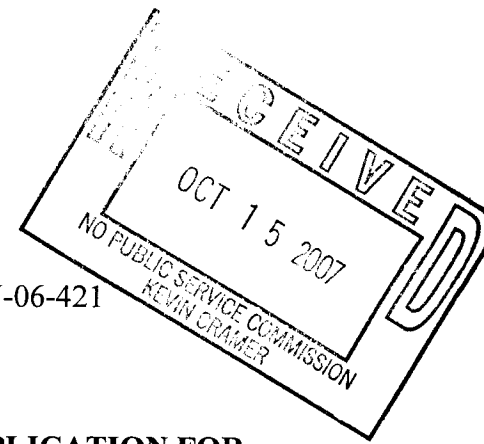


PUBLIC SERVICE COMMISSION
STATE OF NORTH DAKOTA



TRANSCANADA KEYSTONE PIPELINE, LP) CASE NO. PU-06-421
30-INCH OIL PIPELINE/CAVALIER TO)
SARGEANT COUNTIES SITING APPLICATION)

**MEMORANDUM BRIEF OF KEYSTONE IN SUPPORT OF APPLICATION FOR
CERTIFICATE OF CORRIDOR COMPATIBILITY AND ROUTE PERMIT**

APPEARANCES

Commissioners Susan E. Wefald, Tony Clark and Kevin Cramer

Thomas D. Kelsch and Todd D. Kranda, Kelsch Kelsch Ruff & Kranda, 103 Collins Avenue, Mandan, ND 58554 on behalf of the Applicant TransCanada, Keystone Pipeline, LP

Nicholas R. Delaney, Rinke Noonan US Bank Plaza, Suite 300, St. Cloud MN 56302 on behalf of Interveners, Dakota Resources Council, Ramona Klein, Merle and Linette Kratochvill, Janie and John Capp, and Mark Novak

William W. Binek, Chief Counsel, Public Service Commission, State Capitol, Bismarck, ND 58505, on behalf of The Public Service Commission

Al Wahl, Office of Administrative Hearings, 1707 North 9th Street, Bismarck, ND 58501
As Procedural Hearing Officer

EXECUTIVE SUMMARY

The Keystone Pipeline Project involves the construction and operation of a pipeline and related facilities for the purpose of transporting Canadian crude oil from the Western Canadian Sedimentary Basin to markets in the United States. The project would commence at the crude oil supply hub near Hardisty, Alberta, Canada, and extend to Wood River and Patoka, Illinois. Initially, the pipeline would have a nominal capacity to transport 435,000 barrels of oil per day (bpd). Subsequently, the pipeline will be extended to a terminal at Cushing, Oklahoma (Cushing Extension) and the nominal capacity will be expanded to 591,000 bpd. The length of the proposed facility in the United States is approximately 1,078 miles from the Canadian border to Patoka and an additional 294 miles for the Cushing Extension.

The pipeline will enter North Dakota at the Canadian/North Dakota border in Cavalier County and will extend in a southerly direction passing through eight counties, exiting the state at the South Dakota border in Sargent County. The length of the pipeline in North Dakota will be approximately 218 miles.

Keystone has presented uncontested expert testimony that the location, construction and operation of the Keystone Pipeline will produce minimal adverse impacts on the environment, natural resources and welfare of the citizens of North Dakota. The Keystone Pipeline is compatible with preservation of the environment and the efficient use of resources. The Keystone Pipeline corridor and route will minimize adverse human and environmental impacts while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely fashion.

Keystone will provide benefits to the United States by providing access to secure crude oil supplies, which will offset declines in domestic crude oil production and decrease dependence on offshore foreign crude oil supplies, including a reduction in dependence on crude oil from more unstable parts of the world. The Keystone Pipeline project is essential in order to deliver crude oil into the United States to ensure secure future supplies of energy.

Keystone will provide benefits to North Dakota by easing the current bottlenecks in oil pipeline infrastructure, which inhibit North Dakota producers from readily accessing markets with their production and which has caused depressed prices for North Dakota crude oil production. The Keystone pipeline will provide a benefit by providing another transportation route for moving crude oil to refineries in the United States, thereby relieving capacity problems on other parts of the crude oil pipeline system. Construction of the Keystone Pipeline is expected to relieve some stress in the Guernsey Hub. Relieving current crude oil transportation bottlenecks would allow increased production in the State, increase mineral royalties paid to North Dakota citizens, and increase state tax revenues. The Keystone pipeline could provide a further benefit if North Dakota producers are able to connect their facilities to it.

Keystone is requesting the approval of a waiver of the procedures to allow a joint and simultaneous filing of its corridor and route applications, and for the issuance of a Certificate of Corridor Compatibility and a Route Permit.

PRELIMINARY STATEMENT

On April 11, 2007, TransCanada Keystone Pipeline, LP (Keystone) filed an application for a certificate of public convenience and necessity (PCN) under N.D.C.C. Chapter 49-03.1 to construct and operate the Keystone Pipeline in Cavalier, Pembina, Walsh, Nelson, Steele, Barnes, Ransom, and Sargent Counties of North Dakota. Approximately 218 miles of the crude oil pipeline is located in North Dakota.

On April 11, 2007, Keystone filed an application for a waiver of procedures and time schedules, and consolidated applications for a certificate of corridor compatibility and a route

permit authorizing construction of approximately 218 miles of 30-inch crude oil pipeline and associated facilities in Cavalier, Pembina, Walsh, Nelson, Steele, Barnes, Ransom, and Sargent Counties of North Dakota. The proposed corridor and route are shown on the attached map. (Case No. PU-06-421)

On May 2, 2007, the Commission issued a Notice of Filing and Notice of Hearing setting forth the issues to be considered for the Keystone Application. Public hearings were scheduled for Monday, July 23, 2007 at 1:00 p.m. CDT in Barnes County in Valley City and for Tuesday, July 24, 2007 at 1:00 p.m. CDT in Park River.

On May 2, 2007, the Commission issued a Notice of Filing and Notice of Hearing, determined that the Application was complete and waived the procedures set forth in N.D.C.C. Section 49-22-08 and 49-22-08.1 to allow for a single consolidation application for Corridor Certificate and Route Permit.

On May 2, 2007, the Commission in its Notice of Hearing identified the following issues to be considered:

1. Will the location, construction and operation of the proposed pipeline produce minimal adverse effects on the environment, natural resources and upon the welfare of the citizens of North Dakota?
2. Is the proposed pipeline compatible with the environmental preservation and the efficient use of resources?
3. Will the proposed pipeline corridor and route minimize adverse human and environmental impact while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely fashion?
4. Is it appropriate for the Commission to waive the procedures as requested in the application including the request for a single consolidated application for Corridor Certificate and Route Permit?

On June 21, 2007, Gary R. Leistico and Nicholas R. Delaney, Attorneys at Law, on behalf of the Dakota Resource Council, filed a request to postpone the hearings until completion of the Environmental Impact Statement (EIS) being prepared by the Department of State (DOS) and the related comment period. As an alternative, the Dakota Resource Council demanded that the Commission's approval of the Application and Permit be postponed until after the completion of the EIS and related comment period, after which the Dakota Resource Council would demand an additional hearing to discuss environmental related concerns.

On June 27, 2007, the Commission denied Dakota Resource Council's request to

postpone the hearing scheduled for July 23, 2007 until the completion of the EIS, and denied Dakota Resource Council's alternative demand that the Commission's approval of the application be postponed until after completion of the EIS and related comment period.

On July 17, 2007, the Commission moved the place of the scheduled hearing to the Valley City Auditorium located at 320 Central Avenue South, in Valley City, North Dakota and kept the same location for the hearing in Park River, North Dakota.

At the Public Hearing in Valley City the Commission received the following exhibits:

- T-1 TransCanada Power Point Presentation;
- T-2 Application for Corridor and Route, with Appendices and Supplemental filings;
- RS-1 Illustration;
- RS-2 Map;
- RS-3 Photographs;
- RS-4 Minot Daily News clippings;
- MN-1 Videotape;
- MN-2 Map;
- MN-3 WEB Water Development Association literature.

At the continued hearing in Park River the Commission received the following exhibits:

- JC-1 Aerial map;
- JC-2 Aerial map;
- JC-3 Aerial map;
- TB-1 Water Supply Investigation for the City of Park River cover sheet;
- FB-1 Aerial map;
- DO-1 Statement/newspaper article;
- T-26 CV Brian Thomas;
- T-27 TransCanada Keystone Emergency Response Plan;
- I-1 DNV Volume Study Keystone Pipeline;
- PM-1 Easement and ROW Agreement Paul Mathews;
- RS-5 Photographs

The hearing was continued to September 5-6, 2007 at the Public Service Commission Chambers in Bismarck. At this hearing the Commission received the following exhibits:

- T-3 Resume of Dean Cowling;
- T-4 TransCanada's proposed Tree and Shrub Mitigation specifications;
- T-5 Public Service Commission staff Tree and Shrub Mitigation specifications;
- T-6 Curriculum Vitae of Michael Koski;

- T-7 Aerial depiction of Wittenberg residence;
- T-8 Aerial depiction of Mathews residence;
- T-9 Map of Fordville Aquifer area with eastern water reroute concept;
- T-10 Fordville Alternative Route Concept Comparison;
- T-11 Map of Lake Ashtabula Reroute Concept;
- T-12 Ashtabula Alternative Route Concept Comparison;
- T-13 CV Scott Ellis;
- T-14 18 written waivers of 500-foot landowners within avoidance area;
- T-15 CV of LA Buster Gray;
- T-16 Bures reroute;
- T-17 Zacharias reroute;
- T-18 Map existing pipeline residential area Houston, Texas;
- T-19 CV Heidi Tillquist;
- T-20 Photographs Bemidji Spill Site;
- T-21 Water Flow Map Fordville Aquifer area;
- T-22 Travel Time Chart Fordville Aquifer;
- T-23 Water Flow Maps Sheyenne River-Lake Ashtabula;
- T-24 Travel Time Chart Sheyenne River-Lake Ashtabula;
- T-25 CV Meera Kothari

The Commission received the following late filed exhibits:

- T10a Revised Fordville Aquifer alternate route concept comparison chart showing acres of wetlands crossed;
- T28 Directional drilling plan for placement of pipeline in the Pembina Gorge;
- T29 Chart of estimated noise levels for pipeline pump stations relative to locations of residences and business;
- T30 GIS layers created or utilized for the Keystone Project in North Dakota;
- T31 Report of outreach to ND Department of Parks and Recreation re pipeline location;
- T32 Report of follow-up of landowners' testimony of improper conduct of TransCanada agents for easement acquisition;
- T33 Report identifying areas requiring right-of-way in excess of fifty feet;
- T34 Report of available data regarding pipeline spills in North Dakota, including miles of pipeline, size of spill, and barrels per day of spill;
- T35 Copies of all correspondence with state agencies identified by N.D. Admin. Code §§ 69-06-01-05 and 69-06-04-01(3);
- T36 Report on use of external leak protection system;
- T37 Map showing easement acquisitions for pipeline right-of-way five miles north and south of Lankin, North Dakota

Having allowed all interested persons an opportunity to be heard and having reviewed

and considered all testimony and evidence presented the Commission makes the following:

STATEMENTS OF FACT

A. General Project Facts

1. TransCanada is one of North America's leading energy infrastructure companies with more than 24 billion dollars in assets and with more than 50 years of construction and operating experience as it relates to pipelines. (Valley City (VC) Tr. Pgs. 146-147)
2. TransCanada has more than 36,000 miles of pipeline in North America and relationships with over 40,000 landowners across North America. (VC Tr. Pg. 147)
3. The Keystone Pipeline project involves the construction and operation of a pipeline and related facilities for the purpose of transporting Canadian crude oil from the Western Canadian Sedimentary Basin to markets in the United States. The project would commence at the crude oil supply hub near Hardisty, Alberta, Canada, and extend to Wood River and Patoka, Illinois. Initially, the pipeline would have a nominal capacity to transport 435,000 barrels of oil per day (bpd). Subsequently, the pipeline will be extended to a terminal at Cushing, Oklahoma (Cushing Extension) and the nominal capacity will be expanded to 591,000 bpd. The length of the proposed facility in the United States is approximately 1,078 miles from the Canadian border to Patoka and an additional 294 miles for the Cushing Extension. The pipeline will enter North Dakota at the Canadian/North Dakota border in Cavalier County and will extend in a southerly direction passing through eight counties, exiting the state at the South Dakota border in Sargent County. The length of the pipeline in North Dakota will be approximately 218 miles. (Exhibit T-2 Application for Certificate of Corridor Compatibility Pgs. 1-4)
4. The Keystone Pipeline project is an approximately 1,800 mile pipeline with about 1,400 miles in the United States. (VC Tr. Pgs. 150)
5. The Keystone project in the State of North Dakota constitutes approximately 218 miles of 30-inch crude oil pipeline, five pumping stations, a total of 13 main line valves and four check valves. (VC Tr. Pg. 156)
6. The Keystone Pipeline is designed for a maximum allowable operating pressure of 1,440 psi. (VC Tr. Pg. 156)
7. The United States (US) economy consumes 20 million barrels of oil every day, and the U.S. demand for petroleum products continues to increase. (VC Tr. Pg. 149)
8. Keystone is the only alternative to meet the increased demand for crude oil within the time frame required. (VC Tr. Pg. 149)

9. TransCanada has secured a total of 495,000 barrels per day of firm long-term contracts. (VC Tr. Pg. 149)
10. The long-term contracts clearly demonstrate that Keystone is required to meet U.S. energy needs. (VC Tr. Pgs. 149-150)
11. Direct and indirect economic benefits of the proposed Keystone Pipeline Project were fully explained in the Application for Public Convenience and Necessity Case No. PU-07-152 and included increased demand for crude oil in the U.S., ease of current pipeline bottlenecks in North Dakota and surrounding areas, which have caused depressed prices for western North Dakota crude oil, temporary influx of workers during construction, and purchase of supplies, as well as property tax payments to the State.
12. The Keystone Pipeline project utilizes a conversion of a natural gas line in Canada running from Alberta, Canada to a point north of eastern North Dakota. The use of this converted gas line has both economic and environmental benefits. (VC Tr. Pg. 151)
13. Keystone is required to obtain a Presidential Permit from the United States Department of State (DOS). DOS is responsible for preparing an Environmental Impact Statement for the entire project, as required by the National Environmental Policy Act. (NEPA) (VC Tr. Pg. 152)

B. Pipeline Routing and Location

14. The route selection process for a project such as Keystone involves numerous iterations. (VC Tr. Pg. 156)
15. The first step is to identify the project objectives. In the case of Keystone, the objective is to move crude oil from a major supply source in Alberta, Canada to delivery points in the States of Illinois and Oklahoma. (VC Tr. Pg. 156)
16. The next step is to identify control points. There are two main control points for locating the pipeline route through North Dakota. The use of the existing natural gas line in Canada defines where the project enters North Dakota, and the suitable crossing of the Missouri River at Yankton, South Dakota serves as a control point at the South Dakota border. (VC Tr. Pgs. 156-157)
17. The route development process also involves identification of constraints and opportunities. (VC Tr. Pg. 158)
18. Keystone established a study area for the pipeline, collected environmental data, such as wetland, species data and soil information. (VC Tr. Pg. 158)

19. In determining its corridor and route, Keystone sought to avoid or minimize sensitive environmental features, such as wetlands. (VC Tr. Pg. 158)
20. Keystone sought input from professionals and state agencies, as well as public comment to refine the initial route option. The proposed route and corridor was developed with input from numerous sources, including agencies, landowners, the public in general, and as a result of extensive studies. (VC Tr. Pg. 159, BI Tr. Pg. 80)
21. The proposed route of the Keystone Pipeline does not cross any of the exclusion areas as defined by the North Dakota Public Service Commission. (VC Tr. Pg. 160)
22. The Keystone Pipeline crosses one avoidance area in the Tetrault Woods State Forest associated with the Pembina River crossing. The pipeline will not impact this avoidance area because Keystone will use Horizontal Directional Drilling (HDD) to place the pipeline under the forested areas of the State Forest and the Pembina River. (VC Tr. Pg. 160)
23. Nineteen residences are located within the 500 foot avoidance area of the Keystone Pipeline. Of these, 18 owners have signed written waivers of these avoidance areas. (VC Tr. Pg. 161)
24. The one residence (Wittenberg) where a waiver has not been obtained is located 425 feet from the pipeline. See Ex. T-7. The pipeline is located across a county road from the residence and does not cross property owned by the residence owner. The pipeline can not be moved further than 425 feet to the west of the residence because of a pond. Re-routing even further to the west would require the route to be moved a significant distance, add additional length, and impact additional landowners. Moving the pipeline 500 feet or more to the east of the residence would route the pipeline through the actual property of the residence owner, add additional length, involve more road crossings, and impact additional landowners. (Bismarck Volume I (BI) Tr. Pg. 69)
25. The owner of this residence did not testify against the location of the pipeline at the hearings. The residence owner has not agreed to have the pipeline put 500 feet east of his residence, which would be located on his property, and has not answered phone calls or responded to mailed inquiry. (BI Tr. Pgs. 69-70, 259-261, Ex. T-32 Pg. 2)
26. There is no reasonable alternative for the route location at the Wittenberg area. (BI Tr. Pg. 69)
27. Keystone has prepared a reroute on the Bures property to avoid possible burial mounds. Mr. Bures is satisfied that the proposed reroute will avoid the cultural resource issues that he was concerned about. (BI Tr. Pg. 214)

28. Keystone has prepared a reroute on the Zacharias property to the west, which according to Mr. Zacharias, would be less likely to encounter cultural resource artifacts. (BI Tr. Pg. 215)
29. The I-29 corridor was considered for possible location of the Keystone Pipeline. Keystone rejected the options of locating the pipeline within the I-29 right-of-way or adjacent to the I-29 right-of-way. (BI Tr. Pg. 66)
30. According to the North Dakota Department of Transportation Policy Manual, location of the Keystone Pipeline within the I-29 right-of-way would not be permitted. (BI Tr. Pgs. 122-123)
31. Location of the pipeline route adjacent to the I-29 right-of-way was rejected because I-29 includes numerous overpasses and interchanges which would require the project to deviate away from the corridor at frequent locations, increasing the length and impact of the pipeline; interstate highways tend to connect areas of development, which would result in the need for further deviation from the corridor, increasing length and impact; and the I-29 corridor is not consistent with control points for the project route, including the U.S./Canada border crossing location and the Missouri River crossing point. (BI Tr. Pgs. 85-86)
32. Keystone is proposing an open cut crossing for the Sheyenne River. The U.S. Army Corps of Engineers and the North Dakota State Health Department have to approve the method that Keystone uses to cross the Sheyenne River. (BI Tr. Pg. 236)
33. Aligning the Keystone Pipeline route and corridor adjacent to the existing Alliance Pipeline route would increase the length of the Keystone Pipeline by over 100 miles, which would increase the number of landowners affected and have a greater environmental impact. (BII Tr. Pgs. 506-507)
34. The proposed route and corridor across the entire State of North Dakota minimize the impact to the environment and to the landowners of the State of North Dakota. (BI Tr. Pg. 80)

C. Construction Impact Mitigation

35. Construction of the Keystone Project will involve approximately 500 construction workers working on two spreads. One crew will start at the Canadian Border and work southerly approximately 130 miles and the second crew will start northeast of Valley City and work southerly to the South Dakota border. (VC Tr. Pg. 169)
36. Keystone estimates that with decent weather conditions, the pipeline crew will move

approximately one-and-one-half mile per day, and landowners will be impacted on their land for approximately 8-12 weeks. (VC Tr. Pg. 169)

37. The typical construction right-of-way for the Keystone Pipeline will be 110 feet wide made up of a 50-foot permanent easement and a 60-foot wide temporary work space that will revert back to the landowner once construction is completed. (VC Tr. Pg. 165)
38. The Keystone Project will require additional work space in areas where there are large excavations, river and stream crossings, highways and railroads. (VC Tr. Pg. 165)
39. The Keystone Project will require 20-30 acre pipe yards for the storing of pipe, to be located approximately every 30 miles along the pipeline. Keystone tries to find land that has previously been used for some type of commercial use: if that type of land cannot be found, Keystone looks to farmland or other land. (VC Tr. Pg. 165)
40. The Keystone Project will have two or three 20-acre contractor yards in North Dakota. (VC Tr. Pg. 166)
41. Keystone Pipeline has prepared a detailed Construction Mitigation and Reclamation Plan (CMR Plan) that describes procedures for crossing agricultural, cultivated lands, wetlands, streams and the procedures for restoring or reclaiming and monitoring those features crossed by the project. The CMR Plan is a summary of the commitments that Keystone has made for environmental mitigation, restoration and post monitoring compliance, and the adoption of these procedures minimizes the impact associated with the project. (VC Tr. Pg. 162)
42. Keystone's CMR Plan is a compilation of mitigation requirements that minimizes the impacts to land during construction. It covers all types of land the pipeline crosses including wetlands, water bodies, grassland, and pastureland. It also covers noise and dust control during construction, management of weeds, fire prevention and spill prevention and containment during construction. (BI Tr. Pgs. 198-199)
43. The CMR Plan also covers dust control, control of noxious weeds, topsoil removal, storage and replacement, erosion and sediment control and reclamation. (VC Tr. Pg. 167)
44. Keystone will use ripping tools or para-plows to relieve compaction along the right-of-way, to return the agricultural land to the same compaction as adjacent land, and to return agricultural fields to their previous productivity. (VC Tr. Pg. 176)
45. The CMR Plan provides that Keystone will restore the land to the best of its ability to its original productivity. (VC Tr. Pg. 164)
46. FERC, the agency that predominantly regulates gas pipelines, typically requires topsoil to

be removed up to a depth of 12 inches. (BI Tr. Pgs. 282-283)

47. To the extent practical, all effects of pipeline construction will be mitigated. All lands disturbed will be returned to their current land uses. No permanent direct or indirect adverse affects effects are anticipated. (BI Tr. Pgs. 158-159)
48. Keystone will bore the pipeline beneath any paved or well-maintained road. (VC Tr. Pg. 174)

D. Environmental Preservation

49. The Keystone Pipeline Project does not cross public water supply wetlands or surface water supply in lakes. (BI Tr. Pg. 140)
50. Keystone must obtain a Clean Water Act Section 404 Permit from the Corps of Engineers, as well as a Section 401 Water Quality Certificate from the State of North Dakota. These permits will ensure protection of wetlands and other water bodies. (BI Tr. Pg. 145)
51. The North Dakota Health Department (DOH) division of water quality is responsible for water quality in the state. (BII Tr. Pgs. 509, 511)
52. Jim Horner, a geologist with DOH who deals with water quality testified that he was comfortable and satisfied with the location of the Keystone Pipeline Project from a groundwater perspective. (BII Tr. Pgs. 515-516)
53. Michael T. Sauer is a senior scientist from the division of water quality DOH. Sauer administers the Clean Water Act Section 401 program for the state. Section 401 is a water quality certification process that applies to the Section 404 permitting process administered by the U.S. Corps of Engineers. (BII Tr. Pg. 533-34)
54. A Section 404 permit cannot be issued to the Keystone Pipeline Project without a Section 401 water quality certification from the DOH. Anything DOH puts into the Section 401 certification relative to water quality is transcribed verbatim into the Section 404 permit, as a condition of the 404 permit. (BII Tr. Pg. 535)
55. Clean Water Act Section 401 deals with surface water components, river crossings, wetland crossings and considers the construction methods used in river crossings. (BII Tr. Pg. 538)
56. DOH does not have the Section 404 application from the U.S. Corps of Engineers. Once the Section 404 application is complete it is put out for public review and review by other agencies. (BII Tr. Pgs. 534-535)

57. DOH has the ability to change the route of the Keystone Pipeline Project with a denial of the 401 certificate. DOH will be looking closely at the Sheyenne River crossing relative to water quality, and ecological community structure dynamics on the river. (BII Tr. Pgs. 544-545)
58. The North Dakota Game and Fish Department has indicated that it does not believe that the Keystone Pipeline Project will have any significant effects on wildlife or wildlife habitat, including rare or protected species provided best management practices are implemented. (BI Tr. Pg. 136)
59. Keystone, consistent with consultations with the U.S. Fish and Wildlife Service (USFWS) and consistent with discussions with the North Dakota Game and Fish Department, surveyed all the areas identified as being potential habitat for species on the endangered species list. (BI Tr. Pgs. 155, 188)
60. Keystone will be obtaining either a concurrence letter or a biological opinion from the USFWS. Keystone is not applying for a "take permit" and does not anticipate USFWS including a take permit in its opinion. (BI Tr. Pgs. 163, 190-191)
61. Seventy percent (70%) of the project surface disturbance will occur on agricultural lands that are annually tilled. These are lands that are already taken out of native habitat status. (BI Tr. Pg. 148)
62. Irreversible and irretrievable commitments of natural resources are anticipated to be minimal for the proposed project. Surface water will be used short term for hydrostatic testing but no extended consumptive use of water resources. All areas of natural vegetation within the right-of-way will be reclaimed, and no agricultural lands will be taken permanently out of production except for land used to install above ground facilities, (i.e. pump stations and valves). (BI Tr. Pgs.149, 158, 161, 167) (Ex. T-2 Application for Certificate of Corridor Compatibility Pg. 16)
63. Impact to animal health and safety will be minimized through sound construction and operation practices. (BI Tr. Pgs. 146-147)
64. Impact to plant life would be limited to the disturbed portions of the right-of-way. (BI Tr. Pg. 162)
65. Keystone will allow trees and shrubs to regenerate along the construction right-of-way and down to an approximate 30 foot strip over the permanent right-of-way. (BI Tr. Pg. 165)
66. Keystone has identified five locations where more than 110 feet of tree clearance may be

needed for extra work space (EWS) in tree areas. This EWS would be limited to 25 feet beyond the standard 110-foot construction right-of-way. (Ex. T-33)

67. Keystone will inventory trees and shrubs in a wood lot and riparian areas by using a sampling method. Trees in a shelter belt or narrow wind break 30 feet or less would be actually counted for the inventory. (BI Tr. Pgs. 218-219, Ex. T-4)
68. As recommended by the North Dakota State Forester, Keystone has proposed to inventory trees in wind break and shelter belt areas that are 1-inch diameter at breast height and in non-wind break and non-shelter belt areas to inventory trees that have a 3-inch diameter at breast height. (BI Tr. Pg. 220 Ex. T-4)
69. Keystone agrees to inventory for replacement of all shrubs in areas where the topsoil is disturbed and not preserved. (BI Tr. Pg. 221 Ex. T-4)
70. Keystone needs 25-35 feet to weld and place the pipe on skids and to have equipment to travel along and pick up the pipe and place it in the ditch. (BI Tr. Pg. 222-223)
71. All the dirt that comes out of the trench (spoil) needs to be placed in the easement area. (BI Tr. Pg. 222)
72. Due to these construction and safety concerns, Keystone cannot safely limit the tree cuts to 50 feet width in wood lot areas. Keystone agrees to limit the width of construction right-of-way through these woody areas (in excess of 50 feet in length) to 85 feet where practical. (BI Tr. Pg. 223 Ex. T-4)
73. The proposed alignment of the Keystone Pipeline Project where it crosses the Pembina River is east of the area generally considered the Pembina Gorge. The pipeline will be horizontally directionally drilled under the river. The depth of the pipeline will be a minimum of 35 feet under the river and 40 feet under the trees. (Park River (PR) Tr. Pg. 161) (BI Tr. Pg. 109) (BI Tr. Pgs. 138-139) (Ex. T-28)
74. The proposed facility will not affect any noise sensitive land uses, have no visual effect on adjacent areas, no impact on any extraction or storage resources and no permanent impact on wetlands. (BI Tr. Pgs. 142-144) (Ex. T-29)
75. Keystone will manage the sound levels of the five pump stations in North Dakota to EPA guidelines of 55 dBa at the nearest noise sensitive area. No residences or businesses are located within the 55 dBa perimeters from the pump station. (Ex. T-29)
76. The proposed facility would have no impact on communication facilities. (BI Tr. Pg. 146)

E. Landowner Relations

77. The Keystone Pipeline Project in North Dakota requires easements across approximately 519 tracts of land. As of September 12, 2007, Keystone has acquired 344 easement agreements representing 66% of the total easements required in North Dakota. (Ex. T-37)
78. Keystone's land agents have contacted landowners for environmental survey permission, cultural resource survey permission, civil survey permission and land acquisition. (Ex. T-32)
79. Keystone conservatively estimates that in excess of 1,500 landowner contacts have been made with North Dakota landowners. Nine of these contacts have resulted in complaints. Keystone has investigated all of these complaints and has filed with the Commission the follow up actions that have been or will be taken by Keystone to address these complaints. (Ex. T-32)
80. Keystone has written letters of apology to two landowners when survey crews inadvertently went on the landowner's property without permission and has implemented procedures to minimize the potential for miscommunication between landowners and survey crews. (Ex. T-32)
81. Keystone has received survey permissions from 95 percent of the landowners in North Dakota. (BI Tr. Pg. 236)
82. Keystone takes landowner relations very seriously because pipelines will continue to be a neighbor with the landowners after construction. (BI Tr. Pg. 236)
83. If in the future a landowner wishes to develop land that is subject to a Keystone Pipeline easement, the landowner can build up to the 50-foot permanent easement (25 feet either side of center of the pipeline). (BI Tr. Pgs. 212-213)

F. Pipeline Integrity

84. Keystone conducted a threat analysis as part of the environmental review process under the National Environmental Policy Act (NEPA), using industry lists and the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) guidelines, and determined the applicable threats to the Keystone pipeline. Keystone then developed safeguards as part of the project design, construction, and operations to protect against each of these potential threats. (BII Tr. Pg. 396)
85. Keystone considered manufacturing defects. To safeguard against such defects, Keystone qualifies all pipe mills and steel manufacturers using a formal qualification process consistent with the industry and international standards to which quality control is managed in the industry. (BII Tr. Pgs 397-398)

86. The pipe is engineered with stringent chemical requirements. Each batch of pipe is mechanically tested to prove its strength, fracture control and fracture propagation property. (BII Tr. Pg. 398)
87. Pipe in the mill is hydrostatically tested for seam defects. Pipe seams are inspected using ultrasonic instruments and visually inspected. Coating is applied in the mill and the coating plants have similar quality control procedures. (BII Tr. Pgs. 397-398)
88. Keystone considered construction damage. To safeguard against such damage, Keystone will follow applicable industry guidelines for overland transportation and barging over water. The pipe is examined selectively once offloaded from railcars using ultrasonic techniques. The pipe welds which are joined in the field are non-destructively inspected. One hundred percent of the girth welds are inspected. (BII Tr. Pgs. 399-400)
89. An electronic device called a holiday detector or jeep will traverse along the pipe to check for any nick or damage to the coating and repair it before the pipe is put into the trenches. Any defects in the coating are repaired prior to lowering the pipe into the ditch. (BII Tr. Pgs. 399-400)
90. The pipe is again hydrostatically tested once placed in the ditch. At the completion of construction, Keystone will fill the pipeline with water and hydrostatically test the pipeline for leaks and for the integrity of the pipeline as constructed. The pipeline is tested to 125% of its maximum operating pressure. Any pipe that is failed under hydrostatic testing is removed and replaced and the pipeline is again tested. (BII Tr. Pg. 400) (VC Tr. Pg. 175)
91. Once construction is complete, Keystone will run an in-line inspection tool (caliper pig) to check for dents or ovalities. Any defects found will be removed. (BII Tr. Pgs. 399-400) (VC Tr. Pgs. 172, 175, 179)
92. Keystone considered corrosion damage. To safeguard against external corrosion damage, a fusion bond epoxy (FBE) coating is applied to the pipe. In addition, the pipeline has a cathodic protection system that impresses current onto the pipeline to protect it from corrosion in the event any coating is damaged and not repaired or missed during the repair process. In the 28 years that TransCanada has been using FBE coating, there have been no leaks on this type of pipeline using FBE coating coupled with cathodic protection. (BII Tr. Pgs. 401-403) (VC Tr. Pgs. 179-180)
93. To protect against internal corrosion, Keystone's tariff will restrict the amount of solid and water that is acceptable in the crude oil transported. In addition, Keystone is designed to transport crude oil in turbulent flow so that the oil will move at a velocity at which water drop out is minimal and there is no stagnant water in the pipeline. (BII Tr. Pgs 401-402)
94. Keystone also uses cleaning tools during the life of the pipeline and periodically inspect the pipeline to push out any standing water that may remain at low points. To mitigate against

- internal and external corrosion, Keystone uses in-line inspection tools outfitted with sensors that can detect metal loss on internal and external pipe walls. (BII Tr. Pgs. 401-402)
95. Keystone considered mechanical damage, which is damage that results from contact with the pipeline. Keystone will utilize high-strength carbon steel, that is engineered with puncture resistance. (BII Tr. Pg. 404)
 96. The pipeline will be buried at four feet, which drastically reduces the likelihood of contact with the pipeline. (BII Tr. Pg. 404)
 97. Keystone will conduct air patrols per code requirements, which is 26 times a year, not to exceed three weeks apart, to monitor for third-party activity. Keystone will participate in the State One-Call program, install marker signs, and implement a public awareness program. (BII Tr. Pgs. 404-405) (VC Tr. Pgs. 179-180)
 98. Keystone considered hydraulic damage. There are two safeguards in place for the overpressure protection of the pipeline. The SCADA system controls the valves and brings pressure, temperature, and other data to the control center. Also, operator training serves to protect against overpressure of the pipeline. (BII Tr. Pg. 406)
 99. Keystone is using the State One Call System to locate existing utilities, waterlines and septic systems, fiber optic cables, sewer lines and other utilities. Keystone works with these utilities and will enter into agreements concerning inspection and methods of crossing these utilities. (VC Tr. Pgs. 173-174)
 100. Three years after the pipeline has been placed into operation, Keystone will conduct an in-line inspection to ensure the integrity of the pipeline it manages, and will investigate any anomalies found by this inspection. (VC Tr. Pg. 181)
 101. Normal farming practices would not impact the pipeline, because it is designed to manage any stress of equipment crossing the pipeline. (BII Tr. Pg. 421)
 102. Check valves close virtually instantaneously at a detection of a pressure loss. The automated block valves close within three minutes of an emergency shutdown. (BII Tr. Pg. 410)
 103. Pipelines are the safest method of transporting crude oil. To transport 435,000 barrels would require 7,000 trucks to transport the oil every day. (BII Tr. Pg. 430)
 104. There are approximately 2,124 miles of hazardous liquid pipelines in North Dakota. Approximately 1,024 miles of the total are crude oil pipelines. (Ex. T-34)
 105. There have been 14 pipeline incidents in the last 20 years related to crude oil facilities in North Dakota. Eight occurred at pump stations, one occurred at a tank farm and five

occurred on the pipeline. There is a clear correlation between older pipeline vintage and pipeline failure incidents. (Ex. T-34)

106. Since the implementation of DOT PHMSA integrity management rule for hazardous liquid pipelines in 2001, only one incident has occurred in North Dakota, and that was caused by third-party damage. (Ex. T-34)

G. Pipeline Leak Detection/Emergency Response Facts

107. The Keystone Pipeline Project will have a SCADA system (Supervisory Control and Data Acquisition) system. It is comprised of three components: (i) equipment installed at the pump stations and valve sites; (ii) a communications link so the equipment can speak to the host system in the control center in Calgary; and (iii) the host system installed in the operations control center in Calgary that allows the operator to remotely control and operate the pipeline. (BII Tr. Pgs. 433-437)
108. The host system is a fully redundant system. There is one operating system plus a “hot standby” system that can be utilized in the event of trouble with the primary system. (BII Tr. Pgs. 436-437)
109. Within the host system are automatic systems that ensure that the line cannot be over-pressurized at any time. There are also protective features in the local systems installed at the pump stations to ensure that, in the event of a communications failure, the local equipment will take over and ensure that the line cannot be over-pressurized. (BII Tr. Pg. 435)
110. Keystone will have a number of complimentary leak detection systems available within the operations control center, which is manned on a 7-day a week basis, 24 hours a day. (BII Tr. Pg. 436)
111. The first system consists of the operators monitoring the system. They monitor the flow information coming back from the remote locations and typically are capable of detecting leaks very rapidly down to a level of 25 to 30 percent of the pipeline flow rate. (BII Tr. Pg. 436)
112. The second system is a software based, volume-balance system that looks at the volume going into the system and out of the system and compares the two. This system is capable of detecting leaks down to a limit of about five percent. (BII Tr. Pgs.436-437)
113. The third part of the leak detection system is a computational pipeline monitoring system that breaks the pipeline down into smaller segments bounded by flow measurement equipment. It measures volume into and out of a segment every few seconds and looks for discrepancies. Any discrepancies are added up quickly and an alarm will sound. (BII

Tr. Pg. 437)

114. Keystone estimates that leaks at the 1.5 to 2 percent threshold will be detected by the computational monitoring system within 140 minutes. Very small leaks, which could be measured in drips per hour, may take up to 90 days to detect. Leaks just below the 1.5 percent threshold would be discovered much sooner than 90 days. (BII Tr. Pgs. 438-439)
115. The final system used to detect leaks is direct observation, which includes aerial patrols, ground patrols, public and landowner awareness programs, design to encourage reporting of leaks and other events that may suggest a threat to the integrity of the pipeline. (BII Tr. Pg. 437)
116. Control center operators monitor the volume balance system, and if they notice a discrepancy that is not large enough to trigger an automatic alarm, they will take action to verify such as shutting down the pipeline and isolating it into segments to determine if a segment is losing pressure. (BII Tr. Pgs. 439-440)
117. Leaks that are small in nature will come to the surface due to the fact that the dirt placed over the top of the pipeline has not been compacted to the same degree as the virgin ground on either side. Small leaks don't leave the right-of-way, but migrate to the surface following the path of least resistance. (BII Tr. Pg. 462)
118. Keystone's leak detection system meets or exceeds the requirements of 49 CFR Part 194 and 49 CFR Part 195. (BII Tr. Pg. 491)
119. Keystone has prepared a preliminary Emergency Response Plan (ERP) as prescribed by 49 CFR Part 194 and contained in Appendix A of the application (July 6th supplemental filing). (BII Tr. Pg. 442) (Ex. T-27)
120. Keystone will prepare and submit a completed ERP to PHMSA (Pipeline Hazardous Materials Safety Administration) for review in the first quarter of 2009, prior to the commencement of operations. (BII Tr. Pg. 482)
121. Under the ERP, Keystone will have first responders (Keystone employees or contract personnel), on call 24 hours a day 365 days per year, located at various points along the Keystone Pipeline Project, typically near High Consequence Areas. (BII Tr. Pg. 445)
122. Under the ERP Keystone will deploy site specific emergency response equipment at various points along the Keystone Pipeline Project. (BII Tr. Pg. 450)
123. Under the ERP the pipeline is divided into three response zones. Response zone one begins at the Canada/U.S. border and proceeds to a point just in the southern part of

South Dakota where response zones two and three then cover the balance of the system. (BII Tr. Pg 442-443)

124. Keystone maintains a 24-hour response or contact phone number which is posted on all of the right-of-way signs, facility signs, published within all of Keystone's public awareness materials and provided annually to all property owners along the pipeline route. (BII Tr. Pg. 443)
125. Under the ERP, spill detection and on-scene spill mitigation procedures are identified which would include the SCADA system which will continuously monitor the pipeline conditions and update information provided to the OCC operator. (BII Tr. Pg. 448)
126. If there was a leak from the Keystone Pipeline Project, DOH would be involved in the assessment and abatement of the leak, and require the leak to be cleaned up, excavation, and whatever else is required. (BII Tr. Pg. 570)
127. The Keystone Project will be monitored 24-hours a day, 365-days a year. It will have a computer system that will detect changes in pressure along the pipeline and ensure that all of the facilities are working properly. (VC Tr. Pg. 180)

H. Spill Risk Analysis

128. Preliminary spill analysis was done for the Keystone Pipeline Project by DNV Energy, a recognized industry expert. (BII Tr. Pg. 292)
129. DNV estimated the chance of a leak for the Keystone Pipeline to be no more than one every 7 to 11 years over the entire length of the pipeline. (BII Tr. Pg. 293)
130. Using the most conservative frequency interval of 7 years, the DNV estimate equates to a spill of no more than one in 42 years on the 218 miles of pipeline in North Dakota. (BII Tr. Pg. 293)
131. Approximately 80% of the aquifers along the entire Keystone Pipeline Project are overlain by low permeability soils and confining materials that would inhibit the infiltration of crude oil to the aquifers. (BI Tr. Pg. 296)
132. Additionally, the majority of aquifers are more than 50 feet deep, so the majority of aquifers crossed by the pipeline have a low susceptibility to contamination and the chance of a spill occurring at a location that could impact an aquifer is very low. (BI Tr. Pg. 296)
133. Studies show that if a spill does happen to reach an aquifer, the extent of contamination is actually quite small in area. (BI Tr. Pg. 297)

134. At the Bemidji, Minnesota spill, where 10,000 barrels (42,000 gallons) were released, the BTEX, (benzene, toluene, ethyl benzene and xylene), plume moved 170 yards from the crude oil source over a 20-year period. (BII Tr. Pgs. 296, 298-299)
135. In 500 sites with BTEX contamination, the EPA found that BTEX moves much slower than the groundwater because of natural attenuation, i.e. microbes eating the hydrocarbons. (BII Tr. Pg. 297)
136. At these 500 sites 75% of BTEX plume moved less than 250 feet from the source of contamination and in 80% of the cases the plume was stable or decreasing in size. (BI Tr. Pg. 297)
137. Since 2002, the median-sized oil spill (half spills more and half spills less) reported to PHMSA is 12 barrels or 500 gallons. (BII Tr. Pg. 295)
138. At the Bemidji spill vegetation across the majority of the site looks just like the non-contaminated right-of-way. Where vegetation is sparse, topsoil had been stripped and never replaced. (BII Tr. Pgs. 299-303)
139. Most spills are small. In order for the oil spill to get out of the trench and mobilize itself to get into a stream channel, it would have to be a large spill, (thousands of barrels.). (BII Tr. Pg. 311)

I. Fordville Route Location Facts

140. Keystone evaluated the risk of a spill from the proposed Keystone Pipeline route to the Fordville Aquifer. (BII Tr. Pgs. 304)
141. This analysis included evaluation of terrain, stream flow, overland transport, sub-surface transport, combined with probability of spill. (BII Tr. Pg. 304)
142. The margin of the Fordville Aquifer at its closest point is approximately three linear miles away from the Keystone Pipeline route. (BII Tr. Pg. 305)
143. The groundwater wells in the Fordville Aquifer are 6.5 miles from the Keystone Pipeline. (BII Tr. Pg. 305)
144. The depth of the groundwater in the Fordville Aquifer is 0 to 30 feet and averages 20 feet. (BII Tr. Pg. 306)
145. The soils in the area are permeable with infiltration rates of 0.4 to 12.6 feet per day. (BII Tr. Pg. 306)

146. There is a 200 foot in elevation from the pipeline over the three miles to the margin of the aquifer. This calculates to a 1.3% slope and is relatively flat. This slope will not significantly enhance overland transport. (BII Tr. Pg. 307)
147. If a spill occurred, most spills would be contained in the pipeline trench or slightly adjacent to it. (BII Tr. Pg. 307)
148. There is a check valve in the Fordville Aquifer area around mile post marker 49. (BII Tr. Pg. 408)
149. If a very large spill occurred, the oil could come out of the trench and move following the terrain downhill. The overland movement is limited to a few hundred feet and no more than a half mile, because the crude oil adheres to soils and vegetation. Because of the distance oil would have to travel between the pipeline and the Fordville Aquifer, overland transport is eliminated as a viable exposure route. (BII Tr. Pg. 307)
150. Transport down a dry stream channel was eliminated as a viable route, since oil would only have to travel the three and one-half river miles to reach the margin of the aquifer. If a spill reached a dry channel, oil would adhere to soils and vegetation. Even with a large spill volume, the movement of oil would be limited to no more than one-half mile. As a result, the chance of a spill reaching the aquifer via a dry stream channel is highly improbable. (BII Tr. Pgs. 309-310)
151. The entire Middle Branch and the North branch of the Forest River across the majority of the Fordville Aquifer are gaining stream reaches, meaning that groundwater from the Fordville Aquifer is pushing up from below and flowing into these streams. (BII Tr. Pg. 311, 314) (Exh. T-9)
152. In the area of the gaining stream reaches, the chance of a spill is no more than once in 4,800 years. If a spill occurred and it was large enough to get to a flowing stream channel, and if it reached the Fordville Aquifer, it would float on the water. Dissolved constituents from the oil could not enter the aquifer itself since it is a gaining stream reach (i.e., water from the aquifer is entering the stream). In addition, there would be time for emergency response teams to get there, contain, and start cleanup. (BII Tr. Pg. 313)
153. In a gaining stream reach, there is no chance for the contaminants to push down and get into the aquifer itself. (BII Tr. Pg. 314)
154. The northern portion of the North Branch of the Forest River is a losing stream reach, where water from the stream enters the Fordville Aquifer. There are 1.9 miles of pipe where a hypothetical oil spill could potentially transport oil to the margin of the aquifer, assuming water was flowing at the time of the spill. Using the most conservative spill

frequency, a spill is estimated in the losing stream reach to occur no more than once in 8,300 years. (BII Tr. Pgs. 315-316) (Exh T-9)

155. For a spill to reach the losing stream reaches, it would have to be large enough to get to the river channel, then be transported downstream to the margin of the Fordville Aquifer which would take two hours. It is five miles to the surficial portion of the aquifer, and ten miles to the wells. However, the public wells are not along the stream channel where a hypothetical oil spill would be contained. Consequently, for the public wells to become contaminated, the oil's dissolved constituents (e.g. BTEX compounds) would need to be transported subsurface in the aquifer for miles to reach the well intakes. Crude oil and its constituents would not move that far. (BII Tr. Pgs. 317-318)
156. Only five percent of the recharge of the Fordville Aquifer comes from the upper reaches of the North Branch of the Forest River. Because it is such a small fraction of the total recharge, any contaminants would be diluted. (BII Tr. Pg. 318)
157. Trace metals in the crude oil are complexed with the crude oil itself, meaning that they prefer to be with the hydrocarbons with which they are bound. Therefore, their toxicity is lower since they are less bioavailable than free elements. (BII Tr. Pgs. 323-324)
158. Crude oil floats on top of surface water and groundwater. Typically, oil is confined by the soils and materials around it. The crude oil would not move great distances. It has a high affinity to soil, and it is hard for crude oil to move in the soil. (BII Tr. Pg. 326 -327)
159. The crude oil itself would not migrate substantially. The dissolved constituents, such as the BTEX compounds would likely move only hundreds of feet. Consequently, in the event of a spill, crude oil would not likely be transported three miles to reach the aquifer, nor would the constituents be capable of reaching the public water wells. Therefore, subsurface transport is eliminated as a viable exposure route. (BII Tr. Pg. 306, 325)
160. If the BTEX contamination got into the aquifer, the compounds movements would be limited to hundreds of feet, not miles. The contaminants will not reach the public water wells. (BII Tr. Pg. 319)
161. Considering a combined chance of a spill occurring in the 1.9 miles, feeding into the losing stream portion of the North branch of the Forest river, the spill would have to be large enough to get out of the trench and would have to get into a flowing intermittent stream, be transported all the way downstream, and then dissolved constituents would have to get into the Fordville Aquifer in sufficient concentrations is highly improbable. The chance of these constituents then traveling miles from the stream channel to reach the public wells is highly improbable. (BII Tr. Pgs. 319-320)
162. Jim Horner, North Dakota Department of Health – Groundwater Quality, concurred with

Keystone's spill risk analysis witness, Heidi Tillquist, in her testimony concerning the location of the Keystone Pipeline in the Lake Ashtabula and Fordville Aquifer areas. (BII Tr. Pg. 530)

163. Horner agreed that the location of the Keystone Pipeline in the Fordville area is safe in its present location and that Horner is not concerned about the risk of the Keystone Pipelines to the Fordville Aquifer. (BII Tr. Pgs. 530-531)

J. Suggested Relocation of Route in Fordville Area

164. At the public hearings in Valley City and Park River, some members of the public suggested that the pipeline route should be moved either to the east of the Fordville Aquifer or further to the west. (BI Tr. Pg. 74)
165. Keystone looked at a route concept to the east of the Fordville Aquifer. (BI Tr. Pg. 76)
166. The east route concept involved a route length of 160 miles, was 15 miles longer than the proposed Keystone Pipeline route, involved more road crossings, more stream crossings and approximately 2 more miles (29 more acres) of wetland crossings. (BI Tr. Pg. 76)
167. The west route concept involved a route 8-9 miles west of the current proposed Keystone location. The western route concept is three miles longer than the currently proposed Keystone Pipeline route and involves over ten times the quantity of wetlands (2.7 more miles and 43 more acres of wetlands). (BI Tr. Pg. 77)
168. Both the eastern and western route concepts in the Fordville area would affect a greater number of landowners and are inferior from an environmental impact standpoint to the proposed Keystone route alignment. (BI Tr. Pg. 77)
169. The Fordville alternative route concepts would have a greater environmental impact than the proposed Keystone Route. (BI Tr. Pg. 123)
170. The proposed Keystone Pipeline alignment in the Fordville area represents the minimal environmental impact and minimal impact to the landowners. (BI Tr. Pg. 77)
171. Keystone has acquired easements from 230 of the 358 property owners or 64% of the easements along the section of the proposed Keystone right-of-way that would be affected by the eastern route concept. (BI Tr. Pg. 76)
172. Keystone has acquired easements from 70 of the 118 tracts of land or 59% of the easements along the proposed Keystone right-of-way that would be affected by the western reroute concept. (BI Tr. Pg. 77)

173. The western route concept in the Fordville Aquifer area would only decrease the risk of a spill reaching the Fordville Aquifer slightly. (BII Tr. Pg. 336)
174. A leak would have to be thousands of barrels in order to get out of the pipeline trench, start moving across the ground, get into the channel and then get downstream in sufficient volumes to cause any adverse effects downstream. That size of spill would be capable of being detected and would trigger the emergency response plan. (BII Tr. Pg. 336)
175. Regardless of whether the proposed Keystone Route or the western route concept is used, there is not any way for the contaminants within the oil to traverse the distance to get to the public water intakes. (BII Tr. Pg. 340)
176. The western route concept in the Fordville area would have a known environmental impact that will occur on the wetlands. The known impact on wetlands has a greater weight than a rare, hypothetical event, which conservatively would be expected to occur no more than once in 8,300 years and even then would be highly improbable to get to the public wells. (BII Tr. Pg. 358)
177. The total proposed Keystone route alignment through the State of North Dakota crosses approximately 14.7 miles (197 acres) of wetlands. This amounts to approximately 6% of the total construction disturbance. (Ex. T-2 Pg. 31, Ex. T-10a)
178. The Keystone pipeline is safe where it is proposed to be located in the Fordville area. It does not pose a significant threat to the Fordville Aquifer, so moving it is not going to significantly change the overall assessment. (BII Tr. Pg. 381)
179. At the direction of the Commission, Keystone engaged Richard Kuprewicz of Accufacts, Inc., an independent pipeline consulting firm, to provide a review of external leak detection systems and a recommendation for pipeline leak detection in the vicinity of the Fordville Aquifer. (BII Tr. Pgs. 478-479)
180. Accufacts reported that Keystone's current design approach using internal computer-based leak detection (computational pipeline monitoring CPM) is more appropriate for the location. A CPM leak detection system is better suited to identify high-rate pipeline releases that even though a low probability might reach the boundaries of the Fordville Aquifer in unusual conditions. (Ex. T-36)
181. In Accufacts' opinion, external leak detection systems are not warranted in the Fordville Aquifer area because the pipeline is not located in an "ultra-sensitive area." (Ex. T-36)
182. Less than 0.1% of the approximately 200,000 miles of liquid transmission pipeline in the United States currently incorporate real-time computer-based external leak detection systems. (Ex. T-36)

183. The use of external vapor detectors is not a general practice that is used in the pipeline industry. (BII Tr. Pg. 476)

184. Accufacts concluded that because of the various factors, (e.g., distance from Keystone Pipeline, low gradient of terrain between the pipeline and aquifer, soil conditions, as well as characteristics of the crude oil blends), low rate or a seepage leak is not a legitimate threat to the Fordville Aquifer. (Ex. T-36)

K. Impact of Adopting Fordville Reroute Concept on Project

185. The western reroute concept in the Fordville area has not been refined into an actual route. If the Commission required Keystone to adopt the western reroute concept as an actual reroute, thereby requiring Keystone to move a 50-mile segment of the pipeline route eight miles to the west, a number of issues would arise which would have a significant on the Keystone project schedule.

186. The so-called western reroute is only a concept at this time and that there has not been any routing work done on what is currently only a line on a map. In order to develop an actual route in this area, Keystone would have to follow the route development steps testified to by witness Koski.

187. This work could not start until issuance of the Commission's decision in this case, which is anticipated in November.

188. The work would start with the collection of data on the new 50-mile segment and the development of an initial route proposal based on that data. Keystone would have to solicit agency and public input on the initial route proposal and engage in further route refinement based on that input. This route refinement process would take two to three months.

189. Keystone would be required to undertake cultural surveys, wetland surveys, and civil surveys, as well as updating its risk and consequence analysis and rerunning its hydraulic analysis. The additional surveys and studies would then have to be incorporated into further route refinement. This work would probably take on the order of another three months.

190. The cultural surveys and other studies could not be done in the winter and would probably not commence until April 2008.

191. When all of this work was completed, presumably Keystone would have to file the new route proposal with the Public Service Commission for review.
192. The reroute would be submitted to the Department of State along with the studies and surveys. The magnitude of the proposed reroute would likely trigger a supplemental NEPA process that could take six to nine months. (BII Tr. Pgs. 379, 495-499)

L. Sheyenne River-Lake Ashtabula Route Facts

193. At the public hearing in Valley City a suggestion was made to move the pipeline to the east further away from the Sheyenne River and Lake Ashtabula. (BI Tr. Pg. 78)
194. Shifting the pipeline one and one half to two miles to the east puts the pipeline in the drainage system of the Maple River which drains into the Sheyenne. It would also move the Pipeline closer to shallow aquifers and involves crossing one and a half more miles of wetlands. (BI Tr. Pg. 78)
195. The Sheyenne River Alternative Route Concept would have a greater environmental impact than the proposed Keystone Route. (BI Tr. Pg. 123)
196. The proposed Keystone Pipeline alignment in the Sheyenne River-Lake Ashtabula area minimizes the impact to the landowners and to the environment. (BI Tr. Pg. 79)

M. Sheyenne River-Lake Ashtabula Spill Risk Facts

197. In the Sheyenne River-Lake Ashtabula area the pipeline is over two and one-half linear miles away from the water body, so sub-surface transport is not a viable route for crude oil to reach the Sheyenne River or Lake Ashtabula. The terrain is flat to the Sheyenne River, so overland transport is not a viable route for the crude oil. All of the intermittent streams, except for one stream that is right at the Sheyenne River, are at least 1.6 miles away from the river and, when dry, would not be a viable route for crude oil to reach the Sheyenne River. (BII Tr. Pg. 363)
198. The overall pipe that could contribute to a spill reaching the river is 2.8 miles. This results in a conservative risk of a spill reaching the river at once every 5,400 years. (BII Tr. Pg. 364)
199. The Keystone Pipeline is located in the Sheyenne River-Lake Ashtabula area it is on a terrace where the slope is zero. (BII Tr. Pg. 367)
200. The spill frequency figures considered any size spill. In order to get to the river a large spill of thousands of barrels would need to occur. To calculate the risk associated with a large spill, it would add a couple zeros to the already big frequency interval numbers. (BII Tr. P. 367-368)

201. The Keystone Pipeline is safe where it is proposed to be located in the Sheyenne River and Lake Ashtabula area. The risks to the Sheyenne River and Lake Ashtabula are low. In discussing the proximity of the Keystone Pipeline to Lake Ashtabula, Jim Horner concurred with the testimony of Heidi Tillquist, that the pipeline is safe at its present location. Mike Sauer testified that he will be looking very closely at the Sheyenne River crossing relative to water quality. (BII Tr. Pgs. 381, 384, 530)

LEGAL ARGUMENT

General Commission Siting Issues:

Issue No. 1: The location, construction and operation of the Keystone Pipeline will produce minimal adverse effects on the environment, natural resources and upon the welfare of the citizens of North Dakota.

Issue No. 2: The Keystone Pipeline is compatible with the environmental preservation and the efficient use of resources.

Issue No. 3: The Keystone Pipeline corridor and route will minimize adverse human and environmental impact while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely fashion.

A. Testimony of Expert Witnesses Supports Application for Corridor Certificate and Route Permit.

At the hearings, Keystone called seven witnesses that testified in support of Keystone's Application for Corridor Certificate and Route Permit. Dean Cowling, Mike Koski, Scott Ellis, L.A. ("Buster") Gray, Heidi Tillquist, Meera Kothari and Brian Thomas testified.

Dean Cowling testified that there was a demonstrated need for the facility, that Keystone has the ability to construct and operate the pipeline, and the economic and environmental reasons for locating the pipeline in this area of the State. Cowling testified that Keystone is required to obtain a Presidential Permit from the DOS and that DOS is preparing an EIS for the entire Keystone Pipeline Project.

Mike Koski testified about the extensive studies and research that Keystone did and the input Keystone received from professionals, state agencies and the public to refine the proposed Keystone Pipeline route. Koski also testified that the proposed Keystone route minimizes adverse effects on the environment, natural resources and the people of North Dakota.

Buster Gray testified that Keystone has committed to follow a Construction Mitigation and Reclamation Plan (CMR Plan) and that Keystone is committed to restore the land to the best of its ability to its original productivity. Gray testified that as of September 12, 2007, Keystone had acquired 66% of the total easements required in North Dakota.

Scott Ellis testified that there would be minimal irreversible or irretrievable commitments of natural resources should the proposed corridor and route be designated. Surface water will be used short term for hydrostatic testing but no extended consumptive use of such water resources. Also all areas of natural vegetation within the right-of-way would be reclaimed, and no agricultural lands would be taken permanently out of production except for land used to install above ground facilities, pump stations and valves.

Heidi Tillquist testified that based on conservative estimates, the chance of a leak on the entire Keystone Pipeline in North Dakota would be at most one in 42 years. Tillquist testified that half the leaks are small 12 barrels (500 gallons) or less. Tillquist testified that the Keystone Pipeline is safe in the Fordville and Sheyenne River-Lake Ashtabula areas and is not a significant threat to public health and welfare.

Meera Kothari is a professional engineer with Keystone, responsible for the pipeline design and integrity management for the project. Kothari testified that Keystone conducted a threat analysis as part of the NEPA process, using industry lists and the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) guidelines, and determined the applicable threats to the Keystone pipeline. Keystone then developed safeguards as part of the project design, construction, and operations to protect against each of these potential threats.

Brian Thomas testified that Keystone will have a Supervisory Control and Data Acquisition (SCADA) system that will allow the operations control center in Calgary to receive information and remotely control and operate the pipeline system. There are automatic systems in the control center and protective local systems to prevent over-pressurization of the pipeline. Keystone will have a number of complimentary leak detection systems, capable of automatically detecting leaks down to 1.5 percent of the pipeline flow rate. Other leak detection systems will be available to detect leaks below that level. Thomas testified that Keystone's leak detection system meets or exceeds federal requirements. Thomas testified that Keystone has prepared a preliminary Emergency Response Plan (ERP) and will submit the ERP to the DOT's Pipeline Hazardous Materials and Safety Administration in the first quarter of 2009.

The Intervenor called two witnesses from the North Dakota Department of Health.

Jim Horner testified that he was satisfied with the location of the Keystone Pipeline from a groundwater perspective. Horner concurred with Heidi Tillquist's risk analysis testimony concerning the location of the Keystone Pipeline in the Lake Ashtabula and Fordville Aquifer areas.

Mike Sauer testified that he administers the Section 401 water quality program for the State. When DOH gets the 404 Application from the U.S. Corps of Engineers it will be put out for review by public and other agencies. DOH can put conditions dealing with surface water, river crossings and wetland crossings into the 401 and 404 permits, and even change the route of the Keystone Pipeline Project with a denial of the 404 permit.

Neither of the Interveners' witnesses contradicted the testimony of Keystone's witnesses, nor did they testify that Keystone's Application for Corridor Certificate or Route Permit should not be granted or that they had any objections to the proposed corridor or route of the Keystone Pipeline.

B. Public Testimony.

At the public hearings in Valley City, twelve members of the public testified. Two members, Paul Ptacek and Bernard Vculek testified in favor of the Keystone Pipeline Project. The ten others were opposed to the project or its location. Two, Paul Matthews and Richard Starke testified at both Valley City and Bismarck.

At the public hearings in Park River, eleven members of the public testified, two, Harold Bergquist and Duane Otto testified in favor of the Keystone Pipeline Project, the nine others were opposed to the project or its location.

At the public hearing in Bismarck, two new members of the public testified in opposition to the pipeline or its location.

Two witnesses, Frances Bures and Vaughn Zacharias raised concerns about the location of the pipeline in relation to burial mounds and cultural resource issues. Keystone proposed reroutes on the Bures and Zacharias property that the owners believe will avoid the burial mounds and cultural resource artifacts.

Paul Mathews' residence was located 156 feet away from the pipeline and he objected to the pipeline being so close to his home. Keystone shifted the route further to the east and it is now in excess of 500 feet from the Mathews' residence. Mathews has been provided with an easement with the reroute in excess of 500 feet from his residence.

Terry Ellingson expressed concerns about replacing topsoil, multiple lines in the easement and liability questions. These issues were addressed by Keystone witnesses. Topsoil must be segregated and replaced up to 12 inches in depth if available. Keystone cannot place another pipeline within the easement without future Commission approval. Dean Cowling testified that Keystone agrees: "To pay commercially reasonable costs and indemnifies and holds the landowner harmless for any loss, damages, claims or actions resulting from Keystone's use of the easement, except to the extent such loss, damage, claims or actions result from negligence or willful misconduct of the landowner or agents."

Richard Starke testified that the pipeline was not needed and should be located either in the I-29 corridor or in western North Dakota. In late 2006, Starke purchased land south of I-94 east of Valley City. Starke testified that he or his son would someday like to develop into residential lots. Starke does not have a development at present, nor does he have the area platted for sale. If the land would be developed after the pipeline was in place, lots could be sold and built on up to the 50-foot permanent easement (25 feet either side of the centerline of the pipe). Starke's concern is a compensation issue to be determined in the easement acquisition, not a siting issue.

The public raised issues concerning safety of public water supplies and location of the pipeline in the Fordville Aquifer area and Sheyenne River-Lake Ashtabula area.

The majority of public witnesses at the hearings testified that they have concerns about the event of a pipeline leak and crude oil reaching the Fordville Aquifer or Sheyenne River-Lake Ashtabula and impacting public drinking water supplies. However, none of these concerns were supported by any scientific or expert testimony.

C. The location of the pipeline in the Fordville Aquifer area and Sheyenne River-Lake Ashtabula will produce minimal adverse effects on the environment, natural resources and upon the welfare of the citizens of North Dakota.

Heidi Tillquist testified that even a large spill could not get to the Fordville Aquifer or Sheyenne River-Lake Ashtabula by means of sub-surface transport, over land transport, or by dry river bed streams. Tillquist testified that in order for a spill to get out the trench and mobilize itself to get into a flowing stream channel, it would have to be a large spill (thousands of barrels). Tillquist testified that since 2002, the median-sized oil spill (half spills more and half spills less) reported to PHMSA is 12 barrels or 500 gallons.

The only possible way a spill could get to either the Fordville Aquifer or Sheyenne River-Lake Ashtabula would be if the spill occurred at or near a flowing river or stream. The conservative estimate of a spill of any size happening in proximity to a flowing stream was one time in 8,300 years in the losing reaches of the North Branch of the Forest River; one time in 4,800 years in the gaining reaches of the Middle and North Branches of the Forest River; and one time in 5,400 years in the Sheyenne River-Lake Ashtabula area.

Tillquist testified that these estimates were based on conservative figures and that if one factored in that the spill would have to be a large spill, these spill frequency figures would approximate one time every 480,000 - 830,000 years.

Tillquist testified that even in the highly unlikely event that a large crude oil spill occurred, it was highly improbable that any crude oil or BTEX compounds would reach any public water well or intake in either the Fordville Aquifer or Sheyenne River or Lake Ashtabula areas.

One Intervenor witness, Jim Horner, a geologist with the DOH responsible for groundwater safety issues, testified that he has no concerns with the proposed Keystone route from a groundwater protection standpoint and concurred with Ms. Tillquist that the proposed Keystone route in the

Fordville aquifer area is safe. He further testified that he concurred with Ms. Tillquist's testimony that the proposed route in the Lake Ashtabula area is safe.

The scientific testimony of Tillquist and Horner that the location of the Keystone Pipeline is safe has not been challenged by any scientific testimony on the record.

Keystone witnesses have established that the location of the Keystone Pipeline will produce minimal effects on the environment, natural resources and upon the welfare of the citizens of North Dakota, and that the Keystone Pipeline is compatible with environmental preservation and the efficient use of resources.

D. The Western Route Concept in the Fordville Aquifer Is Not Justified.

Because the proposed route of the Keystone Pipeline through the Fordville area is safe and not a danger to the Fordville Aquifer, looking at the western route concept is not warranted.

While the western reroute concept could slightly increase the transit time for crude oil to reach the Fordville Aquifer, the western reroute concept would only result in an incremental change in risk. While it might be "safer" as Horner testified, it would only slightly decrease the already highly improbable risk of a spill reaching the Fordville Aquifer.

On the other hand, the western route concept would have a known impact on 2.7 additional miles of wetland (40 additional acres). This amounts to almost a 20 percent increase in wetlands impacted across the entire state of North Dakota. Tillquist testified that the known impact to wetlands outweighed the highly improbable event of crude oil getting into the Fordville Aquifer and the highly improbable event of BTEX compounds reaching the public wells in the aquifer.

Dean Cowling testified that, if the Commission required Keystone to adopt the western route concept as an actual reroute, thereby requiring Keystone to move a 50-mile segment of the pipeline route eight miles to the west, a number of issues would arise which would have a significant on the Keystone project schedule. Cowling testified that the so-called western route is only a concept at this time and that there has not been any routing work done on what is currently only a line on a map. In order to develop an actual route in this area, Keystone would have to follow the route development steps testified to by witness Koski. This work could not start until issuance of the Commission's decision in this case, which is anticipated in November. The work would start with the collection of data on the new 50-mile segment and the development of an initial route proposal based on that data. Keystone would have to solicit agency and public input on the initial route proposal and engage in further route refinement based on that input. This route refinement process would take two to three months. Keystone would be required to undertake cultural surveys, wetland surveys, and civil surveys, as well as updating its risk and consequence analysis and rerunning its hydraulic analysis. The additional surveys and studies would then have to be incorporated into further route refinement. This work would probably take on the order of another three months. Moreover, the cultural surveys and other studies could not be done in the winter and would probably not commence until April 2008. When all of this work was completed, presumably Keystone would have to file the new route proposal with the Public Service Commission for review. Further, the reroute would be

submitted to the Department of State along with the studies and surveys. The magnitude of the proposed reroute would likely trigger a supplemental NEPA process that could take six to nine months.

If the western route concept was considered additional notices and public hearings would be required before the Commission which could take six months.

The effect of considering this western route concept would be to unnecessarily delay the entire Keystone Pipeline Project and unreasonably delay the direct and indirect benefits of the Keystone Pipeline to North Dakota, its citizens and to the United States.

The proposed Keystone Pipeline corridor and route minimizes adverse human and environmental impact, while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely manner.

Issue No. 4: It is appropriate for the Commission to waive the procedures as requested in the application including the request for a single consolidated application for Corridor Certificate and Route Permit.

Section 49-22-07.2 N.D.C.C. provides, in part, that:

“The commission, after hearing and upon a finding that the proposed facility is of such length, design, location or purpose that it will produce minimal adverse effects. . . may issue an order waiving specified procedures and time schedules required by this chapter or by the rules adopted pursuant to this chapter including, but not limited to, applications, motions, and hearings. . .”

Keystone applied for a waiver and requested the Commission approve and allow a joint and simultaneous filing of its application for a Certificate of Corridor Compatibility and Route Permit.

The Commission held combined hearings on both the corridor and route application. The combined proceeding was not objected to by the Interveners, and no adverse affect was shown or testified to at the hearings. Keystone has shown that the proposed pipeline is of such length, design, location and purpose that it will produce minimal adverse effects.

Keystone respectfully requests the Commission to enter an order waiving the procedures requested and granting a single consolidated application for Corridor Certificate and Route Permit.

Issue No. 5: No North Dakota State agency has filed opposition to the proposed Keystone Pipeline Project, Corridor or Route.

N.D.Admin. Code §§69-06-01-05 sets out that the state agencies and local governments entitled to notice of public hearings on the application for corridor certificates and route permits. In addition, Keystone provided notice of its Application, held numerous public meetings and had individual contact with agencies. (See Exhibit T-35) None of these agencies testified at the Commission hearings or filed comments with the Commission asking that the corridor certificate or

route permit should be denied or that they had any objections to the proposed corridor or route. A Department of Health witness, Jim Horner, called by the Intervener testified favorably for the Keystone Pipeline Project.

Issue No. 6: A large diameter pipeline requires up to an 85-foot clear cut through extended wooded areas.

The Commission has in the past put a condition in pipeline siting orders that “The width of clear cuts through any wooded areas and shelter belts shall be kept to a maximum of 50 feet where possible.

Keystone has proposed that this condition be modified in the Keystone Pipeline Order to read:

“The width of clear cuts through shelter belts shall be kept at a maximum of 50 feet, the width of clear cuts through extended lengths of wooded areas shall be kept to a maximum of 85 feet where possible.”

Buster Gray testified that a 30-inch large diameter pipeline cannot be safely constructed through an extended wood lot area within a 50-foot right-of-way. The reason is that the trench will be 3 ½ to 4 feet wide at the bottom and 10-15 feet wide at the top. The dirt that comes out of the trench (spoil) needs to be placed in the easement area. Then Keystone needs 25-35 feet to weld and place the pipe on skids and to have equipment travel along and pick up the pipe and place it in the ditch. This amounts to 35-50 feet without counting any space for the spoil pile. Keystone needs more than 50 feet to work safely. In shelter belts or narrow strips of wooded areas, Keystone can manage with 50-foot clear cuts.

Keystone has identified six areas where a 25-foot extended work space in excess of the standard 110 foot right-of-way may be required. The areas are listed in Exhibit T-33.

Issue No. 7: Keystone could not utilize existing and proposed right-of-way as corridors for the Keystone Pipeline Project.

At the public hearings, the potential use of the I-29 corridor and use of existing pipeline corridors for the location of the Keystone Pipeline Project was discussed. Keystone witness Mike Koski testified that Keystone had considered and ruled out routing the pipeline either within or adjacent to the Interstate Route 29 corridor. Koski testified that routing the pipeline within the I-29 right-of-way was rejected because it is inconsistent with the North Dakota DOT accommodation manual for utilities, a position that is not uncommon with regard to interstate highways for safety and expansion reasons. Koski testified further that that locating the pipeline adjacent to the I-29 right-of-way was rejected for a number of reasons. First, interstate highways tend to involve a number of overpasses and exchanges, which tend to spur residential and commercial development or connect areas of development. This would require that a route along the interstate deviate away from the interstate at each interchange, which increases the overall length of the project and the number of

landowners that are impacted. Second, the location of the delivery point at Cushing, Oklahoma also eliminates the I-29 corridor as a suitable co-location opportunity.

Dean Cowling testified that existing pipeline right-of-ways in North Dakota are not located in areas that would allow Keystone to meet the overall routing objectives of the pipeline and would not allow Keystone to use the converted natural gas line asset in Canada, which is a benefit to both economically and environmentally. A decision not to use the converted gas pipeline, thereby moving the entry point in North Dakota could increase the length of the pipeline in North Dakota by over 100 miles.

Issue No. 8: No reasonable alternative exists for the locating the pipeline within 500 feet, (425 feet), of the Wittenberg residence.

N.D.Admin. Law §69-06-08-02(2) provides that:

“The following geographical areas shall not be considered in the routing transmission unless the applicant shows that under the circumstances there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the Commission may consider, among other things, the proposed management of adverse impacts, the orderly siting of facilities, system reliability and integrity, the efficient use of resources, and alternative routes . . .”

The proposed route for Keystone Pipeline location is 425 feet away from the Wittenberg residence, just within the 500 feet avoidance area.

The location of the Keystone Pipeline is across a section line road from the Wittenberg residence. The pipeline could not be moved further to the west because of a pond. Moving the pipeline 500 feet or more to the east of the residence would require a significant reroute adding additional length more road crossings, additional parcels and additional environmental impact. This would also put the pipeline on Wittenberg’s property. Wittenberg has not responded to inquiries from Keystone to see if Wittenberg would grant an easement to locate the pipeline on their property. Wittenberg did not appear at the public hearings and has not filed an objection to the location of the pipeline.

The distance of the pipeline and that it is located across a built up roadway from Wittenberg’s residence minimizes any adverse impact to Wittenberg’s residence. The pipeline can’t be moved to the west and to move the route to the east would not constitute an efficient use of resources.

Keystone respectfully requests approval of location of the Keystone Pipeline in an avoidance area in the Wittenberg area because there is no reasonable alternative for the proposed route location.

Issue No. 9: Keystone’s Tree and Shrub Mitigation Plan should be adopted by the Commission for the Keystone Pipeline Project.

The Commission has used the Tree and Shrub Mitigation Plan Ex. T-5 in a recent Enbridge Pipeline Order. Keystone believes that its proposed Tree and Shrub Mitigation Plan (Exh. T-4 and

attachment Exhibit 1 to Order), is more appropriate for the Keystone Pipeline Project and still requires a two for one tree replacement program as established by the Commission.

Keystone's plan provides for a scientific sampling method of inventorying trees in wood lots and riparian areas. This sampling method is used by governmental organizations to quantify trees within larger areas.

It is Keystone's position that its plan is warranted because of the number of tree locations along the pipeline (approximately 180) and because a significant number are on wood lots and riparian areas.

In the Commission's recent Enbridge Pipeline Order, the pipeline was located in the western part of the state. In western North Dakota there are fewer forested areas. Trees are mainly located in wind breaks and shelter belts. According to the North Dakota Forester, one-inch diameter trees are more important in wind breaks and shelter belts than they are in wood lots. The Keystone Pipeline is located in eastern North Dakota where there are more wood lot areas. The North Dakota Forester recommended that in these wood lot areas, three-inch diameter trees at breast height should be inventoried and replaced.

The Keystone plan actually reduces the maintained corridor area over the pipeline from the Commission's Plan of 50 feet (25 feet either side of center line) to 20-30 feet total width; this lessens the impact of the pipeline. The necessity for an 85-foot clear cut in wood lot areas because of the size of the pipe is addressed above.

Keystone's plan gives property owners a 60-day period to respond to a request if they want the 2-1 replacement trees planted on their property. This is more practical than having to go back to owners to get signed waivers to indicate that they don't want their trees replaced on their land.

Keystone's plan provides that tree/shrub replacements shall be inspected once a year for three years, on about the anniversary of the plantings. On or shortly before October 1 of each year, a report shall be submitted to the NDPSC documenting the condition of the replacement planting. If the survival rate is less than 75 %, the commission may order additional plantings. Keystone's proposal is consistent with previous Commission orders in which it ordered monitoring the survival rate of the replacement trees for three years after planting and has ordered additional plantings if survival rates are less than 75%.

Issue No. 10: A Computer-Based External Leak Detection System in Fordville Aquifer Area is not warranted.

At the public hearing in Bismarck, the Commission requested Keystone to look into external leak detection systems, evaluate and then submit a report on computer-based external leak detection systems as Exhibit T-36.

To fulfill this requirement Keystone contacted Richard Kuprewicz of Accufacts, Inc., an

independent pipeline consulting firm to provide a review of computer-based external leak detection systems and make a recommendation for pipeline leak detection in the vicinity of the Fordville Aquifer. Mr. Kuprewicz has over 30 years of experience and has written numerous publications on pipeline safety, risk analysis and leak detectors. (Exhibit T-36)

Kuprewicz, in the Accufacts report, determined that an external leak detection system is not warranted in the proposed location of the Keystone Pipeline in the Fordville Aquifer because that area is not in an “ultra-sensitive area.” An “ultra-sensitive area” is defined as an area “where a low rate or seepage pipeline release could reach a sensitive area, have serious consequences and not be remediated.”

Kuprewicz found that because of the following factors: distance from the Keystone Pipeline, low gradient terrain between pipeline and aquifer, soil conditions, as well as characteristics of the crude oil blends, a low rate or seepage leak from the Keystone Pipeline would not be a legitimate threat to the Fordville Aquifer. Therefore, the Fordville Aquifer is not an “ultra-sensitive area.”

Heidi Tillquist’s testimony is consistent with Kuprewicz’s opinion that small leaks would not reach the Fordville Aquifer.

The Accufacts report found that Keystone’s current design approach utilizing internal computer-based leak detection (computational pipeline monitoring or CPM) is more appropriate for this location than a computer-based external leak detection system. The CPM leak detection system is better suited than an external leak detection system to identify high-rate pipeline releases which, even though of low probability, might reach the boundaries of the Fordville Aquifer.

Exhibit T-36 analyzes four different computer-based external leak detection approaches. In doing this Kuprewicz used “four core principles established over decades of experience involving pipeline siting, design, operation/maintenance, emergency response, and environmental remediation in some of the most sensitive areas of the world: 1) the approach reliably works in the field as expected or claimed (field application and theory can be two entirely different situations), 2) the technology must be cost effective compared to other reasonable alternatives, 3) the technology cannot be overly complicated or complex (increases likelihood of breakdown or failure), such that it hinders the safe operation of the pipeline (such as generating numerous false alarms to get one true alarm), and 4) the system must not create the illusion of safety (fail to work when needed) creating overconfidence in the system’s capabilities.

The vast majority of real-time computer-based external leak detection approaches utilize direct indication where the fluid or its vapor contacts a sensor or receptor to trigger identification of a possible release. There are usually limits to the length of a pipeline segment that can be reliably monitored by computer-based external leak detection.

Accufacts reviewed the following computer-based leak detection systems:

- A. Fiber Optic Monitoring
- B. Hydrocarbon Electric Sensing Cable
- C. Hydrocarbon Vapor Monitoring
- D. Acoustic Emission Monitoring

Accufacts determined that none of these four computer-based external leak detection systems are warranted in the Fordville Aquifer area.

Kuprewicz reviewed the Keystone Pipeline Key parameters and found that this segment of the pipeline is bracketed on the upstream side by Pump Station (PS) #15 (at MP 33.1), and on the downstream side by a check valve (V-47 at MP 49.7), and PS #16 (at MP 77.7). The pump stations contain remotely operated block valves commanded by the control center that can isolate the pipeline segment.

A release on the pipeline segment (MP 48 to MP 58) that might be considered a possible risk to the “gaining,” or discharge zones, of the Fordville Aquifer can be responded to by conventional spill response and cleanup, as oil reaching these areas will not enter the aquifer.

Low-rate releases are associated with small holes or cracks and, given the distance from the aquifer (at least 3 linear miles from the pipeline at its closest point); Kuprewicz concurs with Tillquist’s basic conclusions that threat to the Fordville Aquifer from slow rate releases is essentially non-existent. In the event of such a low-rate leak, Keystone should have time to determine such an event before it becomes a major consequence.

Kuprewicz, in the Accufacts report, concluded “that real-time computer-based external leak detection for the Keystone Pipeline in the vicinity of the Fordville Aquifer is unwarranted as this pipeline segment is not located in an ultra-sensitive area. Because of various factors (e.g., distance from the Keystone Pipeline, low gradient of the terrain between the pipeline and the aquifer, soil conditions, as well as characteristics of the crude oil blends), low-rate or seepage leak is not a legitimate threat to the Fordville Aquifer. Keystone’s current design approach utilizing internal computer-based leak detection efforts (computational pipeline monitoring, or CPM) is more appropriate for this location. Real-time computer-based external leak detection is intended to more quickly identify low-rate releases, and the additional complexities associated with such systems are not justified for the protection of the Fordville Aquifer.”

Keystone’s leak detection witness, Brian Thomas, concurred with the findings and conclusions contained in the Accufacts report that Keystone’s current design approach utilizing internal computer-based leak detection systems is more appropriate for this location. Accordingly, Keystone respectfully requests that the Commission not require a computer-based external leak detection system in the Fordville area.

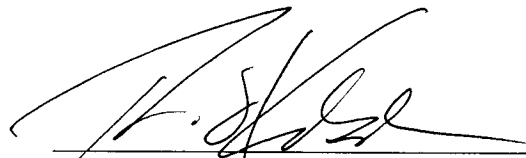
CONCLUSION

Keystone has shown in its application for Public Convenience and Necessity Case No. PU-07-152 that the Keystone Pipeline Project will provide a benefit to the people of the United States and of North Dakota.

Keystone has through uncontested expert testimony shown that the location, construction and operation of the Keystone Pipeline will produce minimal adverse impacts. The location, construction, and operation of the Keystone Pipeline will produce minimal adverse effects on the environment, natural resources and upon the welfare of the citizens of North Dakota. The Keystone Pipeline is compatible with the environmental preservation and the efficient use of resources. The Keystone Pipeline corridor and route will minimize adverse human and environmental impact while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely fashion.

Keystone respectfully requests a Corridor Compatibility Certificate designating a transmission facility corridor issued to Keystone, and a Route Permit Certificate designating a transmission facility route is issued to Keystone.

Dated this 15 day of October, 2007.



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