

APPENDIX Q

Crude Oil Material Safety Data Sheets

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CRUDE OIL MATERIAL SAFETY DATA SHEETS

For planning purposes, the attached Material Safety Data Sheets (MSDS) identify the chemical composition and maximum volumes of those chemicals that would be present in the dilbit or Bakken crude in the event of a release. These MSDS do not represent the actual product that would flow through the proposed Keystone XL pipeline.

In the event of a release, the specific MSDS and exact composition of the product shipped (and released) would be provided to emergency responders, including any federal, state, or local agencies involved in spill response actions, within 1 hour of the release (see Section 4.13.6.2, Safety and Spill Response, for emergency procedures). Keystone would maintain a point of contact (and procedure to contact this point of contact with this hour timeframe) for requests for MSDS and the identification of the exact product composition (both crude and diluents) shipped in the pipeline (when a release occurs) who would be authorized to release the MSDS and chemical composition information (as described above) to first responders.

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Material Safety Data Sheet

FOR INFORMATIONAL/PLANNING PURPOSES ONLY – NOT FOR USE

THIS DOES NOT REPRESENT AN ACTUAL FORMULATION

Bakken Crude Oil

1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer/Supplier: Various

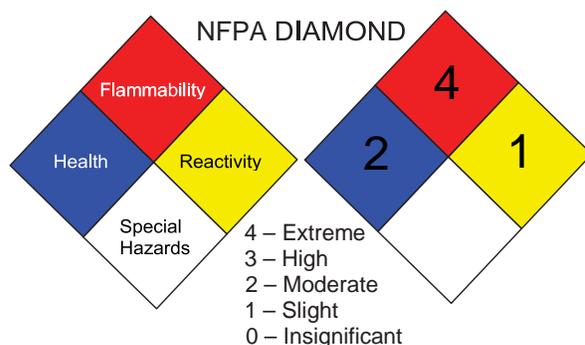
Product Name: Bakken Crude Oil

Synonyms: Hydrocarbons of Petroleum
Bakken Oil
Bakken Light

General Information: 780-420-5306

Emergency Telephone Number: N/A

Date Prepared: 11/22/2013



2 – PRODUCT COMPOSITION: INFORMATION ON INGREDIENTS

REPRESENTATIONAL Bakken Sweet Crude with 40% volatile fraction

Component	CAS Number	Maximum % * by vol./vol. (estimated)	Occupational Exposure Limits (ppm)		
			OSHA	ACGIH	NIOSH
Petroleum hydrocarbons	68919-39-1	100	N/A	N/A	N/A
Benzene	71-43-2	1.2	1	0.5	0.1
Toluene	108-88-3	1.2	100	20	100
Ethylbenzene	100-41-4	1.2	100	20	100
Xylenes	1330-20-7	1.2	100	100	100
n-butane	106-97-8	6.9	800	1000	800
n-pentane	109-66-0	5.7	600	600	120
n-heptane	142-82-5	7.8	500	400	85
n-hexane	110-54-3	4.5	50	50	50
n-octane	111-65-9	6.9	500	300	75
n-nonane	111-84-2	3.3	None	200	200
Hydrogen sulfide	7783-06-4	<0.01	20 ^{Ceiling}	1	10 ^{Ceiling}

* Values reflect reasonable potential maximums

N/A - Not available

3 – HAZARDS IDENTIFICATION

Routes of Entry: Skin contact, skin absorption, eye contact, inhalation, ingestion

Overview: Flammable liquid and vapor. Liquid and vapor may cause irritation or burns to eyes, nose, and throat. Inhalation of vapor may cause dizziness and drowsiness. Possible cancer hazard (benzene). Possible asphyxiation hazard (hydrogen sulfide and ethane). Wear personal protective equipment appropriate for the task.

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Bakken Crude Oil**

Flammability: Flammable liquid and vapor. Keep away from heat, sparks, flames, or other sources of ignition (such as static electricity, pilot lights, mechanical/electrical equipment).

Stability: Stable under normal conditions. Avoid all sources of ignition.

POTENTIAL HEALTH EFFECTS

Acute Effects

Ingestion: Ingestion may result in nausea, vomiting, diarrhea and central nervous system depression.

Aspiration of liquid into the lungs must be avoided as even small quantities in the lungs can produce chemical pneumonitis, pulmonary edema/hemorrhage, and even death.

Skin Contact: Prolonged and repeated contact may cause defatting and drying of the skin and can lead to irritation and/or dermatitis. Exposure to hot material may cause thermal burns.

Eye Contact: Liquid or vapor contact may cause mild eye irritation, including stinging, watering, redness, and swelling. Hydrogen sulfide (H₂S) may cause burning or tearing and visual disturbances at repeated exposures above the TLV.

Inhalation: Prolonged or excessive exposure may cause irritation to the nose, throat, lungs, and respiratory tract and may lead to headache, nausea, drowsiness, fatigue, pneumonitis, pulmonary edema, CNS depression, coma, and respiratory arrest.

Chronic Effects

Skin and eye irritation. May affect the respiratory and central nervous systems.

Special Toxic Effects

n-Hexane (CAS 110-54-3):

Target Organs – Excess exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesia of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs, and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene (CAS 71-43-2):

Carcinogenicity: Benzene is a known animal carcinogen and is known to produce leukemia in humans. Benzene has been identified as a human carcinogen by NTP, IARC, and OSHA.

4 – FIRST AID MEASURES

Ingestion: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe damage. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration.

Skin Contact: Wipe material from skin and remove contaminated clothing. Cleanse affected areas thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops, seek medical attention.

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Eye Contact: Move victim away from exposure and into fresh air. Flush eyes with clean water for 15 minutes, with eyelids held open. If irritation persists, seek medical attention.

Inhalation: Ensure own safety. If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, qualified personnel should administer oxygen. Seek immediate medical attention.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of this material (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for development of cardiac arrhythmias.

5 – FIRE FIGHTING MEASURES

Flash point °C:	< 22	Lower explosive limit %v/v:	0.8 (estimated)
Auto ignition temperature °C:	Not established	Upper explosive limit %v/v:	Not established
Combustion products:	Carbon monoxide, sulfur oxides, nitrogen oxides		

Overview: Material will ignite at normal temperature. Foam, carbon dioxide (CO₂), dry chemical can be used as a mean to extinguish fire. Explosive accumulation can build in areas of poor ventilation. Use water spray to cool fire-exposed containers, and to disperse vapors if spill has not ignited.

Basic Fire Fighting Procedures: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces or when explicitly required by DOT, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant. Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

Extinguishing Media: Any extinguisher capable of handling Class B fires is recommended, including extinguishing media such as CO₂, dry chemical, foam, or water as a fog. Water spray is recommended to cool or protect exposed materials or structures. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Firefighting should be attempted only by those who are adequately trained and equipped with proper personal protective equipment.

Unusual Fire and Explosion Hazards: This material is flammable and may be ignited by heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, or mechanical/electrical equipment). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, outdoors, or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

6 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

Eye Protection: Safety glasses or goggles are recommended when there is a possibility of splashing or spraying.

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Skin Protection: The use of gloves (nitrile or neoprene) is advised to prevent skin contact and possible irritation. Depending on conditions, the use of an apron, chemical protective clothing, and rubber boots may be necessary. When hot material is present, wear thermal resistant gloves, arm protection, and face shield.

Respiratory Protection: A NIOSH-certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets U.S. OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed when workplace conditions warrant a respirator's use.

Engineering Controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Hygiene Measures: Wash hands and face after handling and before eating, drinking, or smoking. Take off contaminated clothing and wash before re-use.

7 – ACCIDENTAL RELEASE MEASURES

Personal Precautions: Appropriately trained personnel should respond to uncontrolled release. Avoid direct contact with material; use the personal protective equipment specified in SDS for a specific spill event because the characteristics could vary for those herein. Stay upwind of release; isolate the immediate hazard area; and keep unnecessary and unprotected people away. Use water spray to cool containers. Eliminate all sources of ignition. Provide explosion-proof clearing ventilation, if possible.

Environmental Precautions: Prevent material from entering soil, waterways, drains, sewers, or confined areas.

Spill Management: Wear appropriate breathing apparatus (if applicable) and protective clothing. A vapor suppressing foam may be used to reduce vapors. Try to work upwind of spill. Dike and contain land spills; contain water spills by booming. For large spills remove by mechanical means such as vacuuming or pumping and place in containers. All equipment used when handling the product must be grounded. Recover and return free product to proper containers. Use suitable absorbent materials such as vermiculite, sands, soil, or clay to clean up residual liquids. Do not wash spills into sewers or other public water systems.

Reporting: Report spills to local or federal authorities as appropriate or required.

8 – HANDLING AND STORAGE

The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits.

Use appropriate grounding and bonding practices. Store recovered material and exposed PPE in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers, or other sources of ignition. Do not cut, drill, grind, or weld on empty containers since they may contain explosive residues.

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Harmful concentrations of hydrogen sulfide (H₂S) gas can accumulate in excavations and low-lying areas as well as the vapor space of storage and bulk transport compartments. Stay upwind and vent open hatches before uploading.

Avoid skin contact. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear to brown liquid
Physical form:	Liquid
Substance type (pure/mixture):	Mixture
Boiling temperature:	<33°C
Melting temperature:	Not determined
Vapor pressure:	about 380 mm Hg
Vapor density:	1.0 - 3.9
Evaporation rate(ethyl ether =1):	>1
Specific gravity:	0.82
Water solubility:	Negligible
pH:	Not determined
Viscosity:	5.43 mm ² /s
Color:	Clear to brown
Odor:	Rotten egg, petroleum-like odor
Percent volatiles, (v/v)	15-40 (estimated)

10 – STABILITY AND REACTIVITY

Conditions to avoid: Excessive heat, sources of ignition, sparks, open flames, and buildup of static electricity.

Chemical stability: Stable at <18°C (estimated), 760 mmHg pressure.

Hazardous decomposition products: Combustion produces carbon monoxide, aldehydes, aromatic and other hydrocarbons.

Hazardous polymerization: Will not occur.

Incompatibility: Strong oxidizers such as nitrates, chlorates, peroxides.

11 – TOXICOLOGICAL INFORMATION– CHRONIC AND ACUTE HEALTH HAZARDS

This product contains benzene at a level of 1.2% v/v. Repeated or prolonged exposure to benzene at concentrations in excess of the TLV may cause serious injury to blood-forming organs. Significant chronic exposure to benzene vapor has been reported to produce various blood disorders ranging from aplastic anemia to certain forms of leukemia (cancer) in humans. Benzene produced tumors in rats and mice in lifetime chronic toxicity studies, but the response has not been consistent across species, strain, sex, or route of exposure. Animal studies on benzene have demonstrated immune toxicity, chromosomal aberrations, testicular effects, and alterations in reproductive cycles and embryo/fetotoxicity, but not teratogenicity.

Hydrogen sulfide gas (H₂S) is toxic by inhalation. Prolonged breathing of 50 to 100 ppm H₂S vapors can produce eye and respiratory tract irritation. Higher concentration (250 to 600 ppm) for 15 to 30 minutes

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Bakken Crude Oil

can produce headache, dizziness, nervousness, nausea, and pulmonary edema or bronchial pneumonia. Concentrations of >1,000 ppm will cause immediate unconsciousness and death through respiratory paralysis. Rats and mice exposed to 80 ppm H₂S, 6 hr/day, 5 days/week for 10 weeks did not produce any toxicity except for irritation of nasal passages. H₂S did not affect reproduction and development (birth defects or neurotoxicity) in rats exposed to concentrations of 75 to 80 ppm or 150 ppm H₂S, respectively. Over the years, a number of acute cases of H₂S poisoning have been reported. Complete and rapid recovery is the general rule. However, if the exposure was sufficiently intense and sustained, causing cerebral hypoxia (lack of oxygen to the brain), neurologic effects such as amnesia, intention tremors, or brain damage are possible.

This product may contain hexane. Studies in laboratory animals have produced systemic toxicity in blood, spleen, and lungs. Fetotoxicity has been observed at hexane concentrations that produced maternal toxicity. Long-term exposure to high concentrations of hexane has been shown to cause testicular effects and nervous system damage.

This product may contain xylenes. Gross overexposure or severe poisoning incidents in humans to xylenes has been reported to cause lung, liver, kidney, heart, and brain damage as well as neurologic disturbances. Laboratory animals exposed to high dose of xylenes showed evidence of effects in the liver, kidneys, lungs, spleen, heart, and adrenals. Exposure of pregnant rats, mice, and rabbits during gestation to significant concentrations of xylenes produced maternal, fetal, and developmental toxicity (skeletal retardation, cleft palate, and wavy ribs) generally at maternally toxic doses. These types of fetotoxic effects have been associated with maternal toxicity. Repeated inhalation of high xylene concentrations has shown impairment of performance abilities (behavioral tests) in animals and humans. Xylenes produced a mild frequency hearing loss in rats subchronically exposed to high concentrations of xylenes.

12 – DISPOSAL INFORMATION

Material should be properly containerized for disposal and must be disposed with care and in full compliance with federal, state, and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities. This product, if it must be discarded, may meet the criteria of a hazardous waste as defined by USEPA RCRA (40 CFR 261), or other state and local regulations. If this product is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility. This product could also contain benzene at >0.5 ppm and could exhibit the characteristic of “toxicity” (D018) as determined by the toxicity characteristic leaching procedure (TCLP). This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s). It is the responsibility of the user to consult federal, state, and local waste regulations to determine appropriate disposal options.

13 – ENVIRONMENTAL INFORMATION

Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Product may release large amounts of flammable vapors (e.g., methane, ethane, and propane) at or below ambient temperature depending on source and process conditions. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory equipment as conditions warrant. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Use foam on spills to minimize vapors. Spilled material may be absorbed into an appropriate absorbent material.

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Bakken Crude Oil

Notify fire authorities and appropriate federal, state (provincial) and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount into navigable waters, notify appropriate federal, state, and local agencies.

Sara Title III Information: This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Chemical	CAS No.	Weight %
Toluene	108-88-3	0 – 3%
n-hexane	110-54-3	up to 11%
Benzene	71-43-2	0 – 3%

14 – REGULATORY INFORMATION

USA: All of the components of this product are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

USEPA Reportable Quantity: The estimated reportable quantity (RQ) for this material is based on the weight % shown below:

- RQ based on benzene: The RQ for benzene is 10 pounds, which equals 46 gallons of crude oil. The RQ is based on 3 wt. % benzene.
- RQ based on n-hexane: The RQ for n-hexane is 5,000 pounds, which equals 8,300 gallons of crude oil. The RQ is based on 11 wt. % n-hexane.
- RQ based on toluene: The RQ for toluene is 1,000 pounds, which equals 4,600 gallons of crude. The RQ is based on 3 wt. % toluene.

15 – SPECIAL PRECAUTIONS AND SUPPLEMENTAL INFORMATION

Before working on or in pipe, fittings, or tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

16 – TRANSPORTATION REQUIREMENTS

General Transportation Information:

DOT proper shipping name (49 CFR 172.101): Petroleum crude oil
DOT hazard classes (49 CFR 172.101): 3
UN/NA code (49 CFR 172.101): UN1267
Packing group (49 CFR 172.101): I or II
Bill of lading description (49 CFR 172.202): Petroleum crude oil
DOT labels required (49 CFR 172.101): Flammable liquid
Prepared by: N/A

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DISCLAIMER

The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet (MSDS). However, MSDSs may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

ABBREVIATIONS

ACGIH American Conference of Governmental Industrial Hygienists

CAS Chemical Abstract Service

CFR Code of Federal Regulations

IARC International Agency for Research on Cancer

NIOSH National Institute for Occupational Safety and Health

NTP National Toxicology Program

OSHA Occupational Safety and Health Administration

SARA Superfund Amendments and Reauthorization Act

TLV threshold limit value

TSCA Toxic Substance Control Act

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Diluted Bitumen

1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer/Supplier: Various

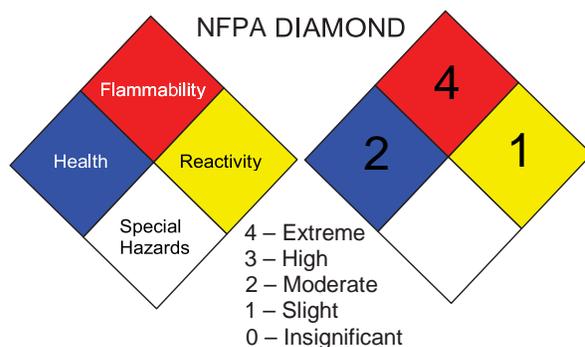
Product Name: Diluted bitumen

Synonyms: Diluted bitumen (DILBIT)
with 60% diluent mix

General Information: 780-420-5306

Emergency Telephone Number: N/A

Date Prepared: 11/22/2013



2 – PRODUCT COMPOSITION: INFORMATION ON INGREDIENTS

REPRESENTATIONAL Diluted bitumen with 60% light naphtha as diluent

Component	CAS Number	Maximum % * by vol./vol. (estimated)	Occupational Exposure Limits (ppm)		
			OSHA	ACGIH	NIOSH
Bitumen	8052-42-4	40	N/A	N/A	N/A
Diluent (light naphtha) ¹	8032-32-4	60	N/A	400	100
Light naphtha: benzene	71-43-2	1.9	1	0.5	0.1
Light naphtha: toluene	108-88-3	7.6	100	20	100
Light naphtha: ethylbenzene	100-41-4	2.7	100	20	100
Light naphtha: xylenes	1330-20-7	13.4	100	100	100
Light naphtha: n-hexane	110-54-3	13.4	50	50	50
Light naphtha: cyclohexane	110-82-7	7.6	300	100	300
Light naphtha: heptane (and isomers)	142-82-5	5.7	500	400	85
Light naphtha: pentane	109-66-0	7.6	600	600	120
Nickel	7440-02-0	57.4 ppm	500	300	75
Vanadium	7440-62-2	137.7 ppm	None	200	200
Sulfur ²	7704-34-9	3.49	20 ^{Ceiling 2}	1	10 ^{Ceiling}

¹ General composition ranges shown and vary greatly by source.

² Exposure limit is for hydrogen sulfide.

* Values reflect reasonable potential maximums.

N/A = Not available

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Diluted Bitumen

REPRESENTATIONAL Diluted bitumen with 60% natural gas condensate as diluent

Component	CAS Number	Maximum % * by vol./vol. (estimated)	Occupational Exposure Limits (ppm)		
			OSHA	ACGIH	NIOSH
Bitumen	8052-42-4	40	N/A	N/A	N/A
Diluent (natural gas condensate) ¹		60	N/A	N/A	N/A
Propane	74-98-6	19.8	1,000	2,500	1,000
Ethane	74-84-0	19.8	N/A	N/A	N/A
n-pentane	109-66-0	8.3	600	600	120
n-hexane	110-54-3	4.3	50	50	50
Heptane (and isomers)	142-82-5	3.3	500	400	85
Octane	111-65-9	3.3	500	75	300
Other hydrocarbons (including BTEX)	N/A	1.7	1	0.5	0.1
Nickel	7440-02-0	57.4 ppm	500	300	75
Vanadium	7440-62-2	137.7 ppm	None	200	200
Sulfur ²	7704-34-9	3.49	20 ^{Ceiling}	1	10 ^{Ceiling}

¹ General composition ranges shown and vary greatly by source.

² Exposure limit is for hydrogen sulfide.

* Values reflect reasonable potential maximums.

N/A = Not available.

3 – HAZARDS IDENTIFICATION

Routes of Entry: Skin contact, skin absorption, eye contact, inhalation, ingestion

Overview: Flammable liquid and vapor. Liquid and vapor may cause irritation or burns to eyes, nose, and throat. Inhalation of vapor may cause dizziness and drowsiness. Possible cancer hazard (benzene). Possible asphyxiation hazard (hydrogen sulfide and ethane). Wear personal protective equipment appropriate for the task.

Flammability: Flammable liquid and vapor. Keep away from heat, sparks, flames, or other sources of ignition (such as static electricity, pilot lights, mechanical/electrical equipment).

Stability: Stable under normal conditions. Avoid all sources of ignition.

POTENTIAL HEALTH EFFECTS

Acute Effects

Ingestion: Ingestion may result in throat burning, gastrointestinal irritation, abdominal pain, nausea, vomiting, and diarrhea. Aspiration of liquid into the lungs must be avoided as even small quantities in the lungs can produce chemical pneumonitis and even death.

Skin Contact: Low toxicity through skin contact. Exposure to hot material may cause thermal burns. Signs of irritation include localized redness, swelling, and itching. Prolonged and repeated contact may cause drying of the skin and can lead to irritation and/or dermatitis.

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Diluted Bitumen

Eye Contact: Hot splashes may cause mild eye irritation to eye damage. Exposure commonly includes stinging, watering, redness, swelling, light sensitivity. Hydrogen sulfide (H₂S) may cause burning or tearing and visual disturbances at repeated exposures above the TLV.

Inhalation: Prolonged or excessive exposure may cause irritation to the nose, throat, lungs, and respiratory tract and may lead to headache, nausea, drowsiness, fatigue, peculiar skin sensations, digestive upset, pulmonary edema, CNS depression, coma, and respiratory arrest.

Chronic Effects

Skin and eye irritation. May affect the respiratory and central nervous systems.

Special Toxic Effects

n-Hexane (CAS 110-54-3):

Target Organs – Excess exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesia of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs, and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene (CAS 71-43-2):

Carcinogenicity: Benzene is a known animal carcinogen and is known to produce leukemia in humans. Benzene has been identified as a human carcinogen by NTP, IARC, and OSHA.

4 – FIRST AID MEASURES

Ingestion: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe damage. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration.

Skin Contact: Wipe material from skin and remove contaminated clothing including shoes. Cleanse affected areas thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops, seek medical attention. For hot material, immediately immerse in or flush affected area with large amounts of cold water to dissipate heat. Cover with clean cotton sheeting or gauze and get prompt medical attention.

Eye Contact: Move victim away from exposure and into fresh air. Flush eyes with clean water for 15 minutes, with eyelids held open. If irritation persists, seek medical attention.

Inhalation: Ensure own safety. If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, qualified personnel should administer oxygen. Seek immediate medical attention.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of this material (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for development of cardiac arrhythmias.

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Diluted Bitumen

5 – FIRE FIGHTING MEASURES

Flash point °C:	< 35	Lower explosive limit %v/v:	0.8 (estimated)
Auto ignition temperature °C:	250 (estimated)	Upper explosive limit %v/v:	Not established
Combustion products:	Carbon monoxide, carbon dioxide, sulfur oxides		

Overview: Material will ignite at normal temperature. Foam, carbon dioxide (CO₂), dry chemical can be used as a mean to extinguish fire. Explosive accumulation can build in areas of poor ventilation. Use water spray to cool fire-exposed containers, and to disperse vapors if spill has not ignited.

Basic Fire Fighting Procedures: Long-duration fires involving diluent stored in tanks may result in a boil-over. The contents of the tank may be expelled beyond the containment dikes or ditches. All personnel should be kept back a safe distance when a boil-over is anticipated (reference NFPA 11). For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces or when explicitly required by DOT, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant. Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

Extinguishing Media: Any extinguisher capable of handling Class B fires is recommended, including extinguishing media such as CO₂, dry chemical, foam, or water as a fog. Water spray is recommended to cool or protect exposed materials or structures. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Firefighting should be attempted only by those who are adequately trained and equipped with proper personal protective equipment.

Unusual Fire and Explosion Hazards: This material is flammable and may be ignited by heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, or mechanical/electrical equipment). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, outdoors, or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

6 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

Eye Protection: Safety glasses or goggles are recommended when there is a possibility of splashing or spraying.

Skin Protection: The use of gloves (nitrile or neoprene) is advised to prevent skin contact and possible irritation. Depending on conditions, the use of an apron or chemical protective and flame resistant clothing and rubber boots may be necessary. When hot material is present, wear thermal resistant gloves, arm protection, and face shield.

Respiratory Protection: A NIOSH-certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators may not provide adequate

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protection. A respiratory protection program that meets U.S. OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed when workplace conditions warrant a respirator's use.

Engineering Controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Hygiene Measures: Wash hands and face after handling and before eating, drinking, or smoking. Take off contaminated clothing and wash before re-use.

7 – ACCIDENTAL RELEASE MEASURES

Personal Precautions: Appropriately trained personnel should respond to uncontrolled release. Avoid direct contact with material; use the personal protective equipment specified in SDS for a specific spill event because the characteristics could vary for those herein. Stay upwind of release; isolate the immediate hazard area; and keep unnecessary and unprotected people away. Use water spray to cool containers. Eliminate all sources of ignition. Provide explosion-proof clearing ventilation, if possible.

Environmental Precautions: Prevent material from entering soil, waterways, drains, sewers, or confined areas.

Spill Management: Wear appropriate breathing apparatus (if applicable) and protective clothing. A vapor suppressing foam may be used to reduce vapors. Try to work upwind of spill. Dike and contain land spills; contain water spills by booming. For large spills remove by mechanical means such as vacuuming or pumping and place in containers. All equipment used when handling the product must be grounded. Recover and return free product to proper containers. Use suitable absorbent materials such as vermiculite, sands, soil, or clay to clean up residual liquids. Do not wash spills into sewers or other public water systems.

Reporting: Report spills to local or federal authorities as appropriate or required.

8 – HANDLING AND STORAGE

The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures. Using appropriate respiratory protection is advised when concentrations exceed any established exposure limits.

Use appropriate grounding and bonding practices. Store recovered material and exposed PPE in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers, or other sources of ignition. Do not cut, drill, grind, or weld on empty containers since they may contain explosive residues.

Harmful concentrations of hydrogen sulfide (H₂S) gas can accumulate in excavations and low-lying areas as well as the vapor space of storage and bulk transport compartments. Stay upwind and vent open hatches before uploading.

Avoid skin contact. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

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9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Petroleum / amber to black color
Physical form:	Liquid
Substance type (pure/mixture):	Mixture
Boiling temperature:	>34°C
Melting temperature:	Not determined
Vapor pressure:	> 150 mm Hg
Vapor density:	>1
Evaporation rate:	Not available
Specific gravity:	< 1
Water solubility:	Not measured
pH:	Not determined
Viscosity:	Estimated at 70 centistokes at 40°C
Color:	Amber to black
Odor:	Petroleum odor and associated smell of “rotten eggs”

10 – STABILITY AND REACTIVITY

Conditions to avoid: Excessive heat, sources of ignition, sparks, open flames, and buildup of static electricity.

Chemical stability: Stable

Hazardous decomposition products: Oxides of carbon, hydrogen sulfide

Hazardous polymerization: Will not occur.

Incompatibility: Heat, ignition sources, oxidizing agents

11 – TOXICOLOGICAL INFORMATION – CHRONIC AND ACUTE HEALTH HAZARDS

This product contains benzene at a level of up to 1.9% v/v. Repeated or prolonged exposure to benzene at concentrations in excess of the TLV may cause serious injury to blood-forming organs. Significant chronic exposure to benzene vapor has been reported to produce various blood disorders ranging from aplastic anemia to certain forms of leukemia (cancer) in humans. Benzene produced tumors in rats and mice in lifetime chronic toxicity studies, but the response has not been consistent across species, strain, sex, or route of exposure. Animal studies on benzene have demonstrated immune toxicity, chromosomal aberrations, testicular effects, and alterations in reproductive cycles and embryo/fetotoxicity, but not teratogenicity.

Hydrogen sulfide gas (H₂S) is toxic by inhalation. Prolonged breathing of 50 to 100 ppm H₂S vapors can produce eye and respiratory tract irritation. Higher concentration (250 to 600 ppm) for 15 to 30 minutes can produce headache, dizziness, nervousness, nausea, and pulmonary edema or bronchial pneumonia. Concentrations of >1,000 ppm will cause immediate unconsciousness and death through respiratory paralysis. Rats and mice exposed to 80 ppm H₂S, 6 hr/day, 5 days/week for 10 weeks did not produce any toxicity except for irritation of nasal passages. H₂S did not affect reproduction and development (birth defects or neurotoxicity) in rats exposed to concentrations of 75 to 80 ppm or 150 ppm H₂S, respectively. Over the years a number of acute cases of H₂S poisoning have been reported. Complete and rapid recovery is the general rule. However, if the exposure was sufficiently intense and sustained causing cerebral hypoxia (lack of oxygen to the brain), neurologic effects such as amnesia, intention tremors, or brain damage are possible.

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This product may contain hexane. Studies in laboratory animals have produced systemic toxicity in blood, spleen, and lungs. Fetotoxicity has been observed at hexane concentrations that produced maternal toxicity. Long-term exposure to high concentrations of hexane has been shown to cause testicular effects and nervous system damage.

This product may contain xylenes. Gross overexposure or severe poisoning incidents in humans to xylenes has been reported to cause lung, liver, kidney, heart, and brain damage as well as neurologic disturbances. Laboratory animals exposed to high dose of xylenes showed evidence of effects in the liver, kidneys, lungs, spleen, heart, and adrenals. Exposure of pregnant rats, mice, and rabbits during gestation to significant concentrations of xylenes produced maternal, fetal, and developmental toxicity (skeletal retardation, cleft palate, and wavy ribs) generally at maternally toxic doses. These types of fetotoxic effects have been associated with maternal toxicity. Repeated inhalation of high xylene concentrations has shown impairment of performance abilities (behavioral tests) in animals and humans. Xylenes produced a mild frequency hearing loss in rats subchronically exposed to high concentrations of xylenes.

12 – DISPOSAL INFORMATION

Material should be properly containerized for disposal and must be disposed with care and in full compliance with federal, state, and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities. This product, if it must be discarded, may meet the criteria of a hazardous waste as defined by USEPA RCRA (40 CFR 261), or other state and local regulations. If this product is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility. This product could also contain benzene at >0.5 ppm and could exhibit the characteristic of “toxicity” (D018) as determined by the toxicity characteristic leaching procedure (TCLP). This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s). It is the responsibility of the user to consult federal, state, and local waste regulations to determine appropriate disposal options.

13 – ENVIRONMENTAL INFORMATION

Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Product may release large amounts of flammable vapors (e.g., methane, ethane, and propane) at or below ambient temperature depending on source and process conditions. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory equipment as conditions warrant. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Use foam on spills to minimize vapors. Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state (provincial) and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount into navigable waters, notify appropriate federal, state, and local agencies.

Sara Title III Information: This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Chemical	CAS No.	Weight %
Benzene	71-43-2	0 – 5%
n-hexane	110-54-3	up to 35%
Toluene	108-88-3	0 – 22%

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14 – REGULATORY INFORMATION

USA: All of the components of this product are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

USEPA Reportable Quantity: The estimated reportable quantity (RQ) for this material is based on the weight % shown below:

- RQ based on benzene: The RQ for benzene is 10 pounds, which equals 27 gallons of crude oil. The RQ is based on 5 wt. % benzene.
 - RQ based on n-hexane: The RQ for n-hexane is 5,000 pounds, which equals 2,600 gallons of crude oil. The RQ is based on 35 wt. % n-hexane.
 - RQ based on toluene: The RQ for toluene is 1,000 pounds, which equals 630 gallons of crude. The RQ is based on 22 wt. % toluene.
-

15 – SPECIAL PRECAUTIONS AND SUPPLEMENTAL INFORMATION

Before working on or in pipe, fittings, or tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

16 – TRANSPORTATION REQUIREMENTS

General Transportation Information:

DOT proper shipping name (49 CFR 172.101):	Petroleum crude oil
DOT hazard classes (49 CFR 172.101):	3
UN/NA code (49 CFR 172.101):	UN1267
Packing group (49 CFR 172.101):	II
Bill of lading description (49 CFR 172.202):	Petroleum crude oil
DOT labels required (49 CFR 172.101):	Flammable liquid
Prepared by:	N/A

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DISCLAIMER

The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet (MSDS). However, MSDSs may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

ABBREVIATIONS

ACGIH American Conference of Governmental Industrial Hygienists

CAS Chemical Abstract Service

CFR Code of Federal Regulations

IARC International Agency for Research on Cancer

NIOSH National Institute for Occupational Safety and Health

NTP National Toxicology Program

OSHA Occupational Safety and Health Administration

SARA Superfund Amendments and Reauthorization Act

TLV threshold limit value

TSCA Toxic Substance Control Act

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Final Supplemental Environmental Impact Statement (SEIS)

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Keystone's answers are based on the requirements of SDCL §§ 15-6-26, 15-6-33, 15-6-34, and 15-6-36.

INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS

1. Please identify the person or persons providing each answer to an Interrogatory or portion thereof, giving the full name, address of present residence, date of birth, business address and occupation.

ANSWER: Given the extremely broad scope volume of more than 800 discovery requests received by Keystone in this docket, a range of personnel were involved in answering the interrogatories. Keystone will designate the following witnesses with overall responsibility for the responsive information as related to the Conditions and proposed changes to the Findings of Fact, which are identified in Appendix C to Keystone's Certification Petition: Corey Goulet, President, Keystone Projects, 450 1st Street S.W., Calgary, AB Canada T2P 5H1; Steve Marr, Manager, Keystone Pipelines & KXL, TransCanada Corporation, Bank of America Center, 700 Louisiana, Suite 700, Houston, TX 77002; Meera Kothari, P. Eng., 450 1st Street, S.W., Calgary, AB Canada T2P 5H1; David Diakow, Vice President, Commercial, Liquids Pipeline, 450 1st Street S.W., Calgary, AB Canada T2P 5H1; Jon Schmidt, Vice President, Environmental & Regulatory, exp Energy Services, Inc., 1300 Metropolitan Boulevard, Suite 200,

Tallahassee, FL 32308; Heidi Tillquist, Senior Associate, Stantec Consulting Ltd., 2950
E. Harmony Rd., Suite 290, Fort Collins, CO 80528.

2. Prior to answering these interrogatories, have you made due and diligent search of all books, records, and papers of the Applicant with the view of eliciting all information available in this action?

ANSWER: Yes, to the extent reasonably practicable in attempting to respond to over 800 discovery requests within the time allowed.

2(a). Describe how TransCanada will comply with these Acts as they apply to the project in relation to rivers, ground water and water system crossings in South Dakota.

ANSWER: Keystone will comply with Clean Water Act 404 by permitting the crossing of all jurisdictional waterbodies in South Dakota under the US Army Corps of Engineers Nationwide General Permit (NWP) 12. As part of the permitting process of the Project route in South Dakota, Keystone will submit a NOI to the US Army Corps of Engineers, South Dakota Regulatory Office and will consult as required with the South Dakota Regulatory Office.

No waterbody crossing in South Dakota requires permitting under the Section 10 Rivers and Harbor Act.

2(b). Provide research entailing migration of benzene in watersheds, rivers and ground water.

ANSWER: The fate and transport of benzene and other crude oil constituents is discussed in numerous studies and articles, including those in the Department of State SFEIS Appendix P, 2009 Keystone XL Risk Assessment, such as:

Freeze, R. A. and J. A. Cherry. 1979. Groundwater. Prentice Hall, Inc. Englewood Cliffs, New Jersey. 604 pp.

Minnesota Pollution Control Agency. 2005. Assessment of Natural Attenuation at Petroleum Release Sites. Guidance Document c-prp4-03, Petroleum Remediation Program, Minnesota Pollution Control Agency. April 2005. 11 pp.

Neff, J. M. 1979. Polycyclic aromatic hydrocarbons in the aquatic environment. Applied Science publ. Ltd., London. 262 pp.

Newell, C. J. and J. A. Connor. 1998. Characteristics of Dissolved Petroleum Hydrocarbon Plumes: Results from Four Studies. American Petroleum Institute Soil / Groundwater Technical Task Force. December 1998.

Spence, L. R., K. T. O'Reilly, R. I. Maagaw, and W. G. Rixey. 2001. Chapter 6 – Predicting the fate and transport of hydrocarbons in soil and groundwater. in: risk-based decision-making or assessing petroleum impacts at exploration and production sites. Edited by S. McMillen, R. Magaw, R. Carovillano, Petroleum Environmental Research Forum and US Department of Energy.

United States Geological Service (USGS). 1998. Groundwater Contamination by Crude Oil near Bemidji, Minnesota. US Geological Survey Fact Sheet 084-98, September 1998.

Additional references on this subject from the FSEIS include:

American Petroleum Institute (API). 1992. Review of Natural Resource Damage Assessments in Freshwater Environments: Effects of Oil Release into Freshwater Habitats. API Publ. No. 4514.

API. 1997. Petroleum in the Freshwater Environment: An annotated Bibliography 1946-1993. API Publ. No. 4640.

Grimaz, S., S. Allen, J. Steward, and G. Dolcetti. 2007. Predictive evaluation of the extent of the surface spreading for the case of accidental spillage of oil on ground. Selected Paper IcheaP8, AIDIC Conference series, Vol. 8, 2007, pp. 151-160.

Hult, M.F. 1984. Groundwater Contamination by Crude Oil at the Bemidji, Minnesota, Research Site: U.S. Geological Survey Toxic Waste—Ground-Water Contamination Study. Papers presented at the Toxic-Waste Technical Meeting, Tucson, Arizona, March 20-22. USGS Water Investigations Report 84-4188.

Weaver, J.W., R.J. Charbeneau, J.D. Tauxe, B.K. Lien, and J.B. Provost. 1994. The hydrocarbon spill screening model (HSSM) Volume 1: User's guide. USEPA/600/R-94/039a. U.S. Environmental Protection Agency, Office of Research and Development, Robert S. Kerr, Environmental Research Laboratory, Ada, OK.

8(a). Explain what changes have been made in the Emergency Response Plan and Integrity Management Plan since 2010.

OBJECTION: To the extent that this request seeks production of the Emergency Response Plan, the request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan and the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan

to PHMSA until sometime close to when the Keystone Pipeline is placed into operation.

Keystone's Emergency Response Plan is addressed in The Final Supplemental

Environmental Impact Statement at

<http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

8(b). Provide the Emergency Response Plan.

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at

<http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

8(c). Provide the Integrity Management Plan.

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also

seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Integrity Management Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation.

18(a). Where will fuel storage facilities be located within 200 feet of private wells and 400 feet of municipal wells?

ANSWER: The locations of the fuel storage facilities have not been determined at this point in the planning process. The fuel storage facility locations will be determined at the time of construction. Refer to Section 2.1.5.3, Fuel Transfer Stations of the DOS FSEIS (2014). Wells will be identified prior to the fuel storage facility final locations and will adhere to HP 09-001, Condition 18.

18(b). How will minimizing and exercising vigilance be enforced?

ANSWER: Keystone will minimize and exercise vigilance by providing adequate training and supervision of its contractors with respect to this provision.

21(a). Define "frac-out."

ANSWER: "Frac-out" is addressed in the FSEIS in Section 4.3.3.2 at page 4.3-21, which provides:

In some instances, pressurized fluids and drilling lubricants used in the HDD process have the potential to escape the active HDD bore, migrate through the sills, and come to the surface at or near the crossing construction site, an event commonly known as a frac-out. Measures identified in a required HDD contingency plan would be implemented, including monitoring of the directional drill bore, monitoring downstream for evidence of drilling fluids, and mitigation measures to address a frac-out should one occur.

21(b). What are concerns and safety issues related to a "frac-out."

ANSWER: This question is addressed at page 4.8-20 of the FSEIS:

The HDD method avoids direct disturbance to the river, channel bed, or banks. While the HDD method poses a small risk of frac-out (i.e., release of bentonite-based drilling fluids), potential releases would be contained by best management practices that would be described within the HDD Contingency Plans required for drilled crossings. Most leaks of HDD fluids occur near the entry, exit locations for the drill, and are quickly contained and cleaned up. Frac-outs that may release drilling fluids into aquatic environments are difficult to contain primarily because bentonite readily disperses in flowing water and quickly settles in standing water. Should this type of release occur, bentonite is non-toxic but in sufficient concentration may physically inhibit respiration of adult fish and eggs.

It is also addressed at pages 4.7-11 to -12 of Section 4.7.3.2 of the FSEIS:

The HDD method for crossing waterbodies would be used to minimize disturbance to aquatic habitat, stream banks, and recreational or commercial fisheries. Impacts could occur if there is an unintended release of drilling fluids (i.e., a frac out) during the HDD operation. A frac out could release bentonitic drilling mud into the aquatic environment. The released drilling mud would readily disperse in flowing water or eventually settle in standing

water. Although bentonite is non-toxic, suspended bentonite may produce short-term impacts to the respiration of fish and aquatic invertebrates due to fouled gills. Longer-term effects could result if larval fish are covered and suffocate due to fouled gills and/or lack of oxygen. If the frac out occurred during a spawning period, egg masses of fish could be covered, thus inhibiting the flow of dissolved oxygen to the egg masses. Benthic invertebrates and the larval stages of pelagic organisms could also be covered and suffocate.

To minimize the potential for these impacts to occur, a contingency plan would be implemented to address an HDD frac out. This plan would include preventive and response measures to control the inadvertent release of drilling fluids. The contingency plan would also include instructions for downstream monitoring for any signs of drilling fluid during drilling operations, and would describe the response plan and impact reduction measures in the event a release of drilling fluids occurred. Drill cuttings and drilling mud would be disposed of according to applicable regulations; disposal/management options may include spreading over the construction ROW in an upland location or hauling to an approved off-site, licensed landfill or other approved sites.

21(c). Provide "frac-out plan."

ANSWER: Keystone currently has no contractors retained to undertake construction. When Keystone employs a pipeline contractor, that contractor will develop the plan. See Section 7.4.5 and Appendix G.

34(a). Describe what progress has been made in the evaluation and performance assessment activities regarding high consequence areas since 2010.

OBJECTION: To the extent that this request seeks a list of High Consequence Areas, the identity and location of High Consequence Areas is confidential

and Keystone is required by PHMSA to keep this information confidential. To the extent that this request seeks production of the Emergency Response Plan, the request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

34(b). Define "high consequence area."

OBJECTION: To the extent that this request seeks a list of High Consequence Areas, the identity and location of High Consequence Areas is confidential and Keystone is required by PHMSA to keep this information confidential. Without waiving the objection, the definition of high consequence area can be found in Department of State SFEIS chapter 3 Section 3.13.4.1 and Code of Federal Regulation 49

CFR 195.450.

34(c). Provide a completed list of high consequence areas.

OBJECTION: The identity and location of High Consequence Areas is confidential and Keystone is required by PHMSA to keep this information confidential.

34(d). Explain how project inhabitants and local communities will be informed and educated about high consequence areas.

ANSWER: TransCanada Public Awareness Program is designed to increase awareness of pipeline safety to protect the public, environment and TransCanada facilities. The PA Program reaches out to affected public, excavators/contractors, emergency officials and local public to ensure they are engaged and education about living and working safely near TransCanada facilities. This includes awareness of areas that have been defined as high consequence areas.

34(c). Provide a copy of the Emergency Response Plan. (Requested above with #8.)

OBJECTION: To the extent that this request seeks production of the Emergency Response Plan, the request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of the U.S. Department of Transportation, Pipeline and Hazardous Materials

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Safety Administration (PHMSA). The PUC's jurisdiction over the emergency response plan is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone.

34(f). Provide Integrity Management Plan. (Requested above with #8.)

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Integrity Management Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation.

19. Explain what has been discussed with the SD Geological Survey, the Dept. of Game Fish and Parks, local landowners and govt. officials.

ANSWER: Keystone referenced publicly available data/reports from the SD Geological Survey. Discussion between Keystone and the South Dakota Dept. of Game, Fish, and Parks focused on the identification of the potential biological resources that may

be impacted by the Project route in South Dakota and the potential mitigation measures that could be implemented to minimize impacts.

The following is a summary of Keystone consultation history with SD Game, Fish, and Parks as documented in the USFWS issued May 2013 Biological Opinion (Appendix H of the of the Department of State FSEIS (2014))

- June 10, 2008: Keystone met with staff from USFWS and South Dakota Department of Game, Fish, and Parks (SDGFP), at the SDGFP office in Pierre, South Dakota, to discuss issues pertaining to wildlife, special status species, and sensitive habitat that could potentially occur in the Project area. The goal of the meeting was to gather input on agency recommendations based on the information sent to them in April 2008 for species occurrence, habitat assessments, and future field surveys. Keystone incorporated comments from the meeting into survey protocols and BMPs for future agency verification.

- January/February 2009: Keystone initiated section 7 consultation with the USFWS. Keystone continued discussions with BLM, and state wildlife agency offices for South Dakota that included state-specific special status species survey protocols and BMPs for the species identified as potentially occurring during the 2008 meetings. A summary of the findings from the 2008 biological field surveys was included in the discussions.

- January 27, 2009: Keystone met with staff from the USFWS and SDGFP at the SDGFP office in Pierre, South Dakota, to discuss issues pertaining to special status species surveys. The goals of the meeting were to verify Keystone's survey approach, BMPs, discuss required field surveys, and review the information that was sent to the USFWS in the January/February 2009, informal consultation package. The USFWS and SDGFP provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.

- October 23, 2012: A meeting was held between the USFWS, Department, SDGFP, BLM, and Keystone regarding the greater sage-grouse and a compensatory mitigation plan for the species in South Dakota. Discussions included a management plan and avoidance, minimization, and mitigation strategies.

35(a). Provide the Integrity Management and Emergency Response Plans. (Requested above.)

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency

response plan and the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit these documents to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

35(b). Define "Unusually Sensitive Areas."

ANSWER: Unusually Sensitive Areas are defined by U.S. federal pipeline safety regulations (49 CFR 195.6) as:

As used in this part, a USA means a drinking water or ecological resource area that is unusually sensitive to environmental damage from a hazardous liquid pipeline release.

(a) An USA drinking water resource is:

- (1) The water intake for a Community Water System (CWS) or a Non-transient Non-community Water System (NTNCWS) that obtains its water supply primarily from a surface water source and does not have an adequate alternative drinking water source;
- (2) The Source Water Protection Area (SWPA) for a CWS or a NTNCWS that obtains its water supply from a Class I or Class IIA aquifer and does not have an adequate alternative drinking water

source. Where a state has not yet identified the SWPA, the Wellhead Protection Area (WHPA) will be used until the state has identified the SWPA; or

(3) The sole source aquifer recharge area where the sole source aquifer is a karst aquifer in nature.

(b) An USA ecological resource is:

(1) An area containing a critically imperiled species or ecological community;

(2) A multi-species assemblage area;

(3) A migratory waterbird concentration area;

(4) An area containing an imperiled species, threatened or endangered species, depleted marine mammal species, or an imperiled ecological community where the species or community is aquatic, aquatic dependent, or terrestrial with a limited range; or

(5) An area containing an imperiled species, threatened or endangered species, depleted marine mammal species, or imperiled ecological community where the species or community occurrence is considered to be one of the most viable, highest quality, or in the best condition, as identified by an element occurrence ranking (EORANK) of A (excellent quality) or B (good quality).”

35(c). Define "Hydrologically Sensitive Areas."

ANSWER: Hydrological sensitive areas were defined by the South Dakota Public Utilities Commission Amended Final Order as "the High Plains Aquifer area in southern Tripp County," as well as "other similarly vulnerable and beneficially useful surficial aquifers that Keystone is aware of."

35(d). Explain how unusually sensitive areas and hydrologically sensitive areas are addressed differently compared to other areas.

ANSWER: Unusually sensitive areas are High Consequence Areas (HCAs), as defined by 49 CFR 195.6. Keystone has elected to treat "hydrologically sensitive areas," as defined in the South Dakota Public Utilities Commission Order Condition 35, as operator-defined HCAs. By designating these segments as operator-defined HCAs, these locations are treated by Keystone as if they were PHMSA-identified HCAs. Portions of the pipeline that could potentially affect HCAs are subject to high levels of inspection and repair criteria, as mandated by 49 CFR 195.

35(e). Confirm that you are not fully aware of all vulnerable and beneficially useful aquifers and your intent is to only become aware of them during construction and route evaluation not yet completed.

ANSWER: Keystone does not confirm these statements. Keystone has consulted with groundwater staff with South Dakota's Department of Natural Resources (SD

DENR) and rural water districts regarding Keystone's route relative to aquifers in South Dakota. Keystone also used data available on the SDDENR website <http://denr.sd.gov/data.aspx> and published literature regarding the geology and hydrology of the along and near the pipeline ROW to assist in identifying vulnerable aquifers in South Dakota. Geological references and hydrogeological references are listed in Chapters 3 and 4 in the Department of State Supplemental FEIS. Some pertinent additional references are:

- Gutentag (1984): USGS Prof. Paper 1400-B
- Downey (1986): USGS Prof. Paper 1402-E
- Thamke et al (2014): USGS Scientific Inv. Report SIR 2014-5047.
- In addition, lithologic logs available from the SD DENR at

<http://denr.sd.gov/des/wr/dblog.search.aspx> and <http://denr.sd.gov/data.aspx> provide aquifer thickness data.

35(f). Define "unconfined aquifers."

ANSWER: From Applied Hydrogeology (1994) "*Unconfined Aquifer: Aquifer close to the surface with materials of high permeability extending from the land surface to the base of the aquifer. Water table aquifer.*"

Source: Fetter, C.W. (1994.) Applied Hydrogeology. Prentice Hall. 680 pp.

35(g). List known unconfined aquifers to be crossed by the project.

ANSWER: Department of State Table 3.3-2 (SFEIS) presents a list of unconfined aquifers in South Dakota crossed by the Keystone XL Pipeline Project. Along the route in South Dakota, the High Plains Aquifer (Ogallala Formation) in Tripp County is often unconfined. Other areas with unconfined aquifers include alluvial aquifers associated with streams, and occasional unconfined stretches in the Hell Creek, Fox Hills, and Pierre Shale aquifers. However, along the majority of the route, aquifers crossed by the Keystone XL pipeline are confined.

35(h). Explain the concern of routing through unconfined aquifers.

ANSWER: In South Dakota, unconfined aquifers are found mainly associated with streams (alluvial aquifers) and in portions of the High Plains Aquifer (Ogallala Formation) in Tripp County (FSEIS). Table 3.3-2 (FSEIS) presents the unconfined aquifers in South Dakota. The Keystone XL pipeline in South Dakota was routed to reduce impacts to a number of valuable resources, including but not limited to, unconfined aquifers.

35(i). Describe how it could be possible to route through an unknown, unconfined aquifer during construction.

ANSWER: Keystone has attempted to identify vulnerable aquifers through consultation with State agencies and rural water districts, as well as data provided South Dakota Department of Environment and Natural Resources (SD DENR)

(<http://denr.sd.gov/data.aspx>), and published literature. The location of unconfined aquifers is documented in the literature on the hydrogeology of South Dakota and the SD DENR website provides well logs for wells near the pipeline ROW, so that unconfined conditions can be identified.

It is possible that, during construction and through discussion with landowners crossed by the Project, Keystone may identify shallow wells located in unconfined aquifers. Many water-bearing units in South Dakota may be unmapped due to their small size and type of geological formation that has limited use due to low water productivity and generally lower water quality. If present, these wells are often associated with agricultural uses (e.g., livestock stock tanks).

35(j). Provide documentation of further route evaluation since 2010, including assessments for aquifers and hydrologically sensitive areas.

OBJECTION AND RESPONSE: This request is vague, overlybroad, and unduly burdensome. Without waiving the objection, since 2010, Keystone has continued to identify groundwater resources through agency consultation use of the South Dakota Department of Environment and Natural Resources (SD DENR) website (<http://denr.sd.gov/data.aspx>) and the following publications. Geological references and hydrogeological references are listed in chapters 3 and 4 in the FSEIS. Some pertinent additional references are:

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- Gutentag (1984): USGS Prof. Paper 1400-B
- Downey (1986): USGS Prof. Paper 1402-E
- Thamke et al (2014): USGS Scientific Inv. Report SIR 2014-5047.

In addition, lithologic logs available from the SD DENR at <http://denr.sd.gov/des/wr/dblog.search.aspx> and <http://denr.sd.gov/data.aspx> provide aquifer thickness data. Since 2010, the Keystone XL pipeline route was evaluated using these data sources to identify hydrologically sensitive areas.

35(k). Explain how you will deem an aquifer vulnerable and beneficially useful?

ANSWER: Keystone relies on two primary sources to identify vulnerable and beneficially useful aquifers: Pipeline and Hazardous Materials Safety Administration (PHMSA)-identified unusually sensitive areas for drinking water, as defined in 49 CFR 195.6, and Source Water Protection Areas for groundwater as identified by the South Dakota Department of Environment and Natural Resources (SD DENR). Both PHMSA and the SD DENR have provided these data confidentially to Keystone.

35(l). This condition states: "...in some reaches of the Project in southern Tripp County, the High Plains Aquifer is present at or very near ground surface and is overlain by highly permeable sands permitting the uninhibited infiltration of contaminants."

Sandy soil and ground water at or above the surface means a pipe with expected pinhole leaks will be immersed in ground water. This is the exact type of situation of soil/ground

water which caused the route change in Nebraska. If this was reason to change the route in Nebraska, explain why it is still acceptable in South Dakota.

OBJECTION AND RESPONSE: This request is argumentative and assumes facts not in evidence. Without waiving the objection, "*Pipeline routing is optimized to reduce impacts and risks to the environment, population, and to reduce integrity concerns.*"

Routing decisions in each state were made in consultation with the various local state and federal agencies. Reroutes in Nebraska were determined based on public and agency input during the NEPA process. Routes approved in South Dakota were based on consultation with South Dakota local agencies. All routing decisions took into account the screening options outlined in the FSEIS Section 2.2.2.2 Major Pipeline Route Alternatives and Section 2.2.5.1 Screening of Major Route Alternatives. The first round of screening included the following criteria:

- "Meeting the proposed Project's purpose and need, including the extent to which additional infrastructure (pipeline) is necessary to access Bakken crude oil;
- Consistency with the proposed border crossing and therefore the approved routing in Canada;
- Availability;
- Reliability;

- Length within the United States;
- Total length of the pipeline, including both the United States and Canada;
- Estimated number of aboveground facilities;
- Length co-located within an existing corridor;
- Acres of land directly affected during construction; and
- Acres of land directly affected permanently.” (FSEIS Section 2.2.2.2 pg 2-2-2).

The second round of screening included the following criteria:

- “Total length of the pipeline, including both the United States and Canada;
- Use of the Canadian-approved Keystone XL pipeline ROW outside of the United States;
- Approximate acres affected by construction of the proposed Project (based on a typical 110-foot construction ROW)
- Federal lands crossed (miles);
- Principal aquifers crossed (miles);
- American Indian lands crossed (miles);
- Total wetlands crossed (miles);
- USFWS critical habitat for threatened and endangered species crossed (miles);

- Known cultural resource sites (listed on National Register of Historic Places) within 500 feet of proposed pipeline;
- Number of waterbodies crossed; and
- Soils designated as highly erodible by wind crossed (miles).” FSEIS Section 2.2.5.1 pg 2.2-59)

Rerouting away from the environmentally sensitive Nebraska Department of Environmental Quality (NDEQ)-identified Sand Hills Region was based on input from the NDEQ and the public.

South Dakota Public Utilities Commission's (SD PUC) Amended Order identified the southern portion of Tripp County as having a “hydrologically sensitive area” for groundwater resources due to the sandy soils and presence of unconfined portions of the High Plains Aquifer. As discussed previously, Keystone will treat “hydrologically sensitive areas”, as defined in the SD PUC Order Condition 35, as operator-defined high consequence areas (HCAs). By designating these segments as operator-defined HCAs, these locations are treated by Keystone as if they were Pipeline and Hazardous Materials Safety Administration (PHMSA)-identified HCAs. Portions of the Keystone XL pipeline that could potentially affect HCAs are subject to high levels of inspection and repair criteria, as mandated by 49 CFR 195.

Where soils are fragile (i.e., sandy soils that exhibit conditions similar to the Nebraska Department of Environmental Quality-identified Sand Hills Region that are highly susceptible to erosion by wind), special considerations and measures also would be undertaken in proposed Project areas to protect environmentally sensitive resources.

“Approximately 76 percent (11,664 acres) of the overall proposed Project would affect soils characterized as highly erodible by either wind or water (see Figure 4.2.1-1). Erosion control measures would be implemented wherever soil is exposed, steep slopes are present, or erosion potential is high. To enforce use of these methods, an environmental inspector (EI) would be assigned to each construction spread. In addition, specific procedures have been developed to address concerns related to potential erosion to the fragile soils in the southern South Dakota and northern Nebraska region; the proposed Project right-of-way (ROW) through these fragile soils would be monitored for several years to ensure that reclamation and revegetation efforts are successful (see Section 4.2.3.2, Operation Impacts).” (FSEIS Section 4.2 Soils, pg 4.2-2)

“Fragile Soils in Southern South Dakota and Northern Nebraska

In southern South Dakota and northern Nebraska, the proposed Project

route would enter an area with fragile soils (i.e., landscapes where the soil exhibits conditions similar to the NDEQ-identified Sand Hills Region and the soils are very susceptible to wind erosion; see Soils Environmental Setting Sections 3.2.2.2, South Dakota, 3.2.2.3, Nebraska, and Figure 3.2.2-2, Highly Wind Erodible Soils). To address concerns related to potential erosion in the region, specific construction, reclamation, and post-construction procedures have been developed, as described in Section 4.15 of the CMRP, Fragile Soil Clean Up and Reclamation/Revegetation, (see Appendix G). This document provides site-specific reclamation plans that itemize construction, erosion control, and revegetation procedures for these fragile areas. Additionally, Keystone would implement micro-routing adjustments where practicable and appropriate to minimize steep topography with fragile soils.

To reduce potential impacts related to severe wind and water erosion, the following provides a summary of proposed Project best management practices (BMPs) that would be implemented during construction, reclamation, and post-construction. These BMPs are included in the CMRP for fragile soil areas. Additional procedures are also described in Sandy Prairie Construction/Reclamation Unit Plan (see Appendix R,

Construction/Reclamation Plans):

- Keystone would educate construction personnel regarding the necessity to strictly adhere to the proposed Project BMPs designed to minimize impacts to fragile soil landscape areas.
- Minor route re-alignments would be incorporated through these fragile areas to avoid particularly erosion-prone locations, such as ridgetops and existing blowouts as much as practicable.
- Keystone would avoid highly saturated areas, such as wetlands, to the maximum extent possible.
- Construction soil handling procedures would strive to reduce the width of disturbance to the native prairie landscape by adopting Trench-line or Blade-width stripping procedures where practicable.
- Topsoil conservation would be conducted on all areas where excavation occurs.
- Topsoil piles would be protected from erosion through matting, mulching, watering, or tackifying as deemed practicable.
- Traffic management limitations would be employed on specific areas possessing high erosion potential or sensitive habitat.
- Native seed mixes would be developed with input from the local

NRCS offices and through collaboration with regional experts. All seed would be certified noxious weed-free and would be calculated on a pure live seed basis.

- Straw or native prairie hay may be used as mulch, applied to the ROW, and crimped into the soil to prevent wind erosion. All mulch would be documented as noxious weed-free.
- Land imprinting may be employed to create impressions in the soil, thereby reducing erosion, improving moisture retention, and creating micro-sites for seed germination. (Land imprinting adds a waffle-like texture to the soil, forming indentations that capture and absorb rainwater that otherwise runs off untreated land.)
- Sediment logs (barriers in the form of logs used to control soil erosion) or straw wattles would be used in place of slope breakers (short terraces) that are constructed of soil. Using sediment logs would result in less soil disturbance to the ROW.
- Photodegradable matting would be applied on steep slopes or areas prone to extreme wind exposure such as north- or west-facing slopes and ridge tops. Biodegradable pins would be used in place of metal staples to hold the matting in place.

- Keystone would work with landowners to evaluate fencing the ROW from livestock, or alternatively, provide compensation to rest a pasture until vegetation can become established.
- Management concerns such as livestock access to water or movement within a pasture would be addressed as necessary by Keystone working with the landowner.
- As part of post-construction monitoring and repair, Keystone would monitor reclamation on the ROW for several years and would repair erosion and reseed poorly revegetated areas as deemed necessary by Keystone. During monitoring, landowners would be informed of these efforts and intended actions going forward.
- A noxious weed management plan would be established based on consultation with state and county experts.

Fragile Soils in Southern South Dakota and in Northern Nebraska

To address concerns related to potential erosion in the fragile soil areas in southern South Dakota and northern Nebraska, specific construction, reclamation, and post-construction procedures have been developed as described in the Fragile Soils section within the CMRP (see Appendix G). This document provides a site-specific reclamation plan that itemizes

construction, erosion control, and revegetation procedures for these fragile areas. Additional procedures are also described in Sandy Prairie Construction/Reclamation Unit Plan (see Appendix R, Construction/Reclamation Plans and Documentation). The proposed Project ROW through this region would be monitored for several years to ensure that reclamation and revegetation efforts are successful. Any proposed Project areas where reclamation and revegetation efforts are initially unsuccessful would be re-evaluated and restored.

Proposed Project areas that have been revegetated would be attractive as cattle forage. Due to potentially warmer soils in the immediate vicinity of the proposed pipeline, early forage may be concentrated along the ROW over time (Dave Wedin, personal communication, June 29, 2011).

Additionally, animal trackways (i.e., a route of frequent travel by animals) can serve as incipient blowout areas. Keystone has agreed to inform landowners of this concern. Fencing of the ROW may be completed if required; however, fencing could be a serious impediment to landowner access. As described previously, Keystone would work with landowners to evaluate fencing the ROW from livestock, or alternatively, provide compensation to rest a pasture until vegetation can become established.

Also as previously indicated, Keystone would monitor reclamation on the ROW for several years and repair erosion and reseed poorly revegetated areas as necessary.

Additionally, based on input received from the NRCS, Keystone would be required to employ a method of assessment of soil productivity such as yield comparison between ROW and non-ROW areas in areas where susceptible soils have been identified with the NRCS." (FSEIS, Section 4.2 Soils).

35(m). Explain TransCanada's follow-up with suggestion by DENR staff, given in testimony, to reroute the KXL pipeline around the city of Colome's source water area.

ANSWER: Routing is an iterative process where refinements to the route are continuously made as new, substantive data are obtained. In this case, Keystone had obtained HCA data from the Pipeline and Hazardous Materials Safety Administration (PHMSA) and consulted with the South Dakota Department of Environment and Natural Resources' (SD DENR) ground water Staff. During the consultation process, Keystone received Source Water Protection Area (SWPA) data. These data sets were integrated into the routing process and, upon identification of the route through the Colome SWPA, Keystone rerouted out of the area. Keystone consulted with the SD DENR's groundwater Staff and informed them of the issue with the initially proposed route and a proposed route refinement to avoid the SWPA. SD DENR staff confirmed that the reroute was acceptable.

36(a). Identify all emergency medical response planning contained within the emergency response plan.

OBJECTION: This request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the exclusive province of PHMSA. The PUC's jurisdiction over the emergency response plan is preempted by federal law, which has exclusive jurisdiction over issues of pipeline safety. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. *See* Amended Final Order, HP 09-001, Condition ¶ 36. Public disclosure of the emergency response plan would commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

36(b). What actions have been taken by TransCanada to ensure the medical communities in South Dakota are prepared and educated to treat people exposed to spills and water contamination from spills?

OBJECTION AND RESPONSE: To the extent that this request seeks production of the Emergency Response Plan, this request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the exclusive province of PHMSA. The PUC's jurisdiction over the emergency response plan is preempted by federal law, which has exclusive jurisdiction over issues of pipeline safety. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. See Amended Final Order, HP 09-001, Condition ¶ 36. Public disclosure of the emergency response plan would commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>. Without waiving the objection, TransCanada has provided educational information to possible affected public elected officials, excavators, and first responders. This educational material comes in the form of a pamphlet and is titled Oil Pipeline for Emergency Responders. It is marked as Keystone 1523-1538.

36(c). How will inhabitants and communities near the project area be notified of spills?

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ANSWER: Keystone's response teams will use the National Incident Management System (NIMS) Incident Command System (ICS) to manage emergency response activities. First response to an incident will be provided by a Keystone local response team. Keystone's Regional Emergency Operations Center (EOC) will respond, to the degree necessary, to incidents exceeding local capability. Duties of the local responders are described in the TransCanada-Keystone Emergency Response Plan (see FSEIS, Appendix I) which will be adapted for use on Keystone XL.

Response teams will be led by an Incident Commander, and will include persons accountable for external notifications including a Public Information Officer (including media communications), and a Liaison Officer (including agency communications). External notifications are those made to entities outside of the Company including Federal, State and local regulatory agencies, as well as railroad and utility companies. These notifications include both verbal and written requirements. Landowners and appropriate public agencies will be notified in the case of potential groundwater contamination.

40(a). Provide documentation supporting your assertion that polyethylene water piping is permeable to BTEX.

ANSWER: Permeation of polyvinyl chlorine (PVC) and polyethylene (PE) pipes by any hydrocarbon is extremely rare (Gaunt et al. 2006). Permeation incidents were

reported at a frequency of one per 14,000 miles of mains and one per 1,000,000 miles of PE/PVC service connections (Gaunt et al. 2006).

A number of studies have been conducted on the topic of hydrocarbon permeation through PVC and PE water piping, including:

Gaunt, James A. et. al. 2006. "Performance of Plastic Pipes and Pipe Gaskets In Hydrocarbon Contamination: Field Experience and Laboratory Studies". Department of Civil, Construction, and Environmental Engineering Iowa State University, Ames, IA. American Waterworks Association.

Berens, A.R. 1985. "Prediction of organic chemical permeation through PVC pipe". JAWWA 77 (11), 57-64 (1985).

40(b). Explain health concerns related to BTEX.

ANSWER: BTEX consists of benzene, toluene, ethylbenzene, and xylenes.

Benzene can result in health impacts from short term (i.e., acute) exposure or long-term (i.e., chronic) exposure. Acute effects can include drowsiness, dizziness, rapid heart rate, headaches, and unconsciousness. At extremely high concentrations, acute toxicity can result in mortality. Benzene levels at these concentrations would not be anticipated from a release from the Keystone XL Pipeline Project. Potential chronic health effects of benzene exposure include anemia and excessive bleeding. Long-term exposure to high concentrations of benzene in the air can lead to cancer (ATSDR 2007a, EPA 2015). Due

to emergency response cleanup, sampling, and monitoring, remedial actions, and the high volatility of benzene, benzene concentrations would largely dissipate within the first 24 hours, minimizing the potential for chronic effects in humans.

Toluene exposure may cause fatigue, confusion, and weakness (ATSDR 2001, EPA 2015). At extremely high levels, toluene may cause mortality. Toluene levels at this concentration would not be expected to occur due to a release along the Keystone XL Pipeline Project.

Ethylbenzene exposure may cause eye and throat irritation or dizziness (ATSDR 2010, EPA 2015). Chronic exposure to low levels of ethylbenzene (weeks to years) may cause damage to the inner ear or kidneys. Ethylbenzene has been identified as a possible human carcinogen.

High levels of xylene exposure, either acute or chronic, can cause headaches, lack of muscle coordination, confusion, and eye, skin, throat, and nose irritation. Extremely high levels can cause unconsciousness and mortality (ATSDR 2007b, EPA 2015). Xylene levels at this concentration would not be expected to occur due to a release along the Project. Studies by the International Agency for Research on Cancer and the EPA have not been able to rule xylene out as a carcinogen.

More detailed information is available through the Agency for Toxic Substances & Disease Registry (ATSDR; <http://www.atsdr.cdc.gov/>) and the US Environmental

Protection Agency (USEPA; <http://water.epa.gov/drink/contaminants/>).

Agency for Toxic Substances and Disease Registry. 2014. ATSDR Toxic Substances Portal. Available from: <http://www.atsdr.cdc.gov/>

Agency for Toxic Substances & Disease Registry (ATSDR). 2010. ToxFAQs for Ethylbenzene. Accessed January 20, 2015.

<http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=382&tid=66>.

Agency for Toxic Substances & Disease Registry (ATSDR). 2001. ToxFAQs for Toluene. Accessed January 20, 2015.

<http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=160&tid=29>.

Agency for Toxic Substances & Disease Registry (ATSDR). 2007a. ToxFAQs for Benzene. Accessed January 20, 2015.

<http://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=38&tid=14>.

Agency for Toxic Substances & Disease Registry (ATSDR). 2007b. ToxFAQs for Xylene. Accessed January 20, 2015.

<http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=295&tid=53>.

US Environmental Protection Agency (EPA). 2015. Drinking Water Contaminants. Accessed January 20, 2015. <http://water.epa.gov/drink/contaminants/>.

Environmental Protection Agency. 2014. National Primary Drinking Water Regulations. Available from: <http://water.epa.gov/drink/contaminants/>

40(c). Provide an MSDS of all products to be transported in KXL, including the diluents.

ANSWER: Representative Material Safety Data Sheets are provided in Appendix Q of the FSEIS.

40(d). Provide list of ground water quality standards, specifically listing chemicals involved in tar sands oil product and diluents.

OBJECTION: Keystone does not determine ground water quality standards. They are established by the South Dakota Department of Environment and Natural Resources.

40(e). Describe how the decision was made to designate concern of BTEX only within 500 feet of the Project.

ANSWER: This decision was made by the PUC as part of Amended Permit Condition 40.

40(f). Confirm this safety measure will only be implemented at the request of a landowner or public water supply system.

ANSWER: Yes.

40(g). Explain why this measure is optional instead of mandatory.

ANSWER: This decision was made by the PUC as part of Amended Permit Condition 40.

40(h). TransCanada has agreed to do this: "At least forty-five days prior to commencing construction, Keystone shall publish a notice in each newspaper of general circulation in each county through which the Project will be constructed advising landowners and public water supply systems of this condition." What percent of inhabitants do you expect to reach by issuing a warning in this manner?

OBJECTION AND RESPONSE: This request is speculative and argumentative. A notice is not a "warning." Without waiving the objection, Keystone expects that notice in newspapers of general circulation would reach a substantial portion of the inhabitants.

46(a). Provide written plan as to how you will find and provide a permanent water supply for various locations along route if a well should become contaminated, including specific alternate sources.

ANSWER: In the unlikely event of a leak, petroleum hydrocarbons generally do not move more than 300 feet through the subsurface and substantive movement takes months to years offering ample time for emergency response and containment. Therefore, impacts to private and public wells are not anticipated. Further, Keystone will comply with the South Dakota Public Utilities Commission order (Condition of Permit #46): "In the event that a person's well is contaminated as a result of construction or pipeline operation, Keystone shall pay all costs associated with finding and providing a permanent

water supply that is at least of similar quality and quantity; and any other related damages, including but not limited to any consequences, medical or otherwise, related to water contamination.”

46(b). Define “quantity” as it is used in this condition.

ANSWER: Keystone interprets “quantity” to have its ordinary meaning.

46(c). Provide cost estimates for providing water to the city of Colome, domestic wells or an entire ranching operation should water supplies become contaminated.

ANSWER: Please refer to DOS SFEIS Appendix Z Mitigation Measures page 108 item 7. Keystone has committed, in the event that a spill contaminates potable water supplies, be responsible for cleanup and restoration. Keystone would be responsible for providing an appropriate alternative potable water supply of comparable volume and quality to those impacted or provide compensation, if this option is agreed upon by the affected parties and Keystone. For groundwater used for industrial or irrigation purposes, Keystone may provide either an alternate supply of water or appropriate compensation for those facilities impacted, as may be agreed upon among the affected parties and Keystone. If the permit were approved, Keystone would memorialize that agreement through an appropriate written agreement with the Environmental Protection Agency.

46(d). Explain how providing a permanent water supply will be ensured into perpetuity.

ANSWER: See answer to interrogatory no. 46(a).

46(e). Explain how people and cattle using private wells and public wells can be assured their water is free of contamination from undetected leakage, particularly in Tripp County.

ANSWER: Given the leak detection methodologies that are part of the project, undetected well contamination is unlikely.

46(f). Describe what experience South Dakota has had cleaning up tar sands oil product spills into rivers and ground water.

OBJECTION: This request seeks information that is not within Keystone's custody or control.

46(g). Describe any experience the State of South Dakota or any other state has had in "sparging" ground water in order to cleanse tar sands oil product from aquifers.

OBJECTION: This request seeks information that is not within Keystone's custody or control.

46(h). Describe types of spills which may be difficult or impossible to remediate.

ANSWER: Crude oil spills can be remediated. Initial contaminant and cleanup is important to limit the area affected and to remove as much product as quickly as possible. Any residual oil can be remediated through a variety of remediation technologies as well as through natural attenuation.

As discussed in Section 2.1 of the FSEIS, Keystone has reviewed the National Transportation Safety Board 2012 Marshall, Michigan Accident Report, including the conditions that led to operational failures on the pipeline that resulted in the spill.

Keystone has stated they would include lessons learned from this spill, including the following:

- “Get big quick: timeliness of a tactical response to an oil spill into water is imperative. While Keystone has stated that it already uses this philosophy, the Kalamazoo spill reinforced this need to respond with as many resources as possible as quickly as possible. To that end, Keystone would strategically store equipment and employ personnel and contractors along the length of the pipeline to ensure a maximum 6-hour response time.
- Pre-qualify a large contractor network: Contractors would be used to supplement any response Keystone would make to an oil spill. By ensuring a large pool of trained/skilled contractors along the length of the pipeline have been pre-qualified and contracted with Keystone, the response time would be minimized and resources (equipment and personnel) available are maximized.
- Emergency response planning details need to include source

containment: source containment plans including strategies and tactics would be included in the overarching ERP.

- Equipment resources required for sunken and submerged oil:
Keystone would further identify equipment resources required to respond to sunken and submerged oil and ensure personnel are appropriately trained on the equipment. A primary strategy for oil spill response would still be to contain and recover as much oil as possible as quickly as possible to prevent oil from weathering and therefore potentially becoming submerged and sinking. In addition, Keystone already owns and practices the use of containment devices that would prevent downstream migration of submerged and sunken oil such as dams. This type of equipment would be further identified and procured for the proposed Project.”

Section 2.1 of the FSEIS also covers remediation of potential crude oil spills and construction related spills.

“Corrective remedial actions would be dictated by federal, state, and local regulations and enforced by the PHMSA Office of Pipeline Safety as well as appropriate state and/or local agencies. Required remedial actions may be large or small, dependent upon a number of factors including state

mandated remedial cleanup levels, potential effects to sensitive receptors, the volume and extent of the contamination, whether or not there is a violation of water quality standards, and the magnitude of adverse impacts caused by remedial activities. A large remediation action could include one or more of a number of approaches (such as excavation of soil, pumping and treating ground water, or natural attenuation). However, the selection of a remedial measure would be in coordination and agreement with the appropriate regulatory agency.

If, during construction, tanks or contamination are found, they would be managed according to federal, state, and/or local regulations. Further, Keystone would make individuals available who are trained in identifying and disposing of hazardous materials during construction.

If there is an accidental release from the proposed Project, Keystone would implement the remedial measures necessary to meet the federal, state, and local standards that are designed to help ensure protection of human health and environmental quality. Additional information on remediation is presented in Section 4.13 of the FSEIS, Potential Releases.”

46(i). Identify responsible parties who will conduct water analysis to assure toxins from

undetected leaks have not migrated into water resources, including frequency of testing and who will assume cost of testing.

ANSWER: If a release were to occur, Keystone would implement its Emergency Response Plan (ERP). This ERP is responsive to the size of spill and resources potentially affected. In the event surface waters were impacted, Keystone would implement its ERP and notify appropriate federal and state agencies. If the release is significant, an Incident Command Team will develop a sampling plan, determined in consultation with the appropriate state and federal agencies that identifies the appropriate sampling, frequency, and responsible payee.

46(j). Describe potential scenarios in which medical costs related to contamination will be reimbursed.

ANSWER: If it is determined that medical costs are incurred and result of contamination caused by Keystone, Keystone will reimburse such costs.

46(k). Provide a detailed listing of potential toxins which could contaminate wells.

ANSWER: The South Dakota Department of Environment and Natural Resources (SD DENR) identifies a number of compounds that can potentially contaminate wells (refer to the following list [SD DENR 2009]). Many of these chemicals are not constituents of petroleum hydrocarbons but are associated with farming, industrial activities, and urban runoff.

- 1,1,1-Trichlorethane
- 1,1,2-Trichlorethane
- 1,1-Dichloroethylene
- 1,2 Dibromo-3-chloropropane (DBCP)
- 1,2,4-Trichlorobenzene
- 1,2-Dichloroethane

- 1,2-Dichloropropane
- 2,4,5-TP (Silvex)
- 2,4-d, 3-Hydroxycarbofuran
- Alachlor (Lasso)
- Aldicarb
- Aldicarb sulfone
- Aldicarb sulfoxide
- Aldrin
- Antimony (total)
- Arsenic (total)
- Atrazine
- Barium (total)
- Benzene
- Benzo[a]pyrene
- Beryllium (total)

- Butachlor
- Cadmium (total)
- Carbaryl
- Carbofuran
- Carbon tetrachloride
- Chlordane
- Chromium (total)

- cis-1,2-Dichloroethylene
- Dalapon
- Di(2-Ethylhexyl) adipate
- Di(2-ethylhexyl) phthalate

- Dicamba
- Dichloromethane (methylene chloride)

- Dieldrin
- Dinoseb
- Diquat
- Endothall
- Endrin
- Ethylbenzene
- Ethylene dibromide (EDB)
- Glyphosate
- Heptachlor
- Heptachlor epoxide
- Hexachlorobenzene (HCB)
- Hexachlorocyclopenta-diene
- Lindane
- m-Xylene
- Mercury (total inorganic)

- Methomyl
- cis-1,2-Dichloroethylene
- Dalapon
- Di(2-Ethylhexyl) adipate
- Di(2-ethylhexyl) phthalate
- Dicamba
- Dichloromethane (methylene chloride)

- Methoxychlor
- Metolachlor
- Metribuzin
- Monochlorobenzene (Chlorobenzene)
- Nitrate
- Nitrite

- o-Dichlorobenzene
- o-Xylene
- Oxamyl (Vydate)
- p-Dichlorobenzene
- p-Xylene
- Pentachlorophenol
- Picloram
- Propachlor
- Selenium (total)
- Simazine
- Styrene
- Tetrachloroethylene
- Thallium (total)
- Toluene
- Total polychlorinated biphenyls (PCBs)
- Toxaphene
- trans-1,2-Dichloroethylene
- Trichloroethylene
- Vinyl chloride
-
-
-

South Dakota Department of Environment and Natural Resources (SD DENR). 2009.

Tripp County Water User District Drinking Water Quality Report. Available from:

<http://www.ewg.org/tap-water/whatsinyourwater2/SD/tripp-county-water-user-district/4600520>.

46(l). Provide documentation detailing adverse health effects caused from exposure to these toxins, including the various routes of entry into the human body.

ANSWER: As stated in the previous response (#54), many of these compounds identified in the previous response are not constituents of crude oil.

The U.S. Environmental Protection Agency has a detailed listing of potential drinking water contaminants. This includes the toxins addressed above and their potential health effects on humans due to ingestion of contaminated drinking water. This information is available at <http://water.epa.gov/drink/contaminants/>.

Additionally, the Agency for Toxic Substances and Disease Registry (ATSDR) website includes detailed reports on potential health effects of these toxins as well as potential routes of entry into the human body. This information is available at <http://www.atsdr.cdc.gov/>.

Agency for Toxic Substances and Disease Registry. 2014. ATSDR Toxic

Substances Portal. Available from: <http://www.atsdr.cdc.gov/>

Environmental Protection Agency. 2014. National Primary Drinking Water

Regulations. Available from: <http://water.epa.gov/drink/contaminants/>.

18(a). Regarding an advisory warning issued in September, 2014 by the federal Pipeline

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and Hazardous Materials Safety Administration, what are TransCanada's plans to ensure pipeline safety due to the fact different types of product will be transported in KXL?

OBJECTION AND RESPONSE: This request seeks information related to pipeline safety, which is within the exclusive jurisdiction of PHMSA. Without waiving the objection, PHMSA Advisory 2014-0040 is not applicable to Keystone. This advisory is related to flow reversal, product change (e.g., crude oil to refined product) and/or conversion to service (e.g., convert from natural gas to crude oil) and throughput capacity change.

18(b). PHMSA cautioned pipeline operators across the country about "the potential significant impact flow reversals, product changes and conversion to service may have on the integrity (safety) of a pipeline." The advisory adds: "Flow reversals, product changes, and conversions to service may impact various aspects of a pipeline's operation, maintenance, monitoring, integrity management, and emergency response. Pressure gradients, velocity, and the location, magnitude, and frequency of pressure surges and cycles may change. Operators may also consider increasing the throughput capacity of the pipeline. Increasing throughput may also impact the pressure profile and pressure transients. ... Leak detection and monitoring systems may be affected."

OBJECTION AND ANSWER: This request is not a question and cannot be answered. It also relates to an issue that is within the exclusive jurisdiction of PHMSA

and is therefore not relevant or likely to lead to the discovery of admissible evidence.

Without waiving the objection, PHMSA Advisory 2014-0040 is not applicable to Keystone. This advisory is related to flow reversal, product change (e.g., crude oil to refined product) and/or conversion to service (e.g., convert from natural gas to crude oil) and throughput capacity change.

18(c). Current regulations state: "Operators must review their integrity (safety) management program. ... Operators must notify PHMSA if these changes will substantially affect their integrity management program, its implementation, or modifies the schedule for carrying out the program elements."

OBJECTION: This request is not a question and cannot be answered. It also relates to an issue that is within the exclusive jurisdiction of PHMSA and is therefore not relevant or likely to lead to the discovery of admissible evidence.

18(d). KXL is intended to transport two very different products, the much less dense and highly volatile Bakken oil product and the heavy diluted bitumen from Alberta. How will the two very different products affect KXL's operation, maintenance, monitoring, integrity management, and emergency response? How will the two very different products affect pressure gradients, velocity, and the location, magnitude, and frequency of pressure surges and cycles?

ANSWER: Please refer to Department of State FSEIS Chapter 3 Section 3.13.3.

The Keystone pipeline is designed to transport a range of crude oils. The hydraulic analysis considers various inputs such velocity, surge and cyclic loading. The operation, maintenance, monitoring, integrity management, and emergency response plans consider the range of products transported.

33(a). Provide updated maps.

OBJECTION AND ANSWER: This request is vague, overlybroad, unduly burdensome, and seeks information that is not relevant or likely to lead to the discovery of admissible evidence. Without waiving the objection, please refer to the attached route variation maps marked as Keystone 0470-0583.

41(a). Provide map detailing all water bodies to be crossed in S.D., to include locations KXL would cross the Missouri and Yellowstone Rivers upstream from S.D.

OBJECTION: Keystone has previously filed with the PUC maps showing the route through South Dakota, which also show where the pipeline crosses rivers and other water bodies. Waterbody crossing permitting is within the control of the United States Army Corps of Engineers, and is beyond Keystone's control.

41(b). Provide map clearly depicting all waterways crossed by route which are tributaries into the Missouri River.

OBJECTION: Keystone has previously filed with the PUC maps showing the route through South Dakota, which also show where the pipeline crosses rivers and other water bodies.

41(c). Identify distances from KXL waterway crossings to point of confluence with the Missouri River.

OBJECTION: Keystone withdraws its previous objection. For the perennial stream crossings where the downstream portions of the stream are located within the boundaries of South Dakota and have a point of confluence with the Missouri River, the distance from the KXL pipeline crossing of each waterway to the Missouri River are in Table 1 below.

Table 1. Downstream Distance to the Missouri River

Stream Name	Periodicity	Miles downstream to Missouri River
Cottonwood Creek	Perennial	87.2
Bad River	Perennial	93.4
South Fork Grand River	Perennial	290.4
Clarks Fork Creek	Perennial	285.7
South Fork Moreau River	Perennial	290.4
Pine Creek	Perennial	222.7
Dry Creek	Perennial	86.5

41(d). Provide map(s) demonstrating all public water utility intakes on the Missouri River system.

OBJECTION: This request is overlybroad, unduly burdensome, and seeks information that is not within Keystone's custody or control. In addition, the location of the information is related to HCA's and deemed confidential by PHMSA.

41(e). By what date will permitting of water body crossings be completed?

OBJECTION: Permitting of water body crossings is within the control of the United States Army Corps of Engineers, and is beyond Keystone's control.

41(f). Provide a copy of the CMR Plan. Ex TC-1, 5.4.1, pp. 45-46.

ANSWER: A current copy of the CMR Plan is attached to Keystone's certification petition and is on file with the PUC.

41(g). Provide research which describes migration of spillage in these waterways.

OBJECTION: This request is vague, overlybroad, and unduly burdensome.

41(h). Please explain and describe water protection areas located downstream of major river crossings on the proposed route.

OBJECTION: This request is overlybroad, unduly burdensome, and seeks information that is not within Keystone's custody or control. In addition, the location of the information is related to HCA's and deemed confidential by PHMSA.

41(i). Explain risks of HDD, including possibility of contaminants being released into waterways during this process.

ANSWER: This issue is addressed in the FSEIS at pages 4.3-21, 4.8-20, and 4.7-11, 12.

50(a). Provide a map depicting the High Consequence Areas.

OBJECTION: This request seeks the identity and location of High Consequence Areas, which is confidential by statute, and Keystone is required by PHMSA to keep this information confidential.

50(b). Explain why the total length of pipe affecting HCA decreased from 34.3 miles to 19.9 miles.

OBJECTION AND ANSWER: To the extent that this request seeks the identity and location of High Consequence Areas, that information is confidential by statute and Keystone is required by PHMSA to keep this information confidential. Without waiving the objection, during the detailed engineering design phase of the Project, the route was adjusted. In doing so, the route deviated away from DOT designated HCA areas there by reducing total HCA miles crossed by the Project. Please refer to the attached route variation list and maps.

50(c). Explain how the statistic which states a spill could affect a HCA no more than once in 250 years.

OBJECTION AND ANSWER: To the extent that this request seeks the identity and location of High Consequence Areas, that information is confidential by statute and

Keystone is required by PHMSA to keep this information confidential. Without waiving the objection, page 4-21 of the 2009 KXL Risk Assessment shows that a spill affecting HCA in any state crossed by the Project has an occurrence interval of 53 years. This is calculated based on historical incident data from Pipeline and Hazardous Materials Safety Administration, as discussed in Section 3.0. This is calculated by taking the inverse of the incident frequency (measured as incidents per mile per year) multiplied by the miles of high consequence areas crossed (141.2 miles). The result is an estimate, in years, of the time between spills. This is similar to the concept of flood recurrence intervals (e.g., 100-year floods).

107(a). Provide the analysis by Dr. Michael Madden which professes the Project would not (ii) substantially impair the health, safety, or welfare of the inhabitants in the project area.

OBJECTION: Dr. Madden was PUC Staff's witness in Docket 09-001, and his direct testimony is a matter of public record.

107(b). Explain how the 2010 permit, which relies on the federal environmental impact statement prepared by the Department of State, addresses specific concerns of South Dakota, including the health, safety and welfare of South Dakota citizens.

OBJECTION: This request is vague, unclear, argumentative, and seeks information that is not relevant or likely to lead to the discovery of admissible evidence.

The PUC addressed the health, safety, and welfare of South Dakota residents in the Amended Final Decision and Order in Docket 09-001. In addition, South Dakota residents had notice and opportunity to participate in the lengthy NEPA process conducted by the Department of State.

107(c). Explain your interpretation of "substantially" as it is used in state law SDCL 49-41 B-22 which states the applicant for a facility construction permit has the burden of proof to establish that:

(3) "The facility will not substantially impair the health, safety or welfare of the inhabitants."

OBJECTION: This request seeks a legal opinion or conclusion and is therefore beyond the scope of discovery and not likely to lead to the discovery of admissible evidence under SDCL § 15-6-26(b). It was an issue for the PUC to determine in Docket HP 09-001.

107(d). State with 100% certainty that this project will have no impact on the health, safety or welfare of the people of South Dakota.

OBJECTION: This request is argumentative and seeks information that is not relevant or likely to lead to the discovery of admissible evidence. The PUC addressed the health, safety, and welfare of South Dakota residents in the Amended Final Decision and Order in Docket 09-001. Keystone has not asserted that the project would

have "no impact" on the health, safety, or welfare of the people of South Dakota.

107(e). Describe how areas of dense populations versus areas of sparse populations affect project decision.

OBJECTION AND RESPONSE: This request is vague and unclear. Without waiving the objection, to the extent feasible and consistent with other routing criteria, areas of dense population are avoided during project routing.

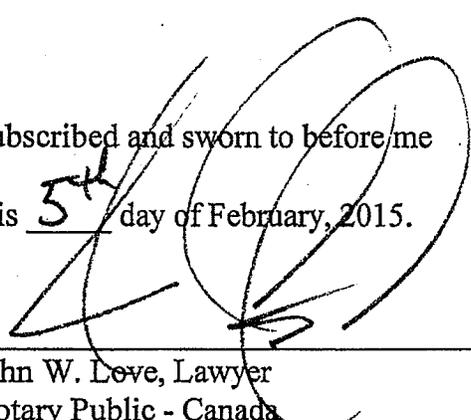
Dated this 5th day of February, 2015.

TRANSCANADA KEYSTONE PIPELINE, LP
by its agent, TC Oil Pipeline Operations, Inc.

By 

Its Director, Authorized Signatory

Subscribed and sworn to before me
this 5th day of February, 2015.

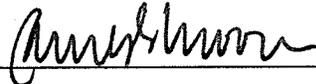

John W. Love, Lawyer
Notary Public - Canada

OBJECTIONS

The objections stated to Cindy Myers' Interrogatories and Request for Production of Documents were made by James E. Moore, one of the attorneys for Applicant TransCanada herein, for the reasons and upon the grounds stated therein.

Dated this 6th day of February, 2015.

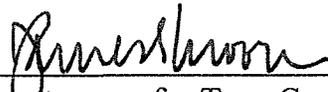
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Attorneys for Applicant TransCanada

CERTIFICATE OF SERVICE

I hereby certify that on the 6th day of February, 2015, I sent by e-mail transmission, a true and correct copy of Keystone's Responses to Cindy Myers' First Interrogatories and Request for Production of Documents, to the following:

Cindy Myers, R.N.
PO Box 104
Stuart, NE 68780
csmyers77@hotmail.com



One of the attorneys for TransCanada

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

0-0

IN THE MATTER OF THE APPLICATION : HP 14-001
BY TRANSCANADA KEYSTONE
PIPELINE, LP FOR A PERMIT UNDER : TRANSCANADA KEYSTONE
THE SOUTH DAKOTA ENERGY : PIPELINE, LP'S OBJECTIONS TO
CONVERSION AND TRANSMISSION : CINDY MYERS' FIRST
FACILITIES ACT TO CONSTRUCT THE : INTERROGATORIES AND
KEYSTONE XL PROJECT : REQUEST FOR PRODUCTION OF
DOCUMENTS
:

0-0

TransCanada Keystone Pipeline, LP (“Keystone”) makes the following objections to interrogatories pursuant to SDCL § 15-6-33 and objections to request for production of documents pursuant to SDCL § 15-6-34(a). Keystone will further respond, as indicated throughout the objections, on or before February 6, 2015. These objections are made within the scope of SDCL § 15-6-26(e) and shall not be deemed continuing nor be supplemented except as required by that rule.

GENERAL OBJECTION

Keystone objects to the instructions and definitions contained in Cindy Myers’ First Set of Interrogatories and Requests for Production of Documents to the extent that they are inconsistent with the provisions of SDCL Ch. 15-6. See ARSD 20:10:01:01.02.

{01808665.1}

Keystone's answers are based on the requirements of SDCL §§ 15-6-26, 15-6-33, 15-6-34, and 15-6-36.

INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS

1. Please identify the person or persons providing each answer to an Interrogatory or portion thereof, giving the full name, address of present residence, date of birth, business address and occupation.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

2. Prior to answering these interrogatories, have you made due and diligent search of all books, records, and papers of the Applicant with the view of eliciting all information available in this action?

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

2(a). Describe how TransCanada will comply with these Acts as they apply to the project in relation to rivers, ground water and water system crossings in South Dakota.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

2(b). Provide research entailing migration of benzene in watersheds, rivers and ground water.

{01808665.1}

ANSWER: Any responsive, non-privileged documents will be provided on or before February 6, 2015.

8(a). Explain what changes have been made in the Emergency Response Plan and Integrity Management Plan since 2010.

OBJECTION: To the extent that this request seeks production of the Emergency Response Plan, the request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan and the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

8(b). Provide the Emergency Response Plan.

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

8(c). Provide the Integrity Management Plan.

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is

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not required to submit its Integrity Management Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation.

18(a). Where will fuel storage facilities be located within 200 feet of private wells and 400 feet of municipal wells?

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

18(b). How will minimizing and exercising vigilance be enforced?

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

21(a). Define "frac-out."

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

21(b). What are concerns and safety issues related to a "frac-out."

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

21(c). Provide "frac-out plan."

ANSWER: Any responsive, non-privileged documents will be provided on or before February 6, 2015.

34(a). Describe what progress has been made in the evaluation and performance assessment activities regarding high consequence areas since 2010.

OBJECTION: To the extent that this request seeks a list of High Consequence Areas, the identity and location of High Consequence Areas is confidential by statute and Keystone is required by PHMSA to keep this information confidential. To the extent that this request seeks production of the Emergency Response Plan, the request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>. Without waiving the objection, Keystone will provide a response to the rest of the request on or before February 6, 2015.

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34(b). Define "high consequence area."

OBJECTION: To the extent that this request seeks a list of High Consequence Areas, the identity and location of High Consequence Areas is confidential by statute and Keystone is required by PHMSA to keep this information confidential. Without waiving the objection, Keystone will provide a response to the rest of the request on or before February 6, 2015.

34(c). Provide a completed list of high consequence areas.

OBJECTION: The identity and location of High Consequence Areas is confidential by statute and Keystone is required by PHMSA to keep this information confidential.

34(d). Explain how project inhabitants and local communities will be informed and educated about high consequence areas.

OBJECTION: To the extent that this request seeks a list of High Consequence Areas, the identity and location of High Consequence Areas is confidential by statute and Keystone is required by PHMSA to keep this information confidential. Without waiving the objection, Keystone will provide a response to the rest of the request on or before February 6, 2015.

34(c). Provide a copy of the Emergency Response Plan. (Requested above with #8.)

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

34(f). Provide Integrity Management Plan. (Requested above with #8.)

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is

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not required to submit its Integrity Management Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation.

35(a). Provide the Integrity Management and Emergency Response Plans. (Requested above.)

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan and the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit these documents to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

35(b). Define "Unusually Sensitive Areas."

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(c). Define "Hydrologically Sensitive Areas."

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ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(d). Explain how unusually sensitive areas and hydrologically sensitive areas are addressed differently compared to other areas.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(e). Confirm that you are not fully aware of all vulnerable and beneficially useful aquifers and your intent is to only become aware of them during construction and route evaluation not yet completed.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(f). Define "unconfined aquifers."

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(g). List known unconfined aquifers to be crossed by the project.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(h). Explain the concern of routing through unconfined aquifers.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(i). Describe how it could be possible to route through an unknown, unconfined aquifer during construction.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(j). Provide documentation of further route evaluation since 2010, including assessments for aquifers and hydrologically sensitive areas.

OBJECTION AND RESPONSE: This request is vague, overlybroad, and unduly burdensome. Without waiving the objection, any responsive, non-privileged documents showing changes in the route or addressing aquifers and hydrologically sensitive areas will be provided on or before February 6, 2015.

35(k). Explain how you will deem an aquifer vulnerable and beneficially useful?

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

35(l). This condition states: "...in some reaches of the Project in southern Tripp County, the High Plains Aquifer is present at or very near ground surface and is overlain by highly permeable sands permitting the uninhibited infiltration of contaminants."

Sandy soil and ground water at or above the surface means a pipe with expected pinhole

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leaks will be immersed in ground water. This is the exact type of situation of soil/ground water which caused the route change in Nebraska. If this was reason to change the route in Nebraska, explain why it is still acceptable in South Dakota.

OBJECTION AND RESPONSE: This request is argumentative and assumes facts not in evidence. Without waiving the objection, Keystone will answer this interrogatory on or before February 6, 2015.

35(m). Explain TransCanada's follow-up with suggestion by DENR staff, given in testimony, to reroute the KXL pipeline around the city of Colome's source water area.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

36(a). Identify all emergency medical response planning contained within the emergency response plan.

OBJECTION: This request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the exclusive province of PHMSA. The PUC's jurisdiction over the emergency response plan is preempted by federal law, which has exclusive jurisdiction over issues of pipeline safety. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. *See* Amended Final Order, HP 09-001,

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Condition ¶ 36. Public disclosure of the emergency response plan would commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at <http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>.

36(b). What actions have been taken by TransCanada to ensure the medical communities in South Dakota are prepared and educated to treat people exposed to spills and water contamination from spills?

OBJECTION AND RESPONSE: To the extent that this request seeks production of the Emergency Response Plan, this request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the exclusive province of PHMSA. The PUC's jurisdiction over the emergency response plan is preempted by federal law, which has exclusive jurisdiction over issues of pipeline safety. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. *See* Amended Final Order, HP 09-001, Condition ¶ 36. Public disclosure of the emergency response plan would commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency

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Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at

<http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf>. Without

waiving the objection, Keystone will provide a response on or before February 6, 2015.

36(c). How will inhabitants and communities near the project area be notified of spills?

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

40(a). Provide documentation supporting your assertion that polyethylene water piping is permeable to BTEX.

ANSWER: Any responsive, non-privileged documents will be provided on or before February 6, 2015.

40(b). Explain health concerns related to BTEX.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

40(c). Provide an MSDS of all products to be transported in KXL, including the diluents.

ANSWER: Any responsive, non-privileged documents will be provided on or before February 6, 2015.

40(d). Provide list of ground water quality standards, specifically listing chemicals involved in tar sands oil product and diluents.

OBJECTION: Keystone does not determine ground water quality standards. They are established by the South Dakota Department of Environment and Natural Resources.

40(e). Describe how the decision was made to designate concern of BTEX only within 500 feet of the Project.

OBJECTION: This request seeks information that is not within Keystone's custody or control. This decision was made by the PUC as part of Amended Permit Condition 40.

40(f). Confirm this safety measure will only be implemented at the request of a landowner or public water supply system.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

40(g). Explain why this measure is optional instead of mandatory.

OBJECTION: This request seeks information that is not within Keystone's custody or control. This decision was made by the PUC as part of Amended Permit Condition 40.

40(h). TransCanada has agreed to do this: "At least forty-five days prior to commencing construction, Keystone shall publish a notice in each newspaper of general circulation in each county through which the Project will be constructed advising landowners and public water supply systems of this condition." What percent of inhabitants do you expect to reach by issuing a warning in this manner?

OBJECTION AND RESPONSE: This request is speculative and argumentative. A notice is not a "warning." Without waiving the objection, Keystone expects that notice in newspapers of general circulation would reach a substantial portion of the inhabitants.

46(a). Provide written plan as to how you will find and provide a permanent water supply for various locations along route if a well should become contaminated, including specific alternate sources.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

46(b). Define "quantity" as it is used in this condition.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

46(c). Provide cost estimates for providing water to the city of Colome, domestic wells or an entire ranching operation should water supplies become contaminated.

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ANSWER: Any responsive, non-privileged documents will be provided on or before February 6, 2015.

46(d). Explain how providing a permanent water supply will be ensured into perpetuity.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

46(e). Explain how people and cattle using private wells and public wells can be assured their water is free of contamination from undetected leakage, particularly in Tripp County.

OBJECTION: This request seeks information that is not within Keystone's custody or control.

46(f). Describe what experience South Dakota has had cleaning up tar sands oil product spills into rivers and ground water.

OBJECTION: This request seeks information that is not within Keystone's custody or control.

46(g). Describe any experience the State of South Dakota or any other state has had in "sparging" ground water in order to cleanse tar sands oil product from aquifers.

OBJECTION: This request seeks information that is not within Keystone's custody or control.

46(h). Describe types of spills which may be difficult or impossible to remediate.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

46(i). Identify responsible parties who will conduct water analysis to assure toxins from undetected leaks have not migrated into water resources, including frequency of testing and who will assume cost of testing.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

46(j). Describe potential scenarios in which medical costs related to contamination will be reimbursed.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

46(k). Provide a detailed listing of potential toxins which could contaminate wells.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

46(l). Provide documentation detailing adverse health effects caused from exposure to these toxins, including the various routes of entry into the human body.

ANSWER: Any responsive, non-privileged documents will be provided on or before February 6, 2015.

18(a). Regarding an advisory warning issued in September, 2014 by the federal Pipeline {01808665.1}

and Hazardous Materials Safety Administration, what are TransCanada's plans to ensure pipeline safety due to the fact different types of product will be transported in KXL?

OBJECTION AND RESPONSE: This request seeks information related to pipeline safety, which is within the exclusive jurisdiction of PHMSA. Without waiving the objection, Keystone will answer this interrogatory on or before February 6, 2015.

18(b). PHMSA cautioned pipeline operators across the country about "the potential significant impact flow reversals, product changes and conversion to service may have on the integrity (safety) of a pipeline." The advisory adds: "Flow reversals, product changes, and conversions to service may impact various aspects of a pipeline's operation, maintenance, monitoring, integrity management, and emergency response. Pressure gradients, velocity, and the location, magnitude, and frequency of pressure surges and cycles may change. Operators may also consider increasing the throughput capacity of the pipeline. Increasing throughput may also impact the pressure profile and pressure transients. ... Leak detection and monitoring systems may be affected."

OBJECTION: This request is not a question and cannot be answered. It also relates to an issue that is within the exclusive jurisdiction of PHMSA and is therefore not relevant or likely to lead to the discovery of admissible evidence.

18(c). Current regulations state: "Operators must review their integrity (safety) management program. ... Operators must notify PHMSA if these changes will

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substantially affect their integrity management program, its implementation, or modifies the schedule for carrying out the program elements.”

OBJECTION: This request is not a question and cannot be answered. It also relates to an issue that is within the exclusive jurisdiction of PHMSA and is therefore not relevant or likely to lead to the discovery of admissible evidence.

18(d). KXL is intended to transport two very different products, the much less dense and highly volatile Bakken oil product and the heavy diluted bitumen from Alberta. How will the two very different products affect KXL's operation, maintenance, monitoring, integrity management, and emergency response? How will the two very different products affect pressure gradients, velocity, and the location, magnitude, and frequency of pressure surges and cycles?

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

33(a). Provide updated maps.

OBJECTION: This request is vague, overlybroad, unduly burdensome, and seeks information that is not relevant or likely to lead to the discovery of admissible evidence. Without waiving the objection, Keystone will provide maps showing changes to the route on or before February 6, 2015.

41(a). Provide map detailing all water bodies to be crossed in S.D., to include locations KXL would cross the Missouri and Yellowstone Rivers upstream from S.D.

OBJECTION: Keystone has previously filed with the PUC maps showing the route through South Dakota, which also show where the pipeline crosses rivers and other water bodies. Waterbody crossing permitting is within the control of the United States Army Corps of Engineers, and is beyond Keystone's control.

41(b). Provide map clearly depicting all waterways crossed by route which are tributaries into the Missouri River.

OBJECTION: Keystone has previously filed with the PUC maps showing the route through South Dakota, which also show where the pipeline crosses rivers and other water bodies.

41(c). Identify distances from KXL waterway crossings to point of confluence with the Missouri River.

OBJECTION: This request seeks information that is beyond Keystone's custody and control and not maintained within the ordinary course of business.

41(d). Provide map(s) demonstrating all public water utility intakes on the Missouri River system.

OBJECTION AND RESPONSE: This request is overlybroad, unduly burdensome, and seeks information that is not within Keystone's custody or control.

Without waiving the objection, Keystone will provide information related to defined well head protection areas and source water intakes within the area of its risk assessment to the extent that they are not confidential.

41(e). By what date will permitting of water body crossings be completed?

OBJECTION: Permitting of water body crossings is within the control of the United States Army Corps of Engineers, and is beyond Keystone's control.

41(f). Provide a copy of the CMR Plan. Ex TC-1, 5.4.1, pp. 45-46.

OBJECTION: A current copy of the CMR Plan is attached to Keystone's certification petition and is on file with the PUC.

41(g). Provide research which describes migration of spillage in these waterways.

OBJECTION: This request is vague, overlybroad, and unduly burdensome.

41(h). Please explain and describe water protection areas located downstream of major river crossings on the proposed route.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

41(i). Explain risks of HDD, including possibility of contaminants being released into waterways during this process.

ANSWER: Keystone will answer this interrogatory on or before February 6, 2015.

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50(a). Provide a map depicting the High Consequence Areas.

OBJECTION: This request seeks the identity and location of High Consequence Areas, which is confidential by statute, and Keystone is required by PHMSA to keep this information confidential.

50(b). Explain why the total length of pipe affecting HCA decreased from 34.3 miles to 19.9 miles.

OBJECTION: To the extent that this request seeks the identity and location of High Consequence Areas, that information is confidential by statute and Keystone is required by PHMSA to keep this information confidential. Keystone will provide a response to the rest of the request on or before February 6, 2015.

50(c). Explain how the statistic which states a spill could affect a HCA no more than once in 250 years.

OBJECTION: To the extent that this request seeks the identity and location of High Consequence Areas, that information is confidential by statute and Keystone is required by PHMSA to keep this information confidential. Keystone will provide a response to the rest of the request on or before February 6, 2015.

107(a). Provide the analysis by Dr. Michael Madden which professes the Project would not (ii) substantially impair the health, safety, or welfare of the inhabitants in the project area.

OBJECTION: Dr. Madden was PUC Staff's witness in Docket 09-001, and his direct testimony is a matter of public record.

107(b). Explain how the 2010 permit, which relies on the federal environmental impact statement prepared by the Department of State, addresses specific concerns of South Dakota, including the health, safety and welfare of South Dakota citizens.

OBJECTION: This request is vague, unclear, argumentative, and seeks information that is not relevant or likely to lead to the discovery of admissible evidence. The PUC addressed the health, safety, and welfare of South Dakota residents in the Amended Final Decision and Order in Docket 09-001. In addition, South Dakota residents had notice and opportunity to participate in the lengthy NEPA process conducted by the Department of State.

107(c). Explain your interpretation of "substantially" as it is used in state law SDCL 49-41 B-22 which states the applicant for a facility construction permit has the burden of proof to establish that:

(3) "The facility will not substantially impair the health, safety or welfare of the inhabitants."

OBJECTION: This request seeks a legal opinion or conclusion and is therefore beyond the scope of discovery and not likely to lead to the discovery of

admissible evidence under SDCL § 15-6-26(b). It was an issue for the PUC to determine in Docket HP 09-001.

107(d). State with 100% certainty that this project will have no impact on the health, safety or welfare of the people of South Dakota.

OBJECTION: This request is argumentative and seeks information that is not relevant or likely to lead to the discovery of admissible evidence. The PUC addressed the health, safety, and welfare of South Dakota residents in the Amended Final Decision and Order in Docket 09-001. Keystone has not asserted that the project would have "no impact" on the health, safety, or welfare of the people of South Dakota.

107(e). Describe how areas of dense populations versus areas of sparse populations affect project decision.

OBJECTION AND RESPONSE: This request is vague and unclear. Without waiving the objection, to the extent feasible and consistent with other routing criteria, areas of dense population are avoided during project routing.

Dated this 23rd day of January, 2015.

WOODS, FULLER, SHULTZ & SMITH P.C.

By /s/ James E. Moore

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Attorneys for Applicant TransCanada

CERTIFICATE OF SERVICE

I hereby certify that on the 23rd day of January, 2015, I sent by e-mail transmission, a true and correct copy of Keystone's Objections to Cindy Myers' First Interrogatories and Request for Production of Documents, to the following:

Cindy Myers, R.N.

PO Box 104

Stuart, NE 68780

csmyers77@hotmail.com

/s/ James E. Moore

One of the attorneys for TransCanada

ANSWER: A number of different people assisted in providing answers to these interrogatories. Keystone previously disclosed the identity of the persons whose prefiled testimony will be provided before the hearing.

2. Re. Condition #36---Does TransCanada have a documented emergency medical response plan for this project?

ANSWER: Not at this time. The current Keystone Pipeline Emergency Response Plan (ERP) will be amended to include Keystone XL Project.

3. Re. Condition #36---Do your drills for cleaning up spills include scouring beds of water bodies for submerged oil?

ANSWER: No, scouring beds of water bodies for submerged oil is a specialized technique performed by an experienced contractor. Based on the assessment of an actual incident this could be one of many techniques implemented. Training and exercises include ICS, table top, deployment and full scale exercises. Our exercise planners are required to invite first responders to full scale exercises which include the development of an incident management team and the simultaneous deployment of equipment resources to proximate a real event. These exercises are conducted in various locations along the pipeline system.

4. Re. Condition #36---What communication has there been from TransCanada to Indian Health Services and South Dakota health care facilities regarding

tar sands oil information, KXL spill scenarios, and staff training for treating victims exposed to tar sands spills?

ANSWER: TransCanada has provided educational information to possible affected public, elected officials, excavators and first responders. This educational material comes in the form of a pamphlet and is titled Oil Pipeline for Emergency Responders. A copy is marked as Keystone 1523-1538.

5. Re. Condition #36---How has TransCanada prepared the South Dakota medical community for spills from this project?

ANSWER: TransCanada has provided educational information to possible affected public, elected officials, excavators and first responders. This educational material comes in the form of a pamphlet and is titled Oil Pipeline for Emergency Responders. A copy is marked as Keystone 1523-1538.

6. Re. Fact #107d---Please further explain and clarify your reply in my first set of interrogatories: "Keystone has not asserted that the project would have 'no impact' on the health, safety and welfare of South Dakota." Does this mean there are potential impacts on the health, safety and welfare of South Dakota residents? What are these potential impacts on the health, safety and welfare of South Dakota residents?

ANSWER: The potential impacts of the Keystone XL project on the health, safety, and welfare of South Dakota residents are addressed in Keystone's permit

application filed in Docket HP09-001, and were addressed by the Commission in the Amended Final Decision and Order dated June 29, 2010.

7. Re. Condition #35---Please explain how the reroute across the High Plains Aquifer in Tripp Co. improved the safety for those depending on that water? Does the reroute still cross the aquifer? Specifically, describe the reroute.

ANSWER: Yes, the route crosses the High Plains Aquifer. Route variations in Tripp County were not due to the aquifer but pertained to landowner and constructability issues. Route variation maps were previously provided.

8. Re. Fact #107e---You try to avoid areas of dense population. Is the reason for this because less number of people at risk? What specifically is your reason for avoiding areas of dense population?

ANSWER: Pipeline routing is an iterative process and takes into consideration numerous aspects: pipeline route length and overall project footprint, public safety, environmental constraints, population density, land-use compatibility, optimization with other industrial infrastructure, constructability limitations and regulatory constraints. Areas of urbanization are avoided to the extent practicable as these locations pose a challenge during construction and operational activities due to work space constraints, congestion and disruption to the public. Avoidance of urbanized and densely populated

areas is also a primary mitigation to the risk of damage to the pipeline due to excavation activities by others.

9. Re. Condition #36---Has TransCanada considered that benzene plumes in flowing water could cause contamination of public water plants?

ANSWER: TransCanada has considered downstream receptors in its analysis per Special Condition 14. Please refer to Department of State SFEIS Appendix P Risk Assessment Section 4.0 Consequences of a Spill.

10. Re. Condition #34---What information has TransCanada provided to residents who live in a high consequence area about the increased risks associated with that designation?

ANSWER: TransCanada's Public Awareness Program is designed to increase awareness of pipeline safety to protect the public, environment and TransCanada facilities. The PA Program reaches out to affected public, excavators/contractors, emergency officials and local and the local public to ensure they are engaged and educated about living and working safely near TransCanada facilities. This includes awareness of areas that have been defined as high consequence areas.

11. Re. Condition #36b---Is the pamphlet titled "Oil Pipeline for Emergency Responders", marked as Keystone the only medical information provided by TransCanada?

ANSWER: TransCanada is not a medical provider and does not provide medical information. The local medical authority has jurisdiction during an incident or emergency.

12. Re. Condition #35---Will TransCanada provide routine analyses of the aquifer water in Tripp County to assure the residents will not be poisoned from those expected/undetected leaks?

ANSWER: In the event of a release, TransCanada will work with the appropriate agencies to complete any required analysis.

13. Re. Condition #36---What education, training, information and/or preparation has TransCanada provided for water treatment plants using water from the Missouri River? What communication has taken place between TransCanada and water treatment systems which use water from the Missouri River?

ANSWER: TransCanada's Public Awareness Program is designed to increase awareness of pipeline safety to protect the public, environment and TransCanada facilities. The PA Program reaches out to affected public, excavators/contractors, emergency officials and local and the local public to ensure they are engaged and educated about living and working safely near TransCanada facilities.

14. Re. Finding of Fact #41---I had previously requested distances between tributaries and their confluence with the Missouri River. You provided a list, but failed

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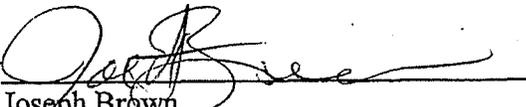
to include the Little Missouri River, Cheyenne River and the White River. I request this information again.

ANSWER: Listed in the table below are the distances from the KXL pipeline crossing of the three waterways requested to the Missouri River.

<u>Stream Name</u>	<u>Miles downstream to Missouri River</u>
Little Missouri River	384.2
Cheyenne River	89.5
White River	82.4

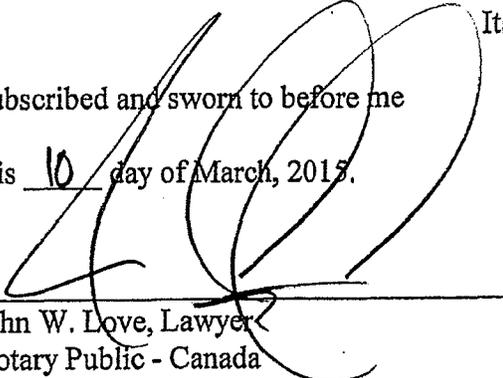
Dated this 10 day of March, 2015.

TRANSCANADA KEYSTONE PIPELINE, LP
by its agent, TC Oil Pipeline Operations, Inc.

By 
Joseph Brown
Its Director, Authorized Signatory

Subscribed and sworn to before me

this 10 day of March, 2015.


John W. Love, Lawyer
Notary Public - Canada

OBJECTIONS

The objections stated to Cindy Myers' Interrogatories and Request for Production of Documents were made by James E. Moore, one of the attorneys for Applicant TransCanada herein, for the reasons and upon the grounds stated therein.

Dated this 10th day of March, 2015.

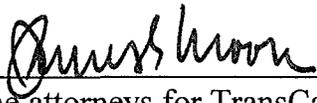
WOODS, FULLER, SHULTZ & SMITH P.C.

By  _____
William Taylor
James E. Moore
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300 South Phillips Avenue, Suite 300
Sioux Falls, SD 57117-5027
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Fax: (605) 339-3357
Email: Bill.Taylor@woodsfuller.com
James.Moore@woodsfuller.com
Attorneys for Applicant TransCanada

CERTIFICATE OF SERVICE

I hereby certify that on the 10th day of March, 2015, I sent by e-mail transmission, a true and correct copy of Keystone's Responses to Cindy Myers' Second Interrogatories and Request for Production of Documents, to the following:

Cindy Myers, R.N.
PO Box 104
Stuart, NE 68780
csmyers77@hotmail.com



One of the attorneys for TransCanada

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

**IN THE MATTER OF THE PETITION
OF TRANSCANADA KEYSTONE
PIPELINE, LP FOR ORDER
ACCEPTING CERTIFICATION OF
PERMIT ISSUED IN DOCKET HP09-
001 TO CONSTRUCT THE KEYSTONE
XL PIPELINE**

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**STAFF'S RESPONSE TO
INTERROGATORIES AND REQUESTS
FOR PRODUCTION OF DOCUMENTS
FROM CINDY MYERS, R.N.**

HP14-001

COMES NOW, Commission Staff by and through its attorney of record, Kristen N. Edwards, and hereby provides the following response to Cindy Myers, R.N.'s Interrogatories and Requests for Production of Documents.

Dated this 10th day of March, 2015.



Kristen N. Edwards
Staff Attorney
South Dakota Public Utilities Commission
500 East Capitol Avenue
Pierre, SD 57501

1-1) As a health professional, I'm concerned about the health community being educated and prepared to treat people adversely affected from tar sands spills. I've requested a copy of TransCanada's Emergency Response Plan to identify specific components of medical emergency response planning. This information was not divulged. How may I obtain a copy of the emergency health plan? If this hasn't been completed for KXL, would it be possible to obtain a copy of the ERP for Keystone I?

Who is responsible for emergency medical response planning in the situation of spillage from TransCanada's KXL project?

Response: OBJECTION. Staff objects to this question on the grounds that it attempts to shift the burden from the company to staff, as well as on the grounds that it attempts to shift the regulatory burden from the federal government to commission staff for the purpose of inspecting Emergency Response Plans of an interstate pipeline.

Subject to and without waiving its objection, staff provides the following answer. It is staff's understanding that the Emergency Response Plan is not completed until close to the time a pipeline is ready to begin operations. All information submitted to the PUC regarding Keystone I's ERP is available in 7.0 of the company's Quarterly Report. For the last Quarterly Report filed by TransCanada for Keystone I, view the report at <http://www.puc.sd.gov/commission/dockets/HydrocarbonPipeline/2007/HP07-001/4thquarterly2010.pdf>.

Additionally, the final version of the Keystone Pipeline Emergency Response Plan will be amended to include Keystone XL. A redacted version of the ERP is available in Appendix I of the Final Supplemental Environmental Impact Study, which is publicly available. The company may choose to redact information for public viewing due to the sensitive nature of the information contained in the ERP.

1-2) Re. Amended Permit Condition #40: According to TransCanada, the SD PUC made the decision to designate the concern of BTEX being hazardous if polyethylene and PVC water pipe is being used near this compound of chemicals. Is this correct? How was it decided that residents could request for their water piping to be changed if they lived within 500 feet of the project? How come this idea was not mandatory, and instead only at the request of the landowner?

Response: OBJECTION. This question calls for a legal opinion from the commission, which Staff is unable to provide. Staff is unable to answer for the commission, as Staff is separate from the commissioners, who are the decision-makers in the process.

1-3) I understand that that TransCanada must obtain permits from the US Army Corps of Engineers before crossing water bodies with their project. Does the US Army Corps of Engineers document studies of benzene migration in water before granting these permits? Does the Army Corps of Engineers rely on the FSEIS for this information? Who will be enforcing the Clean Water Act regulations re. this project?

Response: OBJECTION. This question attempts to shift the regulatory burden from the US Army Corps of Engineers to PUC staff. Furthermore, this information is more appropriately sought from the company or from the US Army Corps of Engineers. Subject to and without waiving its objection, staff provides the following answer.

It is staff's understanding that TransCanada has not submitted any permit applications to the US Army Corps of Engineers. As such, staff does not have any information as to what information would be analyzed should the company apply for a permit.

Enforcement of the Clean Water Act does not fall under the PUC's purview, and therefore, will not be responsible for enforcing the Clean Water Act. It is Staff's understanding that enforcement of the Clean Water Act would be done by the SD DENR and the EPA.

1-4) How did the PUC determine "the facility will not substantially impair the health, safety or welfare of the inhabitants."?

Response: The Commission made that determination after carefully reviewing all of the evidence in HP09-001. See Amended Final Decision and Order and transcript of formal hearing available online in Docket No. HP09-001. However, in HP09-001, as in this and any proceeding before the Commission, staff is a party to the docket and does not take part in Commission decisions. Therefore, staff has no more information than any other party or member of the public.

1-5) Has the PUC considered that toxins from KXL spillage could migrate via flowing water into public water intakes along the Missouri River? Where can I discover information as to locations of public water intakes along the Missouri River?

Response: Staff would rely on DENR's expert testimony on this matter. Staff has not received this information from DENR as of the due date of these responses. However, Staff will supplement this answer if and when this information is received from Staff's DENR witness.

1-6) Who is responsible for testing water for those expected/undetected leaks? Particularly in Tripp County where the pipeline will be immersed in groundwater?

Response: Staff would rely on DENR's expert testimony on this matter. Staff has not received this information from DENR as of the due date of these responses. However, Staff will supplement this answer if and when this information is received from Staff's DENR witness.

1-7) If high consequence areas are kept confidential by TransCanada, how can residents be assured of their safety? I feel residents are entitled to know this information.

Response: Similar to the ERP, the Integrity Management Plan could also contain sensitive information that the company may choose to keep confidential. The HCAs per se are not confidential, but TransCanada could be choosing to keep confidential the locations of the sections of pipe that have the ability to impact an HCA due to the sensitive nature of the information. Per code, an HCA is defined as:

- (1) A commercially navigable waterway, which means a waterway where a substantial likelihood of commercial navigation exists;
- (2) A high population area, which means an urbanized area, as defined and delineated by the Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 people per square mile;
- (3) An other populated area, which means a place, as defined and delineated by the Census Bureau, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area;
- (4) An unusually sensitive area, as defined in §195.6.

This information is readily available on census bureau websites and other sources.

1-8) What actions has the PUC taken to assure the South Dakota Health Care Community has been educated and trained to treat patients adversely affected from KXL spillage? Has there been communication with IHS and other health centers in SD?

Response: OBJECTION. This question attempts to shift the regulatory burden from DENR and the federal government, specifically the EPA or PHMSA, to Staff. This information is covered by the Emergency Response Plan, which is under the jurisdiction of the aforementioned agencies.

1-9) What education and training has been completed for SD public water treatment utilities to prepare them for tar sands spillage into SD waterways?

Response: OBJECTION. This question attempts to shift the burden from the company to Staff. It is the burden of the company to produce this information. Subject to and without waiving its objection, should Staff acquire any information from our experts to answer this question, we may supplement this answer at that time.

1-10) Please explain the reroute in Tripp County. How did the reroute improve safety?

Response: OBJECTION. This question attempts to shift the burden from the company to staff. Subject to and without waiving its objection, staff provides the following answer.

It is staff's understanding that the each route revision in Tripp County was made for the follow reason or reasons:

1. To minimize landowner impacts and reduce crossing of varying terrain features;
2. To minimize constructability and safety concerns with current Interstate 90, Hwy 16, and State Railroad crossings;
3. Per landowner requests to avoid a row of trees and minimize landowner impacts;
4. To minimize multiple creek crossings;
5. To avoid a well and impacts to a fence;
6. To avoid road crossing within a wetland area;
7. To minimize side slope construction;
8. To avoid a well and construction footprint impacts to a fence surrounding a historical site;
9. To avoid a drainage crossing and accommodate a road crossing;
10. To avoid side slop construction and sudden terrain changes;
11. To accommodate pump station design;
12. To accommodate pump station design;
13. To avoid any well impacts;
14. To avoid any well impacts; and
15. To avoid swampy low lying area near a pond.

1-11) What information have you shared with water treatment plants which access the Missouri River about oil spills into the Missouri River or tributaries of the Missouri River?

Response: OBJECTION. This question is outside of the scope of discovery as established by the commission's order, dated, December 17, 2014. Furthermore, water system operators had the opportunity to intervene in this proceeding, as well as HP09-001 if they had concern that their potable water intakes could be adversely impacted by the pipeline. Subject to and without waiving its objection, Staff will provide more information from its DENR witness when such information is received.

1-12) What information about tar sands spills into waterways has TransCanada provided the Department of Environment and Natural Resources?

Response: OBJECTION. This question is outside of the scope of discovery as established by the commission's order, dated, December 17, 2014. This question does not draw from a condition change, as required by the commission Order. Subject to and without waiving its objection, Staff will provide more information from its DENR witness when such information is received.

1-13) What plan do you have in place to respond to tar sands oil spills into the Missouri River or tributaries of the Missouri River?

Response: OBJECTION. This question attempts to shift the regulatory burden from DENR, PHMSA, and the EPA to Staff. The PUC does not have jurisdiction over interstate pipelines and would, therefore, not be involved with spill cleanup. Subject to and without waiving its objection, Staff will provide more information from its DENR witness when such information is received.

1-14) What education and training has been provided to water treatment facilities accessing Missouri River water regarding how to adequately respond to tar sands oil spills into the Missouri River or tributaries of the Missouri River?

Response: OBJECTION. This question attempts to shift the burden from the company to Staff. It is the burden of the company to produce this information. Subject to and without waiving its objection, Staff has asked this question of its DENR witness and will supplement its response if and when that information is received.

1-15) How do you plan to clean up a tar sands spill into the High Plains Aquifer in Tripp County?

Response: The PUC is not involved in cleanup. This would be the responsibility of the company, with the oversight of DENR and the EPA. The company must have a plan, subject to the approval or agreement of DENR and the EPA.

1-16) Describe the experience the State of South Dakota has had using “sparging” to clean up an aquifer. Has “sparging” ever been used to clean tar sands oil product from an aquifer?

Response: This is outside the technical expertise of Staff. Staff does not have knowledge of sparging. Should we acquire such information from one of our experts, Staff may supplement this answer at that time.

Questions from Cindy Myers to PUC Staff

5) Has the PUC considered that toxins from KXL spillage could migrate via flowing water into public water intakes along the Missouri River? Where can I discover information as to locations of public water intakes along the Missouri River?

Information about public water intakes in South Dakota is available on DENR's website at <http://denr.sd.gov/des/dw/sysinfomap.aspx>.

6) Who is responsible for testing water for those expected/undetected leaks? Particularly in Tripp County where the pipeline will be immersed in groundwater?

TransCanada, with regulatory oversight by the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), will be responsible for the monitoring and operation of the proposed Keystone XL pipeline throughout South Dakota. PHMSA's construction, operation and monitoring requirements are outlined in the Code of Federal Regulations Title 49, Part 195 – Transportation of Hazardous Liquids by Pipeline.

If the pipeline leaked, South Dakota Codified Law (SDCL) 34A-18 requires crude oil pipeline operators to implement their response plan regardless of who caused the release. DENR has regulatory authority over the assessment and cleanup of pipeline spills and will ensure cleanup continues until all state requirements and standards are met. This would include sampling water supplies to ensure no water supply sources are impacted. If a water supply is impacted, TransCanada would be responsible for mitigating those impacts.

In addition, the federal Safe Drinking Water Act requires public water systems to periodically sample for volatile organic chemicals. Samples are collected by water systems operation specialists and analyzed in a laboratory certified to analyze drinking water samples for volatile organic chemicals. Samples are collected from the entry point to the distribution system at a frequency based on prior detections with all data reported to DENR's Drinking Water Program. If contamination is detected in a water supply above regulatory limits, operators work with DENR to correct the problem and identify the contaminant source.

9) What education and training has been completed for SD public water treatment utilities to prepare them for tar sands spillage into SD waterways?

DENR contracts for water system operation specialist certification training through the South Dakota Association of Rural Water Systems. The certification training includes information and education on emergency response activities resulting from a variety of scenarios including petroleum releases and other contamination events.

In addition, a research project was conducted through South Dakota's Regional Water System Research Consortium titled *Improving Safety of Crude Oil and Regional Water System Pipeline Crossings*. The report findings were presented at several conferences attended by water system

personnel. The study dealt specifically with crude oil pipelines and makes design recommendation for pipeline designs when crossing regional water systems distribution lines. The report is available on the internet at:

<http://www.sdarws.com/PDF/SDRWRC/PipelineCrossingSafetyFinalReport.pdf>

11) What information have you shared with water treatment plants which access the Missouri River about oil spills into the Missouri River or tributaries of the Missouri River?

DENR along with representatives from Iowa, Nebraska, local emergency managers, wildlife experts, EPA Region VII, and industry representatives including TransCanada are all participants in the Siouxland Sub-area Spill Contingency Committee who worked to develop a Siouxland Sub-area Spill Contingency Plan. As part of the implementation of this plan the group holds exercises, training sessions and meetings to discuss response and recovery efforts needed to respond to large oil or chemical releases. The plan addresses potential impacts to water supply intakes and notification procedures in the event of a release.

In addition, if there is a release into the Missouri River DENR's spill program works with the Drinking Water Program to ensure potentially impacted downstream facilities are notified and assisted as needed.

12) What information about tar sands spills into waterways has TransCanada provided the Department of Environment and Natural Resources?

TransCanada has not provided DENR with any specific information about tar sands spills into waterways from the proposed Keystone XL pipeline. However, SDCL 34A-18 requires crude oil pipeline operators to submit an oil spill response plan to DENR prior to operating the pipeline. The plan will address crude oil spills into waterways. DENR expects TransCanada to comply with SDCL 34A-18 prior to placing the Keystone XL pipeline into operation.

In compliance with SDCL 34A-18, TransCanada has provided DENR with an oil spill response plan for the existing Keystone pipeline and has conducted two full-scale spill response exercises in Yankton, SD where the pipeline crosses the Missouri River.

13) What plan do you have in place to respond to tar sands oil spills into the Missouri River or tributaries of the Missouri River?

SDCL 34A-18 requires crude oil pipeline operators to submit their oil spill response plan to DENR for approval and requires crude oil pipeline operators to implement their response plan in the event of a spill regardless of where the spill is or who caused the release.

In the event of a pipeline leak, DENR has regulatory authority over the assessment and cleanup of the spill and will ensure the cleanup continues until all state requirements and standards are met.

If the pipeline company did not respond to a spill, DENR has the authority to take legal action against the company to force their response, and while legal action is pending, has access to state and federal safety net clean up funds that could be used to initiate a response to protect against immediate threats to human health and the environment.

In addition DENR has been involved in the development of the following response plans and procedures which may be implemented in the event of a major crude oil spill: EPA Region VIII Emergency Response Plan, South Dakota Emergency Response Plan, South Dakota Disaster Recovery Plan, DENR Emergency Operations Plan, and DENR's Handbook for Reporting, Investigating, and Remediating Petroleum Releases in South Dakota.

14) What education and training has been provided to water treatment facilities accessing Missouri River water regarding how to adequately respond to tar sands oil spills into the Missouri River or tributaries of the Missouri River?

Education and training associated with spill response and other source water contamination events is included in DENR's contracted system operations specialist training as noted in question #9 above.

15) How do you plan to clean up a tar sands spill into the High Plains Aquifer in Tripp County?

SDCL 34A-18 requires crude oil pipeline operators to submit their oil spill response plan to DENR for approval and requires crude oil pipeline operators to implement their response plan in the event of a spill regardless of where the spill is or who caused the release. If the proposed Keystone XL pipeline leaked into the High Plains aquifer, TransCanada would be responsible for the cleanup.

However, DENR has regulatory authority over the assessment and cleanup of the spill and will ensure the cleanup continues until all state requirements and standards are met. In general, required cleanup actions would include: stopping the release, removal of free product, sampling of soil, surface water and groundwater to define the nature and extent of the contamination, design and implementation of cleanup actions to remediate remaining contamination to levels below state standards.

If the pipeline company did not respond to a spill, DENR has the authority to take legal action against the company to force their response, and while legal action is pending, has access to state and federal safety net clean up funds that could be used to initiate a response to protect against immediate threats to human health and the environment.

16) Describe the experience the State of South Dakota has had using "sparging" to clean up an aquifer. Has "sparging" ever been used to clean tar sands oil product from an aquifer?

DENR has not used sparging to cleanup a tar sands oil spill in an aquifer because there has not been a tar sands oil spill that has impacted an aquifer in South Dakota. However, DENR staff do

have experience with the installation and operation of soil vapor extraction and sparging systems used to remediate aquifers contaminated with refined petroleum products such as gasoline and diesel fuel.

Safety in the Community

Safety is a core value at TransCanada. We make safety — for ourselves, each other, our contractors and for members of our communities — an integral part of the way we work.

TransCanada's operations extend across North America with established offices in various communities. Each region is fully staffed with qualified employees trained in pipeline safety and emergency response to ensure the safe and efficient operation of the facilities in the area.

We view the communities we operate in as emergency response partners. We will work collaboratively with emergency responders, extending invitations to participate in exercises and training.

In the event of an emergency, we work with emergency response officials in a Unified Command to ensure everyone is familiar with local operations and is ready to respond in the event of an incident. TransCanada does not expect volunteer or dedicated local emergency services to have the equipment or specific experience needed to respond to a leak or rupture with the exception of protecting the public by conducting evacuations if necessary and keeping them out of the impacted area.



KEYSTONE 1533

Actions for Emergency Services

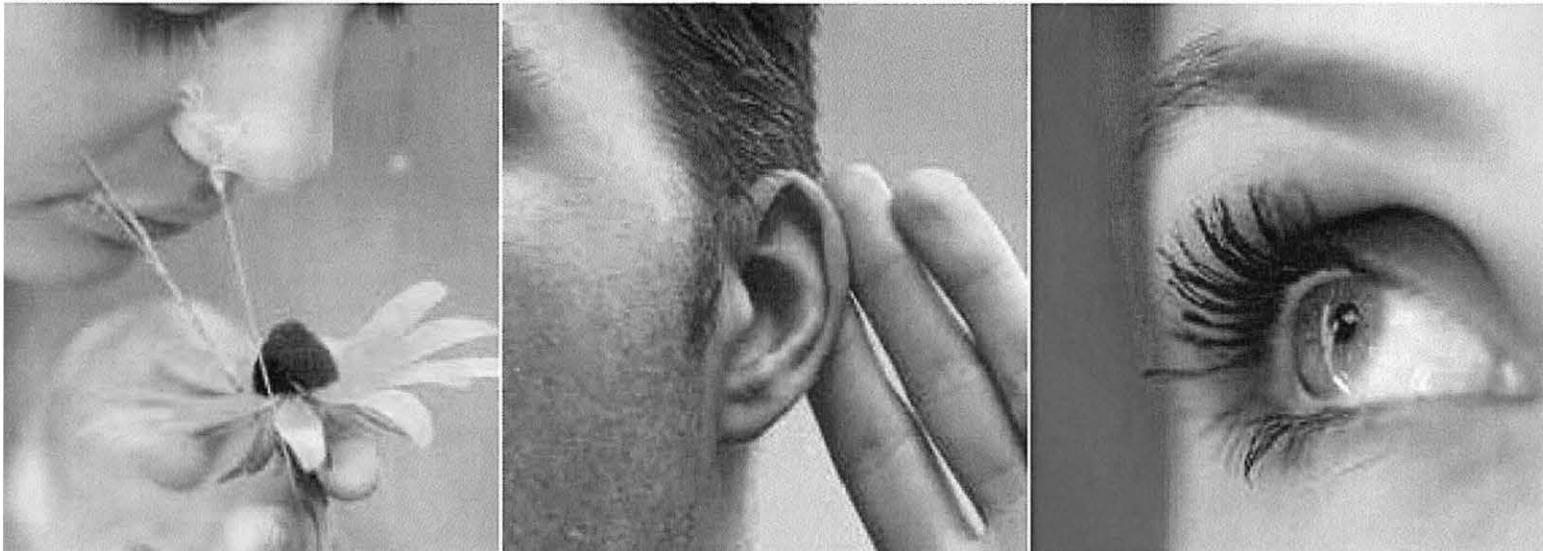
Do

- Protect yourselves and the public.
- Contain and extinguish any secondary fires if safe to do so.
- Refer to 128 in the 2012 ERG for guidance on initial response including potential evacuation distances.
- Provide traffic and crowd control.
- Secure the site and establish a safe zone to ensure public safety. Keep a safe distance away. ● Evacuate unnecessary personnel.

- Monitor for I-EL, H S and benzene if possible.
- Eliminate all ignition sources if safe to do so. ● Provide first aid as needed.
- Allow TransCanada employees clear and quick access to the emergency site.

Do Not

- Attempt to operate any valves.
- Go near the spill until a hazard assessment has been conducted by TransCanada.
- Attempt to contain the oil or try to identify the oil.



Leak Detection

Although a pipeline leak is rare, it is important to know how to recognize the signs. Use your senses of smelling, seeing and hearing to detect a potential pipeline leak.

What you may smell

- Many petroleum products have a distinct smell. Crude oil can possess a rotten egg, gasoline, tar or "skunk-like" odor.

What you may hear

- A hissing or roaring sound.

What you may see

- Amber to black liquid.
- Rainbow sheen or black liquid on top of water.
- Discolored vegetation on or near a pipeline in an area that is usually green.
- Stained or melted snow/ice over pipeline areas.

KEYSTONE 1534



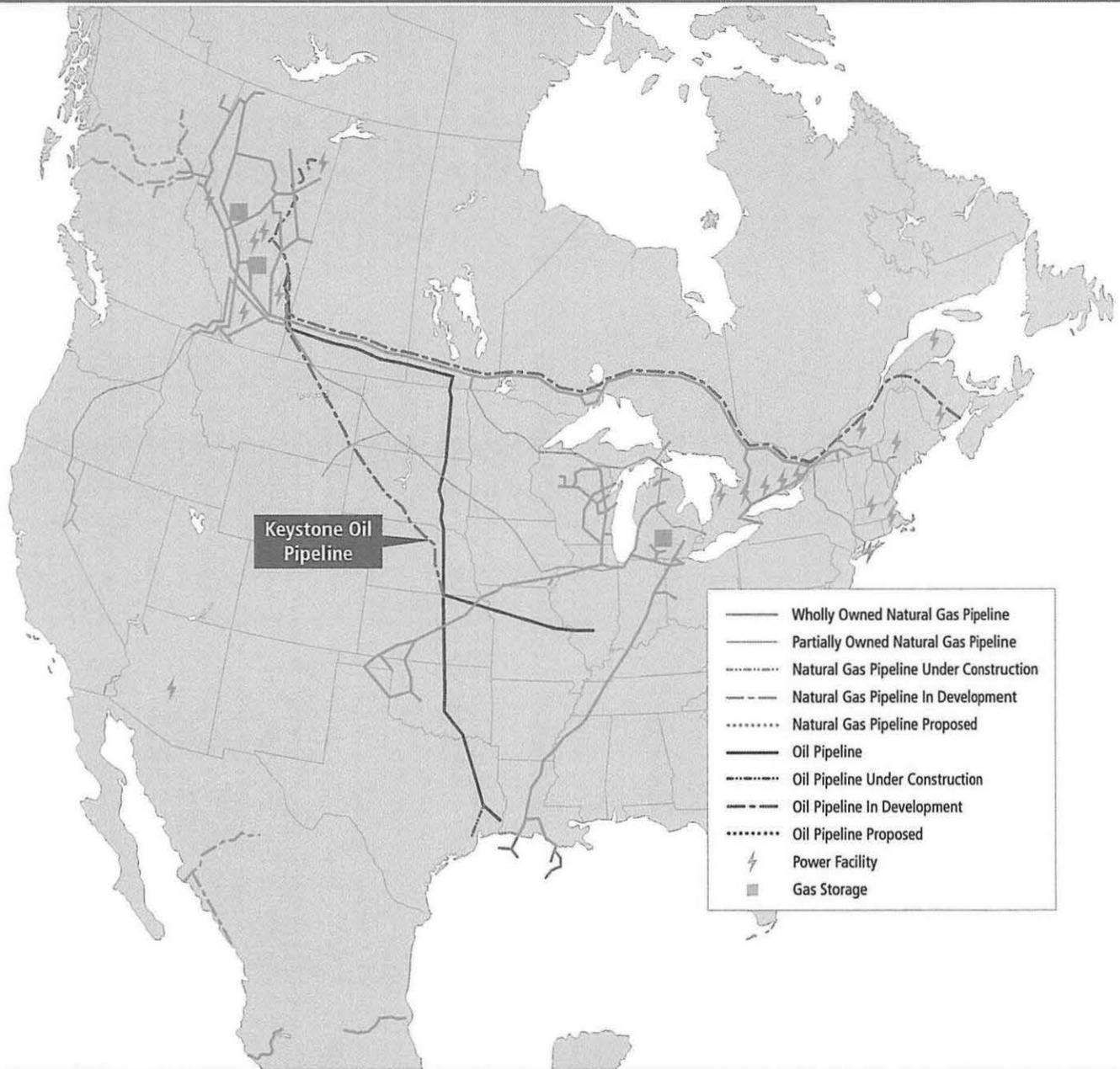
If You Suspect a Leak

If you witness any of the typical signs listed, or any other unusual sights, sounds or smells near a pipeline location, it is important that you follow these steps:

1. Leave the area immediately.
2. Move to a safe location, call '911'.
3. Call TransCanada's emergency number: 1.800.447.8066. This number can be found on all pipeline marker signs and facility gates.
4. Warn others to stay away.

KEYSTONE 1535

North American Assets



KEYSTONE 1536

Important Contact Information

Call Before You Dig - It's Free

United States.....811

Emergencies 1.800.447.8066

General Inquiries..... 1 .866.717.7473

For Crossing or Encroachment Agreements..... us_crossings@transcanada.com

Actions for Emergency Services

Do

- Protect yourselves and the public.
- Contain and extinguish any secondary fires if safe to do so.
- Refer to 128 in the 2012 ERG for guidance on initial response including potential evacuation distances.
- Provide traffic and crowd control.
- Secure the site and establish a safe zone to ensure public safety. Keep a safe distance away.
- Evacuate unnecessary personnel.

- Monitor for I-EL, H2S and benzene if possible.
- Eliminate all ignition sources if safe to do so.
- Provide first aid as needed.
- Allow TransCanada employees clear and quick access to the emergency site.

Do Not

- Attempt to operate any valves.
- Go near the spill until a hazard assessment has been conducted by TransCanada.
- Attempt to contain the oil or try to identify the oil.

TransCanada Emergency Number:

1-8001447-8066

10towhat'sbelow.
Call beforeyou dig.

TransCanada
In business to deliver

KEYSTONE 1538

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

IN THE MATTER OF TRANSCANADA KEYSTONE PIPELINE, LP FOR ORDER ACCEPTING CERTIFICATION OF PERMIT ISSUED IN DOCKET HP- 09-001 TO CONSTRUCT THE KEYSTONE XL PIPELINE	Surrebuttal to Darren Kearney’s rebuttal to Cindy Myers’ testimony regarding Dr. Madden’s socio- economic analysis HP14-001
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I am responding to Darren Kearney’s rebuttal to my direct testimony. My testimony stated:

"testimonial analysis by Dr. Madden is woefully inadequate to meet SDCL 49-416-22, which requires the project must protect the health, safety and welfare of SD residents. He is not a medical doctor, but an economist."

Mr. Kearney states I misunderstood the purpose of Dr. Madden’s testimony.

I understand that Dr. Madden is an economist and his testimony reflects a very brief socio-economic analysis of the project.

However, as written, the HP09-001 document, specifically Finding of Fact #107, implies that Dr. Madden’s analysis from a socioeconomic standpoint was also meant to support the subpart of SDCL 49-41 B-22 which states:

“The facility will not substantially impair the health, safety or welfare of the inhabitants.”

Finding of Fact #107 is included in Appendix C, South Dakota Final Decision and Order Tracking Table of Changes which was ordered by the PUC as part of the scope of discovery.

Finding of Fact #107 is listed under the heading “Socio-Economic Factors”.

HP09-001, Finding of Fact #107, as directly copied from that document:

Socio-Economic Factors

107. Socio-economic evidence offered by both Keystone and Staff demonstrates that the welfare of the citizens of South Dakota will not be impaired by the Project. Staff expert Dr. Michael Madden conducted a socio-economic analysis of the Keystone Pipeline, and concluded that the positive economic benefits of the project were unambiguous, while most if not all of the social impacts were positive or neutral. S-2, Madden Assessment at 21. The Project, subject to compliance with the Special Permit and the Conditions herein, would not, from a socioeconomic standpoint: (i) pose a threat of serious injury to the socioeconomic conditions in the project area; (ii) substantially impair the health, safety, or welfare of the inhabitants in the project area; or (iii) unduly interfere with the orderly development of the region.

I agree with Mr. Kearney that Dr. Madden's testimony does not include information concerning how the project would impact the health, safety, or welfare of the inhabitants, but finding of fact #107, as written, concludes that Dr. Madden's testimony supports SDCL 49-41 B-22, including the subpart "The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area" and also the subpart "the facility will not substantially impair the health, safety or welfare of the inhabitants"

Respectfully submitted this 29th day of April, 2015

Cindy Myers
Individual Intervener HP14-001
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402-709-2920

A copy of this letter has been electronically sent to the following:

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Keystone's answers are based on the requirements of SDCL §§ 15-6-26, 15-6-33, 15-6-34, and 15-6-36.

INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS

1. Please identify the person or persons providing each answer to an Interrogatory or portion thereof, giving the full name, address of present residence, date of birth, business address and occupation.

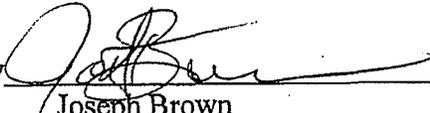
ANSWER: Given the extremely broad scope volume of more than 800 discovery requests received by Keystone in this docket, a range of personnel were involved in answering the interrogatories. Keystone will designate the following witnesses with overall responsibility for the responsive information as related to the Conditions and proposed changes to the Findings of Fact, which are identified in Appendix C to Keystone's Certification Petition: Corey Goulet, President, Keystone Projects, 450 1st Street S.W., Calgary, AB Canada T2P 5H1; Steve Marr, Manager, Keystone Pipelines & KXL, TransCanada Corporation, Bank of America Center, 700 Louisiana, Suite 700, Houston, TX 77002; Meera Kothari, P. Eng., 450 1st Street, S.W., Calgary, AB Canada T2P 5H1; David Diakow, Vice President, Commercial, Liquids Pipeline, 450 1st Street S.W., Calgary, AB Canada T2P 5H1; Jon Schmidt, Vice President, Environmental & Regulatory, exp Energy Services, Inc., 1300 Metropolitan Boulevard, Suite 200,

Tallahassee, FL 32308; Heidi Tillquist, Senior Associate, Stantec Consulting Ltd., 2950 E. Harmony Rd., Suite 290, Fort Collins, CO 80528.

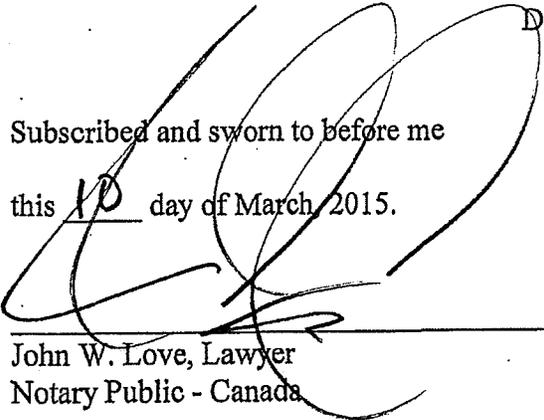
In addition to the witnesses previously identified, Keystone may offer rebuttal testimony from Danielle Dracy regarding emergency response; Lou Thompson regarding tribal engagement; Steve Klekar regarding tax issues; and Doug Robertson regarding SCADA and leak detection. Resumes for these possible rebuttal witnesses are marked as Keystone 1930-1934.

Dated this 10 day of March, 2015.

TRANSCANADA KEYSTONE PIPELINE, LP
by its agent, TC Oil Pipeline Operations, Inc.

By 
Joseph Brown
Director, Authorized Signatory

Subscribed and sworn to before me
this 10 day of March, 2015.


John W. Love, Lawyer
Notary Public - Canada

CERTIFICATE OF SERVICE

I hereby certify that on the 10th day of March, 2015, I sent by e-mail transmission, a true and correct copy of Keystone's Supplemental Responses to Cindy Myers' First Interrogatories and Request for Production of Documents, to the following:

Cindy Myers, R.N.
PO Box 104
Stuart, NE 68780
csmyers77@hotmail.com



One of the attorneys for TransCanada

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

IN THE MATTER OF THE APPLICATION BY)	
TRANSCANADA KEYSTONE PIPELINE, LP)	AMENDED FINAL DECISION
FOR A PERMIT UNDER THE SOUTH DAKOTA)	AND ORDER; NOTICE OF
ENERGY CONVERSION AND TRANSMISSION)	ENTRY
FACILITIES ACT TO CONSTRUCT THE)	
KEYSTONE XL PROJECT)	HP09-001

PROCEDURAL HISTORY

On March 12, 2009, TransCanada Keystone Pipeline, LP (“Applicant” or “Keystone”) filed an application with the South Dakota Public Utilities Commission (“Commission”) for a permit as required by SDCL Chapter 49-41B to construct the South Dakota portion of the Keystone XL Pipeline (“Project”)¹. The originally filed application described the Project as proposed to be an approximately 1,702 mile pipeline for transporting crude oil from Alberta, Canada, to the greater Houston area in Texas, with approximately 1,375 miles to be located in the United States and 313 miles located in South Dakota.

On April 6, 2009, the Commission issued its Notice of Application; Order for and Notice of Public Input Hearings; and Notice of Opportunity to Apply for Party Status. The notice provided that pursuant to SDCL 49-41 B-17 and ARSD 20:10:22:40, each municipality, county, and governmental agency in the area where the facility is proposed to be sited; any nonprofit organization, formed in whole or in part to promote conservation or natural beauty, to protect the environment, personal health or other biological values, to preserve historical sites, to promote consumer interests, to represent commercial and industrial groups, or to promote the orderly development of the area in which the facility is to be sited; or any interested person, may be granted party status in this proceeding by making written application to the Commission on or before May 11, 2009.

Pursuant to SDCL 49-41B-15 and 49-41B-16, and its Notice of Application; Order for and Notice of Public Hearings and Notice of Opportunity to Apply for Party Status, the Commission held public hearings on Keystone’s application as follows: Monday, April 27, 2009, 12:00 noon CDT at Winner Community Playhouse, 7th and Leahy Boulevard, Winner, SD, at which 26 persons presented comments or questions; Monday, April 27, 2009, 7:00 p.m. MDT at Fine Arts School, 330 Scottie Avenue, Philip, SD, at which 17 persons presented comments or questions; and Tuesday, April 28, 2009, 6:00 p.m. MDT at Harding County Recreation Center, 204 Hodge Street, Buffalo, SD, at which 16 persons presented comments or questions. The purpose of the public input hearings was to hear public comment regarding Keystone’s application. At the public input hearings, Keystone presented a brief description of the project, following which interested persons appeared and presented their views, comments and questions regarding the application.

On April 29, 2009, Mary Jasper (Jasper) filed an Application for Party Status. On May 4, 2009, Paul F. Seamans (Seamans) filed an Application for Party Status. On May 5, 2009, Darrell Iversen (D. Iversen) filed an Application for Party Status. On May 8, 2009, the City of Colome (Colome) and Glen Iversen (G. Iversen) filed Applications for Party Status. On May 11, 2009, Jacqueline Limpert (Limpert), John H. Harter (Harter), Zona Vig (Vig), Tripp County Water User District (TCWUD), Dakota Rural Action (DRA) and David Niemi (David Niemi) filed Applications for

¹The Commission’s Orders in the case and all other filings and documents in the record are available on the Commission’s web page for Docket HP09-001 at:
<http://puc.sd.gov/dockets/hydrocarbonpipeline/2009/hp09-001.aspx>

Party Status. On May 11, 2009, the Commission received a Motion for Extension of Time to File Application for Party Status from DRA requesting that the intervention deadline be extended to June 10, 2009. On May 12, 2009, Debra Niemi (Debra Niemi) and Lon Lyman (Lyman) filed Applications for Party Status. On May 15, 2009, the Commission received a Response to Motion to Extend Time from DRA and a Motion to Establish a Procedural Schedule from the Commission's Staff ("Staff").

At its regularly scheduled meeting of May 19, 2009, the Commission voted unanimously to grant party status to Jasper, Seamans, D. Iversen, Colome, G. Iversen, Limpert, Harter, Vig, TCWUD, DRA, David Niemi, Debra Niemi and Lyman. The Commission also voted to deny the Motion for Extension of Time to File Application for Party Status, and in the alternative, the Commission extended the intervention deadline to May 31, 2009. On May 29, 2009, Ruth M. Iversen (R. Iversen) and Martin R. Lueck (Lueck) filed Applications for Party Status. At its regularly scheduled meeting of June 9, 2009, the Commission voted unanimously to grant the Motion to Establish a Procedural Schedule and granted intervention to R. Iversen and Lueck.

On August 26, 2009, the Commission received a revised application from Keystone. On September 3, 2009, the Commission received a Motion for Extension of Time to Submit Testimony from DRA. At its regularly scheduled meeting of September 8, 2009, the Commission voted unanimously to grant the Motion for Extension of Time to Submit Testimony to extend DRA's time for filing and serving testimony until September 22, 2009.

On September 18, 2009, Keystone filed Applicant's Response to Dakota Rural Action's Request for Further Discovery. On September 21, 2009, DRA filed a Motion to Compel Responses and Production of Documents Addressed to TransCanada Keystone Pipeline, LP Propounded by Dakota Rural Action. At an ad hoc meeting on September 23, 2009, the Commission considered DRA's Motion to Compel and on October 2, 2009, issued its Order Granting in Part and Denying in Part Motion to Compel Discovery. By letter filed on September 29, 2009, Chairman Johnson requested reconsideration of the Commission's action with respect to DRA's Request 6 regarding Keystone documents pertaining to development of its Emergency Response Plan for the Project. At its regularly scheduled meeting on October 6, 2009, the Commission voted two to one, with Commissioner Hanson dissenting, to require Keystone to produce to DRA via email the References for the Preparation of Emergency Response Manuals before the close of business on October 6, 2009, that DRA communicate which documents on the list it wished Keystone to produce on or before the close of business on October 8, 2009, and that Keystone produce such documents to DRA on or before October 15, 2009.

On October 2, 2009, Staff filed a letter requesting the Commission to render a decision as to whether the hearing would proceed as scheduled commencing on November 2, 2009. Staff's letter stated that rescheduling the hearing would result in significant scheduling complications for Staff's expert witnesses whose scheduling and travel arrangements had been made months earlier based on the Commission's Order Setting Procedural Schedule issued on June 30, 2009. At its regular meeting on October 6, 2009, the Commission considered Staff's request. At the meeting, all parties agreed that the hearing could proceed on the scheduled dates. DRA requested that its date for submission of pre-filed testimony be extended from October 14, 2009, until October 22, if possible, or at least until October 20, 2009. After discussion, the parties agreed on an extension for DRA's pre-filed testimony until October 20, 2009, with Applicant's rebuttal to be filed by October 27, 2009. The Commission voted unanimously to approve such dates and issued its Order Setting Amended Procedural Schedule on October 8, 2009.

On October 15, 2009, the Commission issued its Order for and Notice of Hearing setting the matter for hearing on November 2-6, 2009, and its Order for and Notice of Public Hearing for an

additional informal public input hearing to be held in Pierre on November 3, 2009, commencing at 7:00 p.m. CST. On October 19, 2009, DRA requested that the time for commencement of the public hearing be changed from 7:00 p.m. CST to 6:00 p.m. CST to better accommodate the schedules of interested persons. On October 21, 2009, the Commission issued an Amended Order for and Notice of Public Hearing amending the start time for the public hearing to 6:00 p.m. CST.

On October 19, 2009, Keystone filed a second revised application ("Application") containing minor additions and amendments reflecting refinements to the route and facility locations and the most recent environmental and other planning evaluations.

In accordance with the scheduling and procedural orders in this case, Applicant, Staff and Intervenor David and Debra Niemi filed pre-filed testimony. The hearing was held as scheduled on November 2-4, 2009, at which Applicant, DRA and Staff appeared and participated. The informal hearing was held as scheduled on the evening of November 3, 2009, at which 23 persons presented comments and/or questions. A combined total of 326 persons attended the public input hearings in Winner, Phillip, Buffalo and Pierre. As of February 26, 2009, the Commission had received 252 written comments regarding this matter from the public.

On December 31, 2009, the Commission issued its Amended Order Establishing Briefing Schedule setting the following briefing schedule: (i) initial briefs and proposed findings of fact and conclusions of law from all parties wishing to submit them due by January 20, 2010; and (ii) reply briefs and objections and revisions to proposed findings of fact and conclusions of law due from all parties wishing to submit them on or before February 2, 2010.

On January 13, 2009, Intervenor David Niemi filed a letter with the Commission requesting and recommending a series of conditions to be included in the order approving the permit, if granted. On January 20, 2010, initial briefs were filed by the Applicant and Staff. On January 20, 2010, Applicant also filed and served proposed findings of fact and conclusions of law. On January 21, 2010, DRA filed an initial brief and Motion to Accept Late-Filed Brief. On January 21 and 26, 2010, respectively, Keystone and Staff filed letters of no objection to acceptance of DRA's late-filed initial brief. On February 2, 2010, reply briefs were filed and served by Applicant, DRA and Staff, and Keystone filed Applicant's Response to David Niemi's Letter filed on January 13, 2010.

At an ad hoc meeting on February, 18, 2010, after separately considering each of a set of draft conditions prepared by Commission Counsel from inputs from the individual Commissioners and a number of Commissioner motions to amend the draft conditions, the Commission voted unanimously to approve conditions to which a permit to construct the Project would be subject, if granted, and to grant a permit to Keystone to construct the Project, subject to the approved conditions.

On April 14, 2010, Keystone filed Applicant's Motion for Limited Reconsideration of Certain Permit Conditions ("Motion"). On April 19, 2010, intervenors David Niemi and Seamans filed responses to the Motion. On April 19, 2010, Peter Larson ("Larson") filed two comments responsive to the Motion. On April 27, 2010, Keystone filed Applicant's Reply Brief In Support of Motion for Limited Reconsideration responding to the responses and comments filed by Niemi, Seamans and Larson. On April 28, 2010, Staff filed a response to the Motion. On April 29, 2010, DRA filed the Answer of Dakota Rural Action in Opposition to Applicant's Motion for Limited Reconsideration of Certain Permit Conditions.

At its regularly scheduled meeting on May 4, 2010, the Commission considered the Motion and the responses and comments filed by the parties and Larson. Applicant, Staff, intervenor John

H. Harter, DRA and Larson appeared and participated in the hearing on the Motion. After an extensive discussion among the Commission and participants, the Commission made rulings on the specific requests in the Motion and voted to grant the Motion in part and deny in part and amend certain of the Conditions as set forth in the Commission's Order Granting in Part Motion to Reconsider and Amending Certain Conditions In Final Decision And Order, which was issued by the Commission on June 29, 2010.

Having considered the evidence of record, applicable law and the arguments of the parties, the Commission makes the following Findings of Fact, Conclusions of Law and Decision:

FINDINGS OF FACT

Parties

1. The permit applicant is TransCanada Keystone Pipeline, LP, a limited partnership, organized under the laws of the State of Delaware, and owned by affiliates of TransCanada Corporation ("TransCanada"), a Canadian public company organized under the laws of Canada. Ex TC-1, 1.5, p. 4.

2. On May 19, 2009, the Commission unanimously voted to grant party status to all persons that had requested party status prior to the commencement of the meeting. On June 9, 2009, the Commission unanimously voted to grant party status to all persons that had requested party status after the commencement of the meeting on May 19, 2009, through the intervention deadline of May 31, 2009. Fifteen persons intervened, including: Mary Jasper, Paul F. Seamans, Darrell Iversen, the City of Colome, Glen Iversen, Jacqueline Limpert, John H. Harter, Zona Vig, Tripp County Water User District ("TCWUD"), Dakota Rural Action, David Niemi, Debra Niemi, Ruth M. Iversen, Martin R. Lueck, and Lon Lyman. Minutes of May 19, 2009, and June 9, 2009, Commission Meetings; Applications for Party Status.

3. The Staff also participated in the case as a full party.

Procedural Findings

4. The application was signed on behalf of the Applicant on February 26, 2009, in Calgary, Alberta, Canada, and was filed with the Commission on March 12, 2009. Ex TC -1, 9.0, p. 116.

5. The Commission issued the following notices and orders in the case as described in greater detail in the Procedural History above, which is hereby incorporated by reference in these Findings of Fact and Conclusions of Law:

- Order of Assessment of Filing Fee
- Notice of Application; Order for and Notice of Public Input Hearings; and Notice of Opportunity to Apply for Party Status
- Order Granting Party Status; Order Denying Motion for Extension of Time to File Application for Party Status; Order Extending Intervention Deadline
- Order Granting Motion to Establish Procedural Schedule and Order Granting Party Status
- Order Setting Procedural Schedule
- Order Granting Motion for Extension of Time to Submit Testimony

- Order Granting in Part and Denying in Part Motion to Compel Discovery
- Order Amending Order Granting in Part and Denying in Part Motion to Compel Discovery
- Order Setting Amended Procedural Schedule
- Order for and Notice of Hearing
- Order for and Notice of Public Hearing
- Amended Order for and Notice of Public Hearing
- Order Establishing Briefing Schedule
- Amended Order Establishing Briefing Schedule
- Order Granting in Part Motion to Reconsider and Amending Certain Conditions In Final Decision And Order

6. Pursuant to SDCL 49-41B-15 and 49-41B-16 and its Notice of Application; Order for and Notice of Public Hearings; and Notice of Opportunity to Apply for Party Status, the Commission held public hearings on Keystone's application at the following times and places (see Public Hearing Transcripts):

- Monday, April 27, 2009, 12:00 noon CDT at Winner Community Playhouse, 7th and Leahy Boulevard, Winner, SD
- Monday, April 27, 2009, 7:00 p.m. MDT at Fine Arts School, 330 Scottie Avenue, Philip, SD
- Tuesday, April 28, 2009, 6:00 p.m. MDT at Harding County Recreation Center, 204 Hodge Street, Buffalo, SD.

7. The purpose of the public hearings was to afford an opportunity for interested persons to present their views and comments to the Commission concerning the Application. At the hearings, Keystone presented a brief description of the project after which interested persons presented their views, comments and questions regarding the application. Public Hearing Transcripts.

8. The following testimony was prefiled in advance of the formal evidentiary hearing held November 2, 3 and 4, 2009, in Room 414, State Capitol, Pierre, South Dakota:

- A. Applicant's March 12, 2009, Direct Testimony.
 - Robert Jones
 - John Phillips
 - Richard Gale
 - Jon Schmidt
 - Meera Kothari
 - John Hayes
 - Donald Scott
 - Heidi Tillquist
 - Tom Oster
- B. Supplemental Direct Testimony of August 31, 2009.
 - John Phillips
- C. Intervenors' Direct Testimony of September 11, 2009.
 - David Niemi
 - Debra Niemi

- D. Staff's September 25, 2009, Direct Testimony.
- Kim McIntosh
 - Brian Walsh
 - Derric Iles
 - Tom Kirschenmann
 - Paige Hoskinson Olson
 - Michael Kenyon
 - Ross Hargove
 - Patrick Robblee
 - James Arndt
 - William Walsh
 - Jenny Hudson
 - David Schramm
 - William Mampre
 - Michael K. Madden
 - Tim Binder
- E. Applicant's Updated Direct and Rebuttal Testimony.
- Robert Jones Updated Direct (10/23/09)
 - Jon Schmidt Updated Direct and Rebuttal (10/19/09)
 - Meera Kothari Updated Direct and Rebuttal (10/19/09)
 - Donald M. Scott Updated Direct (10/19/09)
 - John W. Hayes Updated Direct (10/19/09)
 - Heidi Tillquist Updated Direct (10/20/09)
 - Steve Hicks Direct and Rebuttal (10/19/09)
- F. Staff's Supplemental Testimony of October 29, 2009.
- William Walsh
 - William Mampre
 - Ross Hargrove

9. As provided for in the Commission's October 21, 2009, Amended Order for and Notice of Public Hearing, the Commission held a public input hearing in Room 414 of the State Capitol beginning at 6:00 p.m. on November 3, 2009, at which 23 members of the public presented comments and/or questions. Transcript of November 3, 2009 Public Input Hearing.

Applicable Statutes and Regulations

10. The following South Dakota statutes are applicable: SDCL 49-41B-1 through 49-41B-2.1, 49-41B-4, 49-41B-11 through 49-41B-19, 49-41B-21, 49-41B-22, 49-41B-24, 49-41B-26 through 49-41B-38 and applicable provisions of SDCL Chs. 1-26 and 15-6.

11. The following South Dakota administrative rules are applicable: ARSD Chapter 20:10:01, ARSD 20:10:22:01 through ARSD 20:10:22:25 and ARSD 20:10:22:36 through ARSD 20:10:22:40.

12. Pursuant to SDCL 49-41B-22, the Applicant for a facility construction permit has the burden of proof to establish that:

- (1) The proposed facility will comply with all applicable laws and rules;

- (2) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area;
- (3) The facility will not substantially impair the health, safety or welfare of the inhabitants; and
- (4) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

The Project

13. The Project will be owned, managed and operated by the Applicant, TransCanada Keystone Pipeline, LP. Ex TC-1, 1.5 and 1.7, p. 4.

14. The purpose of the Project is to transport incremental crude oil production from the Western Canadian Sedimentary Basin ("WCSB") to meet growing demand by refineries and markets in the United States ("U.S."). This supply will serve to replace U.S. reliance on less stable and less reliable sources of offshore crude oil. Ex TC-1, 1.1, p. 1; Ex TC-1, 3.0 p. 23; Ex TC-1, 3.4 p. 24.

15. The Project will consist of three segments: the Steele City Segment, the Gulf Coast Segment, and the Houston Lateral. From north to south, the Steele City Segment extends from Hardisty, Alberta, Canada, southeast to Steele City, Nebraska. The Gulf Coast Segment extends from Cushing, Oklahoma south to Nederland, in Jefferson County, Texas. The Houston Lateral extends from the Gulf Coast Segment in Liberty County, Texas southwest to Moore Junction, Harris County, Texas. It will interconnect with the northern and southern termini of the previously approved 298-mile-long, 36-inch-diameter Keystone Cushing Extension segment of the Keystone Pipeline Project. Ex TC-1, 1.2, p. 1. Initially, the pipeline would have a nominal capacity to transport 700,000 barrels per day ("bpd"). Keystone could add additional pumping capacity to expand the nominal capacity to 900,000 bpd. Ex TC-1, 2.1.2, p. 8.

16. The Project is an approximately 1,707 mile pipeline with about 1,380, miles in the United States. The South Dakota portion of the pipeline will be approximately 314 miles in length and will extend from the Montana border in Harding County to the Nebraska border in Tripp County. The Project is proposed to cross the South Dakota counties of Harding, Butte, Perkins, Meade, Pennington, Haakon, Jones, Lyman and Tripp. Ex TC-1, 1.2 and 2.1.1, pp. 1 and 8. Detailed route maps are presented in Ex TC-1, Exhibits A and C, as updated in Ex TC-14.

17. Construction of the Project is proposed to commence in May of 2011 and be completed in 2012. Construction in South Dakota will be conducted in five spreads, generally proceeding in a north to south direction. The Applicant expects to place the Project in service in 2012. This in-service date is consistent with the requirements of the Applicant's shippers who have made the contractual commitments that underpin the viability and need for the project. Ex TC-1, 1.4, pp. 1 and 4; TR 26.

18. The pipeline in South Dakota will extend from milepost 282.5 to milepost 597, approximately 314 miles. The pipeline will have a 36-inch nominal diameter and be constructed using API 5L X70 or X80 high-strength steel. An external fusion bonded epoxy ("FBE") coating will be applied to the pipeline and all buried facilities to protect against corrosion. Cathodic protection will be provided by impressed current. The pipeline will have batching capabilities and will be able to transport products ranging from light crude oil to heavy crude oil. Ex TC-1, 2.2, 2.2.1, 6.5.2, pp. 8-9, 97-98; Ex TC-8, ¶ 26.

19. The pipeline will operate at a maximum operating pressure of 1,440 psig. For location specific low elevation segments close to the discharge of pump stations, the maximum operating pressure will be 1,600 psig. Pipe associated with these segments of 1,600 psig MOP are excluded from the Special Permit application and will have a design factor of 0.72 and pipe wall thickness of 0.572 inch (X-70) or 0.500 inch (X-80). All other segments in South Dakota will have a MOP of 1,440 psig. Ex TC-1, 2.2.1, p. 9.

20. The Project will have seven pump stations in South Dakota, located in Harding (2), Meade, Haakon, Jones and Tripp (2) Counties. TC-1, 2.2.2, p. 10. The pump stations will be electrically driven. Power lines required for providing power to pump stations will be permitted and constructed by local power providers, not by Keystone. Initially, three pumps will be installed at each station to meet the nominal design flow rate of 700,000 bpd. If future demand warrants, pumps may be added to the proposed pump stations for a total of up to five pumps per station, increasing nominal throughput to 900,000 bpd. No additional pump stations will be required to be constructed for this additional throughput. No tank facilities will be constructed in South Dakota. Ex TC-1, 2.1.2, p.8. Sixteen mainline valves will be located in South Dakota. Seven of these valves will be remotely controlled, in order to have the capability to isolate sections of line rapidly in the event of an emergency to minimize impacts or for operational or maintenance reasons. Ex TC-1, 2.2.3, pp. 10-11.

21. The pipeline will be constructed within a 110-foot wide corridor, consisting of a temporary 60-foot wide construction right-of-way and a 50-foot permanent right-of-way. Additional workspace will be required for stream, road, and railroad crossings, as well as hilly terrain and other features. The Applicant committed to reducing the construction right-of-way to 85 feet in certain wetlands to minimize impacts. Ex TC-1, 2.2.4, pp. 11-12; Ex TC-7, ¶ 20. FERC guidelines provide that the wetland construction right-of-way should be limited to 75 feet except where conditions do not permit, and Staff witness Hargrove's Construction, Mitigation and Reclamation Plan Review states that industry practice is to reduce the typical construction right-of-way width to 75 feet in non-cultivated wetlands, although exceptions are sometimes made for larger-diameter pipelines or where warranted due to site-specific conditions. Ex S-5, p. 2 and Attachment 2, 6.2; TR 335, 353. The Commission finds that the construction right-of-way should be limited to 75 feet, except where site-specific conditions require use of Keystone's proposed 85-foot right-of-way or where special circumstances are present, and the Commission accordingly adopts Condition 22(a), subject to the special circumstance provisions of Condition 30.

22. The Project will be designed, constructed, tested, and operated in accordance with all applicable requirements, including the U.S. Department of Transportation, Pipeline Hazardous Materials and Safety Administration (PHMSA) regulations set forth at 49 CFR Part 195, as modified by the Special Permit requested for the Project from PHMSA (see Finding 71). These federal regulations are intended to ensure adequate protection for the public and the environment and to prevent crude oil pipeline accidents and failures. Ex TC-1, 2.2, p. 8.

23. The current estimated cost of the Keystone Project in South Dakota is \$921.4 million. Ex TC-1, 1.3, p. 1.

Demand for the Facility

24. The transport of additional crude oil production from the WCSB is necessary to meet growing demand by refineries and markets in the U.S. The need for the project is dictated by a number of factors, including increasing WCSB crude oil supply combined with insufficient export pipeline capacity; increasing crude oil demand in the U.S. and decreasing domestic crude supply;

the opportunity to reduce U.S. dependence on foreign off-shore oil through increased access to stable, secure Canadian crude oil supplies; and binding shipper commitments to utilize the Keystone Pipeline Project. Ex TC-1, 3.0, p. 23.

25. According to the U.S. Energy Information Administration (“EIA”), U.S. demand for petroleum products has increased by over 11 percent or 2,000,000 bpd over the past 10 years and is expected to increase further. The EIA estimates that total U.S. petroleum consumption will increase by approximately 10 million bpd over the next 10 years, representing average demand growth of about 100,000 bpd per year (EIA Annual Energy Outlook 2008). Ex TC-1, 3.2, pp. 23-24.

26. At the same time, domestic U.S. crude oil supplies continue to decline. For example, over the past 10 years, domestic crude production in the United States has declined at an average rate of about 135,000 bpd per year, or 2% per year. Ex TC-1, 3.3, p. 24. Crude and refined petroleum product imports into the U.S. have increased by over 3.3 million bpd over the past 10 years. In 2007, the U.S. imported over 13.4 million bpd of crude oil and petroleum products or over 60 percent of total U.S. petroleum product consumption. Canada is currently the largest supplier of imported crude oil and refined products to the U.S., supplying over 2.4 million bpd in 2007, representing over 11 percent of total U.S. petroleum product consumption (EIA 2007). Ex TC-1, 3.4, p. 24.

27. The Project will provide an opportunity for U.S. refiners in Petroleum Administration for Defense District III, the Gulf Coast region, to further diversify supply away from traditional offshore foreign crude supply and to obtain direct access to secure and growing Canadian crude supplies. Access to additional Canadian crude supply will also provide an opportunity for the U.S. to offset annual declines in domestic crude production and, specifically, to decrease its dependence on other foreign crude oil suppliers, such as Mexico and Venezuela, the top two heavy crude oil exporters into the U.S. Gulf Coast. Ex TC-1, 3.4, p. 24.

28. Reliable and safe transportation of crude oil will help ensure that U.S. energy needs are not subject to unstable political events. Established crude oil reserves in the WCSB are estimated at 179 billion barrels (CAPP 2008). Over 97 percent of WCSB crude oil supply is sourced from Canada’s vast oil sands reserves located in northern Alberta. The Alberta Energy and Utilities Board estimates there are 175 billion barrels of established reserves recoverable from Canada’s oil sands. Alberta has the second largest crude oil reserves in the world, second only to Saudi Arabia. Ex TC-1, 3.1, p. 23.

29. Shippers have already committed to long-term binding contracts, enabling Keystone to proceed with regulatory applications and construction of the pipeline once all regulatory, environmental, and other approvals are received. These long-term binding shipper commitments demonstrate a material endorsement of support for the Project, its economics, proposed route, and target market, as well as the need for additional pipeline capacity and access to Canadian crude supplies. Ex TC-1, 3.5, p. 24.

Environmental

30. In order to construct the Project, Keystone is required to obtain a Presidential Permit from the U.S. Department of State (“DOS”) authorizing the construction of facilities across the international border. Ex TC-1, 1.8, pp. 4-5; 5.1, p. 30.

31. Because Keystone is required to obtain a Presidential Permit from the DOS, the National Environmental Policy Act requires the DOS to prepare an Environmental Impact Statement

("EIS"). Ex TC-1, 1.8, pp. 4-5; Ex TC-4; Ex S-3. In support of its Presidential Permit application, Keystone has submitted studies and other environmental information to the DOS. Ex TC-1, 1.8, pp. 4-5; 5.1, p. 30.

32. Table 6 to the Application summarizes the environmental impacts that Keystone's analysis indicates could be expected to remain after its Construction Mitigation and Reclamation Plan is implemented. Ex TC-1, pp. 31-37.

33. The pipeline will cross the Unglaciated Missouri Plateau. This physiographic province is characterized by a dissected plateau where river channels have incised into the landscape. Elevations range from just over 3,000 feet above mean sea level in the northwestern part of the state to around 1,800 feet above mean sea level in the White River valley. The major river valleys traversed include the Little Missouri River, Cheyenne River, and White River. Ex TC-1, 5.3.1, p. 30; Ex TC-4, ¶15. Exhibit A to the Application includes soil type maps and aerial photograph maps of the Keystone pipeline route in South Dakota that indicate topography, land uses, project mileposts and Section, Township, Range location descriptors. Ex TC-1, Exhibit A. Updated versions of these maps were received in evidence as Exhibit TC-14.

34. The surficial geologic deposits along the proposed route are primarily composed of Quaternary alluvium, colluvium, alluvial terraces, and eolian deposits (sand dunes). The alluvium primarily occurs in modern stream channels and floodplains, but also is present in older river terraces. The bedrock geology consists of Upper Cretaceous and Tertiary rocks. The Upper Cretaceous units include the Pierre Shale, Fox Hills Formation, and the Hell Creek Formation. The Ogallala Group, present in the far southern portion of the Project in South Dakota, was deposited as a result of uplift and erosion of the Rocky Mountains. Material that was eroded from the mountains was transported to the east by streams and wind. Ex TC-1, 5.3.2, p. 37.

35. Sand, gravel, crushed stone, oil, natural gas, coal and metallic ore resources are mineral resources existing along the proposed route. The route passes through the Buffalo Field in Harding County. Construction will have very minor and short-term impact on current mineral extraction activities due to the temporary and localized nature of pipeline construction activities. Several oil and gas wells were identified within or close to the Project construction ROW. Prior to construction, Keystone will identify the exact locations of active, shut-in, and abandoned wells and any associated underground pipelines in the construction ROW and take appropriate precautions to protect the integrity of such facilities. Ex TC-1, 5.3.3, pp. 38-39.

36. Soil maps for the route are provided in Exhibit A to Ex TC-1. In the northwestern portions of South Dakota, the soils are shallow to very deep, generally well drained, and loamy or clayey. Soils such as the Assiniboine series formed in fluvial deposits that occur on fans, terraces, and till plains. Soils such as the Cabbart, Delridge, and Blackhall series formed in residuum on hills and plains. Fertile soils and smooth topography dominate Meade County. The soils generally are shallow to very deep, somewhat excessively drained to moderately well drained, and loamy or clayey. Cretaceous Pierre Shale underlies almost all of Haakon, Jones, and portions of Tripp counties. This shale weathers to smectitic clays. These clays shrink as they dry and swell as they get wet, causing significant problems for road and structural foundations. From central Tripp County to the Nebraska state line, soils typically are derived from shale and clays on the flatter to moderately sloping, eroded tablelands. In southern Tripp County, the route also crosses deep, sandy deposits on which the Doger, Dunday, and Valentine soils formed. These are dry, rapidly permeable soils. Topsoil layers are thin and droughty, and wind erosion and blowouts are a common hazard. Ex TC-1, 5.3.4, p. 40.

37. Grading and excavating for the proposed pipeline and ancillary facilities will disturb a variety of agricultural, rangeland, wetland and forestland soils. Prime farmland soils may be altered temporarily following construction due to short-term impact such as soil compaction from equipment traffic, excavation and handling. However, potential impacts to soils will be minimized or mitigated by the soil protection measures identified in the Construction Mitigation and Reclamation Plan (CMR Plan) to the extent such measures are fully implemented. The measures include procedures for segregating and replacing top soil, trench backfilling, relieving areas compacted by heavy equipment, removing surface rock fragments and implementing water and wind erosion control practices. Ex TC-1, 5.3.4, p. 41; TC-1 Ex. B.

38. To accommodate potential discoveries of contaminated soils, Keystone made a commitment in the Application to develop, in consultation with relevant agencies, procedures for the handling and disposal of unanticipated contaminated soil discovered during construction. These procedures will be added to the CMR Plan. If hydrocarbon contaminated soils are encountered during trench excavation, the appropriate federal and state agencies will be contacted immediately. A remediation plan of action will be developed in consultation with that agency. Depending on the level of contamination found, affected soil may be replaced in the trench or removed to an approved landfill for disposal. Ex TC-1, 5.3.4, p. 42.

39. The USGS ground motion hazard mapping indicates that potential ground motion hazard in the Project area is low. South Dakota historically has had little earthquake activity. No ground subsidence or karst hazards are present in the vicinity of the route. Ex TC-1, 5.3.6, p. 43.

40. Cretaceous and Tertiary rocks in the Missouri River Plateau have high clay content and upon weathering can be susceptible to instability in the form of slumps and earth flows. Landslide potential is enhanced on steeper slopes. Formations that are especially susceptible are the Cretaceous Hell Creek and Pierre Shale as well as shales in the Tertiary Fort Union Formation mainly on river banks and steep slopes. These units can contain appreciable amounts of bentonite, a rock made up of montmorillonite clay that has deleterious properties when exposed to moisture. The bentonite layers in the Pierre Shale may present hazards associated with swelling clays. These formations are considered to have "high swelling potential." Bentonite has the property whereby when wet, it expands significantly in volume. When bentonite layers are exposed to successive cycles of wetting and drying, they swell and shrink, and the soil fluctuates in volume and strength. Ex TC-1, 5.3.4, pp. 43.

41. Fifteen perennial streams and rivers, 129 intermittent streams, 206 ephemeral streams and seven man-made ponds will be crossed during construction of the Project in South Dakota. Keystone will utilize horizontal directional drilling ("HDD") to cross the Little Missouri, Cheyenne and White River crossings. Keystone intends to use open-cut trenching at the other perennial streams and intermittent water bodies. The open cut wet method can cause the following impacts: loss of in-stream habitat through direct disturbance, loss of bank cover, disruption of fish movement, direct disturbance to spawning, water quality effects and sedimentation effects. Alternative techniques include open cut dry flume, open cut dam-and-pump and horizontal directional drilling. Exhibit C to the Application contains a listing of all water body crossings and preliminary site-specific crossing plans for the HDD sites. Ex TC-14. Permitting of water body crossings, which is currently underway, will ultimately determine the construction method to be utilized. Keystone committed to mitigate water crossing impacts through implementation of procedures outlined in the CMR Plan. Ex TC-1, 5.4.1, pp. 45-46.

42. The pipeline will be buried at an adequate depth under channels, adjacent flood plains and flood protection levees to avoid pipe exposure caused by channel degradation and lateral scour. Determination of the pipeline burial depth will be based on site-specific channel and hydrologic investigations where deemed necessary. Ex TC-1, 5.4.1, p. 46.

43. Although improvements in pipeline safety have been made, the risk of a leak cannot be eliminated. Keystone's environmental consulting firm for the Project, AECOM, estimated the chances of and the environmental consequences of a leak or spill through a risk assessment. Ex TC-1, 6.5.2, pp. 96-102; Table 6; TC-12, 10, 24.

44. Keystone's expert estimated the chance of a leak from the Project to be not more than one spill in 7,400 years for any given mile of pipe. TR 128-132, 136-137; Ex TC-12, ¶10; TC-1, 5.5.1, p. 54; 6.1.2.1, p. 87. The frequency calculation found the chance to be no more than one release in 24 years in South Dakota. TR 137.

45. Keystone's spill frequency and volume estimates are conservative by design, overestimating the risk since the intent is to use the assessment for planning purposes. The risk assessment overestimates the probable size of a spill to ensure conservatism in emergency response and other planning objectives. If a spill were to occur on the Keystone pipeline, PHMSA data indicate that the spill is likely to be three barrels or less. Ex TC-12, ¶10; TR 128-132, 137; TC-1, 6.1.2.1, p. 87.

46. Except for a few miles in the far southern reach of the Project in southern Tripp County which will be located over the permeable Sand Hills and shallow High Plains Aquifer, the Project route in South Dakota does not cross geologic units that are traditionally considered as aquifers. TR 440. Where aquifers are present, at most locations they are more than 50 feet deep, which significantly reduces the chance of contamination reaching the aquifer. Additionally, the majority of the pipeline is underlain by low permeability confining materials (e.g., clays, shales) that inhibit the infiltration of released crude oil into aquifers. TR 158; Ex TC-12, ¶13, EX TC-1, 5.4.2, pp. 47-48. Keystone consulted with the DENR during the routing process to identify and subsequently avoid sensitive aquifers and recharge areas, e.g., Source Water Protection Areas (SWPAs) in order to minimize risk to important public groundwater resources, and no groundwater SWPAs are crossed by the Project in South Dakota. EX TC-1, 5.4.2, pp. 47-48. Except for the Sand Hills area, no evidence was offered of the existence of a shallow aquifer (i.e. less than 50 feet in depth) crossed by the Project.

47. Because of their high solubility and their very low Maximum Contaminant Levels ("MCLs"), the constituents of primary concern in petroleum, including crude oil, are benzene, toluene, ethyl benzene and xylene. These constituents are commonly referred to as BTEX. TR 142, 146. The crude oil to be shipped through the Project will be similar in composition to other crude oils produced throughout the world and currently shipped in the United States. TR 155-56. The BTEX concentration in the crude oil to be shipped through the Project is close to 1 % to 1.5%. TR 151.

48. The Project will pass through areas in Tripp County where shallow and surficial aquifers exist. Since the pipeline will be buried at a shallow depth, it is unlikely that the construction or operation of the pipeline will alter the yield from any aquifers that are used for drinking water purposes. Keystone will investigate shallow groundwater when it is encountered during construction to determine if there are any nearby livestock or domestic wells that might be affected by construction activities. Appropriate measures will be implemented to prevent groundwater contamination and steps will be taken to manage the flow of any ground water encountered. Ex TC-

1, 5.4.2, pp. 47-48. The Tripp County Water User District is up-gradient of the pipeline and therefore would not be affected by a spill. TR 441, 449-50.

49. The risk of a spill affecting public or private water wells is low because the components of crude oil are unlikely to travel more than 300 feet from the spill site. TR 142-43. There are no private or public wells within 200 or 400 feet, respectively, of the right of way. TC-16, Data Response 3-46.

50. The total length of Project pipe with the potential to affect a High Consequence Area ("HCA") is 34.3 miles. A spill that could affect an HCA would occur no more than once in 250 years. TC-12, ¶ 24.

51. In the event that soils and groundwater are contaminated by a petroleum release, Keystone will work with state agency personnel to determine what type of remediation process would be appropriate. TR 148. Effective emergency response can reduce the likelihood and severity of contamination. TC-12, ¶ 10, 14, 24. Soils and groundwater contaminated by a petroleum release can be remediated. TR 499-500. The experience of DENR is that pipeline facilities have responded immediately to the incident in every case. TR 502.

52. The Commission finds that the risk of a significant release occurring is low and finds that the risk that a release would irretrievably impair a water supply is very low and that it is probable that Keystone, in conjunction with state and federal response agencies, will be able to and will be required to mitigate and successfully remediate the effects of a release.

53. The Commission nevertheless finds that the Sand Hills area and High Plains Aquifer in southeastern Tripp County is an area of vulnerability that warrants additional vigilance and attention in Keystone's integrity management and emergency response planning and implementation process. The evidence demonstrates that the shallow Sand Hills groundwater or High Plains Aquifer is used by landowners in the Project area, that many wells are developed into the aquifer, including TCWUD 's, that the very high permeability of both the sandy surficial soils and deeper soils render the formation particularly vulnerable to contamination and that rapid discovery and response can significantly lessen the impact of a release on this vulnerable groundwater resource. The Commission further finds that if additional surficial aquifers are discovered in the course of pipeline construction, such aquifers should have similar treatment. The Commission accordingly finds that Condition 35 shall be adopted.

54. Of the approximately 314-mile route in South Dakota, all but 21.5 miles is privately owned. 21.5 miles is state-owned and managed. The list is found in Table 14. No tribal or federal lands are crossed by the proposed route. Ex TC-1, 5.7.1, p. 75.

55. Table 15 of the Application identifies the land uses affected by the pipeline corridor. Among other things, it shows that the project will not cross or be co-located with any major industrial sites, the pipeline will not cross active farmsteads, but may cross near them and the pipeline will not cross suburban and urban residential areas. The project will not cross municipal water supplies or water sources for organized rural water districts. Ex TC-1, 5.7.1, pp. 76-78.

56. The pipeline will be compatible with the predominant land use, which is rural agriculture, because the pipeline will be buried to a depth of four feet in fields and will interfere only minimally with normal agricultural operations. In most locations, the pipeline will be placed below agricultural drain tiles, and drain tiles that are damaged will be repaired. The only above-ground

facilities will be pump stations and block valves located at intervals along the pipeline. Ex TC-1, 5.7.3, pp.78-79.

57. The Project's high strength X70 steel will have a puncture resistance of 51 tons of digging force. Ex TC-8, ¶ 28. Keystone will have a public awareness program in place and an informational number to call where landowners and others can obtain information concerning activities of concern. TC-1, 6.3.4, pp. 93-94. The Commission finds that the risk of damage by ordinary farming operations is very low and that problems can be avoided through exercise of ordinary common sense.

58. If previously undocumented sites are discovered within the construction corridor during construction activities, all work that might adversely affect the discovery will cease until Keystone, in consultation with the appropriate agencies such as the SHPO, can evaluate the site's eligibility and the probable effects. If a previously unidentified site is recommended as eligible to the National Registry of Historic Places, impacts will be mitigated pursuant to the Unanticipated Discovery Plan submitted to the SHPO. Treatment of any discovered human remains, funerary objects, or items of cultural patrimony found on federal land will be handled in accordance with the Native American Grave Protection and Repatriation Act. Construction will not resume in the area of the discovery until the authorized agency has issued a notice to proceed. If human remains and associated funerary objects are discovered on state or private land during construction activities, construction will cease within the vicinity of the discovery and the county coroner or sheriff will be notified of the find. Treatment of any discovered human remains and associated funerary objects found on state or private land will be handled in accordance with the provisions of applicable state laws. TR 40; Ex TC-1, 6.4, pp. 96; Ex TC-16, 3-54. In accordance with these commitments, the Commission finds that Condition 43 should be adopted.

59. Certain formations to be crossed by the Project, such as the Fox Hills, Ludlow and particularly the Hell Creek Formation are known to contain paleontological resources of high scientific and monetary value. TR 438-439, 442-444. In northwest South Dakota, the Hell Creek Formation has yielded valuable dinosaur bones including from a triceratops, the South Dakota State fossil. Ex TC-1, 5.3.2, p. 38. Protection of paleontological resources was among the most frequently expressed concerns at the public input hearings held by the Commission. There is no way for anyone to know with any degree of certainty whether fossils of significance will be encountered during construction activities. TR 439. Because of the potential significance to landowners of the encounter by construction activities with paleontological resources and the inability to thoroughly lessen the probability of such encounter through pre-construction survey and avoidance, the Commission adopts Condition 44 to require certain special procedures in high probability areas, including the Hell Creek formation, such as the presence of a monitor with training in identification of a paleontological strike of significance.

Design and Construction

60. Keystone has applied for a special permit ("Special Permit") from PHMSA authorizing Keystone to design, construct, and operate the Project at up to 80% of the steel pipe specified minimum yield strength at most locations. TC-1, 2.2, p. 8; TR 62. In Condition 2, the Commission requires Keystone to comply with all of the conditions of the Special Permit, if issued.

61. TransCanada operates approximately 11,000 miles of pipelines in Canada with a 0.8 design factor and requested the Special Permit to ensure consistency across its system and to reduce costs. PHMSA has previously granted similar waivers adopting this modified design factor for natural gas pipelines and for the Keystone Pipeline. Ex TC-8, ¶¶ 13, 17.

62. The Special Permit is expected to exclude pipeline segments operating in (i) PHMSA-defined HCAs described as high population areas and commercially navigable waterways in 49 CFR Section 195.450; (ii) pipeline segments operating at highway, railroad, and road crossings; (iii) piping located within pump stations, mainline valve assemblies, pigging facilities, and measurement facilities; and (iv) areas where the MOP is greater than 1,440 psig. Ex TC-8, ¶ 16.

63. Application of the 0.8 design factor and API 5L PSL2 X70 high-strength steel pipe results in use of pipe with a 0.463 inch wall thickness, as compared with the 0.512 inch wall thickness under the otherwise applicable 0.72 design factor, a reduction in thickness of .050 inches. TR 61. PHMSA previously found that the issuance of a waiver is not inconsistent with pipeline safety and that the waiver will provide a level of safety equal to or greater than that which would be provided if the pipeline were operated under the otherwise applicable regulations. Ex TC-8, ¶ 15.

64. In preparation for the Project, Keystone conducted a pipeline threat analysis, using the pipeline industry published list of threats under ASME B31.8S and PHMSA to determine threats to the pipeline. Identified threats were manufacturing defects, construction damage, corrosion, mechanical damage and hydraulic event. Safeguards were then developed to address these threats. Ex TC-8, ¶ 22.

65. Steel suppliers, mills and coating plants were pre-qualified using a formal qualification process consistent with ISO standards. The pipe is engineered with stringent chemistry to ensure weldability during construction. Each batch of pipe is mechanically tested to prove strength, fracture control and fracture propagation properties. The pipe is hydrostatically tested. The pipe seams are visually and manually inspected and also inspected using ultrasonic instruments. Each piece of pipe and joint is traceable to the steel supplier and pipe mill shift during production. The coating is inspected at the plant with stringent tolerances on roundness and nominal wall thickness. A formal quality surveillance program is in place at the steel mill and at the coating plant. Ex TC-8, ¶ 24; TR 59-60.

66. All pipe welds will be examined around 100 percent of their circumferences using ultrasonic or radiographic inspection. The coating is inspected and repaired if required prior to lowering into the trench. After construction the pipeline is hydrostatically tested in the field to 125 percent of its maximum operating pressure, followed by caliper tool testing to check for dents and ovality. Ex TC-8, ¶ 25.

67. A fusion-bonded epoxy ("FBE") coating will be applied to the external surface of the pipe to prevent corrosion. Ex TC- 8, ¶ 26.

68. TransCanada has thousands of miles of this particular grade of pipeline steel installed and in operation. TransCanada pioneered the use of FBE, which has been in use on its system for over 29 years. There have been no leaks on this type of pipe installed by TransCanada with the FBE coating and cathodic protection system during that time. When TransCanada has excavated pipe to validate FBE coating performance, there has been no evidence of external corrosion. Ex TC-8, ¶ 27.

69. A cathodic protection system will be installed comprised of engineered metal anodes, which are connected to the pipeline. A low voltage direct current is applied to the pipeline, resulting in corrosion of the anodes rather than the pipeline. Ex TC-8, ¶ 27. FBE coating and cathodic protection mitigate external corrosion. Ex TC-8, ¶ 26.

70. A tariff specification of 0.5 percent solids and water by volume will be utilized to minimize the potential for internal corrosion. This specification is half the industry standard of one percent. In Condition 32, the Commission requires Keystone to implement and enforce its crude oil specifications in order to minimize the potential for internal corrosion. Further, the pipeline is designed to operate in turbulent flow to minimize water drop out, another potential cause of internal corrosion. During operations, the pipeline will be cleaned using in-line inspection tools, which measure internal and external corrosion. Keystone will repair areas of pipeline corrosion as required by federal regulation. Ex TC-8, ¶ 26. Staff expert Schramm concluded that the cathodic protection and corrosion control measures that Keystone committed to utilize would meet or exceed applicable federal standards. TR 407-427; Ex S-12.

71. To minimize the risk of mechanical damage to the pipeline, it will be buried with a minimum of four feet of cover, one foot deeper than the industry standard, reducing the likelihood of mechanical damage. The steel specified for the pipeline is high-strength steel with engineered puncture resistance of approximately 51 tons of force. Ex TC-8, ¶ 28.

72. Hydraulic damage is caused by over-pressurization of the pipeline. The risk of hydraulic damage will be minimized through the SCADA system's continuous, real-time pressure monitoring systems and through operator training. Ex TC-8, ¶ 29.

73. The Applicant has prepared a detailed CMR Plan that describes procedures for crossing cultivated lands, grasslands, including native grasslands, 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-construction monitoring and compliance related to the construction phase of the Project. Among these, Keystone will utilize construction techniques that will retain the original characteristics of the lands crossed as detailed in the CMR Plan. Keystone's thorough implementation of these procedures will minimize the impacts associated with the Project. A copy of the CMR Plan was filed as Exhibit B to Keystone's permit application and introduced into evidence as TC-1, Exhibit B.

74. The CMR Plan establishes procedures to address a multitude of construction-related issues, including but not limited to the following:

- Training
- Advance Notice of Access
- Depth of Cover
- Noise Control
- Weed Control
- Dust Control
- Fire Prevention and Control
- Spill Prevention and Containment
- Irrigation Systems
- Clearing
- Grading
- Topsoil Removal and Storage
- Temporary Erosion and Sediment Control
- Clean-Up
- Reclamation and Revegetation
- Compaction Relief

- Rock Removal
- Soil Additives
- Seeding
- Construction in Residential and Commercial/Industrial Areas
- Drain Tile Damage Mitigation and Repair

Ex TC-1, Exhibit B.

75. The fire prevention and containment measures outlined in the CMR Plan will provide significant protection against uncontrolled fire in the arid region to be crossed by the Project. The Commission finds, however, that these provisions are largely centered on active construction areas and that certain additional fire prevention and containment precautions are appropriate as well for vehicles performing functions not in proximity to locations where fire suppression equipment will be based, such as route survey vehicles and vehicles involved in surveillance and inspection activities whether before, during and after construction. The Commission accordingly adopts Conditions 16(p) and the last sentence of Condition 30 to address these situations.

76. Keystone's CMR Plan includes many mitigation steps designed to return the land to its original production. These include topsoil removal and replacement, compaction of the trench line, decompaction of the working area, and tilling the topsoil after replacement. Ex TC-1, Exhibit B; Ex TC-6, ¶ 27; Ex TC-1, 6.1.2.2, pp. 87-88.

77. In areas where geologic conditions such as ground swelling, or slope instability, could pose a potential threat, Keystone will conduct appropriate pre-construction site assessments and subsequently will design facilities to account for various ground motion hazards as required by federal regulations. The main hazard of concern during construction of the pipeline will be from unintentional undercutting of slopes or construction on steep slopes resulting in instability that could lead to landslides. Other hazards may result from construction on Cretaceous shales that contain bentonite beds. The high swelling hazard may cause slope instability during periods of precipitation. Ex TC-1, 5.3.6, p. 44.

78. When selecting the proposed pipeline route, Keystone has attempted to minimize the amount of steep slopes crossed by the pipeline. Special pipeline construction practices described in the CMR Plan will minimize slope stability concerns during construction. Landslide hazards can be mitigated by:

- Returning disturbed areas to pre-existing conditions or, where necessary, reducing steep grades during construction;
- Preserving or improving surface drainage;
- Preserving or improving subsurface drainage during construction;
- Removing overburden where necessary to reduce weight of overlying soil mass; and
- Adding fill at toe of slope to resist movement.

Ex TC-1, 5.3.6, pp. 43-44.

79. Slope instability poses a threat of ground movement responsible for approximately 1 percent of liquid pipeline incidents (PHMSA 2008). Keystone will monitor slope stability during routine surveillance. Areas where slope stability poses a potential threat to the pipeline will be incorporated into Keystone's Integrity Management Plan. If ground movement is suspected of having caused abnormal movement of the pipeline, federal regulations (49 CFR Part 195) require

Keystone to conduct an internal inspection. Consequently, damage to the pipeline would be detected quickly and spills would be averted or minimized. Ex TC-1, 5.3.6, p. 44

80. Keystone is in the process of preparing, in consultation with the area National Resource Conservation Service, construction/reclamation unit ("Con/Rec Unit") mapping to address differing construction and reclamation techniques for different soils conditions, slopes, vegetation, and land use along the pipeline route. This analysis and mapping results in the identification of segments called Con/Rec Units. Ex. TC-5; TC-16, DR 3-25.

81. The Applicant will use special construction methods and measures to minimize and mitigate impacts where warranted by site specific conditions. These special techniques will be used when constructing across paved roads, primary gravel roads, highways, railroads, water bodies, wetlands, sand hills areas, and steep terrain. These special techniques are described in the Application. Ex TC-1, 2.2.6, p. 17; TC-6, ¶ 11.

82. Of the perennial streams that are crossed by the proposed route, the Cheyenne River is the largest water body and is classified as a warm water permanent fishery. Of the other streams that have been classified, habitat is considered more limited as indicated by a warm water semi-permanent or warm water marginal classification. Ex TC-1, 5.6.2, pp. 71-72, Table 13.

83. Keystone will utilize HDD for the Little Missouri, Cheyenne and White River crossings, which will aid in minimizing impacts to important game and commercial fish species and special status species. Open-cut trenching, which can affect fisheries, will be used at other perennial streams. Keystone will use best practices to reduce or eliminate the impact of crossings at the perennial streams other than the Cheyenne and White Rivers. Ex TC-1, 5.4.1, p. 46; 5.6.2, p. 72; TC-16, DR 3-39.

84. Water used for hydrostatic testing during construction and subsequently released will not result in contamination of aquatic ecosystems since the pipe is cleaned prior to testing and the discharge water is monitored and tested. Ex TC-1, 5.4.3.1, pp. 48-50. In Conditions 1 and 2, the Commission has required that Keystone comply with DENR's regulations governing temporary use and discharge of water and obtain and comply with the DENR General Permits for these activities.

85. During construction, Keystone will have a number of inspectors on a construction spread, including environmental inspectors, who will monitor erosion control, small spills, full tanks, and any environmental issues that arise. TR. 37-38. In Condition 14, the Commission requires that Keystone incorporate such inspectors into the CMR Plan.

86. The Pipeline corridor will pass through areas where shallow and surficial aquifers exist. Appropriate measures will be implemented to prevent groundwater contamination and steps will be taken to manage the flow of any ground water encountered. Ex TC-1, 5.4.2, p. 47-48.

87. In addition to those recommendations of Staff and its expert witnesses referenced specifically in these Findings, Staff expert witnesses made a number of recommendations which the Commission has determined will provide additional protections for affected landowners, the environment and the public, and has included Conditions in this Order requiring certain of these measures. These recommendations encompassed matters such as sediment control at water body crossings, soil profile analysis, topsoil, subsoil and rock segregation and replacement, special procedures in areas of bentenitic, sodic, or saline soils, noise, etc. Staff's final recommendations are set forth in its Brief. See also Staff Exhibits and testimony in Transcript Vols. II and III.

88. Keystone will be required to acquire permits authorizing the crossing of county roads and township roads. These permits will typically require Keystone to restore roads to their pre-construction condition. If its construction equipment causes damage to county or township roads, Keystone will be responsible for the repair of those roads to pre-construction condition. Pursuant to SDCL 49-41B-38, Keystone will be required to post a bond to ensure that any damage beyond normal wear to public roads, highways, bridges or other related facilities will be adequately compensated. Staff witness Binder recommended that the bond amount under SDCL 49-41B-38 for damage to highways, roads, bridges and other related facilities be set at \$15,600,000 for 2011 and \$15,600,000 for 2012. TR 224. Keystone did not object to this requirement.

89. The Commission finds that the procedures in the CMR Plan and the other construction plans and procedures that Keystone has committed to implement, together with the Conditions regarding construction practices adopted by the Commission herein, will minimize impacts from construction of the Project to the environment and social and economic condition of inhabitants and expected inhabitants in the Project area.

Operation and Maintenance

90. The Keystone pipeline will be designed constructed, tested and operated in accordance with all applicable requirements, including the PHMSA regulations set forth at 49 CFR Parts 194 and 195, as modified by the Special Permit. These federal regulations are intended to ensure adequate protection for the public and the environment and to prevent crude oil pipeline accidents and failures. Ex TC-8, ¶ 2.

91. The safety features of Keystone's operations are governed by 49 CFR Part 195 and include aerial inspection 26 times per year, with any interval not to exceed three weeks, right-of-way maintenance for accessibility, and continual monitoring of the pipeline to identify potential integrity concerns. A Supervisory Control and Data Acquisition ("SCADA") system will be used to monitor the pipeline at all times. Ex TC-8, ¶ 9.

92. The Project will have a SCADA system to remotely monitor and control the pipeline. The SCADA system will include: (i) a redundant, fully functional back-up Operational Control Center available for service at all times; (ii) automatic features within the system to ensure operation within prescribed limits; and (iii) additional automatic features at the pump stations to provide pipeline pressure protection in the event that communications with the SCADA host are interrupted. Ex TC-10, ¶ 8.

93. The pipeline will have a control center manned 24 hours per day. A backup control center will also be constructed and maintained. A backup communications system is included within the system design and installation. Keystone's SCADA system should have a very high degree of reliability. TR 82-83.

94. Keystone will use a series of complimentary and overlapping SCADA-based leak detection systems and methods at the Operational Control Center, including: (i) remote monitoring; (ii) software-based volume balance systems that monitor injection and delivery volumes; (iii) Computational Pipeline Monitoring or model-based leak detection systems that break the pipeline into smaller segments and monitor each segment on a mass balance basis; and (iv) computer-based, non-real-time, accumulated gain/(loss) volume trending to assist in identifying low rate or seepage releases below the 1.5 percent by volume detection threshold. The SCADA and other monitoring and control systems to be implemented by Keystone for the Project are state of the art

and consistent with the best commercially available technology. Ex TC-10, ¶ 8. Staff witness, William Mampre, testified that Keystone's SCADA system was one he probably would have selected himself. TR 431.

95. Additionally, Keystone will implement and utilize direct observation methodologies, which include aerial patrols, ground patrols and public and landowner awareness programs designed to encourage and facilitate the reporting of suspected leaks and events that may suggest a threat to the integrity of the pipeline. Ex TC10, ¶ 8. Remote sensing technologies that could be employed in pipeline surveillance such as aerial surveillance are in their infancy and practical systems are not currently available. Keystone would consider using such technology if it becomes commercially available. TR 89-90.

96. Keystone will implement abnormal operating procedures when necessary and as required by 49 CFR 195.402(d). Abnormal operating procedures will be part of the written manual for normal operations, maintenance activities, and handling abnormal operating and emergencies. Ex TC-1, 2.3.2, p. 20.

97. As required by US DOT regulations, Keystone will prepare an emergency response plan ("ERP") for the system. Ex TC-11, ¶ 13. The ERP will be submitted to PHMSA for review prior to commencement of pipeline operations. Ex TC-11, ¶ 13. The Commission finds that the ERP and manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies as required under 49 CFR195.402 should also be submitted to the Commission at the time it is submitted to PHMSA to apprise the Commission of its details. Keystone has agreed to do this. The Commission has so specified in Condition 36.

98. Keystone will utilize the ERP approved by PHMSA for the Keystone Pipeline as the basis for its ERP for the Project. Under the ERP, Keystone will strategically locate emergency response equipment along the pipeline route. The equipment will include trailers, oil spill containment and recovery equipment, boats, and a communication office. Keystone will also have a number of local contractors available to provide emergency response assistance. Ex TC-11, ¶ 15. Keystone's goal is to respond to any spill within six hours. TR 102-103. Additional details concerning the ERP and the ERP process are set forth in the Application at Section 6.5.2 and in the pre-filed and hearing testimony of John Hayes. Ex TC-11; EX TC-1, 6.5.2, pp. 96-101. Keystone has consulted with DENR in developing its ERP. TR 111-12.

99. If the Keystone pipeline should experience a release, Keystone would implement its ERP. TC-11, ¶ 10; S-18, p. 4. DENR would be involved in the assessment and abatement of the release, and require the leak to be cleaned up and remediated. S-18, p. 5. DENR has been successful in enforcing remediation laws to ensure the effects of any pipeline releases are mitigated. TR 488-89, 497, 502-03.

100. Local emergency responders may be required to initially secure the scene and ensure the safety of the public, and Keystone will provide training in that regard. Ex TC-11, ¶ 17; TR 105-107.

101. If ground movement is suspected of having caused abnormal movement of the pipeline, federal regulations (49 CFR Part 195) require Keystone to conduct an internal inspection. Consequently, damage to the pipeline would be detected quickly and spills would be averted or minimized. Ex TC-1, 5.3.6, p. 44.

102. In addition to the ERP, hazardous materials pipeline segments through High Consequence Areas (“HCAs”) are subject to the Integrity Management Rule. 49 CFR 195.452. Pipeline operators are required to develop a written Integrity Management Plan (“IMP”) that must include methods to measure the program’s effectiveness in assessing and evaluating integrity and protecting HCAs. Keystone will develop and implement an IMP for the entire pipeline including the HCAs. The overall objective of the IMP is to establish and maintain acceptable levels of integrity and having regard to the environment, public and employee safety, regulatory requirements, delivery reliability, and life cycle cost. The IMP uses advanced in-line inspection and mitigation technologies applied with a comprehensive risk-based methodology. 49 CFR Part 195 also requires pipeline operators to develop and implement public awareness programs consistent with the API’s Recommended Practice 1162, Public Awareness Programs for Pipeline Operators. Staff witness Jenny Hudson testified that Keystone’s planning and preparation of the IMP were fully compliant with the PHMSA regulations and had no recommendations for conditions. Ex S-9, p.5.

103. The Commission finds that the threat of serious injury to the environment or inhabitants of the State of South Dakota from a crude oil release is substantially mitigated by the integrity management, leak detection and emergency response processes and procedures that Keystone is continuing to plan and will implement.

Rural Water Crossings

104. The route crosses through two rural water system districts, the West River/Lyman-Jones Rural Water District and the Tripp County Water User District. Keystone met with these rural water districts to discuss the Project and will continue to coordinate with these districts. During construction and maintenance, Keystone will coordinate with the One Call system to avoid impacts to underground utilities, including water lines. Ex TC-4.

Alternative Routes

105. The proposed Project route was developed through an, iterative process. TC-1, 4.1, p. 25. During the course of the route evaluation process, Keystone held public meetings, open houses, and one-on-one meetings with stakeholders to discuss and review the proposed routing through South Dakota. TC-1, 4.1.5, p. 27. The route was refined in Mellette County to avoid environmentally sensitive areas and reduce wetland crossings, and near Colome to avoid groundwater protection areas. Ex TC-3; TC-1, 4.2.1-4.2.2, p. 28.

106. SDCL 49-41B-36 explicitly states that Chapter 49-41B “shall not be construed as a delegation to the Public Utilities Commission of the authority to route a facility.” The Commission accordingly finds and concludes that it lacks authority to compel the Applicant to select an alternative route or to base its decision on whether to grant or deny a permit for a proposed facility on whether the selected route is the route the Commission itself might select.

Socio-Economic Factors

107. Socio-economic evidence offered by both Keystone and Staff demonstrates that the welfare of the citizens of South Dakota will not be impaired by the Project. Staff expert Dr. Michael Madden conducted a socio-economic analysis of the Keystone Pipeline, and concluded that the positive economic benefits of the project were unambiguous, while most if not all of the social impacts were positive or neutral. S-2, Madden Assessment at 21. The Project, subject to compliance with the Special Permit and the Conditions herein, would not, from a socioeconomic standpoint: (i) pose a threat of serious injury to the socioeconomic conditions in the project area; (ii)

substantially impair the health, safety, or welfare of the inhabitants in the project area; or (iii) unduly interfere with the orderly development of the region.

108. The Project will pay property taxes to local governments on an annual basis estimated to be in the millions of dollars. Ex TC-2, ¶ 24, TC-13, S-13; TR 584. An increase in assessed, taxable valuation for school districts is a positive development. TR 175.

109. The Project will bring jobs, both temporary and permanent, to the state of South Dakota and specifically to the areas of construction and operation. Ex TC-1 at 6.1.1, pp. 85-86.

110. The Project will have minimal effect in the areas of agriculture, commercial and industrial sectors, land values, housing, sewer and water, solid waste management, transportation, cultural and historical resources, health services, schools, recreation, public safety, noise, and visual impacts. Ex TC-1. It follows that the project will not substantially impair the health, safety, or welfare of the inhabitants.

General

111. Applicant has provided all information required by ARSD Chapter 20:10:22 and SDCL Chapter 49-41B. S-1.

112. The Commission finds that the Conditions attached hereto as Exhibit A and incorporated herein by reference are supported by the record, are reasonable and will help ensure that the Project will meet the standards established for approval of a construction permit for the Project set forth in SDCL 49-41B-22 and should be adopted.

113. The Commission finds that subject to the conditions of the Special Permit and the Conditions set forth as Exhibit A hereto, the Project will (i) comply with all applicable laws and rules; (ii) not pose an unacceptable threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area; (iii) not substantially impair the health, safety or welfare of the inhabitants; and (iv) not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

114. The Commission finds that a permit to construct the Project should be granted subject to the Conditions set forth in Exhibit A.

115. To the extent that any Conclusion of Law set forth below is more appropriately a finding of fact, that Conclusion of Law is incorporated by reference as a Finding of Fact.

Based on the foregoing Findings of Fact, the Commission hereby makes the following:

CONCLUSIONS OF LAW

1. The Commission has jurisdiction over the subject matter and parties to this proceeding pursuant to SDCL Chapter 49-41B and ARSD Chapter 20:10:22. Subject to the findings made on the four elements of proof under SDCL 49-41B-22, the Commission has authority to grant,

deny or grant upon reasonable terms, conditions or modifications, a permit for the construction, operation and maintenance of the TransCanada Keystone Pipeline.

2. The TransCanada Keystone Pipeline Project is a transmission facility as defined in SDCL 49-41B-2.1(3).

3. Applicant's permit application, as amended and supplemented through the proceedings in this matter, complies with the applicable requirements of SDCL Chapter 49-41B and ARSD Chapter 20:10:22.

4. The Project, if constructed and operated in accordance with the terms and conditions of this decision, will comply with all applicable laws and rules, including all requirements of SDCL Chapter 49-41B and ARSD 20:10:22.

5. The Project, if constructed and operated in accordance with the terms and conditions of this decision, will not pose an unacceptable threat of serious injury to the environment nor to the social and economic conditions of inhabitants or expected inhabitants in the siting area.

6. The Project, if constructed and operated in accordance with the terms and conditions of this decision, will not substantially impair the health, safety or welfare of the inhabitants in the siting area.

7. The Project, if constructed and operated in accordance with the terms and conditions of this decision, will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

8. The standard of proof is by the preponderance of evidence. The Applicant has met its burden of proof pursuant to SDCL 49-41B-22 and is entitled to a permit as provided in SDCL 49-41B-25.

9. The Commission has authority to revoke or suspend any permit granted under the South Dakota Energy Facility Permit Act for failure to comply with the terms and conditions of the permit pursuant to SDCL 49-41B-33 and must approve any transfer of the permit granted by this Order pursuant to SDCL 49-41B-29.

10. To the extent that any of the Findings of Fact in this decision are determined to be conclusions of law or mixed findings of fact and conclusions of law, the same are incorporated herein by this reference as a Conclusion of Law as if set forth in full herein.

11. Because a federal EIS will be required and completed for the Project and because the federal EIS complies with the requirements of SDCL Chapter 34A-9, the Commission appropriately exercised its discretion under SDCL 49-41B-21 in determining not to prepare or require the preparation of a second EIS.

12. PHMSA is delegated exclusive authority over the establishment and enforcement of safety-orientated design and operational standards for hazardous materials pipelines. 49 U.S.C. 60101, et seq.

13. SDCL 49-41B-36 explicitly states that SDCL Chapter 49-41B "shall not be construed as a delegation to the Public Utilities Commission of the authority to route a facility." The

Commission accordingly concludes that it lacks authority (i) to compel the Applicant to select an alternative route or (ii) to base its decision on whether to grant or deny a permit for a proposed facility on whether the selected route is the route the Commission might itself select.

14. The Commission concludes that it needs no other information to assess the impact of the proposed facility or to determine if Applicant or any Intervenor has met its burden of proof.

15. The Commission concludes that the Application and all required filings have been filed with the Commission in conformity with South Dakota law and that all procedural requirements under South Dakota law, including public hearing requirements, have been met or exceeded.

16. The Commission concludes that it possesses the authority under SDCL 49-41B-25 to impose conditions on the construction, operation and maintenance of the Project, that the Conditions set forth in Exhibit A are supported by the record, are reasonable and will help ensure that the Project will meet the standards established for approval of a construction permit for the Project set forth in SDCL 49-41B-22 and that the Conditions are hereby adopted.

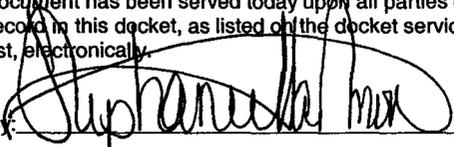
It is therefore

ORDERED, that a permit to construct the Keystone Pipeline Project is granted to TransCanada Keystone Pipeline, LP, subject to the Conditions set forth in Exhibit A.

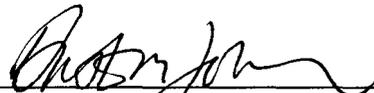
NOTICE OF ENTRY AND OF RIGHT TO APPEAL

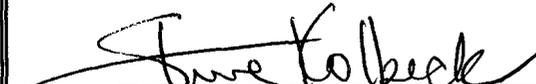
PLEASE TAKE NOTICE that this Amended Final Decision and Order was duly issued and entered on the ____ day of June, 2010. Pursuant to SDCL 1-26-32, this Final Decision and Order will take effect 10 days after the date of receipt or failure to accept delivery of the decision by the parties. Pursuant to ARSD 20:10:01:30.01, an application for a rehearing or reconsideration may be made by filing a written petition with the Commission within 30 days from the date of issuance of this Final Decision and Order; Notice of Entry. Pursuant to SDCL 1-26-31, the parties have the right to appeal this Final Decision and Order to the appropriate Circuit Court by serving notice of appeal of this decision to the circuit court within thirty (30) days after the date of service of this Notice of Decision.

Dated at Pierre, South Dakota, this 29th of June, 2010.

CERTIFICATE OF SERVICE	
The undersigned hereby certifies that this document has been served today upon all parties of record in this docket, as listed on the docket service list, electronically.	
By:	
Date:	06/29/10
(OFFICIAL SEAL)	

BY ORDER OF THE COMMISSION:


DUSTIN M. JOHNSON, Chairman


STEVE KOLBECK, Commissioner


GARY HANSON, Commissioner

Exhibit A

AMENDED PERMIT CONDITIONS

I. Compliance with Laws, Regulations, Permits, Standards and Commitments

1. Keystone shall comply with all applicable laws and regulations in its construction and operation of the Project. These laws and regulations include, but are not necessarily limited to: the federal Hazardous Liquid Pipeline Safety Act of 1979 and Pipeline Safety Improvement Act of 2002, as amended by the Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006, and the various other pipeline safety statutes currently codified at 49 U.S.C. § 60101 et seq. (collectively, the "PSA"); the regulations of the United States Department of Transportation implementing the PSA, particularly 49 C.F.R Parts 194 and 195; temporary permits for use of public water for construction, testing or drilling purposes, SDCL 46-5-40.1 and ARSD 74:02:01:32 through 74:02:01:34.02 and temporary discharges to waters of the state, SDCL 34A-2-36 and ARSD Chapters 74:52:01 through 74:52:11, specifically, ARSD § 74:52:02:46 and the General Permit issued thereunder covering temporary discharges of water from construction dewatering and hydrostatic testing.

2. Keystone shall obtain and shall thereafter comply with all applicable federal, state and local permits, including but not limited to: Presidential Permit from the United States Department of State, Executive Order 11423 of August 16, 1968 (33 Fed. Reg. 11741) and Executive Order 13337 of April 30, 2004 (69 Fed. Reg. 25229), for the construction, connection, operation, or maintenance, at the border of the United States, of facilities for the exportation or importation of petroleum, petroleum products, coal, or other fuels to or from a foreign country; Clean Water Act § 404 and Rivers and Harbors Act Section 10 Permits; Special Permit if issued by the Pipeline and Hazardous Materials Safety Administration; Temporary Water Use Permit, General Permit for Temporary Discharges and federal, state and local highway and road encroachment permits. Any of such permits not previously filed with the Commission shall be filed with the Commission upon their issuance. To the extent that any condition, requirement or standard of the Presidential Permit, including the Final EIS Recommendations, or any other law, regulation or permit applicable to the portion of the pipeline in this state differs from the requirements of these Conditions, the more stringent shall apply.

3. Keystone shall comply with and implement the Recommendations set forth in the Final Environmental Impact Statement when issued by the United States Department of State pursuant to its Amended Department of State Notice of Intent To Prepare an Environmental Impact Statement and To Conduct Scoping Meetings and Notice of Floodplain and Wetland Involvement and To Initiate Consultation Under Section 106 of the National Historic Preservation Act for the Proposed Transcanada Keystone XL Pipeline; Notice of Intent--Rescheduled Public Scoping Meetings in South Dakota and extension of comment period (FR vol. 74, no. 54, Mar. 23, 2009). The Amended Notice and other Department of State and Project Documents are available on-line at: <http://www.keystonepipeline-xl.state.gov/clientsite/keystonexl.nsf?Open>.

4. The permit granted by this Order shall not be transferable without the approval of the Commission pursuant to SDCL 49-41B-29.

5. Keystone shall undertake and complete all of the actions that it and its affiliated entities committed to undertake and complete in its Application as amended, in its testimony and

exhibits received in evidence at the hearing, and in its responses to data requests received in evidence at the hearing.

II. Reporting and Relationships

6. The most recent and accurate depiction of the Project route and facility locations is found on the maps in Exhibit TC-14. The Application indicates in Section 4.2.3 that Keystone will continue to develop route adjustments throughout the pre-construction design phase. These route adjustments will accommodate environmental features identified during surveys, property-specific issues, and civil survey information. The Application states that Keystone will file new aerial route maps that incorporate any such route adjustments prior to construction. Ex TC-1.4.2.3, p. 27. Keystone shall notify the Commission and all affected landowners, utilities and local governmental units as soon as practicable if material deviations are proposed to the route. Keystone shall notify affected landowners of any change in the route on their land. At such time as Keystone has finalized the pre-construction route, Keystone shall file maps with the Commission depicting the final pre-construction route. If material deviations are proposed from the route depicted on Exhibit TC-14 and accordingly approved by this Order, Keystone shall advise the Commission and all affected landowners, utilities and local governmental units prior to implementing such changes and afford the Commission the opportunity to review and approve such modifications. At the conclusion of construction, Keystone shall file detail maps with the Commission depicting the final as-built location of the Project facilities.

7. Keystone shall provide a public liaison officer, approved by the Commission, to facilitate the exchange of information between Keystone, including its contractors, and landowners, local communities and residents and to promptly resolve complaints and problems that may develop for landowners, local communities and residents as a result of the Project. Keystone shall file with the Commission its proposed public liaison officer's credentials for approval by the Commission prior to the commencement of construction. After the public liaison officer has been approved by the Commission, the public liaison officer may not be removed by Keystone without the approval of the Commission. The public liaison officer shall be afforded immediate access to Keystone's on-site project manager, its executive project manager and to contractors' on-site managers and shall be available at all times to the Staff via mobile phone to respond to complaints and concerns communicated to the Staff by concerned landowners and others. Keystone shall also implement and keep an up-dated web site covering the planning and implementation of construction and commencement of operations in this state as an informational medium for the public. As soon as the Keystone's public liaison officer has been appointed and approved, Keystone shall provide contact information for him/her to all landowners crossed by the Project and to law enforcement agencies and local governments in the vicinity of the Project. The public liaison officer's contact information shall be provided to landowners in each subsequent written communication with them. If the Commission determines that the public liaison officer has not been adequately performing the duties set forth for the position in this Order, the Commission may, upon notice to Keystone and the public liaison officer, take action to remove the public liaison officer.

8. Until construction of the Project, including reclamation, is completed, Keystone shall submit quarterly progress reports to the Commission that summarize the status of land acquisition and route finalization, the status of construction, the status of environmental control activities, including permitting status and Emergency Response Plan and Integrity Management Plan development, the implementation of the other measures required by these conditions, and the overall percent of physical completion of the project and design changes of a substantive nature. Each report shall include a summary of consultations with the South Dakota Department of Environment and Natural Resources and other agencies concerning the issuance of permits. The

reports shall list dates, names, and the results of each contact and the company's progress in implementing prescribed construction, land restoration, environmental protection, emergency response and integrity management regulations, plans and standards. The first report shall be due for the period ending June 30, 2010. The reports shall be filed within 31 days after the end of each quarterly period and shall continue until the project is fully operational.

9. Until one year following completion of construction of the Project, including reclamation, Keystone's public liaison officer shall report quarterly to the Commission on the status of the Project from his/her independent vantage point. The report shall detail problems encountered and complaints received. For the period of three years following completion of construction, Keystone's public liaison officer shall report to the Commission annually regarding post-construction landowner and other complaints, the status of road repair and reconstruction and land and crop restoration and any problems or issues occurring during the course of the year.

10. Not later than six months prior to commencement of construction, Keystone shall commence a program of contacts with state, county and municipal emergency response, law enforcement and highway, road and other infrastructure management agencies serving the Project area in order to educate such agencies concerning the planned construction schedule and the measures that such agencies should begin taking to prepare for construction impacts and the commencement of project operations.

11. Keystone shall conduct a preconstruction conference prior to the commencement of construction to ensure that Keystone fully understands the conditions set forth in this order. At a minimum, the conference shall include a Keystone representative, Keystone's construction supervisor and Staff.

12. Once known, Keystone shall inform the Commission of the date construction will commence, report to the Commission on the date construction is started and keep the Commission updated on construction activities as provided in Condition 8.

III. Construction

13. Except as otherwise provided in the conditions of this Order and Permit, Keystone shall comply with all mitigation measures set forth in the Construction Mitigation and Reclamation Plan (CMR Plan) as set forth in Exhibit TC-1, Exhibit B. If modifications to the CMR Plan are made by Keystone as it refines its construction plans or are required by the Department of State in its Final EIS Record of Decision or the Presidential Permit, the CMR Plan as so modified shall be filed with the Commission and shall be complied with by Keystone.

14. Keystone shall incorporate environmental inspectors into its CMR Plan and obtain follow-up information reports from such inspections upon the completion of each construction spread to help ensure compliance with this Order and Permit and all other applicable permits, laws, and rules.

15. Prior to construction, Keystone shall, in consultation with area NRCS staff, develop specific construction/reclamation units (Con/Rec Units) that are applicable to particular soil and subsoil classifications, land uses and environmental settings. The Con/Rec Units shall contain information of the sort described in response to Staff Data Request 3-25 found in Exhibit TC-16.

a) In the development of the Con/Rec Units in areas where NRCS recommends, Keystone shall conduct analytical soil probing and/or soil boring and analysis in areas of

particularly sensitive soils where reclamation potential is low. Records regarding this process shall be available to the Commission and to the specific land owner affected by such soils upon request.

b) Through development of the Con/Rec Units and consultation with NRCS, Keystone shall identify soils for which alternative handling methods are recommended. Alternative soil handling methods shall include but are not limited to the "triple-lift" method where conditions justify such treatment. Keystone shall thoroughly inform the landowner regarding the options applicable to their property, including their respective benefits and negatives, and implement whatever reasonable option for soil handling is selected by the landowner. Records regarding this process shall be available to the Commission upon request.

c) Keystone shall, in consultation with NCRS, ensure that its construction planning and execution process, including Con/Rec Units, CMR Plan and its other construction documents and planning shall adequately identify and plan for areas susceptible to erosion, areas where sand dunes are present, areas with high concentrations of sodium bentonite, areas with sodic, saline and sodic-saline soils and any other areas with low reclamation potential.

d) The Con/Rec Units shall be available upon request to the Commission and affected landowners. Con/Rec Units may be evaluated by the Commission upon complaint or otherwise, regarding whether proper soil handling, damage mitigation or reclamation procedures are being followed.

e) Areas of specific concern or of low reclamation potential shall be recorded in a separate database. Action taken at such locations and the results thereof shall also be recorded and made available to the Commission and the affected property owner upon request.

16. Keystone shall provide each landowner with an explanation regarding trenching and topsoil and subsoil/rock removal, segregation and restoration method options for his/her property consistent with the applicable Con/Rec Unit and shall follow the landowner's selected preference as documented on its written construction agreement with the landowner, as modified by any subsequent amendments, or by other written agreement(s).

a) Keystone shall separate and segregate topsoil from subsoil in agricultural areas, including grasslands and shelter belts, as provided in the CMR Plan and the applicable Con/Rec Unit.

b) Keystone shall repair any damage to property that results from construction activities.

c) Keystone shall restore all areas disturbed by construction to their preconstruction condition, including their original preconstruction topsoil, vegetation, elevation, and contour, or as close thereto as is feasible, except as is otherwise agreed to by the landowner.

d) Except where practicably infeasible, final grading and topsoil replacement and installation of permanent erosion control structures shall be completed in non-residential areas within 20 days after backfilling the trench. In the event that seasonal or other weather conditions, extenuating circumstances, or unforeseen developments beyond Keystone's control prevent compliance with this time frame, temporary erosion controls shall be maintained until conditions allow completion of cleanup and reclamation. In the event

Keystone can not comply with the 20-day time frame as provided in this Condition, it shall give notice of such fact to all affected landowners, and such notice shall include an estimate of when such restoration is expected to be completed.

e) Keystone shall draft specific crop monitoring protocols for agricultural lands. If requested by the landowner, Keystone shall provide an independent crop monitor to conduct yield testing and/or such other measurements of productivity as he shall deem appropriate. The independent monitor shall be a qualified agronomist, rangeland specialist or otherwise qualified with respect to the species to be restored. The protocols shall be available to the Commission upon request and may be evaluated for adequacy in response to a complaint or otherwise.

f) Keystone shall work closely with landowners or land management agencies to determine a plan to control noxious weeds. Landowner permission shall be obtained before the application of herbicides.

g) Keystone's adverse weather plan shall apply to improved hay land and pasture lands in addition to crop lands.

h) The size, density and distribution of rock within the construction right-of-way following reclamation shall be similar to adjacent undisturbed areas. Keystone shall treat rock that cannot be backfilled within or below the level of the natural rock profile as construction debris and remove it for disposal offsite except when the landowner agrees to the placement of the rock on his property. In such case, the rock shall be placed in accordance with the landowner's directions.

i) Keystone shall utilize the proposed trench line for its pipe stringing trucks where conditions allow and shall employ adequate measures to decompact subsoil as provided in its CMR Plan. Topsoil shall be decompacted if requested by the landowner.

j) Keystone shall monitor and take appropriate mitigative actions as necessary to address salinity issues when dewatering the trench, and field conductivity and/or other appropriate constituent analyses shall be performed prior to disposal of trench water in areas where salinity may be expected. Keystone shall notify landowners prior to any discharge of saline water on their lands or of any spills of hazardous materials on their lands of one pint or more or of any lesser volume which is required by any federal, state, or local law or regulation or product license or label to be reported to a state or federal agency, manufacturer, or manufacturer's representative.

k) Keystone shall install trench and slope breakers where necessary in accordance with the CMR Plan as augmented by Staff's recommendations in Post Hearing Commission Staff Brief, pp. 26-27.

l) Keystone shall apply mulch when reasonably requested by landowners and also wherever necessary following seeding to stabilize the soil surface and to reduce wind and water erosion. Keystone shall follow the other recommendations regarding mulch application in Post Hearing Commission Staff Brief, p. 27.

m) Keystone shall reseed all lands with comparable crops to be approved by landowner in landowner's reasonable discretion, or in pasture, hay or native species areas with comparable grass or forage crop seed or native species mix to be approved by landowner in

landowner's reasonable discretion. Keystone shall actively monitor revegetation on all disturbed areas for at least two years.

n) Keystone shall coordinate with landowners regarding his/her desires to properly protect cattle, shall implement such protective measures as are reasonably requested by the landowner and shall adequately compensate the landowner for any loss.

o) Prior to commencing construction, Keystone shall file with the Commission a confidential list of property owners crossed by the pipeline and update this list if route changes during construction result in property owner changes.

p) Except in areas where fire suppression resources as provided in CMR Plan 2.16 are in close proximity, to minimize fire risk, Keystone shall, and shall cause its contractor to, equip each of its vehicles used in pre-construction or construction activities, including off-road vehicles, with a hand held fire extinguisher, portable compact shovel and communication device such as a cell phone, in areas with coverage, or a radio capable of achieving prompt communication with Keystone's fire suppression resources and emergency services.

17. Keystone shall cover open-bodied dump trucks carrying sand or soil while on paved roads and cover open-bodied dump trucks carrying gravel or other materials having the potential to be expelled onto other vehicles or persons while on all public roads.

18. Keystone shall use its best efforts to not locate fuel storage facilities within 200 feet of private wells and 400 feet of municipal wells and shall minimize and exercise vigilance in refueling activities in areas within 200 feet of private wells and 400 feet of municipal wells.

19. If trees are to be removed that have commercial or other value to affected landowners, Keystone shall compensate the landowner for the fair market value of the trees to be cleared and/or allow the landowner the right to retain ownership of the felled trees. Except as the landowner shall otherwise agree in writing, the width of the clear cuts through any windbreaks and shelterbelts shall be limited to 50 feet or less, and the width of clear cuts through extended lengths of wooded areas shall be limited to 85 feet or less. The environmental inspection in Condition 14 shall include forested lands.

20. Keystone shall implement the following sediment control practices:

a) Keystone shall use floating sediment curtains to maintain sediments within the construction right of way in open water bodies with no or low flow when the depth of non-flowing water exceeds the height of straw bales or silt fence installation. In such situations the floating sediment curtains shall be installed as a substitute for straw bales or silt fence along the edge or edges of each side of the construction right-of-way that is under water at a depth greater than the top of a straw bale or silt fence as portrayed in Keystone's construction Detail #11 included in the CMR Plan.

b) Keystone shall install sediment barriers in the vicinity of delineated wetlands and water bodies as outlined in the CMR Plan regardless of the presence of flowing or standing water at the time of construction.

c) The Applicant should consult with South Dakota Game, Fish and Parks (SDGFP) to avoid construction near water bodies during fish spawning periods in which in-stream

construction activities should be avoided to limit impacts on specific fisheries, if any, with commercial or recreational importance.

21. Keystone shall develop frac-out plans specific to areas in South Dakota where horizontal directional drilling will occur. The plan shall be followed in the event of a frac-out. If a frac-out event occurs, Keystone shall promptly file a report of the incident with the Commission. Keystone shall also, after execution of the plan, provide a follow-up report to the Commission regarding the results of the occurrence and any lingering concerns.

22. Keystone shall comply with the following conditions regarding construction across or near wetlands, water bodies and riparian areas:

a) Unless a wetland is actively cultivated or rotated cropland or unless site specific conditions require utilization of Keystone's proposed 85 foot width and the landowner has agreed to such greater width, the width of the construction right-of-way shall be limited to 75 feet in non-cultivated wetlands unless a different width is approved or required by the United States Army Corps of Engineers.

b) Unless a wetland is actively cultivated or rotated cropland, extra work areas shall be located at least 50 feet away from wetland boundaries except where site-specific conditions render a 50-foot setback infeasible. Extra work areas near water bodies shall be located at least 50 feet from the water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land or where site-specific conditions render a 50-foot setback infeasible. Clearing of vegetation between extra work space areas and the water's edge shall be limited to the construction right-of-way.

c) Water body crossing spoil, including upland spoil from crossings of streams up to 30 feet in width, shall be stored in the construction right of way at least 10 feet from the water's edge or in additional extra work areas and only on a temporary basis.

d) Temporary in-stream spoil storage in streams greater than 30 feet in width shall only be conducted in conformity with any required federal permit(s) and any applicable federal or state statutes, rules and standards.

e) Wetland and water body boundaries and buffers shall be marked and maintained until ground disturbing activities are complete. Keystone shall maintain 15-foot buffers where practicable, which for stream crossings shall be maintained except during the period of trenching, pipe laying and backfilling the crossing point. Buffers shall not be required in the case of non-flowing streams.

f) Best management practices shall be implemented to prevent heavily silt-laden trench water from reaching any wetland or water body directly or indirectly.

g) Erosion control fabric shall be used on water body banks immediately following final stream bank restoration unless riprap or other bank stabilization methods are utilized in accordance with federal or state permits.

h) The use of timber and slash to support equipment crossings of wetlands shall be avoided.

i) Subject to Conditions 37 and 38, vegetation restoration and maintenance adjacent to water bodies shall be conducted in such manner to allow a riparian strip at least 25 feet wide as measured from the water body's mean high water mark to permanently re-vegetate with native plant species across the entire construction right-of way.

23. Keystone shall comply with the following conditions regarding road protection and bonding:

a) Keystone shall coordinate road closures with state and local governments and emergency responders and shall acquire all necessary permits authorizing crossing and construction use of county and township roads.

b) Keystone shall implement a regular program of road maintenance and repair through the active construction period to keep paved and gravel roads in an acceptable condition for residents and the general public.

c) Prior to their use for construction, Keystone shall videotape those portions of all roads which will be utilized by construction equipment or transport vehicles in order to document the pre-construction condition of such roads.

d) After construction, Keystone shall repair and restore, or compensate governmental entities for the repair and restoration of, any deterioration caused by construction traffic, such that the roads are returned to at least their preconstruction condition.

e) Keystone shall use appropriate preventative measures as needed to prevent damage to paved roads and to remove excess soil or mud from such roadways.

f) Pursuant to SDCL 49-41B-38, Keystone shall obtain and file for approval by the Commission prior to construction in such year a bond in the amount of \$15.6 million for the year in which construction is to commence and a second bond in the amount of \$15.6 million for the ensuing year, including any additional period until construction and repair has been completed, to ensure that any damage beyond normal wear to public roads, highways, bridges or other related facilities will be adequately restored or compensated. Such bonds shall be issued in favor of, and for the benefit of, all such townships, counties, and other governmental entities whose property is crossed by the Project. Each bond shall remain in effect until released by the Commission, which release shall not be unreasonably denied following completion of the construction and repair period. Either at the contact meetings required by Condition 10 or by mail, Keystone shall give notice of the existence and amount of these bonds to all counties, townships and other governmental entities whose property is crossed by the Project.

24. Although no residential property is expected to be encountered in connection with the Project, in the event that such properties are affected and due to the nature of residential property, Keystone shall implement the following protections in addition to those set forth in its CMR Plan in areas where the Project passes within 500 feet of a residence:

a) To the extent feasible, Keystone shall coordinate construction work schedules with affected residential landowners prior to the start of construction in the area of the residences.

- b) Keystone shall maintain access to all residences at all times, except for periods when it is infeasible to do so or except as otherwise agreed between Keystone and the occupant. Such periods shall be restricted to the minimum duration possible and shall be coordinated with affected residential landowners and occupants, to the extent possible.
- c) Keystone shall install temporary safety fencing, when reasonably requested by the landowner or occupant, to control access and minimize hazards associated with an open trench and heavy equipment in a residential area.
- d) Keystone shall notify affected residents in advance of any scheduled disruption of utilities and limit the duration of such disruption.
- e) Keystone shall repair any damage to property that results from construction activities.
- f) Keystone shall separate topsoil from subsoil and restore all areas disturbed by construction to at least their preconstruction condition.
- g) Except where practicably infeasible, final grading and topsoil replacement, installation of permanent erosion control structures and repair of fencing and other structures shall be completed in residential areas within 10 days after backfilling the trench. In the event that seasonal or other weather conditions, extenuating circumstances, or unforeseen developments beyond Keystone's control prevent compliance with this time frame, temporary erosion controls and appropriate mitigative measures shall be maintained until conditions allow completion of cleanup and reclamation.

25. Construction must be suspended when weather conditions are such that construction activities will cause irreparable damage, unless adequate protection measures approved by the Commission are taken. At least two months prior to the start of construction in South Dakota, Keystone shall file with the Commission an adverse weather land protection plan containing appropriate adverse weather land protection measures, the conditions in which such measures may be appropriately used, and conditions in which no construction is appropriate, for approval or modification by the Commission prior to the start of construction. The Commission shall make such plan available to impacted landowners who may provide comment on such plan to the Commission.

26. Reclamation and clean-up along the right-of-way must be continuous and coordinated with ongoing construction.

27. All pre-existing roads and lanes used during construction must be restored to at least their pre-construction condition that will accommodate their previous use, and areas used as temporary roads during construction must be restored to their original condition, except as otherwise requested or agreed to by the landowner or any governmental authority having jurisdiction over such roadway.

28. Keystone shall, prior to any construction, file with the Commission a list identifying private and new access roads that will be used or required during construction and file a description of methods used by Keystone to reclaim those access roads.

29. Prior to construction, Keystone shall have in place a winterization plan and shall implement the plan if winter conditions prevent reclamation completion until spring. The plan shall be provided to affected landowners and, upon request, to the Commission.

30. Numerous Conditions of this Order, including but not limited to 16, 19, 24, 25, 26, 27 and 51 relate to construction and its effects upon affected landowners and their property. The Applicant may encounter physical conditions along the route during construction which make compliance with certain of these Conditions infeasible. If, after providing a copy of this order, including the Conditions, to the landowner, the Applicant and landowner agree in writing to modifications of one or more requirements specified in these conditions, such as maximum clearances or right-of-way widths, Keystone may follow the alternative procedures and specifications agreed to between it and the landowner.

IV. Pipeline Operations, Detection and Emergency Response

31. Keystone shall construct and operate the pipeline in the manner described in the application and at the hearing, including in Keystone's exhibits, and in accordance with the conditions of this permit, the PHMSA Special Permit, if issued, and the conditions of this Order and the construction permit granted herein.

32. Keystone shall require compliance by its shippers with its crude oil specifications in order to minimize the potential for internal corrosion.

33. Keystone's obligation for reclamation and maintenance of the right-of-way shall continue throughout the life of the pipeline. In its surveillance and maintenance activities, Keystone shall, and shall cause its contractor to, equip each of its vehicles, including off-road vehicles, with a hand held fire extinguisher, portable compact shovel and communication device such as a cell phone, in areas with coverage, or a radio capable of achieving prompt communication with emergency services.

34. In accordance with 49 C.F.R. 195, Keystone shall continue to evaluate and perform assessment activities regarding high consequence areas. Prior to Keystone commencing operation, all unusually sensitive areas as defined by 49 CFR 195.6 that may exist, whether currently marked on DOT's HCA maps or not, should be identified and added to the Emergency Response Plan and Integrity Management Plan. In its continuing assessment and evaluation of environmentally sensitive and high consequence areas, Keystone shall seek out and consider local knowledge, including the knowledge of the South Dakota Geological Survey, the Department of Game Fish and Parks and local landowners and governmental officials.

35. The evidence in the record demonstrates that in some reaches of the Project in southern Tripp County, the High Plains Aquifer is present at or very near ground surface and is overlain by highly permeable sands permitting the uninhibited infiltration of contaminants. This aquifer serves as the water source for several domestic farm wells near the pipeline as well as public water supply system wells located at some distance and upgradient from the pipeline route. Keystone shall identify the High Plains Aquifer area in southern Tripp County as a hydrologically sensitive area in its Integrity Management and Emergency Response Plans. Keystone shall similarly treat any other similarly vulnerable and beneficially useful surficial aquifers of which it becomes aware during construction and continuing route evaluation.

36. Prior to putting the Keystone Pipeline into operation, Keystone shall prepare, file with PHMSA and implement an emergency response plan as required under 49 CFR 194 and a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies as required under 49 CFR 195.402. Keystone shall also prepare and implement a written integrity management program in the manner and at such time as required under 49 CFR 195.452. At such time as Keystone files its Emergency Response Plan and

Integrity Management Plan with PHMSA or any other state or federal agency, it shall also file such documents with the Commission. The Commission's confidential filing rules found at ARSD 20:10:01:41 may be invoked by Keystone with respect to such filings to the same extent as with all other filings at the Commission. If information is filed as "confidential," any person desiring access to such materials or the Staff or the Commission may invoke the procedures of ARSD 20:10:01:41 through 20:10:01:43 to determine whether such information is entitled to confidential treatment and what protective provisions are appropriate for limited release of information found to be entitled to confidential treatment.

37. To facilitate periodic pipeline leak surveys during operation of the facilities in wetland areas, a corridor centered on the pipeline and up to 15 feet wide shall be maintained in an herbaceous state. Trees within 15 feet of the pipeline greater than 15 feet in height may be selectively cut and removed from the permanent right-of-way.

38. To facilitate periodic pipeline leak surveys in riparian areas, a corridor centered on the pipeline and up to 10 feet wide shall be maintained in an herbaceous state.

V. Environmental

39. Except to the extent waived by the owner or lessee in writing or to the extent the noise levels already exceed such standard, the noise levels associated with Keystone's pump stations and other noise-producing facilities will not exceed the L10=55dbA standard at the nearest occupied, existing residence, office, hotel/motel or non-industrial business not owned by Keystone. The point of measurement will be within 100 feet of the residence or business in the direction of the pump station or facility. Post-construction operational noise assessments will be completed by an independent third-party noise consultant, approved by the Commission, to show compliance with the noise level at each pump station or other noise-producing facility. The noise assessments will be performed in accordance with applicable American National Standards Institute standards. The results of the assessments will be filed with the Commission. In the event that the noise level exceeds the limit set forth in this condition at any pump station or other noise producing facility, Keystone shall promptly implement noise mitigation measures to bring the facility into compliance with the limits set forth in this condition and shall report to the Commission concerning the measures taken and the results of post-mitigation assessments demonstrating that the noise limits have been met.

40. At the request of any landowner or public water supply system that offers to provide the necessary access to Keystone over his/her property or easement(s) to perform the necessary work, Keystone shall replace at no cost to such landowner or public water supply system, any polyethylene water piping located within 500 feet of the Project with piping that is resistant to permeation by BTEX. Keystone shall not be required to replace that portion of any piping that passes through or under a basement wall or other wall of a home or other structure. At least forty-five (45) days prior to commencing construction, Keystone shall publish a notice in each newspaper of general circulation in each county through which the Project will be constructed advising landowners and public water supply systems of this condition.

41. Keystone shall follow all protection and mitigation efforts as identified by the US Fish and Wildlife Service ("USFWS") and SDGFP. Keystone shall identify all greater prairie chicken and greater sage and sharp-tailed grouse leks within the buffer distances from the construction right of way set forth for the species in the FEIS and Biological Assessment (BA) prepared by DOS and USFWS. In accordance with commitments in the FEIS and BA, Keystone shall avoid or restrict

construction activities as specified by USFWS within such buffer zones between March 1 and June 15 and for other species as specified by USFWS and SDGFP.

42. Keystone shall keep a record of drain tile system information throughout planning and construction, including pre-construction location of drain tiles. Location information shall be collected using a sub-meter accuracy global positioning system where available or, where not available by accurately documenting the pipeline station numbers of each exposed drain tile. Keystone shall maintain the drain tile location information and tile specifications and incorporate it into its Emergency Response and Integrity Management Plans where drains might be expected to serve as contaminant conduits in the event of a release. If drain tile relocation is necessary, the applicant shall work directly with landowner to determine proper location. The location of permanent drain tiles shall be noted on as-built maps. Qualified drain tile contractors shall be employed to repair drain tiles.

VI. Cultural and Paleontological Resources

43. In accordance with Application, Section 6.4, Keystone shall follow the "Unanticipated Discoveries Plan," as reviewed by the State Historical Preservation Office ("SHPO") and approved by the DOS and provide it to the Commission upon request. Ex TC-1.6.4, pp. 94-96; Ex S-3. If during construction, Keystone or its agents discover what may be an archaeological resource, cultural resource, historical resource or gravesite, Keystone or its contractors or agents shall immediately cease work at that portion of the site and notify the DOS, the affected landowner(s) and the SHPO. If the DOS and SHPO determine that a significant resource is present, Keystone shall develop a plan that is approved by the DOS and commenting/signatory parties to the Programmatic Agreement to salvage avoid or protect the archaeological resource. If such a plan will require a materially different route than that approved by the Commission, Keystone shall obtain Commission and landowner approval for the new route before proceeding with any further construction. Keystone shall be responsible for any costs that the landowner is legally obligated to incur as a consequence of the disturbance of a protected cultural resource as a result of Keystone's construction or maintenance activities.

44. Keystone shall implement and comply with the following procedures regarding paleontological resources:

a) Prior to commencing construction, Keystone shall conduct a literature review and records search, and consult with the BLM and Museum of Geology at the S.D. School of Mines and Technology ("SDSMT") to identify known fossil sites along the pipeline route and identify locations of surface exposures of paleontologically sensitive rock formations using the BLM's Potential Fossil Yield Classification system. Any area where trenching will occur into the Hell Creek Formation shall be considered a high probability area.

b) Keystone shall at its expense conduct a pre-construction field survey of each area identified by such review and consultation as a known site or high probability area within the construction ROW. Following BLM guidelines as modified by the provisions of Condition 44, including the use of BLM permitted paleontologists, areas with exposures of high sensitivity (PFYC Class 4) and very high sensitivity (PFYC Class 5) rock formations shall be subject to a 100% pedestrian field survey, while areas with exposures of moderately sensitive rock formations (PFYC Class 3) shall be spot-checked for occurrences of scientifically or economically significant surface fossils and evidence of subsurface fossils. Scientifically or economically significant surface fossils shall be avoided by the Project or mitigated by collecting them if avoidance is not feasible. Following BLM guidelines for the assessment

and mitigation of paleontological resources, scientifically significant paleontological resources are defined as rare vertebrate fossils that are identifiable to taxon and element, and common vertebrate fossils that are identifiable to taxon and element and that have scientific research value; and scientifically noteworthy occurrences of invertebrate, plant and trace fossils. Fossil localities are defined as the geographic and stratigraphic locations at which fossils are found.

c) Following the completion of field surveys, Keystone shall prepare and file with the Commission a paleontological resource mitigation plan. The mitigation plan shall specify monitoring locations, and include BLM permitted monitors and proper employee and contractor training to identify any paleontological resources discovered during construction and the procedures to be followed following such discovery. Paleontological monitoring will take place in areas within the construction ROW that are underlain by rock formations with high sensitivity (PFYC Class 4) and very high sensitivity (PFYC Class 5), and in areas underlain by rock formations with moderate sensitivity (PFYC Class 3) where significant fossils were identified during field surveys.

d) If during construction, Keystone or its agents discover what may be a paleontological resource of economic significance, or of scientific significance, as defined in subparagraph (b) above, Keystone or its contractors or agents shall immediately cease work at that portion of the site and, if on private land, notify the affected landowner(s). Upon such a discovery, Keystone's paleontological monitor will evaluate whether the discovery is of economic significance, or of scientific significance as defined in subparagraph (b) above. If an economically or scientifically significant paleontological resource is discovered on state land, Keystone will notify SDSMT and if on federal land, Keystone will notify the BLM or other federal agency. In no case shall Keystone return any excavated fossils to the trench. If a qualified and BLM-permitted paleontologist, in consultation with the landowner, BLM, or SDSMT determines that an economically or scientifically significant paleontological resource is present, Keystone shall develop a plan that is reasonably acceptable to the landowner(s), BLM, or SDSMT, as applicable, to accommodate the salvage or avoidance of the paleontological resource to protect or mitigate damage to the resource. The responsibility for conducting such measures and paying the costs associated with such measures, whether on private, state or federal land, shall be borne by Keystone to the same extent that such responsibility and costs would be required to be borne by Keystone on BLM managed lands pursuant to BLM regulations and guidelines, including the BLM Guidelines for Assessment and Mitigation of Potential Impacts to Paleontological Resources, except to the extent factually inappropriate to the situation in the case of private land (e.g. museum curation costs would not be paid by Keystone in situations where possession of the recovered fossil(s) was turned over to the landowner as opposed to curation for the public). If such a plan will require a materially different route than that approved by the Commission, Keystone shall obtain Commission approval for the new route before proceeding with any further construction. Keystone shall, upon discovery and salvage of paleontological resources either during pre-construction surveys or construction and monitoring on private land, return any fossils in its possession to the landowner of record of the land on which the fossil is found. If on state land, the fossils and all associated data and documentation will be transferred to the SDSMT; if on federal land, to the BLM.

e) To the extent that Keystone or its contractors or agents have control over access to such information, Keystone shall, and shall require its contractors and agents to, treat the locations of sensitive and valuable resources as confidential and limit public access to this information.

VII. Enforcement and Liability for Damage

45. Keystone shall repair or replace all property removed or damaged during all phases of construction and operation of the proposed transmission facility, including but not limited to, all fences, gates and utility, water supply, irrigation or drainage systems. Keystone shall compensate the owners for damages or losses that cannot be fully remedied by repair or replacement, such as lost productivity and crop and livestock losses or loss of value to a paleontological resource damaged by construction or other activities.

46. In the event that a person's well is contaminated as a result of construction or pipeline operation, Keystone shall pay all costs associated with finding and providing a permanent water supply that is at least of similar quality and quantity; and any other related damages, including but not limited to any consequences, medical or otherwise, related to water contamination.

47. Any damage that occurs as a result of soil disturbance on a persons' property shall be paid for by Keystone.

48. No person will be held responsible for a pipeline leak that occurs as a result of his/her normal farming practices over the top of or near the pipeline.

49. Keystone shall pay commercially reasonable costs and indemnify and hold the landowner harmless for any loss, damage, claim or action resulting from Keystone's use of the easement, including any resulting from any release of regulated substances or from abandonment of the facility, except to the extent such loss, damage claim or action results from the gross negligence or willful misconduct of the landowner or its agents.

50. The Commission's complaint process as set forth in ARSD 20:10:01 shall be available to landowners, other persons sustaining or threatened with damage or the consequences of Keystone's failure to abide by the conditions of this permit or otherwise having standing to obtain enforcement of the conditions of this Order and Permit.

Exhibit B

RULINGS ON PROPOSED FINDINGS OF FACT

Rulings on Applicants' Proposed Findings of Fact

As Applicant is the prevailing party, most of Applicant's Proposed Findings of Fact have been accepted in their general substance and incorporated in the Findings of Fact, with additions and modifications to reflect the Commission's understanding of the record.

49-41B-22. Applicant's burden of proof. The applicant has the burden of proof to establish that:

- (1) The proposed facility will comply with all applicable laws and rules;
- (2) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area;
- (3) The facility will not substantially impair the health, safety or welfare of the inhabitants;
and
- (4) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

Source: SL 1977, ch 390, § 17; SL 1981, ch 340, § 3; SL 1991, ch 386, § 6.
