



MEMORANDUM

To: Don Blankenau
From: The Flatwater Group, Inc.
Date: 7 July 2017
Re: Attorney Work Product: Response to Questions

Question 1: "Page 45 of the application refers to numerous surveys conducted between 2008 and 2013." Can you identify those surveys and what they were?

Review Response 1: The surveys referenced on page 45 of the application are in regards to federally- and state-listed threatened and endangered species. The Biological Opinion issued by USFWS indicates Keystone conducted presence/absence surveys through a Keystone-hired contractor. The application does not indicate who performed the surveys or describe the survey methodology. The applicant indicates surveys were performed along those portions of the Preferred Route for which survey access permission was granted. It also states that surveys will be performed on the remaining areas along the route prior to construction.

6 federally-listed species are documented. Section 16.3.1.1 of the application indicates survey for the American Burying Beetle were conducted in suitable habitat along the Preferred Route in Antelope, Holt, Keya Paha, and Boyd Counties during the summer of 2012. Section 16.3.1.2 of the application indicates survey for the Interior Least Tern and Piping Plover were conducted in suitable habitat along the Preferred Route during the spring and summer of 2012. Section 16.3.1.5 of the application indicates survey for the Northern Long-Eared Bat were conducted in suitable habitat along the Preferred Route during the spring and summer of 2012. The application does not indicate surveys were performed for the Whooping Crane, the Pallid Sturgeon or the Red Knot (federally-listed on 11 December 2014). Section 16.3.2.1 of the application indicates survey for the River Otter were conducted in June 2013 at the crossing of the Elkhorn River and the Platte River. Section 16.3.2.3 of the application indicates survey for State-listed minnow species (northern redbelly dace, blacknose shiner and finescale dace) were conducted in May 2013 at tributaries of the Keya Paha or Niobrara River. The application does not indicate surveys were performed for the Massasauga rattlesnake.

Language in the EIS indicates that the applicant is responsible for completing T&E surveys as well as other types of surveys. It is typical to have the applicant or party that is proposing any to do the surveys as they can be time consuming and costly. Generally, the applicant would hire firms with expertise in such surveys and there may be multiple firms and/or subcontractors conducting such surveys. Per their website, SCI Engineering Inc., headquartered in St. Charles, Missouri, provided services to TransCanada for the Keystone XL Pipeline (as well as the original Keystone Pipeline). Their project summary reads as follows:

"SCI performed wetland and waterbody delineations of approximately 852 miles of the Keystone-XL Pipeline route through Montana, South Dakota and Nebraska. Hundreds of wetlands, ponds and streams along the pipeline Right-of-way, access roads, pump stations, transmission lines and contractor/pipe yards were surveyed. Our services included wetland delineations, threatened/endangered species habitat surveys and noxious weed surveys. SCI also provided a more specific survey for threatened and endangered species including; the burrowing owl, swift fox, terns/ plovers, and several fish species within South Dakota and Nebraska.

Question 2: “Impacts on natural resources, particularly on water, between # of spills per application as provided by TransCanada compared to UNL study: <https://www.scribd.com/document/341213517/UNL-Worst-Case-Spill-Study-for-Keystone-XL-Pipeline>”

Review Response 2: The application does not specifically reference the number of, types, descriptions, or predicted frequency of pipeline spill/leaks. The NDEQ Final Evaluation Report (2013) and the DOS Final Supplemental Environmental Impact Statement (2014) are referenced in the application. The analysis prepared by University of Nebraska Professor John Stansbury, Ph.D., P.E., (referenced above and referred to as UNL Study) considers an assessment of potential for leaks from the pipeline and the potential for environmental damage from those leaks. The UNL Study does reference TransCanada’s estimation of pipeline spills as documented in the Draft Environmental Impact Statement prepared in 2010.

The UNL Study references TransCanada estimated spills from the 2010 Draft EIS.

Question 3: “Alternative route as compared to preferred route would decrease what items as compared to the listed items it would increase? Are these listed increases miles, acres, what specifically? (page 61)”

Review Response 3: The complete comparison of the preferred route and the two alternative routes is detailed by the applicant in Table 2-1. The Keystone Mainline Alternate Route is listed at 280.5 miles while the preferred route is listed at 275.2 miles.

The application statement on page 61 that the Keystone Mainline Alternate Route would result in a greater total number of acres disturbed due to the increase route length would be the calculation of ROW width of 110-feet multiplied by the total length. The Keystone Mainline Alternate Route would have 70 more acres of disturbance based on information provided in the application.

The application statement on page 61 that the Keystone Mainline Alternate Route would result in an increase to the crossing length of the ranges of federally-listed threatened and endangered species applies to the Topeka shiner (7.7 more miles); the Pallid sturgeon (3.2 more miles); the Northern long-eared bat (5.3 more miles) and the Western prairie fringed orchid (27.2 more miles).

Based on Table 2-1, the Keystone Mainline Alternate Route would result in a decrease to the crossing length of the ranges of the following federally-listed threatened and endangered species:

American burying beetle	same crossing length
Interior least tern	Alternate Route would DECREASE 9.1 miles of crossing length
Whooping Crane	Alternate Route would DECREASE 84.6 miles of crossing length
Piping Plover	Alternate Route would DECREASE 9.1 miles of crossing length

The application states on page 61 that the Keystone Mainline Alternate Route would increase the crossing length of highly erodible soils; however, Table 2-1 would indicate that the Alternate Route would decrease the crossing length of highly water erodible soils by 24.4 miles and decrease the crossing length of highly wind erodible soils by 3.6 miles.

The application states on page 61 that the Keystone Mainline Alternate Route would increase the crossing of ecological unusually sensitive areas. Table 2-1 indicates an increase of 2.2 miles of crossing length. The High Consequence Area – Ecological Unusually sensitive areas, is sourced

in Table 2-1 from the US Department of Transportation. It is not further described in the application.

Question 4: “More information why route co-locating entire Keystone pipeline from Cedar County through Jefferson County (page 59) is not a viable alternative other than this is 100 miles east of South Dakota exit point.” Possible to answer?

Review Response 4: The application includes a brief description of the Keystone Mainline Alternate Route and the Sandhills Alternate Route. Additional potential routes not included in the application may be viable alternatives.

The ultimate route (overall route) of the Keystone XL pipeline was determined via a two-phase process. The Final Supplemental EIS considered potential alternative pipeline routes to assess whether or not route alternatives could avoid or reduce impacts to environmentally sensitive resources while also meeting the proposed Project’s purpose. Consistent with NEPA, a two-phase screening process was used to evaluate prospective alternatives using a set of criteria (Final Supplemental EIS, Executive Summary, page ES-29), one of which was whether the route met the proposed Project’s purpose and need. Pipeline length was also used as an important screening criterion because of the relatively direct relationship with system reliability, environmental impacts, and construction and operation costs. All other factors being equal, longer pipelines are less desirable because they represent greater risks to system reliability, environmental impacts, and project cost.

As a result of the Phase I screening, several of the overall route alternatives were eliminated because they would not meet the project purpose and/or were significantly longer than other viable options. One alternative (with 2 options) that was eliminated was a route using the existing Keystone Pipeline Corridor from its existing border crossing in North Dakota or from the proposed crossing location for the current route in Montana, then east to the Keystone Pipeline corridor. These routes were both longer and did not meet the Project’s purpose and need (i.e., would not meet Keystone’s contractual obligation to transport Bakken crude oil picked up at a facility in Baker, Montana). The result was a route that entered South Dakota in the far northwest corner of the state, thus establishing a diagonal route. Three alternatives were retained at the end of the Phase I evaluation including one alternative that used the I-90 corridor in South Dakota to go east to the Keystone Pipeline corridor.

Phase II of the screening process used a desktop data review of key environmental and other features. One additional alternative was eliminated at the end of Phase II due route length. At this point the I-90 corridor to Keystone Pipeline corridor route was still being considered. Ultimately, this route was determined to be significantly longer and the proposed route through South Dakota resulted in a diagonal route (approximately in line with the route through Montana) to the current entry point into Nebraska for the three Nebraska route alternatives considered. It is difficult to evaluate the Nebraska route alternatives without consideration of the overall route evaluation in this process.

All Nebraska routes consider the entry point into Nebraska from South Dakota as well as the end point at Steele City, NE to be “fixed”; therefore, a route fully co-located within the Keystone Mainline starting in Cedar County through Jefferson County was not evaluated. Section 20.3 references “the approved pipeline entry location at the South Dakota – Nebraska border in Keya Paha County as described in Section 2.1.” Section 2.1 lists the constraints, goals, and objectives used to identify the preferred and alternative routes. The first constraint states:

Utilizing the existing fixed starting point: the pipeline entry location at the South Dakota–Nebraska border in Keya Paha County, Nebraska, north of Mills, Nebraska. This location

was approved by the South Dakota Public Utilities Commission (SDPUC) in 2010 under the South Dakota Energy Conversion and Transmission Facilities Siting Act;

Basically, the SDPUC issued a permit for a route in South Dakota that resulted in the one exit point. Given that constraint, any route in Nebraska not using that entry point is not likely viable without a change in permitting in South Dakota.

Question 5: What does this mean? “nearest sensitive receptor” (page 63 re: noise levels).

Review Response 5: EPA has defined sensitive receptors as locations that “include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants”. The concept is similar with sensitive noise receptors. Review of an EIS conducted for a wind turbine and power transmission line project in Oregon (North Steens Transmission Line EIS, Administrative Draft June 2010) listed sensitive receptors as follows: “Sensitive receptors are those populations that are more susceptible to the effects of noise than the population at large and those located in close proximity to localized sources of noise. Sensitive receptors can include long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, parks and recreations centers, and athletic facilities.” They also reference nearby residences as “sensitive receptors.” The nearest sensitive receptor the applicant is referring to would likely be considered a residence or other occupied building outside of commercial or industrial facilities that may generate higher noise levels on their own.

Page 63 of the application specifically references an EPA standard of 55 decibels on the A-weighted scale (dBA) day-night sound level measured at the nearest sensitive receptor. Federal Highway Administration (FHWA) and other state and local transportation departments, sometimes define Noise-sensitive receptors “as those locations or areas where dwelling units or other fixed, developed sites of frequent human use occur”.

In 1974, EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local agencies to use in developing their ambient noise standards. In it, EPA identified outdoor and indoor noise levels to protect public health and welfare. An LEQ(24) of 70 dBA was identified as the level of environmental noise that would not result in any measurable hearing loss over a lifetime. An LDN of 55 dBA outdoors and an LDN of 45 dBA indoors were identified as noise thresholds that would prevent activity interference or annoyance. These levels are not “peak” levels but are 24-hour averages over several years. Occasional high levels of noise may occur. An LDN of 55 dBA is equivalent to a continuous noise level of 48.6 dBA. Examples of typical noise levels are as follows (EPA 1974):

- Quiet room: 28–33 dBA
- Computer: 37–45 dBA
- Refrigerator: 40–43 dBA
- Forced hot air heating system: 42–52 dBA
- Microwave: 55–59 dBA
- Clothes dryer: 56–58 dBA

The following relationships occur with regard to increases in noise measured on the A-weighted decibel scale (EPA 1974):

- A change of 1 dBA cannot be perceived by humans, except in carefully controlled laboratory environments;

- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference by humans;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

EPA does not regulate noise. That authority has generally been delegated to state and local authorities. The 1974 EPA document specifically states that the report should “not be construed as a standard, specification, or regulation.” The statement in the application of an EPA standard may be erroneous.

Question 6: Toxicity values of crude oil LC 50 – not available, why? (page 1 of Appendix C)

The LD50 (lethal dose) is a single dose of a chemical that, when fed to a group of test animals or applied dermally, will kill 50% of the test animals. LC50 (lethal concentration) is the concentration of the chemical in the air or water that will kill 50% of the test animals with a single exposure. The concept of LD50 and LC50 toxicity values was developed in the late 1920s and has been used with some variations since. The Registry of Toxic Effects of Chemical Substances (RTECS) is a definitive toxicological database listing data for more than 160,000 chemicals.

The Material Safety Data Sheet for Heavy Oil presented by the applicant in Appendix C does not provide a lethal concentration (LC50) for any test animals. This is common among other crude or heavy oil MSDS.

Since Heavy Oil and Light Oil are mixtures, the reporting on the MSDS is generally not as detailed for the mixture (i.e., there are more “Not Available (NA)” entries and “Not Determined (ND)” entries than for individual substances. There are specific guidelines outlined in the OSHA Hazard Communication Standard (HCS) (Subpart Z, Toxic and Hazardous Substances, 29 CFR 1910.1200) relevant to what needs to be included in the MSDS including special consideration for mixtures and for any proprietary substances that may be in the mixture.

Question 7: Solubility in water, and evaporation rate – not available, why? (Appendix C, page 2)

The Material Safety Data Sheet for Heavy Oil presented by the applicant in Appendix C does not provide a solubility rate or an evaporation rate. This is common among other crude or heavy oil MSDS.

Other MSDS sheets for crude oil, list the solubility as “insoluble to slightly soluble.” Oil is not soluble in water due it’s molecular makeup relative to water. The “slightly soluble” part is likely due to the presence of other substances (e.g., benzene, toluene). The solubility of the mixture may not have specifically been determined and it likely varies. That might be a question to ask TC. I do not think it is a requirement but would have to do more research on that. Based on the fact that it is not listed, I would think it is not required. Similarly, the evaporation rate evidently has not been determined. See response to comment 6 regarding MSDS requirements.

Question 8: Meaning of -40°C +/- -40°F? (page 4 Appendix C)

Flash point tests are used to show the lowest temperature that a volatile substance is vaporized into a flammable gas. This is done by introducing a source of ignition, then waiting for the “flash” where the substance is ignited. Open cup and Closed cup are basic descriptions of common methods for testing flash point. The product being tested is either placed in an open cup or closed cup prior to introduction of the source of ignition. The Material Safety Data Sheet

presented by the applicant indicates use of a closed cup methodology and shows a flash point temperature of -40 degrees Celsius (-40 degrees Fahrenheit). It's not uncommon to reference the F temperature when C is reported.

The MSDS presented in the application likely has an error, as generally a crude oil flash point is near 100 degrees F. +40 degrees Celsius would equal 104.8 degrees Fahrenheit.

Question 9: Need information for alternate route where it leaves proposed route and co-locates existing Keystone pipeline.

The application briefly describes the Sandhills alternate route (which was eliminated in 2012) and the Keystone Mainline alternate route.

It seems that Section 2.1.3 and Table 2-1 address this. Most of the analysis between the preferred route and the Keystone comes down to length of the route; the longer the route, the more cost, and easement issues.