BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP07-001

IN THE MATTER OF THE APPLICATION OF TRANSCANADA KEYSTONE PIPELINE, LP FOR A PERMIT UNDER THE SOUTH DAKOTA ENERGY CONVERSION AND TRANSMISSION FACILITY ACT TO CONSTRUCT THE KEYSTONE PIPELINE PROJECT

Direct Testimony of Brenda Winkler on behalf of the
Staff of the South Dakota Public Utilities Commission
October 31, 2007

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DIRECT TESTIMONY OF BRENDA WINKLER

Q: Please state your name and address for the record.

A: Brenda L. Winkler, 953 Colorado Avenue, Whitefish, MT 59937

Q: What is your position at Bay West?

A: My title is Project Manager/Geologist. I have been employed at Bay West as a Project Manager/Geologist since 2000. In that capacity I have performed hydrogeologic and geologic investigation and remediation activities for State and Federal agencies.

Q: Please state your professional qualifications.

A: I have a BA in Geology from the University of Minnesota. I am a registered Professional Geologist in the states of Minnesota and Wisconsin. I have 21 years experience in the environmental industry, including 11 years working for engineering/consulting firms as a project manager/geologist performing hydrogeologic and geologic investigations for State and Federal agencies. From 1990 to 2000 I was employed by the Minnesota Pollution Control Agency (MPCA) where I served as a Project Manager/Geologist. At the MPCA I performed oversight of responsible parties and managed contractors in the investigation and remediation of groundwater, surface water, soil, and sediment in accordance with State and Federal Superfund statutes.

Q: Have you provided your resume?

A: Yes

Q: In what capacity are you involved in the TransCanada Keystone Pipeline, LP (Keystone) project?

A: The Staff of the South Dakota Public Utilities Commission (Staff) has hired Bay West to review certain application documents. The results of Bay West's review are presented in the attached Limited Application Review Report dated October 31, 2007. Bay West has been assigned 10 tasks to perform, of which, I am assigned to perform Task 7 and assist with Task 9:

Task 7 - Identify hydrogeological and geological sensitive areas vulnerable to crude oil.
Task 9 - Search for any other environmental impact issues of consequence not previously identified and shall propose mitigation measures for any found.

Q: Please summarize the objective of Task #7.

A: The purpose of Task #7 was to review the applicant's filings and available hydrogeological publications for the pipeline area and identify areas where the geology would be highly susceptible to a crude oil release from the pipeline. The hydrogeologic evaluation, focusing particularly on drinking water source area protections, was addressed as part of Task 3. Therefore this assessment focuses on geologically sensitive areas.

Q: Where there limiting factors that made it difficult to meet the objectives of Task #7?

A: Bay West's review was limited by time and to available published geologic maps in conjunction with the summaries provided in the Draft Environmental Impact Statement (DEIS). In addition, several attempts were made to contact representatives of the South Dakota Geologic Survey (SDGS) to discuss conclusions and summaries of the hydrogeologic and geologic data. However, the SDGS was not available during the time of the review.

Q: Please Explain the Findings, Conclusions and Recommendations associated with the performance of Task #7?

The DEIS presents a general overview of potentially sensitive geologic and hydrogeologic areas. The DEIS geologic summary generally coincides with SDGS geologic maps reviewed. In general an analysis of sensitive geologic and hydrogeologic areas is based on the potential due to geologic characteristics for surface contamination to reach ground-water resources. The type of geologic material present at the surface determines the vertical travel time for water-soluble, geologically inert contaminants released at the surface to reach the uppermost aquifer. Travel times are controlled by the permeability, and thickness of the geologic materials through which contaminants would move. The sensitivity of an aquifer is inversely proportional to the time of travel. Longer travel times are associated with both a greater degree of geologic protection and

reduced sensitivity to ground-water pollution. Shorter travel times represent an increased sensitivity and an inability to protect ground water from vertical contaminant movement. However, high sensitivity does not indicate that water quality has or will be degraded. Low sensitivity does not guarantee that ground water will remain pristine. In general the current published geologic maps available for the pipeline route do not contain enough detail information about distribution of surficial geologic materials and bedrock outcrops to allow for a complete evaluation of hydrogeologically and geologically sensitive areas. One potential highly susceptible geologic feature is the Niobrara Formation, a carbonate rock that can form fissures up to 1,000 feet long and 100 feet deep. Carbonate bedrock are typified hydrogeologically by very high flow rates along interconnected, solution-enlarged fractures and cavities, which may result in a very high sensitivity area where present, typically regardless of the depth to the water table.

The DEIS indicates the Niobrara Formation may be present in the southern half of the state from mile post (MP) 353 to 436 (Nebraska border). It also states that karst features are found in southern portions of Miner County, northern Hanson County, southern Hutchinson County, and all of Yankton County (ENSR 2006a). However, it does not describe what these features are. The SDGS First Occurrence Aquifer Maps indicate the Niobrara Formation is the first aquifer present in Beadle County, although it is greater than 100 feet below the ground surface and as you move south it can be between 50 to 100 feet below the ground surface. The aquifer maps suggest that the Niobrara Formation may cover a larger area than summarized in the DEIS. The Geologic Map of South Dakota indicates that the surfical Quaternary deposits can be as thick as 300 feet. However, depth to bedrock was not provided on the maps reviewed.

In concurrence with the DEIS, I recommend that additional measures be performed to assess the thickness of overburden and distribution of bedrock outcrops in the karst areas. Additionally, a detailed review of depth to bedrock maps, boring logs, and well logs should be completed to confirm the thickness of overburden and bedrock type along the pipeline ROW. This review could be supplemented through meetings with the SDGS and a field walking survey in areas where available information is limited and areas that have a potential for landslides and/or flooding where topography can change rapidly. Also, it is recommended that the karst features in Miner County, northern Hanson County, southern Hutchinson County, in the DEIS be further described and an analysis

of their potential impacts to the study area be completed. We would recommend that TransCanada report identified karst outcroppings within 0.5 miles of the pipeline ROW or areas of shallow overburden that could potentially be impacted by a crude oil release to the SDGS, SD PUC and United States Department of Transportation (USDOT). In addition to the karst areas, the Environmental Analysis section of the DEIS summarized other potential impacts and mitigation measures which in some instances included recommendations for further evaluation in the study area. These recommendations could best be addressed as conditions of the PUC issuing a construction permit for the project. Findings associated with this more detailed review should be provided to the USDOT, the SD PUC and the Geological Survey. The USDOT may use the findings to assess if this new information would cause some areas to be defined as geologically sensitive High Consequence Areas.

Q: With respect to Task #9, can you please summarize the objective of the task and explain your findings?

A: The purpose of this task was to call attention to and propose mitigation for other environmental impact issues of consequence not previously identified. The ability to identify environmental issues of consequence were somewhat limited by the documents reviewed as part of Bay West's scope of work. During the review of project documents, environmental issues of consequence, other than what were already identified by others or by Bay West (in other Tasks), have not been identified.

Q: With respect to Tasks 7, can you please state whether the project will: pose a threat of serious injury to the environment or the inhabitants within the siting area; substantially impair the health, safety or welfare of the inhabitants in the siting area; comply with all applicable laws and rules; or interfere with the orderly development of the region with due consideration being given the views of governing bodies of affected local units of government.

A: It is Bay West's opinion that the construction of the proposed Keystone Pipeline presents both significant and insignificant risk to the environment and inhabitants of South Dakota. The proper implementation of the regulatory design requirements, construction and operational requirements, TransCanada's proposed mitigation measures, and the

recommendations provided within this document, reduces, to currently recognized industry standards, the:

- threat (risk) of serious injury to the environment or the inhabitants within the siting area;
- complies with all applicable laws and rules (as they pertain to Tasks 7 and 9 of this document); and
- interference with the orderly development of the region with due consideration being given the views of governing bodies of affected local units of government.

TransCanada would be required to comply with all applicable laws and rules during construction and operation.

BRENDA WINKLER, PG
Project Manager

Education:
- BA Geology

Training/Registrations/Certifications/Licenses:
- Registered Professional Geologist (PG)
- 40-Hour OSHA Training
- CPR/First Aid Certification

Years Experience: 21
Years with Bay West: 7

Ms. Winkler has 21 years experience in the environmental industry, including 11 years as project manager for HTRW site investigation and cleanup for governmental customers, including the USACE and State Regulatory Agencies. She has managed USACE projects for the Omaha District, including the current Feasibility Study Lead for the Black Hills Army Depot; and the Lead Remedial Investigation/Feasibility Study for the Charles Melvin Price Support Center.

As a project manager/geologist for the Minnesota Pollution Control Agency, she managed responsible parties and contractors for remediation of groundwater, surface water, soil and sediment sites according to State and Federal Superfund statutes. She also coordinated development of the State's Risk-Based Site Evaluation Manual for Site Investigations and Remedy Selection on Superfund, Brownfield, and petroleum release sites; co-authored section on 'Incorporation of Planned Property Use Into Site Decisions.'

Relevant Projects:

- *Project Geologist, Former Waverly Radar Station Remediation/Restoration, IA, USACE Omaha*—Prepared Tier I Report and Tier II Workplan for a Task Order under Bay West's current ERS Contract at this FUDS site. Project consisted of an asbestos survey, asbestos abatement, building demolition, UST removal, and an Iowa DNR Tier 1 site assessment.
- *Project Manager, St. Louis River/Interlake/ Duluth Tar State Superfund Site, Duluth, MN Pollution Control Agency*—Prepared a SAP and QAPP to define sediment contamination and ecological impacts. Managed sampling activities. Assisting in development of ARARs. Prepared the Record of Decision for contaminated sediments. Prepared a CERCL Five-Year Review for the soil. The Site is largest contaminated sediment site in the State.
- *Project Manager, Reserve Mining Superfund Site, Two Harbors, MN Pollution Control Agency*—In conjunction with MPCA staff, developed and was awarded a $100,000 grant from Great Lakes Coastal Recreation group for investigation of ground water contamination at the site. Prepared and implemented SAP and QAPP for ground water investigation. Prepared the ground water investigation report. Prepared a Feasibility Study, Decision Document, and Response Action Plan for barrel removal.
- *Project Manager, Feasibility Study Development/Implementation, Milltown Reservoir Sediments Site, Bozeman, MT*—Assisted in development of the Feasibility Study for one of the largest contaminated sediment sites in the country. Developed standard operating procedures for the field investigation activities and environmental sampling procedures.
- *Project Manager, Perham Arsenic Superfund Site, Perham, MN Pollution Control Agency*—Compiled all historical site data into a comprehensive database for preparation of a CERCLA Five-Year Review. Completed the Five-Year Review Report.
- *Project Manager, Minnesota Slip Site, Duluth, MN Pollution Control Agency*—Prepared a Focused Feasibility Study for remediation of contaminated sediments.
- *Project Manager, Duluth Air Force Base FUDs Site Investigation, Remediation, O&M, MN Pollution Control Agency*—Managed investigation and cleanup of multiple operable units contaminated with various hazardous and petroleum contaminants (solvents, PAHs, and petroleum-related compounds).
- *Project Manger, Finland Air Force Base FUDS Site Groundwater Investigation and Remediation, Finland, MN Pollution Control Agency*—Managed cleanup (via pump-and-treat system) of groundwater, drinking water supply, and landfill contaminated with chlorinated solvents.

- Project Manager, St. Louis River/Interlake/ Duluth Superfund Site, MN – Because this site was partially located in WI, she worked with the WDNR during development of groundwater/surface water cleanup goals.