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-____ **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 4 – 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 4 – 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 8,400 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 4, 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 #8.

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 #9.

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 #9 (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 #9 (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 efforts will model the fate and transport of hypothetical crude oil spills in 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 #9.

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 #9.

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 #9.

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 #15). 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 #9.

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 1.6 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 5,300 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 #9.

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 #9.

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 #18). 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 #9.

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 #13. 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 #9.

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 #10 and #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 pasturelands or

rangelands. I base this opinion on the detailed rationale discussed in the answer to Question #9.

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 #10 and #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 agricultural lands. I base this opinion on the detailed rationale discussed in the answer to Question #9.

24. Could you briefly summarize the information that you are responsible for in Section 6.4.2 – 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 efforts will model the fate and transport of hypothetical crude oil spills, 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 #8.

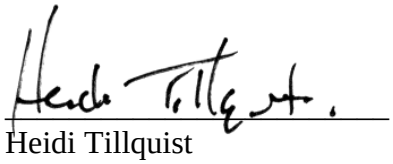
25. Do you adopt the portions of the application referenced above as your own testimony in this matter?

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 27 day of February, 2009.



Heidi Tillquist

Exhibit A

Resume for Heidi Tillquist

Heidi Tillquist, M.S.

Years Experience: 19

Technical Specialties

- Risk Assessment
- Environmental Toxicology
- Fisheries Biology
- Wildlife Biology

Professional History

- ENSR
- U.S. Fish and Wildlife Service
- Lovelace Inhalation Research Institute
- U.S. Forest Service

Education

- MS (Environmental Toxicology) Colorado State University
- BS (Fishery and Wildlife Biology) Colorado State University

Professional Registrations and Affiliations

- Certified Fisheries Professional, American Fisheries Society
- Certified Wildlife Biologist, The Wildlife Society

Representative Project Experience

Pipeline Experience

Keystone XL Pipeline Project, Montana, South Dakota, Nebraska, Oklahoma, and Texas. Keystone is proposing to construct a 1,980 mile pipeline system in Canada and the U.S. to transport Canadian crude oil to refinery destinations along the U.S. Gulf Coast. Keystone XL has started filing environmental documents with the Bureau of Land Management and the Department of State. Ms. Tillquist is the Senior Environmental Technical Advisor to the Project and is also responsible for conducting a risk assessment for accidental releases from the pipeline system, including estimates of the probability of occurrence based on Pipeline and Hazardous Materials Safety Administration's databases and sensitive area maps; estimates of potential toxicological effects on wildlife, fisheries, domestic livestock, and humans from crude oil releases; and estimates of oil spill recovery rates in terrestrial and aquatic systems.

Keystone Pipeline Project, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Missouri, and Illinois. Keystone proposed to construct a 1,372 mile pipeline system in the U.S. to transport Canadian crude oil to refinery destinations in the mid-western U.S. Keystone prepared technical documents that were filed with the Department of State, the lead federal agency for the EIS. Ms. Tillquist was the Lead Environmental Manager for the Project. Additionally, Ms. Tillquist was responsible for

conducting a risk assessment for accidental releases from the pipeline system, including estimates of the probability of occurrence based on Office of Pipeline Safety databases and sensitive area maps; estimates of potential toxicological effects on wildlife, fisheries, domestic livestock, and humans from crude oil releases; and estimates of oil spill recovery rates in terrestrial and aquatic systems. The Keystone Pipeline received regulatory approval and construction began in 2008.

Texas Offshore Port System (TOPS), Texas. The TOPS project consists of a 42-inch offshore and onshore pipeline system that transports crude oil from an offshore port to refineries in the Houston area. Ms. Tillquist conducted a pipeline risk assessment that estimated the spill frequency and evaluated the potential impacts to the ecological and human environment. Applications and filings were submitted in late 2008 to the US Coast Guard, the lead federal agency for the project.

Shell Pipeline Company, New Mexico Products Pipeline EIS, New Mexico and Texas. Shell proposed to convert and reverse the flow of an existing 406-mile crude oil pipeline to transport refined petroleum products (i.e., gasoline, diesel, jet fuel). System conversion also entailed the construction of two new pipeline extensions (about 100 miles total), pump stations, pressure reducing stations, miscellaneous appurtenances, and associated electrical transmission lines. The project would affect portions of New Mexico and Texas, involving many local, state, federal, and tribal jurisdictions. Due to public concern, a probabilistic risk assessment evaluated risk to humans and the environment that could result from the accidental release from the pipeline and its facilities. Pipeline safety was identified as one of the key issues due to the existing pipe's age (45 years old) and its composition (pre-1970 electric resistance welded [ERW] pipe). Historically, pre-1970 ERW pipe has a higher than expected rate of failure. Due to the extreme scrutiny of this project and high probability for litigation, the BLM requested that the pipeline's structural integrity be carefully evaluated. Information from various sources (e.g., previous hydrostatic test; leak history; pipeline repairs; magnetic particle inspection; burst test; close interval survey) were compiled and integrated into a risk assessment where the time-to-failure was calculated, based on Shell's proposed hydrostatic test pressures and proposed operating cycles (frequency and magnitude). The probability of a failure due to pressure reversal and stress-induced cracking was determined to be low. Presuming the pipe passes the pre-operational hydrostatic test and in-line inspection, the elevated hydrostatic test pressures and low frequency, low-magnitude operating cycles proposed by Shell in High Consequence Areas would provide sufficient protection to reasonably ensure the safety of nearby residences and environmental resources.

The EIS also evaluated the potential consequences of a release. Risk statistics were generated from the Office of Pipeline Safety (OPS) database and the potential impacts to sensitive resources were identified. Results indicate that alternatives to the proposed project, including No Action, Pipe Replacement, and Pipe Reroute, would pose greater risks to the public and environment. Moreover, the risk was not distributed equally along the pipeline route. For the pipeline alternatives, risk to environmentally sensitive areas (e.g., groundwater aquifers, residential areas) was disproportionally higher than for other less-sensitive areas along the pipeline. Ms. Tillquist conducted the risk assessment for the EIS, served on the Pipeline Safety Technical Panel, and acted as the Project Manager for this project.

Questar, Williams, Kern River Pipeline Companies, Environmental Impact Statement Preparation for Natural Gas and Crude Oil Pipelines, Utah, Colorado, New Mexico. This EIS incorporated information from three different pipelines, In the first proposal, Williams proposed to convert an existing crude oil pipeline to refined

petroleum product service as well as construct new pipeline extensions. The entire project would extend about 500 miles through portions of New Mexico, Colorado, and Utah. In the second and third proposals, Questar and Kern River proposed to simultaneously build natural gas transmission pipelines within a portion of the same corridor in Utah. ENSR prepared a third-party EIS for the BLM, the lead agency. Primary issues included petroleum spills, natural gas releases, and conflicts with inventoried roadless areas in National Forests. Due to increased public concern regarding the safety of pipelines, national US Department of Transportation incident databases were assessed and used to estimate the probability of future releases. Additionally, adverse effects to sensitive environmental receptors, including residential areas and endangered fish species, were evaluated.

At the BLMs request, ENSR conduct a detailed risk assessment as part of the NEPA process. The structural integrity of the existing pipe and the operational procedures proposed for the entire pipe system were evaluated to ensure the protection of public safety and the environment. The assessment process integrated operational and environmental factors that could affect the safe operation of the pipeline (e.g., cathodic protection measures, internal inspections, ongoing surveillance, leak detection capabilities, operational pressures and cycles, designed safety features, and emergency response capabilities). Geological hazards (e.g., seismicity, landslides) were examined to identify areas along the pipe that might be exposed to additional physical stress. Environmentally sensitive areas (e.g., drinking water recharge area, residential areas, threatened and endangered species habitat) were also incorporated into the analysis. This information was integrated into a comprehensive risk assessment framework that also estimated the probability of an incident (spill, injury, fatality, fire, or explosion) based on the existing pipe's leak history and national statistics. Once the probability of an event was estimated, the potential consequences of a release to sensitive resources were quantified. Based on the assessment, the potential risks to public safety and drinking water sources were considered among the highest priority risks. While no additional safety mitigation was required for the natural gas pipelines, the BLM and Williams met to jointly discuss the analysis, the areas of potential risk from a liquid spill, and discuss potential mitigation. Ultimately, Williams modified their operational plans to further reduce the hazard to these sensitive areas to the satisfaction of BLM technical staff. Ms. Tillquist conducted the risk assessment for the EIS and acted as the Assistant Project Manager for this project.

Entrega Gas Pipeline Inc., Entrega Pipeline Project EIS, Colorado, Wyoming. Entrega Gas Pipeline Inc. (a subsidiary of EnCana Oil and Gas) proposed to construct and operate a 327.5-mile 36- to 42-inch-diameter natural gas transmission pipeline. The pipeline would transport up to 1.5 Bcfd of natural gas from the Piceance Basin in Colorado to interconnections in Wamsutter and near Cheyenne, Wyoming. ENSR was preparing the EIS as a third-party contractor to the FERC and the BLM was a cooperating agency. Major issues included potential impacts to threatened and endangered species (water depletion issues), noxious weed management, and socioeconomic impacts. Because Western Interstate Company (a subsidiary of El Paso Corporation) also proposed to build a large diameter pipeline from the Piceance Basin to Wamsutter, cumulative impacts were also an issue. Ms. Tillquist served as the Project Manager on this project.

Wyoming Interstate Company, Piceance Basin Expansion Project EIS, Colorado, Wyoming. Wyoming Interstate Company (WIC, a subsidiary of El Paso Corporation) proposes to construct and operate a 141.7-mile 36-inch-diameter natural gas pipeline. The pipeline would transport up to 350 MMcfd of natural gas from the Piceance Basin in Colorado to interconnections near Wamsutter, Wyoming. ENSR is preparing the

EIS as a third-party contractor to the FERC and the BLM is a cooperating agency. Major issues include potential impacts to threatened and endangered species (water depletion issues), noxious weed management, and socioeconomic impacts. Because Entrega Pipeline Company Inc.(a subsidiary of EnCana Oil and Gas) also proposes to build a large diameter pipeline from the Piceance Basin to Wamsutter, cumulative impacts are also an issue. Ms. Tillquist serves as the Project Coordinator for this project.

Questar Natural Gas Company, Preparation of the Southern Trails Natural Gas Pipeline Environmental Impact Statement (EIS)/Environmental Impact Report (EIR), California, Arizona, Utah, and New Mexico. Questar proposed to convert a 600-mile crude oil pipeline to the Southern Trail natural gas pipeline. Construction resulting from the proposed extensions, reroutes, realignments, and replacements affected portions of California, Arizona, Utah, and New Mexico and involved many local, state, federal, and tribal jurisdictions. ENSR prepared this third-party EIS/EIR for the Federal Energy Regulatory Commission (FERC). Ms. Tillquist participated in project coordination, wrote several technical sections, and provided technical review of the EIS.

El Paso Energy, Federal Energy Regulatory Commission (FERC) Application to Convert a Crude Oil Pipeline to Natural Gas Pipeline, Texas, New Mexico, Arizona. ENSR coordinated El Paso Energy's Line 2000 application to the FERC for the conversion of an existing approximately 800-mile crude oil pipeline to natural gas service. This conversion project affected lands within Texas, New Mexico, and Arizona. ENSR's duties included the preparation of FERC resource reports, an applicant-prepared biological assessment (BA), applicant-prepared environmental assessment (EA), and 404 permit. Project management activities including project budgeting, coordinating office staff and field survey crews, and creation and maintenance of a database detailing over 300 construction sites and activities.

Newfield Exploration Company, Castle Peak and Eightmile Flat Oil Expansion Project, Utah. ENSR was contracted by the BLM's Vernal Field Office to prepare a third-party EIS for a proposed expansion of oil field development operations in the Unitah Basin area of northeastern Utah. The study area covers approximately 110 sections or 65,500 acres. Inland is proposing to expand its existing waterflood oil recovery operations by drilling up to 900 additional wells in the Castle Peak and Eightmile Flat areas of the greater Monument Butte-Myton Bench oil and gas production region. Important issues associated with this project included cumulative effects to raptor species in the Unitah Basin, air quality, and effects on sensitive species, such as the mountain plover and hookless cactus. ENSR also prepared a Biological Assessment for the U.S. Fish and Wildlife Service as part of the project permitting requirements. Ms. Tillquist evaluated the effects of habitat fragmentation on wildlife resources.

Risk Assessment – Oil and Gas Emphasis

Inland Resources, Natural Gas Liquid Pipeline Environmental Assessment, Wyoming. Inland Resources plans to develop an area for natural gas liquids extraction. As part of the development, a new pipeline would be constructed which would cross a tributary to the Green River in Utah, which contains several endangered fish species. At the request of the BLM and US Fish and Wildlife Service, the potential hazard posed by the pipeline was evaluated by assessing the likelihood of a spill, attenuation rates, and dilution potential. Additionally, cumulative risk from other natural gas liquid pipelines within the same drainage was also estimated. Based on the

pipelines location, volume of natural gas liquids, probability of failure, and likelihood of downstream transport, the assessment showed that no impacts to endangered fish species would be anticipated.

American Petroleum Institute (API), Fate and Environmental Effects of Oil Spills in Freshwater Environments. ENSR prepared a report for API describing the fate and effects of oil spills in freshwater environments. This report summarizes and documents potential environmental effects from inland oil spills into fresh surface waters. It identifies, describes, and compares the behavior, fate, and ecological implications of crude oil and petroleum products in inland waters. The document is intended to provide basic information necessary for the formulation of spill response strategies that are tailored to the specific chemical, physical, and ecological constraints of a given spill situation. The report describes the relevant features of various inland spill habitat types, discusses the chemical characteristics of oils and the fate processes that are dependent thereon, summarizes reported ecological and toxicological effects results both generally and with specific reference to distinct organism groupings, and, finally, in the context of case histories from past spills, highlights some of the considerations, difficulties, and elements of success of presently available spill response techniques.

Bolivian National Government, Evaluation of the Transredes Petroleum Product Spill, Bolivia. Following a pipeline rupture on the Rio Desaguardero, the spatial extent and environmental effects of hydrocarbon contamination was evaluated by chemical analysis of environmental media and laboratory toxicity tests. These data were then used in a risk assessment to evaluate the potential risk to aquatic biota, terrestrial herbivores (cattle, sheep, and endangered vicunas), and human receptors.

Reliant Energy, Pipeline and Facility Decommissioning Evaluation, New Jersey and Pennsylvania. Reliant owned a 10-mile pipeline that had been used to transport fuel oil #6 (historically) and fuel oil #2 (currently). The company also owned a related facility with breakout tanks and aboveground piping. Reliant was considering temporarily (1 to 3 years) suspending the transport of oil through the pipeline and facility and, perhaps, totally abandoning these assets. Alternatively, Reliant could chose to reactivate the pipeline after a temporary suspension. Ms. Tillquist evaluated the federal, state, and local regulations that govern the temporary suspension, reactivation, and abandonment processes. Additionally, she identified technical issues that would be associated with each process. Finally, ENSR provided Reliant with a range of anticipated costs associated with each of these activities.