BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY TRANSCANADA KEYSTONE PIPELINE, LP FOR A PERMIT UNDER THE SOUTH DAKOTA ENERGY CONVERSION AND TRANSMISSION FACILITIES ACT TO CONSTRUCT THE KEYSTONE XL PIPELINE PROJECT	)	HP 09-001 **UPDATED DIRECT TESTIMONY OF HEIDI TILLQUIST**

1. Please state your name and address for the record.

Answer: My name is Heidi Tillquist. My business address is 1601 Prospect Parkway, Fort Collins, Colorado.

2. What is your role with the Keystone XL Pipeline Project?

Answer: I am a contractor of Keystone. I am employed as an environmental toxicologist, risk assessor, and project manager with AECOM Environmental (AECOM) in Fort Collins, Colorado (formerly ENSR). I am AECOM's National Pipeline Risk Assessment Coordinator. AECOM is providing environmental consulting services to Keystone with respect to the Keystone XL Project (Project).

3. Please provide a description of your areas of responsibility with the Project?

Answer: I am responsible for evaluating risk posed by the Project to human and environmental resources.

4. Please state your professional qualifications and experience with pipeline operations.

Answer: I have 19 years of experience in environmental toxicology and conducting risk assessments. I have worked on the permitting of over 5,000 miles of

pipeline projects including crude oil, refined products, natural gas liquid (condensate), and natural gas pipelines. I have conducted risk assessments of pipelines, oil and gas field developments, power plants, mining sites, and Superfund sites. I have authored reference texts, including a book discussing the environmental effects of crude oil in freshwater environments.

5. Have you provided a resume?

Answer: Yes, my resume is attached as Exhibit A.

6. Are you responsible for portions of the application which Keystone is filing with the South Dakota Public Utilities Commission seeking a permit under the Energy Conversion and Transmission Facilities Act?

Answer: Yes, I am individually or jointly responsible for the information provided in the following sections:

- Section 2.3.2.1 – SCADA and Leak Detection;
- Section 2.3.2.2 – Emergency Response Procedures;
- Section 2.3.2.3 – Remediation;
- Table 6 – Impact Summary Table;
- Section 5.3.4 – Soils;
- Section 5.3.6 – Seismic, Subsidence, and Slope Stability Risks;
- Section 5.4.2 – Groundwater;
- Section 5.4.3.2 – Spill Prevention;
- Section 5.5.1.1 – General Vegetation (Operations);
- Section 5.5.2.4 – Potential Impacts to Wildlife (Operations);
- Section 5.5.3.4 – Potential Impacts to Sensitive Species (Operations);
- Section 5.6.1 – Wetlands (Operations);
- Section 5.6.2.2 – (Aquatic Biota) Operational Impacts;

- Section 5.6.3 – Aquatic Sensitive Species;
- Section 5.8 – Water Quality and Uses (Operations);
- Section 6.1.2.1 – Pastureland and Rangeland (Operations);
- Section 6.1.2.2 – Cropland (Operations); and
- Section 6.5.2 – Protection of Human Health and Safety.

7. Could you briefly summarize the information that you are responsible for in Section 2.3.2.1 – SCADA and Leak Detection?

Answer: I analyzed the national hazardous liquid pipeline incident database maintained by the Pipeline and Hazardous Material Safety Administration (PHMSA). Section 2.3.2.1 discusses leak detection times and associated spill volumes.

8. Could you briefly summarize the information that you are responsible for in Section 2.3.2.2 – Emergency Response Procedures?

Answer: My analysis of the PHMSA pipeline incident database indicated that fire occurred in approximately two percent of the pipeline incidents.

9. Could you briefly summarize the information that you are responsible for in Section 2.3.2.3 – Remediation?

Answer: This section discusses remedial activities in the unlikely event of a spill. In the event of a spill, federal and state regulations dictate remediation. Decisions concerning remedial methods and extent of the cleanup will account for state-mandated remedial cleanup levels, potential effects to sensitive receptors, volume and extent of the contamination, potential violation of water quality standards, and the magnitude of adverse impacts caused by remedial activities. In coordination with federal and state

agencies, the appropriate remedial measures would be implemented to meet federal and state standards designed to ensure protection of human health and environmental quality.

10. Could you briefly summarize the information that you are responsible for in Table 6 – Impact Summary?

Answer: This table summarizes project impacts to human and environmental resources. I am responsible for the summary statements related to operational impacts, specifically those pertaining to spill impacts.

It is my expert opinion that the Project will not pose a significant threat of serious injury to the environment nor would it substantially impair the health, safety, or welfare of the inhabitants because the likelihood a pipeline release is low and adverse effects would be mitigated. I base this opinion on the following:

Keystone will employ multiple safeguards to prevent and minimize impacts from a potential pipeline release. Broadly, these safeguards encompass routing (e.g., minimize stream crossings; avoidance of sensitive resources, when practical), material selection (e.g., steel grade, pipeline coating), engineering design (e.g., valve locations, depth of cover), pre-operational testing (e.g., hydrostatic testing, non-destructive testing of welds), continuous operational monitoring (e.g., SCADA, aerial surveillance, leak detection systems, in-line inspection tools), and emergency preparedness (e.g., Emergency Response Plan, pre-positioned personnel and equipment, on-going integrity management planning). Consequently, the chance of a spill occurring is low. I have conservatively estimated (i.e., over-estimated risk) that the chance of a pipeline incident is no more than one spill in 7,400 years for any given mile of pipe. If a spill did occur, the volume is

likely to be relatively small (i.e., 3 barrels or less) and would likely be contained within the pipeline trench.

In the unlikely event of a pipeline release, as stated in the testimony of Witness John Hayes, Keystone would initiate its Emergency Response Plan (ERP) and Keystone teams would be immediately deployed to contain and clean up the spill. The ERP contains detailed information on notification procedures and contact information for appropriate federal, state and local agencies; emergency responder response locations; anticipated response deployment times; and trained emergency response personnel and associated equipment that would be deployed in an emergency. South Dakota-specific details of the ERP will be developed when the route is finalized, but prior to initiating pipeline operation.

If a spill affected the resources identified in Table 6, the appropriate remedial measures will be implemented to meet federal and state standards designed to ensure long-term protection of human health and environmental quality as described in Response #9.

11. Could you briefly summarize the information that you are responsible for in Section 5.3.4 – Soils?

Answer: This section summarizes potential impacts to soils from a pipeline release. It is my expert opinion that the Project will not pose a significant threat of long-term severe injury to soils because the likelihood a pipeline release is low, impacts would be localized, and adverse effects would be mitigated. I base this opinion on the rationale discussed in the answer to Question #10.

12. Could you briefly summarize the information that you are responsible for in Section 5.3.6 – Seismic, Subsidence, and Slope Stability Risks?

Answer: I am responsible for the statement that approximately one percent of the pipeline incidents are attributable to ground motion.

13. Could you briefly summarize the information that you are responsible for in Section 5.4.2 – Groundwater?

Answer: Impacts to groundwater during operations are expected to be low. Groundwater along the majority of the route is not very susceptible to contamination from a pipeline release due to the depths of the aquifers and presence of confining materials. Keystone consulted with the SD DENR during the routing process to identify and subsequently avoid sensitive aquifers and recharge areas (Source Water Protection Areas) in order to minimize risk to important public groundwater resources.

In those areas where shallow, unconfined aquifers exist, the likelihood of adverse affects is low due to the low probability of a spill and the factors described in Item #10 (i.e., safeguards, spill volumes, emergency response, and remediation).

If a spill were to occur, Keystone would immediately implement its Emergency Response Plan to contain and cleanup the spill. Infiltration rates in most areas will allow sufficient time for Keystone to detect, contain, and clean up the crude oil before long-term environmental impacts occur.

If groundwater were affected despite Keystone's efforts, groundwater contamination would tend to be localized within a few hundred feet of the spill site. If public or private groundwater wells were impacted by contamination, appropriate

remedial measures will be implemented to meet federal and state standards designed to ensure protection of human health and environmental quality.

Because the likelihood a pipeline release is low, impacts would be localized, and adverse effects would be mitigated, it is my expert opinion that the Project will not pose a significant threat of long-term severe injury to groundwater resources nor would it substantially impair the health, safety, or welfare of South Dakota inhabitants.

14. Could you briefly summarize the information that you are responsible for in Section 5.4.3.2 – Spill Prevention (Operations)?

Answer: I am responsible for the pipeline operational spill risk analysis. During routing, Keystone attempted to minimize the number of stream crossings. To avoid sensitive water resources, Keystone used PHMSA drinking water HCA data and consulted with the SD DENR during the routing process to identify and avoid surface water Source Water Protection Areas in order to minimize risk to important public surface water resources.

Where the Project crosses or is close proximity to surface waters, the likelihood of adverse affects is low due to the low probability of a spill, the low probability of a spill reaching a waterbody, and the factors described in Item #10 (i.e., safeguards, spill volumes, emergency response, and remediation).

If a spill were to occur, Keystone would immediately implement its Emergency Response Plan to contain and clean up the spill. Keystone will attempt to contain and clean up a release prior to its entering a surface waterbody.

If surface waters were affected despite Keystone's efforts, crude oil would spread downstream or across a waterbody. Crude oil floats on the water's surface providing the opportunity for Keystone to detect, contain, and clean up the crude oil before long-term environmental impacts occur. To minimize potential impacts to surface waters, particularly those that are public water sources, Keystone's emergency preparedness will evaluate transport of hypothetical crude oil spills in certain, sensitive waterways, identify locations where a release would be contained, and preposition emergency responders and the types of equipment needed to respond to a release in a timely and effective manner. Keystone would notify downstream water utilities if there was a potential for crude oil contamination to affect their water supply. Impacts to water quality in flowing streams are transitory. If water quality were affected, appropriate remedial measures will be implemented to meet federal and state standards designed to ensure protection of human health and environmental quality.

Because the likelihood a pipeline release is low and adverse effects would be mitigated, it is my expert opinion that the Project will not pose a significant threat of long-term severe injury to surface water resources nor would it substantially impair the health, safety, or welfare of South Dakota inhabitants. I base this opinion on the detailed rationale discussed in the answer to Question #10.

15. Could you briefly summarize the information that you are responsible for in Section 5.5.1.1 – General Vegetation (Operations)?

Answer: This section describes potential impacts to vegetative communities from a pipeline release. It is my expert opinion that the Project will not pose a significant threat of long-term severe injury to vegetation because the likelihood a pipeline release is low,

impacts would be localized, and adverse effects would be mitigated. I base this opinion on the rationale discussed in the answer to Question #10.

16. Could you briefly summarize the information that you are responsible for in Section 5.5.2.4 – Potential Impacts to Wildlife (Operations)?

Answer: This section summarizes potential impacts to wildlife from a pipeline release. It is my expert opinion that the Project will not pose a significant threat of long-term severe injury to wildlife populations because the likelihood a pipeline release is low, direct and indirect impacts to wildlife would be localized, and adverse effects would be mitigated. I base this opinion on the more detailed rationale discussed in the answer to Question #10.

17. Could you briefly summarize the information that you are responsible for in Section 5.5.3.4 – Potential Impacts to Sensitive Species (Operations)?

Answer: Potential impacts to wildlife sensitive species from a pipeline release are comparable to those described for most wildlife species (See Response #16). It is my expert opinion that the Project will not pose a significant threat of long-term severe injury to wildlife sensitive species populations because the likelihood a pipeline release is low, the probability of a sensitive species present at a release site is low, and adverse effects to habitat would be mitigated. I base this opinion on the detailed rationale discussed in the answer to Question #10.

18. Could you briefly summarize the information that you are responsible for in Section 5.6.1 – Wetlands (Operations)?

Answer: This section summarizes potential impacts to wetlands from a pipeline release. Wetlands comprise approximately 1.2 miles of the route in South Dakota. Based on my conservative estimation of spill frequencies, a spill within a South Dakota wetland would occur no more than once in 6,200 years. It is my expert opinion that the Project will not pose a significant threat of long-term severe injury to wetlands because the likelihood of a pipeline release is low, the robustness of wetland habitats, and adverse effects to water quality and habitat would be mitigated. I base this opinion on the detailed rationale discussed in the answer to Question #10.

19. Could you briefly summarize the information that you are responsible for in Section 5.6.2.2 – (Aquatic Biota) Operational Impacts?

Answer: This section summarizes potential impacts to aquatic biota from a pipeline release. It is my expert opinion that the Project will not pose a significant threat of long-term severe injury to aquatic biota because the likelihood of a pipeline release is low, the robustness of most aquatic populations to disturbance, and adverse effects to water quality and habitat would be mitigated. I base this opinion on the detailed rationale discussed in the answer to Question #10.

20. Could you briefly summarize the information that you are responsible for in Section 5.6.3 –Aquatic Sensitive Species?

Answer: Potential impacts to aquatic sensitive species from a pipeline release are comparable to those described for most aquatic species (See Response #19). It is my

expert opinion that the Project will not pose a significant threat of long-term severe injury to aquatic sensitive species populations because the likelihood of a pipeline release is low, the probability of a sensitive species present at a release site is low, and adverse effects to water quality and habitat would be mitigated. I base this opinion on the detailed rationale discussed in the answer to Question #10.

21. Could you briefly summarize the information that you are responsible for in Section 5.8 – Water Quality, Uses, and Availability?

Answer: This section describes potential impacts to water resources from a pipeline release. Potential impacts to water resources from a pipeline release were summarized in Response #14. Because the likelihood of a pipeline release is low and adverse effects would be mitigated, it is my expert opinion that the Project will not pose a significant threat of long-term severe injury to surface water resources nor would it substantially impair the health, safety, or welfare of South Dakota inhabitants. I base this opinion on the detailed rationale discussed in the answer to Question #10.

22. Could you briefly summarize the information that you are responsible for in Section 6.1.2.1 – Pasturelands and Rangelands (Operations)?

Answer: This section describes potential impacts to pasturelands and rangelands from a pipeline release. Potential impacts to soils and vegetation from a pipeline release were briefly summarized in Responses #11 and #15. Because the likelihood of a pipeline release is low and adverse effects would be mitigated, it is my expert opinion that the Project will not pose a significant threat of long-term severe injury to pasturelands or

rangelands. I base this opinion on the detailed rationale discussed in the answer to Question #10.

23. Could you briefly summarize the information that you are responsible for in Section 6.1.2.2 – Agriculture (Operations)?

Answer: This section describes potential impacts to agricultural lands from a pipeline release. Potential impacts to soils and vegetation from a pipeline release were briefly summarized in Responses #11 and #15. Because the likelihood of a pipeline release is low and adverse effects would be mitigated, it is my expert opinion that the Project will not pose a significant threat of long-term severe injury to agricultural lands. I base this opinion on the detailed rationale discussed in the answer to Question #10.

24. Could you briefly summarize the information that you are responsible for in Section 6.5.2 – Protection of Human Health and Safety?

Answer: This section describes federal regulations that ensure the safe operation of the pipeline. Pipeline safety regulations use the concept of High Consequence Areas (HCAs) to identify specific locales and areas where a release could have the most significant adverse consequences. HCAs, defined by PHMSA regulations, include high population areas, sensitive drinking water resources, and ecologically sensitive resource areas that could be damaged by a hazardous liquid pipeline release. To ensure protection of these sensitive resources, HCAs are subject to higher levels of regulation, per 49 CFR Part 195.

In South Dakota, the total length of pipe that has the potential to affect HCAs is 34.3 miles. Based on my conservative estimation of spill frequencies, a spill that could

potentially affect a HCA would occur no more than once in 250 years. To minimize potential impacts to HCAs, Keystone's emergency preparedness and Integrity Management Program efforts will evaluate the transport of hypothetical crude oil spills in certain sensitive waterways, identify portions of the pipe where a release could affect an HCA, identify locations where a release would be contained, and preposition emergency responders and the types of equipment needed to respond to a release in a timely and effective manner.

This section also briefly describes remediation techniques commonly used in the event of a crude oil release, supplementing the discussion of remediation described in Response #9.

25. Do you adopt the portions of the application referenced above as your own testimony in this matter?

Answer: Yes, with the caveat that I am jointly responsible for certain portions of the application with additional witnesses, as discussed above.

26. Does this conclude your prepared direct testimony?

Answer: Yes it does.

Dated this 19th day of October, 2009.

Heidi Tillquist