT	Water	0.0495	
		PEM	Wetland	0.0646	
	PS-14	CROP	Agriculture/Cropland	0.0101	
		DROW	Developed	0.029	
		EPH	Water	0.0357	
		GR	Rangeland/Grassland	6.6232	
		IND	Developed	0.0051	
		INT	Water	0.0495	
		PEM	Wetland	0.1185	
				Subtotal	89.1846
	South Dakota	PS-16	CROP	Agriculture/Cropland	6.2424
			DROW	Developed	1.3778
			GR	Rangeland/Grassland	33.8237
			INT	Water	0.0133
OW			Water	0.0269	

Table 6.1-2 Land Use – Current Power Line Data				
State	PS	LULC	Land Use	Length(mi)
		PEM	Wetland	0.1546
		PER	Water	0.1451
		SP	Developed	0.0149
	PS-21	CROP	Agriculture/Cropland	6.89
		DIND	Developed	0.03
		DRES	Developed	0.11
		DROW	Developed	4.77
		EPH	Water	0.07
		GR	Rangeland/Grassland	7.77
		MABO	Water	0.02
		PEM	Wetland	0.12
		PFO	Wetland	0.06
		UF	Forest Land	0.21
		WB	Forest Land	0.08
				Subtotal

LULC – Land Use/Land Category

PS – Pump Station

Table 6.1-3 Land Ownership - FEIS Power Line Data (miles)		
PS-09	Federal	30.18
PS-09	Local	0.73
PS-09	Private	27.57
PS-09	State	3.33
PS-12	Private	2.30
PS-12	State	0.92
PS-13	Private	15.19
PS-14	Private	6.26
PS-14	State	0.07
PS-16	Federal	4.98
PS-16	Private	25.86

Table 6.1-3 Land Ownership - FEIS Power Line Data (miles)		
PS-16	State	9.27
PS-21	Local	0.892225
PS-21	Private	19.192778
Totals		
	Federal	35.16
	Local	1.62
	Private	96.37
	State	13.59

Table 6.1-4 Land Ownership - Current Power Line Data (miles)

PS-09	Federal	30.81
PS-09	Local	0.73
PS-09	Private	27.41
PS-09	State	3.42
PS-12	Private	3.77
PS-12	State	0.89
PS-13	Federal	0.02
PS-13	Private	15.25
PS-14	Private	6.64
PS-14	State	0.23
PS-16	Federal	4.98
PS-16	Local	0.03
PS-16	Private	28.04
PS-16	State	8.75
PS-21	Local	0.89
PS-21	Private	19.10
PS-21	State	0.15
Totals		
	Federal	35.82
	Local	1.65
	Private	100.22
	State	13.44

Table 6.1-5 Recreation and Special Interest Areas – FEIS Power Line Data

PS	Name / Ownership	Length(mi)
PS-09	Montana State Trust Lands	3.38
PS-09	Phillips County	0.73
PS-09	US Bureau of Land Management	29.57
PS-09	US Bureau of Reclamation	0.38
PS-09	Water	0.18
PS-12	Montana State Trust Lands	0.86
PS-14	Montana State Trust Lands	0.10
PS-16	Custer National Forest	2.97
PS-16	South Dakota Game, Fish, and Parks	5.26
PS-16	State Of South Dakota	1.00
PS-16	State School Land	1.05
PS-16	US Forest Service	1.51
PS-16	Water	0.10
PS-21	City Of Gregory	0.89
PS-21	School	0.15

Table 6.1-6 Recreation and Special Interest Areas - Current Power Line Data

PS	Name / Ownership	Length(mi)
PS-09	Montana State Trust Lands	3.46
PS-09	Phillips County	0.73
PS-09	US Bureau of Land Management	30.40
PS-09	Water	0.18
PS-12	Montana State Trust Lands	0.86
PS-14	Montana State Trust Lands	0.05
PS-16	Custer National Forest	2.97
PS-16	Harding County	0.12
PS-16	South Dakota Game, Fish, and Parks	4.73
PS-16	State Of South Dakota	1.00
PS-16	State School Land	1.05
PS-16	US Forest Service	1.51
PS-16	Water	0.10
PS-21	City Of Gregory	0.89
PS-21	School	0.15

Table 6.1-7 Number of Buildings Within 50 Feet of a Power Line	
<i>FEIS powerline routes</i>	<i>Current powerline routes</i>
Montana	Montana
2	3
South Dakota	South Dakota
0	0

Nebraska

The Nebraska Public Power District (NPPD) power line ROW procurement process requires approximately 18 to 24 months to complete and begins when Keystone determines the locations of the pump stations. NPPD will apply to the Southwest Power Pool (SPP) with a proposal to interconnect the pump stations showing the start and end points for the interconnection. This is a technical application demonstrating compliance with National Rural Electric Cooperative (NREC) reliability standards and has little or no impact on existing customers in the transmission system. When SPP determines that the interconnections are acceptable, NPPD will begin the transmission line ROW consultation process. The NPPD land owner consultation process includes three stages. The first stage consists of an open house that provides land owners with the start and end points and asks for suggestions on where the transmission line could be located. Based on landowner input, NPPD creates a corridor where the transmission line could be located. In the second stage, an open house is held to present the corridors, and land owners are asked to provide suggestions on the location of the transmission line ROW within the corridor. The third state, a final open house, provides the final ROW and asks land owners for any further comments. The final right of way is then filed with the Power Review Board (PRB) for final approval. As part of the PRB application process NPPD conducts an environmental review of the ROW.

This information represents Critical Energy Infrastructure Information (CEII) and has been redacted. CEII is information concerning proposed or existing critical infrastructure (physical or virtual) and is considered sensitive information not for public distribution.

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7.0 Keystone XL Project Glossary

Term	Definition
access road	A temporary or permanent road that provides access to a facility, campsite, pipeline ROW, water source, or infrastructure site.
alluvial	Pertaining to, or consisting of, material deposited by flowing water.
alluvium	Pertaining to, or consisting of, unconsolidated material, usually clay, sand, silt and gravel, deposited by flowing water.
amphibian	Any of the class of cold-blooded vertebrates, including frogs, toads, and salamanders, intermediate between fish and reptiles; they are gilled, aquatic larvae and air-breathing adults.
aquatic	Growing in, living in, or frequenting water. Also, occurring, situated in, or on water.
aquifer	A saturated geologic unit having relatively higher permeability compared with adjacent units that can transmit relatively greater quantities of water under normal hydraulic gradients.
archaeological site	A location that contains evidence of past human activity, such as artifacts or structural remains.
artifact	Any portable object made, modified or used by humans, including tools, weapons, ceremonial items, art objects, industrial materials, and floral and faunal materials.
backhoe	An excavating machine fitted with a hinged arm with a rigidly attached bucket used for excavating ditches.
bank	The rising slope or face of ground bordering a watercourse. It is located above the streambed and below the level of rooted vegetation.
bedrock	Solid rock either exposed at the surface or found underlying soil or any other unconsolidated surficial cover.
best management practices (BMPs)	A practice or combination of practices that are determined to be the most technically and economically feasible means of preventing or managing potential detrimental effects.
calcareous soil	Soil containing sufficient calcium carbonate, often with magnesium carbonate, to effervesce visibly when treated with cold 0.1 N hydrochloric acid.
cathodic protection	Application of an electric potential to a buried pipeline so that it is slightly negative (typically -0.85 V) with respect to the surrounding soil. Since corrosion of the pipe occurs when the pipe's potential is greater than that of its environment, cathodic protection acts to prevent corrosion.
channel	A natural or artificial waterway that periodically or continuously contains moving water, has a defined bed (evidence of alluvial scour), and has banks that confine water at low to moderate stream-flow.

Term	Definition
clay	As a particle-size or textural term: a size fraction less than 0.002 mm in equivalent diameter. As a rock term: a natural, earthy, fine-grained material that develops plasticity with a small amount of water. As a soil term: a textural class.
construction phase	The phase of a Project preceding operations, during which Project facilities are assembled, installed on their foundations, connected, and tested to ensure that they will operate as designed.
contract	Defined in Keystone's proposed Tariff as a Petroleum Transportation Service Agreement between the Carrier (Keystone) and a Term Shipper.
Cretaceous	A geological period ranging from 144 to 65 million years ago when the climate was warmer and dinosaurs were at their peak. All dinosaurs, marine reptiles, and ammonites went extinct at the end of the Cretaceous.
deposit	Material left in a new position by a natural transporting agent, such as water, wind, ice, or gravity, or by the activity of people.
discharge	The rate of flow at a given moment, expressed as volume per unit of time (e.g., stream flow usually expressed as cfs (cubic feet/sec).
diversity, in ecology	The variety, distribution, and abundance of different plant and animal communities and species in an area.
downstream	Below a reference point in the direction of the flow of a stream or river.
drainage	The process or means of draining.
easement	An agreement under which a company acquires the right to use land for the pipeline or power line. It is a written contract that sets out the rights of the company and rights of the landowner for the use of the right-of-way.
ecoregion	An ecological area that has broad similarities in soil, relief, and dominant vegetation.
endangered	A species facing immediate extinction or extirpation.
environment	The components of the earth, including land, water, and air, all layers of the atmosphere, organic and inorganic matter, and living organisms, and the interacting natural systems of all components.
eolian	Pertaining to, or consisting of, materials eroded, transported, or deposited by wind, usually including poorly graded, well-sorted medium to fine sand and coarse silt that is sorted and not compacted.
equivalent sound level (Leq)	The A-weighted equivalent continuous sound level. This measure is an energy average of the varying sound levels over a specified time.
erosion	The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.
facilities	Structures of the pipeline system, including pump stations, block valves, pigging facilities, and meter stations.
floodplain	The low-lying land adjacent to a watercourse that may be inundated when the stream is at flood stage.

Term	Definition
footprint	The amount and shape of area to be disturbed. For example, the perimeter of a facility site.
forage fish	Fish species used as a food source by other fish.
forb	Any herbaceous plant, other than a grass (e.g., a weed or a broad-leaved non-woody plant).
formation	A geological stratigraphic unit that consists predominantly of a certain lithologic type or combination of types. It is the fundamental lithostratigraphic unit and can be combined into groups or subdivided into members.
fossil	Any remains, traces or imprints of past life preserved in the earth's crust. Also known as a paleontological resource.
furbearer	Mammals that have traditionally been trapped or hunted for their fur.
gravel	Rock fragments with diameters of 2 mm to 7.5 cm.
groundwater	Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.
habitat	The area where an animal or plant naturally or normally lives and grows (e.g., stream habitat or forest habitat).
historic period	The period after time of contact between indigenous peoples and Europeans. A term used to indicate a time for which there are written (documentary) records. In North America, this typically refers to the time period following contact between Europeans and EuroCanadians and aboriginal peoples. Also called the Post contact Period.
historic site	A site characterized by structures, features, and objects of European influence.
horizontal directional drilling (HDD)	A trenchless method of crossing obstacles such as watercourses whereby a pilot hole is first drilled in a guided arc under the obstacle. If this is successful, the pilot hole is reamed to a diameter sufficient to accommodate the pipe, which is then pulled through the hole. Since success is not guaranteed, all HDD crossing plans must include a contingency alternative.
hydraulics	The branch of science and technology concerned with the mechanics of fluids, especially liquids.
hydrologic unit	USGS subdivisions of a drainage basin to demark the land area that contributes to each major drainage.
hydrostatic testing	The final quality control check of the structural soundness of a pipeline or facility. In this test, the line is filled with water or a glycol-water mixture and pressurized to a designated point. This pressure is maintained for a specific period of time. Any ruptures or leaks revealed by the test are repaired. The test is repeated until no problems are noted. Also known as pressure testing.
impervious	Resistant to penetration by fluids or roots.

Term	Definition
incident	A specific unplanned event or sequence of events that has an unwanted and unintended effect on people's safety or health, property, the environment, or on regulatory compliance.
infrastructure	Basic facilities, such as transportation, communications, power supplies and buildings, which enable an organization, Project or community to function.
invasive species	A term describing species that move into a habitat and reproduce so aggressively that indigenous species are displaced or existing community structures are changed.
lacustrine	Pertaining to, produced by, or inhabiting a lake or lakes.
lacustrine deposits	Material deposited in lake water and later exposed either by lowering the water level or uplifting the land.
leak detection system	A system of sensors, combined with the SCADA that will enable operators in the control center to become aware of leaks above certain sizes.
lithic	Hard bedrock.
meter	An instrument for measuring and indicating, or recording the volume of a substance that has passed through it.
mitigation	In respect to a Project, the elimination, reduction, or control of the adverse environmental effects of the Project; includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation, or any other means.
noise	The phenomenon of unwanted sound.
operation phase	The phase of the Project during which the pipeline and associated facilities are operated. The operation phase is the period immediately following the construction phase whereby the facilities are commissioned and placed in service to support the needs of the executed contracts.
operations control center	The room from which the operation of the Project will be monitored and controlled 24 hours a day.
overburden	The loose soil, silt, sand, gravel, or other unconsolidated materials overlying bedrock.
paleontology	A scientific discipline that studies fossil plant and animal remains.
perennial watercourse	Stream with water continuously present during a normal water year.
permeability	As relating to geologic deposits, the interconnected pore space that is a function of grain size, sphericity, roundness, and packing. Gravel has a high permeability and clay has low permeability. The capacity of a porous rock, soil or sediment for transmitting a fluid without damaging the structure of the medium. Also known as perviousness.
pH	A measure of the relative acidity or alkalinity of a liquid or soil. The pH scale ranges from 1 to 14, with 7 being neutral, 1 being the most acidic and 14 being the most alkaline.

Term	Definition
pigging	The movement of a tool—the pig--propelled by gas or liquid through the inside of a pipeline for the purpose of cleaning, dimensioning, or inspecting. Inspection pigs, equipped with sophisticated sensors and electronics to detect and measure corrosion and other defects are known as “smart pigs.”
pigging facilities	Receivers and launchers for the pipeline in-line inspection and cleaning tool.
population (in biology)	A collective word for individuals of the same species that potentially interbreed.
Project, the	The Keystone XL Project.
pump station	A group of one or more pumps that raises the pressure of the oil to a maximum of the MOP of the downstream pipeline.
Quaternary Period	A geological period ranging from 1.8 million years ago to the present. This is a time of major glaciations and cool climates.
raptor	A carnivorous (meat-eating) bird, includes eagles, hawks, falcons, and owls.
reclamation	The process of re-establishing a disturbed site to a former or other productive use, not necessarily to the same condition that existed before disturbance.
revegetation	Re-establishment of vegetation in disturbed areas.
right-of-way, construction	The pipeline easement and temporary workspace required to construct the pipeline.
right-of-way, new pipeline	Pipeline right-of-way not contiguous with existing rights-of-way.
right-of-way, pipeline	The easement in which the pipeline will be installed and operated.
right-of-way, ROW	Land rights held by a linear utility, such as a pipeline company, which gives the company a perpetual right to install and operate its lines within a legally-designated area. See also easement.
riparian area	The land next to the normal high-water mark in a stream, river, or lake. Riparian areas typically exemplify a rich and diverse vegetation mosaic, reflecting the influence of available surface water.
river	A large, natural, or human-modified freshwater waterbody that flows in a defined course or channel. It has considerable flow volume compared to its smaller tributaries.
rolling	An assemblage of parallel or sub-parallel linear forms with subdued relief.
sand	A soil particle between 0.05 and 2.0 mm in diameter. Any one of five soil separates: very coarse sand, coarse sand, medium sand, fine sand, or very fine sand. A soil textural class.
saturate	The act of filling all voids between soil particles with a liquid. The act of forming the most concentrated solution possible under a given set of physical conditions in the presence of an excess of the solute. The act of filling to capacity, as the adsorption complex with a cation species.

Term	Definition
sediment	Fragmented material from weathered rocks and organic material that is suspended in, transported by, and eventually deposited by, air, water, or ice.
sediment quality	The physical, chemical, or biological properties of sediment relative to its use or value as an environment for aquatic life.
sensitive	Any species that is not at risk of extinction or extirpation but might require special attention or protection to prevent it from becoming at risk. Also used to describe species at risk in general.
shale	A fine-grained laminated or fissile sedimentary rock made up of silt or clay-sized particles. It usually comprises about one-third quartz, one-third clay materials, and one-third minerals, such as carbonates, iron oxides, feldspars, and organic matter.
silt	A soil separate consisting of particles between diameters of 0.002 and 0.05 mm; a soil textural class.
slope	The percentage of vertical rise to the horizontal run.
slump	Mass sliding of semi-consolidated sediment downslope under the influence of gravity.
soil	The top few meters of regolith, generally including some organic matter derived from plants.
soil permeability	The ease with which gases and liquids penetrate or pass through a bulk mass of soil or a layer of soil. The property of a porous medium that relates to the ease with which gases and liquids can pass through.
song birds	Perching birds (e.g., warblers, sparrows, swallows, chickadees, thrushes and kinglets).
sound	Any pressure variation the human ear can detect. These variations in pressure travel between source and receptor as atmospheric waves.
species	A group of organisms that actually or potentially interbreed and are reproductively isolated from all other such groups or a taxonomic grouping of genetically and morphologically similar individuals. Also the classification below genus.
stakeholders	People or organizations with an interest in, or, who are affected by, or share in an undertaking.
stockpile	A supply of materials, such as line pipe or borrow materials, to be used later.
stream	Natural water course containing flowing water, at least part of the year, together with dissolved or suspended materials, that normally supports communities of plants and animals.
substrate	Mineral and organic material forming the bottom of a watercourse or waterbody.
temporary workspace	Space adjacent to a permanent right-of-way, which is required during the construction period only, and is not required for operation of the pipeline.

Term	Definition
threatened	The term used to describe any indigenous classification (species) of fauna or flora likely to become endangered if the factors affecting its vulnerability are not reversed.
till, glacial	Unsorted sedimentary material deposited directly by, and underneath, a glacier, consisting of a mixture of clay, silt, sand, gravel, and boulders. Also known as till.
topography	The physical feature of a district or region, such as those represented on a map, taken collectively; especially, the relief and contours of the land. The configuration of a surface, including its relief and natural and artificial features.
topsoil	(i) the layer of soil moved in cultivation; (ii) the A horizon; (iii) the Ah horizon; (iv) presumably, fertile soil material used to top-dress road banks, gardens, and lawns.
total suspended solids	A measure of the total concentration (usually in milligrams per liter (mg/L)) of suspended solids in water.
TransCanada	The abbreviation for TransCanada Pipelines, Limited.
upland	Terrain with sufficient topographical relief that the communities and processes of the site are not influenced by a surface or near-surface water table, and in which riparian vegetation or aquatic processes do not persist.
upstream	The direction from which a watercourse flows.
water column	A portion of water in a waterbody extending vertically from a given point on the surface to any depth. It is generally used to locate, describe, or characterize the chemical and physical constituents at a given depth or range.
waterbody	A body of water up to the high-water mark. Including canals, reservoirs, oceans and wetlands, but not including sewage or waste treatment lagoons.
waterfowl	Aquatic birds, especially swimming game birds, such as ducks and geese.
watershed	An area of land that drains to a single outlet and is separated from other watersheds by a divide.
wetland	Wetland is those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (USACE Wetland Delineation Manual, 1987)

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