BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE PROJECT	))))))	HP14-002

REBUTTAL TESTIMONY OF

JOEY MAHMOUD

ON BEHALF OF

DAKOTA ACCESS, LLC

DAKOTA ACCESS EXHIBIT#___

August 14, 2015

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

A. My name is Joey Mahmoud, I am Vice President of Engineering of Dakota Access, LLC ("Dakota Access"), the Applicant in this proceeding, and Senior Vice President of Engineering of Energy Transfer Partners, L.P. ("ETP"). My business address is 1300 Main St, Houston, TX. 77002.

Q. Have you previously submitted direct testimony in this proceeding?

A. Yes, I previously submitted direct testimony, dated July 6, 2015 which is identified as Dakota Access Exhibit 2.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to respond to the testimony of Commission Staff Witness Darren Kearney that recommended the Commission require an indemnity bond of $24 million for the year in which construction is to commence and a second bond in the amount of $24 million for the ensuing year.

In addition, I will address various concerns expressed by interveners.

Q. Do you believe Staff's bond recommendation is consistent with past Commission decisions?

A. No.

Q. What is the methodology used by the Commission in past decisions?

A. In the TransCanada in Docket No. HP07-001, the Commission used the proposed bond value identified in the Socioeconomic Assessment of Keystone Pipeline, prepared by Staff Witness John Muehlhausen. Mr. Muehlhausen recommended a $3 million bond in 2008 and $12 million for 2009. Staff Witness Muehlhausen's Socioeconomic Assessment of the Keystone Pipeline stated on page 38, "The cumulative bond amount is

12 times the estimated cost of repairs/maintenance."

Then, in Docket No. HP09-001, the Commission adopted the same approach in which the Keystone XL indemnity bond was established at $15,600,000 for each year of construction.

Doing the math then, in HP 07-001, the estimated road repairs and maintenance amounted to $250,000 in 2008 and $1,000,000 in 2009.

For HP 09-001, this equates to $2,600,000 per calendar year or 1.69% of total construction cost per calendar year.

Q. How do you apply that methodology in this case?

A. In simple terms, 1.69% of Dakota Access construction cost is $7,024,930 ($415,676,350 x 1.69%). However, we estimate road repairs and maintenance to be approximately 1% of the total construction costs of the project, which is based upon Energy Transfer's collective project experience over more than 72,000 miles of pipe and thousands of pipes being constructed over the years. For Dakota Access and the construction in South Dakota, the construction cost is estimated to be roughly $415,676,350 over a one-year construction season. One-percent of this amount is $4,156,764. Therefore, Dakota Access believes $4,156,764 is a fair and equitable amount for a road bond and would cover any expenses related to construction.

Q. How does it work if you base the bond on a percentage of total construction cost?

A. Keystone XL (HP09-001), the $15.6 million bond equated to 1.69% of the estimated capital cost of $921.4 million on a per construction year basis. Which, based upon Dakota Access's experience is slightly elevated, but roughly accurate. As mentioned above, 1% of the construction cost of Dakota Access's construction cost is approximately

$4,156,764 and 1% of the overall capital cost (similar comparison to Keystone XL is [$820,000,000 X 1%]) $8,200,000.

Q. Did Dakota Access propose and indemnity bond?

A. Yes, in response to Staff's Completeness Review Data Request No. 32, Dakota Access proposed an indemnity bond totaling $15,000,000.

Q. **Do you feel the proposed $15,000,000 bond amount is sufficient to insure any damage beyond normal wear and tear to public roads, highways, bridges, or other related facilities would be adequately compensated?**

A. Yes. The $15,000,000 is roughly 2.6 times more than the equitable value of the road bond as a percentage of construction and 1.8 times more than the capital cost assuming 1 percent of construction or at 1.69% of capital cost as utilized on Keystone XL, the $13,858,000 is 1.08 times more than what was conditioned on Keystone XL. In any comparative metric, Dakota Access's proposal is more than the previous bonds as a percentage basis compared to Keystone XL on a per calendar year.

Q. Are you still proposing the $15,000,000 bond in light of the above application of prior Commission methodology?

A. Yes, even though Dakota Access views the amount as excessive and since we have previously agreed to the amount, we would honor the previously proposed bond amount of $15,000,000. However, we would accept a lesser amount to be equitable across "similar in concept" projects in South Dakota.

Q. Mr. Mahmoud, have you studied the Keystone conditions imposed by the Commission in HP09-001?

A. Yes I have. The Order, which states those conditions, is attached to this testimony marked as Exhibit 1.

Q. Can Dakota Access accept and agree to implement any of those listed conditions on this proposed project?

A. Conceptually, in relative comparative terms, yes. However, certain aspects of the conditions would have to be revised to account for project-specific differences, timing of the project and certain submittal deadlines and to account for the fact that Dakota Access is not proposing to construct or operate its pipeline under an alternative methodology or special permit under PHMSA and Dakota Access is a 100% domestic project with no international border crossing or Federal permit or corresponding Federal Environmental Impact Statement. Taking into account those major differences and the site-specific nature of the each project and the applicable conditions, Dakota Access generally agrees to the conditions and specifically we would agree to the following with project-specific adjustments as listed on Keystone XL's Exhibit 1:

1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, , 26, 27, 28, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 42, 43, 45, 46, 47, 48, 49, 50.

Q. What about the other conditions you did not list?

A. The conditions not listed as being acceptable are of such difference to the concepts, designs, and site-specific criteria that Dakota Access does not think even with modifications would those conditions apply. For example, Condition 3 under Keystone XL's Exhibit 1 is specific to the requirements of the Keystone XL Federal requirements since it requires a Presidential Permit from U.S. Department of State for the international border crossing and a resultant federally prepared Environmental Impact Statement and

certain consultation requirements as required by the National Environmental Policy Act. Dakota Access simply does not have such a requirement as part of its project as it is a 100% domestic project with its origin and termination within the lower 50 states of the United States.

Condition 41. This condition is specific to Keystone XL in its entirety and does not apply to Dakota Access.

Q. Which Keystone XL's Exhibit 1 conditions would not apply to Dakota Access in their entirety?

A. Conditions 3, Condition 29 and 35.

Condition 3 as mentioned above is not applicable as Dakota Access does not require those type of approvals or an Environmental Impact Statement is not being proposed.

Condition 29 is not applicable as we will not engage in mainline winter construction. However, if for some reason mainline construction would occur in the winter, Dakota Access agrees to provide a winter construction plan to the Commission no less than 60 days prior to conventional construction in the winter.

Condition 35 is not applicable as it pertains to a county that is not traversed by the proposed project.

Q. Comment on those Conditions imposed in the Keystone XL project that may need some adjustment to apply to the Dakota Access proposed project.

A. In general all of the conditions that pertain to the construction and operation of the pipeline require some level of updating and to make those conditions project specific. Overall, Dakota Access have different methodologies and fall under similar, but different, rules under 49 CFR 195 because Dakota Access is not requesting any exceptions or

changes to the standard requirements under 49 CFR 195 whereas Keystone XL have proposed their pipeline under a Special Permit. Therefore, the various plans we filed as Exhibit D to the Application address our techniques and plans. Several staff experts and interveners raised questions regarding various aspects of our plans. Monica Howard and Aaron DeJoia, in their rebuttal, address those concerns. In addition to the project specific modifications required for the overall set of Keystone XL conditions, provided below are Dakota Access's comments to the Keystone XL conditions that with certain specific modifications, are acceptable.

Condition 2 requires modification to remove the requirements for consultation and adherence to the Presidential Permit, the reference to the PHMSA special permit and any reference to an Environmental Impact Statement.

Condition 7. Dakota Access agrees to provide a public liaison officer but this person is proposed to be the Dakota Access lead Project Manager for South Dakota and will be back-stopped for times when he cannot be available by the lead right-of-way manager for South Dakota. These individuals are generally available in the state and on the project every day and will have the greatest knowledge of the project during construction and have immediate access to Dakota Access Executive Project Manager and other staff, corporate resources, contractors or any other contact on the project.

Condition 10. Dakota Access accepts this condition, but since we are within 6 months of construction, the timing should be updated to reflect "Prior to Construction, Dakota Access shall continue its program of contacts and consultation with……"

Condition 19. In the event trees are to be removed along the pipeline, Dakota Access has or will pay the landowners for loss of and removal of any trees on their property and will replant any trees in accordance with the land or right-of-way agreement. Additionally, the width of the right-of-way may be greater than 85 feet or 50 feet as contemplated in the Keystone Xl condition based upon site-specific needs, landowner and/or right-of-way agreements that allow for larger openings. Any such limitation should be predicated upon the proposed project plan as submitted and not an overall blanket or general statement as it does not accurately reflect the site-specific conditions of the pipeline or project construability needs or landowner agreements. Also, after construction, no trees will be replanted or allowed to grow within 25 feet of the centerline of the pipeline.

Condition 23 f. Any road bonds or special conditions should be specific to Dakota Access and as previously mentioned should be a total of $15,000,000 or less as determined by the Commission based upon the aforementioned data provided.

Condition 24 g. Dakota Access agrees to the concepts of this condition but suggests that the time to backfill the trench would be 14 days in residential areas. In all instances, Dakota Access will backfill the ditch as soon as practical after installing the pipeline to reduce hazards to the residents or public.

Condition 25. Dakota Access has provided its construction plan, agriculture crossing plan and erosion and sedimentation plan which all contemplate construction in adverse weather conditions. Therefore, an additional plan is not necessary outside of the information already provided. However, Dakota Access will agree to limit its construction or stop construction in the event weather conditions pose a threat to safety of the construction workforce and/or irreparable damage that cannot be mitigated for with construction or work techniques.

Condition 31. Dakota Access has not or is not requesting a Special permit from PHMSA and therefore this provision is not applicable.

Condition 37. Dakota Access agrees to this condition in concept but suggests that it be changed to and have the word ‘minimum” added to the width requirements. In most instances and in accordance with the landowner easements, Dakota Access will maintain a 50 foot wide easement (25 foot on each side of the centerline) for operations in a herbaceous state, but in select areas may reduce this to 15 feet or a minimum of a 30 foot maintained corridor in a herbaceous state. However, this is the exception and not the majority.

Condition 38. Similar to Condition 37, Dakota Access agrees to the concept of this condition but suggests that it be changed to and have the word ‘minimum” added to the width requirements and replace the 10 feet with 15 feet as the minimum clearing width

from the centerline of the pipeline. Ten feet, let alone 15 feet, is simply not wide enough to do meaningful and complete leak detection surveys and Dakota Access does not believe this conforms to the monitoring requirements as required by 49CFR195. In most instances and in accordance with the landowner easements, Dakota Access will maintain a 50 foot wide easement (25 foot on each side of the centerline) for operations in a herbaceous state, but in select areas may reduce this to 15 feet or a minimum of a 30 foot maintained corridor in a herbaceous state. However, this is the exception and not the majority. Anything less than the 30 foot wide corridor impacts the ability to do aerial patrol leak detection surveys?

Condition 40. Dakota Access agrees with a portion of this condition as it relates to the South Dakota water districts, but does not agree with the overly burdensome notice provisions or expansiveness of the condition above and beyond the federal requirements as contemplated under the 49 CFR 195 or any requirements under the Clean Water Act (1972), Oil Pollution Act (1990), Comprehensive Environmental Response, Compensation, and Liability Act of 1980 or the National Pollution Funds Center guidance manual for water quality or spills and remediation (or any other Federal or state legislation that may contemplate spills and clean-up activities). Dakota Access has reached agreement with the water districts traversed by the proposed pipeline to implement voluntary protection mechanisms that will result in relocating the water lines to a depth below the proposed pipeline and to replace the water lines with materials impervious to BTEX up to and extending a minimum to the extent of the permanent easement or more depending upon the water district's guidance (copies can be provided if

requested). However, this agreement is limited to the water districts and does not apply to specific landowners or other owners of water systems that may be traversed or as suggested in the Keystone XL conditions. Dakota Access has reviewed the technical documentation pertaining to submersion of water lines in crude oil and although the study results indicated the possibility of permeating into the water or into the pipe, the reality of real world conditions suggests this would not occur and therefore, the science behind the studies is substantially flawed and cannot reasonably be applied to actual real world conditions. Simply put, a spill large enough to saturate the soils surrounding the water pipe would never be allowed to sit for one year without notice, clean-up or remediation. Dakota Access will and agrees to protect any water system and will take immediate measures to protect any water system in the event of a release of any size and would mitigate the exposure to a water line or system. In the event a release did occur and a water line was submerged or impacted, Dakota Access, as part of its restoration and mitigation responsibilities, would ensure that water pipes or any impacts were mitigated so as not to result in any impact to the public, landowners or water system or districts.

Condition 44. Dakota Access consulted with Museum of Geology at the South Dakota School of Minerals and Technology for paleontological resources and based upon that consultation and review of their data, no areas of concern were identified and therefore Keystone XL condition 44 in its entirety does not apply. However, Dakota Access Unanticipated Discoveries Plan contemplates paleontological resources and the actions Dakota Access would employ if such resources were encountered during construction.

Q. **Is it your testimony that the proposed project will meet or exceed all relevant federal and state requirements?**

A. Yes it is. We have asked for no waivers from PHMSA with respect to the construction and operation of this pipeline. This pipeline meets or exceeds all state and federal requirements for construction and operations.

Q. Will the proposed facility comply with all applicable laws and rules?

A. Yes it will.

Q. Will the facility pose a threat of serious injury to the environment or to the social and economic condition of inhabitants or expected inhabitants in the siting area?

A. No. Dakota Access will be a state of the art facility constructed and operated by professionals. Normal operation of the pipeline poses no threat of serious injury to the environment. Our construction techniques, materials utilized, testing plans and operational plans, procedures and continuous monitoring activities are designed and built into the project to avoid, minimize and mitigate any threat from abnormal operations of the pipeline. Our emergency response plans and staging of personnel and equipment to manage and abnormal conditions or other effects of abnormal operations are also designed and incorporated into the project and facilities to substantially mitigate any threat.

Q. Under normal pipeline operations, will agricultural activities be affected?

A. No. We know that construction will have effects, although temporary, on agricultural activities. We have developed construction and agricultural mitigation plans, have hired local and regional experts to design construction techniques and restoration plans to restore agricultural areas to their pre-project conditions and fully expect any impacts to

be fully mitigated within a three year period. As such, we have and are paying landowners for three years of crop loss up front and in instances where there is a reduction of yield that has resulted from our pipeline beyond the three year period, we will work with those landowners to restore the production to similar production as compared to undisturbed areas not affected by construction and compensate those landowners until such impacts are fully restored.

Q. Will the facility substantially impair the health, safety or welfare of the inhabitants?

A. No.

Q. Will the facility unduly interfere with the orderly development of the region?

A. No. During the routing of the pipeline, Dakota Access spent considerable time and resources as well as consulting with the various Federal, state, and local governmental bodies and landowners and any other interested parties identifying and avoiding as many stakeholders, development areas, constraints and/or obstacles as possible while still allowing for a route that is constructible and safe. Based upon this routing, Dakota Access believes the route will not interfere with the orderly development of the region and is located along such a route to avoid areas of potential development.

Q. What consideration has been given the views of governing bodies of affected local units of government?

A. We consulted with local governments as much as practicable in all counties and a number of cities along the proposed route, made the recommended adjustments when requested and believe that we have routed the pipeline to account for the best route with the least amount of impacts to the most stakeholders while still allowing for a pipeline route that is constructible and safe and minimizes impacts to the human and natural environmental

considerations and resources.

Q. Does this conclude your testimony?

A. Yes.

Dated this 14 day of August, 2015

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Joey Mahmoud

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF SOUTH DAKOTA

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

[1]The 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 Intervenors 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 irremediably 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 he 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 of 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% pedestrial 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 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 SDSM; 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.

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE PROJECT	))))))	HP14-002

REBUTTAL TESTIMONY OF

MONICA HOWARD

ON BEHALF OF

DAKOTA ACCESS, LLC

DAKOTA ACCESS EXHIBIT #___

August 14, 2015

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

A. My name is Monica Howard, I am the Environmental Project Manager with Dakota Access, LLC ("Dakota Access"), the Applicant in this proceeding, and Director of Environmental Science for Energy Transfer Partners, L.P. ("ETP"). My business address is 1300 Main St, Houston, TX. 77002.

Q. Have you previously submitted direct testimony in this proceeding?

A. Yes, I previously submitted direct testimony, dated July 6, 2015 which is identified as Dakota Access Exhibit 6.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to respond to the environmental components of the testimony of Derric Iles, Tom Kirschenmann, Ryan Ledin, Kimberly McIntosh, David Nickel, Paige Olson, Andrea Thorton, DeAnn Thyse, Brian Walsh, and Cameron Young.

Q. Several of the above listed parties referenced the Federal Energy Regulatory Commission (FERC) filing requirements in their testimony. Is the Dakota Access Pipeline project subject these FERC environmental regulations?

A. No.

Q. Did Dakota Access omit reference to general permit SDG070000 for hydrostatic and trench dewatering as stated by Ryan Ledin (See page 2 of his testimony, starting at line 20)?

A. No. The application submitted in December 2014 identifies permit number SDG070000 as a permit required for construction. Table 5.0-1 within Section 5.0 discusses permit applicability. The permit is again discussed in Section 15.5.

Q. Will Dakota Access implement the hydrostatic test water withdrawal or discharge recommendations made by Ryan Ledin in his prefiled testimony?

A. Yes.

Q. **Do you have any comments on Ryan Ledin's statements regarding perceived deficiencies in the SWPPP ?**

A. Yes, throughout his testimony Mr. Ledin referenced Federal Energy Regulatory Commission (FERC) Procedures; however this project is not regulated by FERC; nor is the pipeline construction subject to NPDES permitting as it has been expressly exempted by the EPA. The submitted SWPPP meets the applicable federal requirements designed to protect the environment and specifically waters of the U.S.

Mr. Ledin's testimony repeatedly expressed concern regarding consistency in applying Best Management Practices (BPMs). However, consistency is not the measure of a successful SWPPP. Rather, BMPs must be employed to meet site specific challenges in the field. BMPs will be employed as necessary to comply with the Clean Water Act at each specific location.

Dakota Access intends to employ experienced and qualified Environmental Inspectors familiar with appropriate implementation of BMPs to ensure compliance. It should be further noted that the typical drawings appended to the SWPPP did provide maximum spacing recommendations for slope breakers and trench breakers.

Q. Do you have any comments regarding Mr. Ledin's recommendations relative to vegetation management and control of noxious weed including wash stations?

A. Yes, as directed by the Department of Agriculture, Dakota Access is managing noxious weeks in consultation with individual landowners on a case-by-case basis. Dakota

Access requires the contractor to ensure that equipment mobilized to the project is clean/free of dirt and debris that may host noxious weeds. Further, plots of noxious weeds warranting the implementation of wash stationswere not observed during surveys or reported to us by landowners. As a result, the use of wash stations is not warranted.

Q. Do you have a response to Mr. Ledin's recommendation that a "master waterbody and wetland" crossing table be included in the SWPPP with milepost or stationing to indicate the features' exact location? (See page 4 of his testimony starting at line 14)

A. Yes, all wetlands and waterbodies are incorporated onto the alignment sheets issued for construction, which identifies the features by name and station and it is evident which features will be crossed via HDD. The crossing method for all other features will be determined by the contractor, with advice as necessary from the Chief Inspector and the Environmental Inspector, to ensure compliance with applicable regulations. The site by site decision for which crossing method to employ is based on conditions present at the time of crossing. Any given wetland or waterbody could be crossed by any of the presented methods. As a result, once again, a site by site analysis at the time of crossing is necessary to assure the best method given current circumstances.

Q. Are you aware of the concern Tom Kirschenmann raises in his testimony regarding the pipeline's close proximity to Game Production Areas (See page 2 of his testimony starting at line 1)?

A. Yes, Dakota Access understands that the proposed route is in close proximity to these sensitive areas. However, the route does not currently pass through these areas and Dakota Access has no plans to change the route such that it will pass through these areas.

Based on the current route, Dakota Access does not anticipate adverse impacts on these sensitive areas.

Q. Are you aware of the concern Tom Kirschenmann raises in his testimony regarding Native Prairie areas (See page 2 of his testimony starting at line 10)?

A. Yes, again we appreciate his concern. As noted in Section 16.1 of the December 2014 submittal, a very small amount of native prairie is crossed by the Project, and Dakota Access is consulting with the NRCS regarding appropriate seed mixtures for restoration.

Q. Are you aware of the concern Tom Kirschenmann raises in his testimony regarding waterfowl production areas and private lands under conservation easements (See page 2 of his testimony starting at line 10)?

A. Yes. The route does not cross any waterfowl production areas or federal wildlife management areas. However, Wetland and Grassland easements held by the USFWS on private lands are being crossed by the Project. As a result, an Environmental Assessment has been submitted to the USFWS-Refuge Division for review as part of the Special Use Permit process to cross these easements.

Q. Can you comment on the potential impact the project may have on federally protected species in South Dakota?

A. Dakota Access has been working with the USFWS since June of 2014. Impact assessments on all federally protected species is being coordinated in accordance with the Endangered Species Act.

Q. Please comment specifically on the impact to the Topica Shiner.

A. The SD Ecological Field Office identified nine waterbodies crossed by the project where the Topeka shiner was potentially present. As a result, Dakota Access proposes to to

HDD four of these of these water crossings. As a result, impacts will be avoided. Biological surveys determined that the pipeline crossing location at two other waterbodies lack suitable habitat for the species. As such, the Project has the potential to impact the Topkea shiner at three remaining streams that will be conventionally crossed. Based on communication with the USFWS and USACE, Dakota Access intends to utilize the existing Programmatic Biological Opinion for the Issuance of Selected Nationwide Permits Impacting the Topeka Shiner in South Dakota, dated October 2014, to address impacts to the species.

Q. Please comment specifically on the impact to the Dakota Skipper.

A. The Dakota Skipper is a federally protected species and is listed in Campbell and Edmunds Counties. However, biological surveys concluded that no suitable habitat within those counties is crossed by the project, thus no impacts are anticipated.

Q. Did you read Ms. Andrea Thornton's prefiled testimony and do you have any comments to offer?

A. Yes. Ms. Thornton's testimony references the Federal Energy Regulatory Commission filing requirements, Plan, and the Interstate Natural Gas Association of America. None of the listed references are applicable to this Project.

Q. In addition, Ms. Thornton recommends the PUC "require a more quantifiable measure to determine when revegation is successful…" She recommends 70% revegation as a quantifiable measure. Does Dakota Access agree to do so?

A. Yes. In section 5.0 of the SWPPP submitted in December 2014 we propose the 70% revegation measure as it is consistent with EPA recommendations

Q. On page 7 of her testimony, Ms. Thornton addresses revegation potential. How did

Dakota Access determine the revegetation potential?

A. The SSURGO database was utilized and supplemented with the Official Soil Series Descriptions within the County Soil Surveys of the affected counties. The attribute data within the geospatially references database provides the extent of the component soils and properties for each map unit. The soil attribute data was used to determine the revegetation potential for each soil map unit. For example, soils with low revegetation potential typically have high compaction and/or erosion potentials, have slopes greater than 8 percent, are generally not classified as prime farmland, and/or are usually hydric in nature.

Q. Did Dakota Access omit identification of areas with saline, sodic, and saline-sodic soils crossed by the project as stated in Ms. Thornton's testimony?

A. No, the December 2014 submittal contained this information in Section 14.5 and Exhibit C. The potential for negative impacts to revegetation from these factors was discussed, as well as the fact that Dakota Access has retained an agricultural consultant to develop specific measures for work in these areas.

Q. Do you have a response to Ms. Thornton's statements that Dakota Access lacks measures to address specific seed mixes as needed or areas with revegetation concerns (see page 8 of her testimony)?

A. As stated in Section 16.1, Dakota Access will consult with the NRCS for recommended seed mixes for restoration of grasslands and pasture/rangeland. Additionally, our agricultural consultant is developing measures to be included in the construction line list for site specific measures needed during construction and/or revegetation. Such recommendations will be incorporated into the construction line list or under separate

cover.

Q. Did Dakota Access route the project to avoid Zone A Wellhead or Source Water Protection Areas as recommended by Brian Walsh?

A. Yes.

Q. Did Dakota Access contact the counties with Zone B areas in accords with Mr. Walsh's testimony?

A. Yes. All counties with identified Zone B areas were contacted and Dakota Access confirmed that no respective permitting or coordination is needed.

Q. Do you agree with Cameron Young's testimony that the northern long-eared bat is a federally protected species in South Dakota (See page 3 of his testimony)?

A. No. On April 2, 2015, the USFWS published the final listing in the Federal Register with an effective date of May 4, 2015 listing the northern long-eared bat as threatened and exercised the option of issuing an interim 4(d) rule. The 4(d) rule allowed for more flexible implementation of the Endangered Species Act and "to tailor prohibitions to those that make the most sense for protecting and managing at-risk species." In areas outside of the 150-mile White Nose Syndrome (WNS) buffer zone, incidental take from lawful activities is not prohibited. The state of South Dakota currently falls outside of the WNS 150-mile buffer zone; thus impacts to the species in South Dakota are exempted.

Q. Do you agree with Cameron Young's testimony that the Sprague's pipit is a federally listed species in Campbell and McPherson Counties (See page 3 of his testimony)?

A. No, this species is a candidate for listing and has no statutory protection under the Endangered Species Act.

Q. Do you agree with Cameron Young's testimony regarding impacts and mitigation for the whooping crane (See page 3 of his testimony)?

A. No. During migration, during which the project may be constructed, the species may inhabit various areas including croplands and palustrine wetlands. While the Project area within South Dakota may provide suitable stopover habitat for migrating whooping cranes, this species is highly mobile and would likely avoid the areas affected during construction. Additionally, there is ample suitable stopover habitat surrounding the Project area and throughout the region that would provide habitat for the whooping crane outside the construction footprint that may be more desirable to individuals than the temporarily affected area within the project footprint. Further, impacts to potential stop over habitat does not warrant mitigation under the ESA.

Q. Do you agree with Cameron Young's testimony regarding the Pallid Sturgeon, Dakota Skipper, or Western prairie fringed orchid in South Dakota (see page 4 of his testimony)?

A. No. The project is being designed, constructed and operated to meet or exceed US DOT regulations and will therefore be protective of aquatic resources, including the pallid sturgeon. All sturgeon habitat will be crossed via HDD and there are block valves located on both sides of waterbodies known to support the pallid sturgeon. Block valves are remotely operated and constantly monitored (24/7).

No suitable habitat for the Dakota skipper is crossed in Edmunds or McPherson Counties; therefore a no effect determination is appropriate. Additionally, the western prairie fringed orchid was not observed during surveys, thus a no effect determination is appropriate.

Q. Is Dakota Access committed to compliance with all applicable federal and state regulations respective to protection of species and the environment and will Dakota Access contractually require their contractor to comply as well?

A. Yes.

Q. Are there any archeological or historically sensitive areas crossed by DAPL, if so can Dakota Access mitigate the risks associated with those sensitive crossings?

A. During early coordination with the SD SHPO Dakota Access committed to surveying all high and moderate probability areas, which constitutes 80% of the Project area in South Dakota. To date, Dakota Access has surveyed 89% of the route, which is inclusive of the high and moderate probability areas, and has exceeded survey commitments. The results of the 89% surveyed was documented in the 2015 Level III report and addendum reports dated June 2 and August 7, respectively.

A total of 11 archaeological sites within the 400 foot survey corridor were recommended as eligible for listing in the National Register of Historic Places (NRHP), or were determined to have an unevaluated NRHP status and recommended to be avoided. The Project has been successfully tweaked the route to avoid impacts to all 11 sites. Dakota Access is confident that impacts to sensitive cultural resources will be avoided through rerouting, modifications to Project workspace, or trenchless installation (i.e, bore, HDD).

It should be noted that Dakota Access is not involved in the sighting or permitting of the contractor or delivery yards, those are the responsibility of the contractor and manufacturer/vender, respectively.

Q. Has the extent of federal involvement on the project been established?

A. Yes. The extent of federal involvement is limited to the federally jurisdictional areas

along the route. For Waters of the U.S. this is up to 257 feet on either side of the water feature. For USFWS easements, it is limited to the jurisdictional areas along the respective tracts containing easements. There is no other federal jurisdiction along the Project in South Dakota. A map of the federal jurisdictional areas was created and provided to Ms. Paige Olson on 08/07/15 for clarification of areas of federal involvement questioned in her testimony.

Q. Will Dakota Access make the changes to the Unanticipated Discovery Plan provided in Ms. Paige Olson's and DeAnn Thyse's testimonies?

A. Yes, these revisions have been made and a revised plan was submitted to Paige Olson on August 8, 2015.

Q. Can Dakota Access clarify the three items from the June Level III report that were discussed in Ms. Paige Olson's testimony?

A. Yes. Clarifications were provided to Mr. Olson on August 8, 2015.

Q. Does this conclude your testimony?

A. Yes.

Dated this ____ day of August 2015

_____

Monica Howard

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE PROJECT	))))))	HP14-002

REBUTTAL TESTIMONY OF

CHUCK FREY

ON BEHALF OF

DAKOTA ACCESS, LLC

DAKOTA ACCESS EXHIBIT # ___

August 14, 2015

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

A. My name is Chuck Frey. I am employed by Energy Transfer Partners and my business address is 1300 Main St, Houston, TX. 77002.

Q. What is your position with Dakota Access, LLC ("Dakota Access")?

A. I am the Vice President of Engineering.

Q. Did you previously file direct testimony in this matter?

A. Yes

Q. What is the purpose of this rebuttal testimony?

A. I intent to address the concerns raised by interveners regarding the outside storage of pipe prior to construction.

Q. What was the concern raised by landowners?

A. Various landowners commented that they believe premature aging and deterioration will occur due to the elements the pipe experiences prior to installation.

Q. What is your response to that concern?

A. I appreciate the concern; however, based on my experience I do not believe pipe integrity will be compromised. Pipeline construction includes a time of pipe storage prior to construction. However, we also responded to the concern by making a direct inquiry with Valspar. The pipe coating is a Valspar product. Attached to my testimony as Exhibit A is the reply we received from Valspar. In addition please find attached as Exhibit B a Technical Brief on the subject.

Q. Does this conclude your testimony?

A. Yes.

Dated this ____ day of July, 2015

_____

Chuck Frey

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Jeffrey D. Rogozinski, PhD
Global Technical Director
Protective Coatings
jrogozinski@valspar.com

Mailing Address:
1101 South 3rd Street
Minneapolis, MN 55415

Cell: (816)728-2781
Fax: (612) 375-7745

June 2, 2015

To: David McQuilling
Energy Transfer

Re: Pipeclad® 2000 UV Exposure

Dear Sir,

I write this letter in response to your following questions:

1. Valspar's recommendations for short term (< 1 year) outdoor storage of FBE coated pipe.
2. Valspar's estimate of FBE coating deterioration, if any, resulting from short term outdoor storage.

Based on Valspar's experience and product knowledge, we expect that Pipeclad® 2000, when properly applied in accordance with Valspar's written application instructions, would not need any special protection from UV degradation for outdoor storage of <1 year. Valspar's estimate of deterioration, if any, would be extremely low and would not affect performance properties of the coating.

If you have any questions about this, please do not hesitate to contact me.

Kindest regards,

Jeffrey D. Rogozinski, Ph.D.
Global Technical Director
Protective Coatings

Technical Brief

UV Protection of Coated Line Pipe

Background

Fusion bonded epoxy (FBE) is a one part powdered epoxy coating that is sprayed onto the hot metal substrate where it melts, flows and cures to give a corrosion resistant coating. The first line pipe coated with FBE was placed into service in 1960[1]. Since that time, FBE coatings have become the most commonly used coating for new pipeline construction in North America. FBE coatings are formulated to meet both the requirements of the applicator who will apply the coating and the performance requirements of the end user (pipeline owner).

The primary raw materials used to formulate FBE coatings include epoxy resins, curing agents (hardeners), catalysts, pigments and fillers. Other additives may be used to control the flow characteristics, improve adhesion performance and provide other useful benefits. While there are several types of epoxy resins commercially available, those based on diglycidyl ether of bisphenol A (DGEBA) or novolac chemistry are the two epoxy resin types most frequently used in FBE coatings. While these epoxy resins can be used to make polymers with a wide range of properties and are very versatile in many ways, they are aromatic and thus have poor ultraviolet (UV) light resistance limiting their use in exterior applications.

UV Exposure – Chalking

Due to the presence of the aromatic group, epoxy resins generally absorb at about 300 nm and will degrade in the presence of UV light and humidity via photoinitiated free-radical degradation. This polymer degradation is known as chalking and results in the formation of a loose powdery residue on the pigmented coating surface. The residue on the polymer surface protects against further degradation unless it is removed. Removal of this protective barrier (either by natural or mechanical means) exposes a fresh surface which is then subject to further UV exposure and degradation.

Numerous studies have been conducted to investigate the UV degradation of epoxy resins[2-5]. One study investigated several possible weak links in amine cured epoxy systems and reported that the presence of the aromatic bisphenol moiety is primarily responsible for the absorption of UV light[6]. Modification of the polymer backbone by changing the chemistry (use of alternate diglycidyl ethers such as diglycidyl ether of bisphenol F and/or varying the curing agent) can have some impact on the degree chalking but does not eliminate the phenomena. In other words, all FBE pipeline coatings based on aromatic epoxy resins will chalk but there may be some difference in the degree of chalking due to slight differences in the chemistry of the various formulations.

Efforts have been made to improve the UV stability of epoxy products; however, to date commercial success of epoxy resins with improved weatherability has been limited[7-9]. These resins are much higher in price and end users have other ways to limit UV exposure as will be discussed later in this paper.

In addition to the susceptibility of specific FBE formulations to UV attack, the degree of chalking also depends on direct exposure to UV, the intensity and duration of the UV radiation, and the availability of water on the coating surface[1]. A pipe stored above ground experiences the most chalking on the top (12 o'clock position), less on the sides (3 and 9 o'clock positions) and little or none on the bottom (6 o'clock position). Since the degree of chalking is dependant on the intensity and duration of the UV radiation and the presence of moisture, it is not surprising that variations in the degree of chalking observed in the field appear to be geographic-location specific.

Effects of Chalking on Coating Performance

The chalking process is polymer degradation and thus thickness loss is an obvious concern. Thickness loss is caused by alternate chalking and removal of this loose surface material by wind, rain, tidal splash or blowing particulate. The rate of thickness loss depends on the rate of removal of the protective layer as well as the factors that determine the degree of chalking reviewed in the previous section. Field experience suggests that there is considerable variance in the rate of thickness loss which tends to relate to location/geography. The chalking process takes some time to get started. One study reported a thickness reduction in the 12 o'clock position of about 20 µm (3/4 mil) after approximately a year of storage in northern US and southern Canada[10]. Historical observation suggests that measurable thickness loss typically begins within 9 to 18 months[1]. Once started, the typical rate of loss is in the range of 10 to 40 µm (0.375 to 1.5 mil) per year.

As long as thickness has not been substantially reduced, weathering appears to have only minimal effects on the performance of FBE coatings. One published study of pipe coated in the US and installed in the Middle East showed no significant reduction in either flexibility or short-term cathodic disbondment tests (65°C, 3% NaCl, and 48 hour duration) after 3 years in a stockpile[11]. The Cetiner study, which evaluated pipe that had been stored for approximately one year, showed no measurable reduction in performance in either the 48-hour cathodic disbondment test or hot water adhesion tests. There was however a measurable reduction in flexibility as measured by the CSA FBE flexibility test method at -30°C[12]. Based on this work, Cetiner and coworkers recommended that pipe stored for longer than one year should be protected from UV radiation.

Again, it is important to keep in mind that the rate of chalking/thickness loss can vary considerably and is dependant on the susceptibility of the specific FBE formulation to UV attack, the intensity and duration of the UV exposure, the availability of moisture, as well as the rate at which the protective chalk layer is removed.

Common Industry Solutions

Many different methods have been used throughout the industry to protect coated pipe from UV radiation. As a preventative measure, many applicators apply additional coating thickness at the time the FBE coating is applied in order to compensate for any thickness loss that may occur during the time between when the pipe is coated and when the pipe is actually installed. The typical procedure in most cases is to provide a barrier between the sun and the coated pipe. The barrier could include any of the following:

1. Covering pipe stock piles with tarps.
2. Applying white wash to the UV exposed upper layer of the stock pile.
3. Applying an overcoat of an aliphatic polyurethane to the entire coated surface
4. Applying an overcoat of polyester powder coating. (Separate spray booths are required due to the incompatibility of epoxy and polyester systems)

Selection of the barrier is dependant on the length of time the UV exposure is expected. In the short term, a water permeable paint such as latex is sufficient. For longer term storage or permanent above ground usage, selection of the barrier coating and surface preparation are crucial. Prior to use, any UV-barrier coating should be evaluated for their ability to adhere to the FBE coating. Any residual chalking must be removed before application of a UV-barrier coating. The long-term adhesion performance of the UV-barrier coating can be improved by roughening the FBE coating surface with sandpaper or a light abrasive blast. For storage over two years; a weldable primer should be applied to the cutback area. This helps prevent corrosion in the cutback area and undercreep of the FBE coating.

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BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE PROJECT	))))))	HP14-002

REBUTTAL TESTIMONY OF

MICAH RORIE

ON BEHALF OF

DAKOTA ACCESS, LLC

DAKOTA ACCESS EXHIBIT #___

August 14, 2015

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

A. My name is Micah Rorie. I am employed by Energy Transfer Partners and my business address is 1300 Main St, Houston, TX. 77002.

Q. What is your position with Dakota Access, LLC ("Dakota Access")?

A. I am the Senior Manager of Land and Right-of-Way.

Q. Please briefly describe your educational experience.

A. I have a Bachelor's degree in Economics from Texas A&M University and have 8 years of experience in various facets of right of way acquisitions and management.

Q. Please describe your duties with Dakota Access.

A. I am responsible for the right-of-way acquisition and related work activities for Dakota Access.

Q. Have you previously submitted direct testimony and exhibits in this proceeding?

A. No, I have not.

Q. What is the basis for your rebuttal testimony?

A. Several affected landowners filed direct testimony in the proceeding making statements that need to be addressed and/or corrected by means of my rebuttal testimony.

Q. Exactly what statements are you referring to?

A. A common theme throughout their direct testimony was the concern about the impacts of the project to clay and/or cement drain tiles. Also, another concern brought forth with their testimony was the concern about crop production post pipeline construction.

Q. How does Dakota Access look to address the landowners concerns?

A. The Agricultural Impact Mitigation Plan ("AIMP"), attached as Exhibit D to the Direct Testimony of John H. Edwards "Jack" was developed by Dakota Access for the project

and addresses the concerns brought for the by the landowners related to drain tiles and for crop loss.

Q. Where in the AIMP does it address these items?

A. Section 6 f. – Temporary and Permanent Repair of Drain Tiles, Section 6 k. – Future Drain Tiles and Soil Conservation Structure Installation and Section 7 – Compensation for Damages specifically address the concerns of the landowners.

Q. And how so?

A. Section 6 f specifically states that Dakota Access will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction in order to maintain the drainage of the field tile drain system. In addition, Section 6 also addresses the temporary repair of drain tile lines encountered during construction as well as the permanent repairs to any tile disturbed or damaged during construction. Any tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Dakota Access will utilize a Tile Inspector that will inspect each permanent tile repair for compliance prior to backfilling the trench area.

Q. What about if it is later determined the drain tile system in not functioning correctly?

A. If it is determined that the tile line in the area disturbed by construction in not functioning correctly or that land adjacent to the pipeline in not draining properly and can be reasonably be attributed to the pipeline construction, Dakota Access will make further repairs or install additional tile as necessary to restore subsurface drainage.

Q. That addresses concerns about drain tile, now what about crop production?

A. As I stated earlier, Section 7 – Compensation for Damages addresses the landowner concerns related to crop production in that it specifically states that Dakota Access will be responsible for compensation landowners for the value of crop loss during construction and will also compensate for the loss of use of agricultural land, if attributable to construction.

Q. That response only addresses crop loss during construction. What about future crop production?

A. As part of the calculation of payments to landowners, Dakota Access has committed to paying for crop damages for a three year period at 100% for the first year, 80% for the second year, and 60% for the third year.

Q. One landowner expressed concern about rocks brought to the surface during construction. How does Dakota Access address that concern?

A. Section 6 g. – Removal of Rocks and Debris from the Right-of-Way specifically addresses the manner in which rocks will be removed from the right-of-way and/or utilized during the backfilling process of construction. In addition, Dakota Access will examine areas adjacent to the pipeline easement and along access roads and will remove any large rocks or debris that may have rolled or blown from the right-of-way or fallen from vehicles.

Q. What other areas related to Agricultural Mitigation Measures are addressed within the AIMP?

A. Other Agricultural Mitigation Measures addressed within the AIMP are as follows: Clearing Brush and Trees along the Easement; Topsoil Separation and Replacement; Prevention of Erosion; Aboveground Facilities; Pumping Water from Open Trenches;

Restoration after Soil Compaction and Rutting; Restoration of Terraces, Waterways and other Erosion Control Structures; Revegetation of Untilled Land; Restoration of Land Slope and Contour; Siting and Restoration of Areas Used for Field Entrances and Temporary Roads; and Construction in Wet Conditions.

Q. How will landowners be able to contact Dakota Access during construction if there is an issue?

A. Section 4 – Points of Contact in the AIMP states that Dakota Access will provide each landowner a name, telephone number, email address, and mailing address of the Dakota Access landowner representative two weeks prior to construction. The Dakota Access representative will be the primary contact for landowners throughout construction. In addition, a team of experienced Environmental and/or Agricultural Inspectors (EI's/AI's) will be involved in project construction, initial restoration, and the post-construction monitoring and follow-up restoration. For agricultural related issues, the name and telephone number of the EI/AI assigned to the area will also be provided as a secondary contact during construction.

Q. Does this conclude your testimony?

A. Yes.

Dated this ____ day of August 2015

_____

Micah Rorie

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE PROJECT	))))))	HP14-002

REBUTTAL TESTIMONY OF

STACEY GERARD

ON BEHALF OF

DAKOTA ACCESS, LLC

DAKOTA ACCESS EXHIBIT #___

August 14, 2015

Q. Please state your name, present position and business address.

A. My name is Stacey Gerard.

Q. What is your professional background?

A. I previously served as the Assistant Administrator and Chief Safety Officer, U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) and before that, the Associate Administrator for Pipeline Safety. PHMSA is the federal agency which works in partnership with states to oversee the safety of oil and gas pipelines and all hazardous materials in transportation. I was the senior career safety official. In that capacity I was responsible for all pipeline and hazardous materials safety regulatory matters and response to incidents of national significance. I was accountable to the Secretary of Transportation for meeting all statutory mandates and recommendations of the National Transportation Safety Board (NTSB), the General Accountability Office (GAO) and the Department Inspector General (IG). I set the regulatory agenda and made decisions about where to set safety standards. I also determined: the extent to which to prosecute companies which violated pipeline safety regulations, how to respond to and investigate accidents, how to prioritize the research agenda, training requirements, and overall strategic plan for the federal and state pipeline safety program. I served in an executive capacity from 1997 to 2008. More recently I served as a public safety expert on the American Petroleum Institute team developing the Safety Management System Standard for pipelines, as recommended by the National Transportation Safety Board. Currently, I work independently and have also served as a senior fellow with the Blacksmith Group of Houston, Texas. I conduct safety and operational audits of pipeline

companies, make recommendations for organizational improvements with emphasis on leadership, risk management, training, emergency response and safety.

Q. Have you previously submitted or prepared testimony in this proceeding in South Dakota?

A. No.

Q. What is the purpose of your testimony?

A. I will testify regarding pipeline oversight. Specifically, my testimony focuses on how the government oversees industry operations for positive safety and environmental outcomes. My testimony is in response, or to rebut, direct testimony filed by various interveners and expert witness, Brian Topp.

Q. Did you read testimony in preparation for your written rebuttal?

A. Yes.

Q. What fact witness, or intervener, testimony did you read?

A. I read testimony submitted by the following individuals: Corliss Faye Wiebers, Delores Assid, Devona Smith, Janice Elaine Petterson, Kevin John Schoffelman, Linda Ann Goulet, Margaret Hilt, Marilyn Murray, Matthew Anderson, Mavis Parry, Nancy Stofferhan, Peggy Hoogestraat, Rod and Joy Hohn, Ron Stofferhan, Shirley Oltmanns, Tom Stofferhan, Ruth Arends, Allen Arends, Lorrie Bacon and Sherrie Fines, Orrin Geide, Kent Moeckly, Sue Sibson and Laurie Kunzelman and the testimony of the applicant's witnesses.

My testimony is intended to address the concerns raised by individual interveners and clarify the role that PHMSA plays in the pipeline industry.

Q. What is PHMSA and what does it do?

A. Pipeline and Hazardous Materials Safety Administration is known as PHMSA. PHMSA is the federal agency which works in partnership with states to oversee the safety of oil and gas pipelines and all hazardous materials in transportation. PHMSA's pipeline safety program accomplishes its mission by identifying problems, setting the bar on where safety should be in regulation, educating and enforcing safety and environmental regulations. It conducts risk assessments, performs data analyses, conducts safety inspections and investigations, and makes grants to support state pipeline safety programs, outreach, training and research to advance technology.

PHMSA and its regulated community have reduced the number of pipeline incidents with death or major injury to below 40 since 2010, which is lower than the ten year average. The long term trend is an average decline of ten percent every three years. The safety performance of the oil pipeline industry has improved in the last 14 years. Pipelines transport over 14 billion barrels of crude oil, gasoline, diesel and jet fuel across our nation with more than 99.99 percent of those barrels reaching their destination safely. In the past decade, the risk of hazardous liquid spills with environmental consequence has declined by an average of five percent per year. All major causes of liquid petroleum spills were reduced in that same time frame, including corrosion, third party excavation and pipe material, seams and welds. Even age related threats can be managed effectively. The challenge remains to eliminate the lower probability/ high consequence incidents.

Q. Are you aware of South Dakota's history of hazardous liquid and natural gas pipeline incidents? If so, please provide detail.

A. I am aware. South Dakota experience reflects seven hazardous liquid and natural gas pipeline incidents between 2003 and 2014. Three of those incidents involved hazardous

liquid pipelines. Of the seven total incidents, three were excavation related, three were material/weld/or equipment related and one was corrosion related. Reports indicate no death or injury, less than 700 gross barrels and a net of 89 barrels lost, and property damage totaling $2 million from the seven events.

Q. How does the pipeline safety record compare to other modes of transportation for petroleum liquids?

A. U. S. Department of Transportation statistics show that pipelines have a better safety record than other modes of transportation for petroleum liquids.

Q. How does the age of the pipeline affect its safety?

A. As stated by the past chairman of the National Transportation Safety Board, Deborah Hersman, Janauary, 2013, "If a pipeline is adequately maintained and inspected properly, its age is not the critical factor. The condition of the pipe is the critical factor." In other words, I do not believe an aging pipeline is automatically a dangerous pipeline. The availability of new technology in the design, construction, operation and maintenance of this pipeline is significant, however, and I will address that later in my testimony.

Q. What does government do to influence or affect the maintenance of pipeline to assure their safety?

A. As much as I would like to say that it is in industry's interest to maintain its assets in good condition, the healthy tension of the regulator- regulatee relationship is a significant contributor to improved safety performance.

PHMSA has over 139 federal inspection and enforcement staff along with over 300 state inspectors. These folks are responsible for regulating nearly 3,000 companies that

operate 2.6 million miles of pipelines, 118 liquefied natural gas plants, and 6,970 hazardous liquid breakout tanks. The work of the inspectors has proven successful. PHMSA states in its budget that through its oversight programs, serious pipeline incidents have decreased by 37% since 2009.

PHMSA pipeline safety personnel report spending 60 percent of their time on inspections and investigations, of which 16 percent is spent inspecting the construction of new pipeline facilities. The balance is spent communicating with stakeholders, especially on excavation damage prevention and land use planning; working to continuously improve inspection methodologies and business processes and training.

While PHMSA serves as the federal pipeline safety regulator, pipeline operators must know, understand, and manage the risks associated with their own pipeline facilities. In addition to PHMSA inspections, operators frequently conduct internal reviews of their procedures, facilities, staff and emergency procedures. A recently published API Recommended Practice 1173 is expected to strengthen operators' required focus on safety assurance through their conduct of independent auditing and evaluation.

Q. Where do federal regulations fit into the analysis?

A. Pipeline safety regulations that establish minimum federal safety standards are a critical element of the safety analysis. Ensuring compliance involves regular inspections of pipeline operator programs and facilities and, when compliance violations are identified, the application of appropriate administrative, civil, or criminal remedies. Federal and state pipeline inspectors conduct these compliance inspections and also conduct accident investigations and respond to public complaints concerning

pipeline operations.

Pipeline safety regulations were originally established in the early 1970s and were based primarily on industry consensus standards in effect at the time. The regulations have been updated throughout the years with the addition of several significant new regulatory programs, including the Oil Spill Response Program, the Integrity Management Program, Operator Qualification Program and Control Room Management. As these took effect, OPS implemented an inspection program for each specific new regulatory program. Standard inspections are conducted to review operator compliance with the pipeline safety regulations originally put in place in the early 1970s. Both gas and hazardous liquid pipeline safety regulations include requirements for an operator to safely operate and maintain its pipeline systems. Inspectors review the operator's documented processes, procedures and records, they observe operator employees performing work in accordance with the operators processes and procedures, and check operating records to ensure the operator's pipeline systems are operated at or below the maximum parameters allowed by regulations. They also examine the operator's emergency procedures to determine if the operator is prepared to respond promptly and effectively if an abnormal condition or pipeline failure occurs.

In 2008, Office of Pipeline Safety (OPS) began pilot testing an integrated inspection process. By using data and information about a specific operator and pipeline system, an inspector can custom-build a list of regulatory requirements to be evaluated during an inspection. This data-driven process allows OPS to focus inspection resources on the regulatory provisions addressing the greatest identified risks. OPS maintains the ability to conduct the program-based inspections listed below, and has been conducting an

increasing number of integrated inspections since 2008. State partners may choose to conduct integrated inspections or continue with the program-based inspections.

Q. What is an oil spill response plan?

A. The Oil Pollution Act of 1990 requires the preparation of spill response plans by operators that store, handle, or transport oil to minimize the environmental impact of oil spills and to improve public and private sector response. DAPL has provided testimony that they have in fact already drafted the required plan. PHMSA reviews response plans submitted by operators of onshore oil pipelines to ensure the plans comply with PHMSA regulations. These plans also must be regularly updated by the operator and submitted for subsequent review by PHMSA. PHMSA also seeks to improve oil spill preparedness and response through data analysis, spill monitoring, mapping pipelines in areas unusually sensitive to environmental damage, and advanced technologies to detect and prevent leaks from hazardous liquid pipelines.

Q. Will Dakota Access be required to prepare and submit such a plan to PHMSA?

A. Yes.

Q. Does the Oil Pollution Act (OPA) provide any funding to help relieve some of the financial cost of an oil pipeline spill? Some landowners have expressed concern about the lack of South Dakota funding for such an eventuality.

A. Yes. In August 1990, the Oil Pollution Act was signed into law and authorized the use of the Oil Spill Liability Trust Fund. It consolidated the liability and compensation requirements of certain prior federal oil pollution laws. With the consolidation of these funds and the collection of a tax on the petroleum industry, the funding level was $1 billion. Fund uses include removal costs incurred by the U.S. Guard and the EPA in

response to an oil spill, state access for removal activities, payments to federal, state and Indian tribe trustees to conduct natural resource damage assessments and restorations, payment for claims for uncompensated removal costs and damages, and other specific appropriations like PHMSA's review and approval of the DAPL response plan. The OPA defines the conditions under which costs and damages may be recovered. Claim types include natural resources damages, removal costs, property damage, loss of profits and earning capacity, loss of subsistence use of natural resources, loss of government revenue, increased public services, and other claims.

Q. What are the various types of inspections that PHMSA will perform on the Dakota Access pipeline?

A. The following inspections will be performed: Standard Inspections, Integrity Management Program Inspections, Operator Qualification Inspections, Control Room Management Inspections, New Construction Inspections and review and approval of the oil spill response plan. There could be other forms of inspections as well.

Q. What is an Integrity Management Program (IMP) Inspection?

A. The goals of the IMP program are to improve pipeline safety through accelerating the integrity assessment of pipelines in High Consequence Areas, improving integrity management systems within companies, improving the government's role in reviewing the adequacy of integrity programs and plans, and providing increased public assurance in pipeline safety.

The initial integrity management rule for hazardous liquid pipelines applied to operators with more than 500 miles of pipeline. It became effective May 29, 2001. A rule change effective February 15, 2002, made the rule applicable to owners of all hazardous liquid

pipelines.

In the context of pipeline operations, the term "integrity" means that a pipeline system is of sound and unimpaired condition and can safely carry out its function under the conditions and parameters for which it was designed. "integrity management" (IM) encompasses the many activities pipeline operators must undertake to ensure the integrity of their pipeline systems. The IM regulations are tailored to each pipeline system type. Inspections of IM programs generally verify that an operator uses all available information about its pipeline system to assess risks and take appropriate action to mitigate those risks. Inspections include reviewing the written IM program and associated records.

The Liquid IM Rule specifies how pipeline operators must identify, prioritize, assess, evaluate, repair and validate the integrity of hazardous liquid pipelines that could, in the event of a leak or failure, affect High Consequence Areas (HCAs) within the United States. HCAs include: population areas; areas containing drinking water and ecological resources that are unusually sensitive to environmental damage; and commercially navigable waterways.

Key features include providing enhanced protection for HCAs which have been mapped by PHMSA and made available to industry. Hazardous liquid pipeline operators must develop a written IM Program. Within this plan, an operator must specify by what methods it can demonstrate condition and provide a schedule for assessment of each segment, and explain risk factors used in scheduling the assessments. An operator's IM Program must include a process for continual integrity assessment and evaluation, an analytical process that integrates all available information about pipeline integrity and the

consequences of a failure, repair criteria to address issues identified by the integrity assessment method and data analysis, a process to identify and evaluate preventive and mitigative measures to protect HCAs, methods to measure the integrity management program's effectiveness, and a process for review of integrity assessment results and data analysis by a qualified individual. An operator must perform periodic integrity assessments (i.e., continual integrity evaluation and assessment) on line segments that could affect HCAs at intervals not to exceed 5 years. The rule requires that certain defects identified through internal inspection be repaired within defined time limits. In evaluating the integrity of the line, the operator must integrate all available information, including information about the potential impacts of a release on drinking water intakes and other sensitive areas.

Operators must conduct risk analyses for the line segments that could affect HCAs. These analyses should identify and evaluate the need for additional preventive and mitigative actions to protect drinking water. Operators must explicitly evaluate the need for emergency flow restricting devices and enhancements to leak detection systems to protect HCAs.

Q. How are the preventative and mitigative measures relevant to the concerns of South Dakota landowners?

A. I understand that landowners have concern about leaks into water and the watershed area. The IM rule is designed to bring more protection to drinking water and environmentally sensitive areas. PHMSA requires the DAPL operator to consider how its pipeline can affect these areas – not just whether these areas are crossed, but if they could be affected in the event of a leak or failure, considering terrain and weather. This is a high standard

to consider.

First, operators are required to have a means of detecting leaks and they must evaluate and consider if the means is adequate to protect the high consequence areas. The evaluation must include the length and size of the pipeline, the product carried, the proximity to the high consequence area, the swiftness of the leak detection, location of nearest response personnel, and risk assessment results. There are many ways an operator may detect leaks. DAPL has provided testimony that within their control system, they will use a form of computational pipeline monitoring that must comply with PHMSA standards. The standard speaks to design, operation and maintenance, including instrumentation, alarms, controller response, analysis, testing, training, control limits, how data is displayed and presented and the man-machine interface and relationship. Other PHMSA regulations on control room management go even further to address factors like fatigue. The computational pipeline monitoring is more advanced leak detection that those used in many older liquid pipeline systems.

The IM program also requires devices operators must use to limit the amount of product released in the event of a leak or rupture. This device could be a check valve or a remotely controlled valve. DAPL has provided testimony that in the 274.65 miles of proposed pipeline in South Dakota, their design calls for 40 main line valve which can be remotely activated and locally activated. They IM rule requires the evaluation of right of way information about the population and the environment in the consideration of placement of these valves including terrain surrounding the segment, drainage systems such as small streams and other small waterways that could act as a conduit to high consequence areas, elevation profile, possibility of a spillage in a farm field following the

drain tiles into a waterway, and ditches alongside a roadway the pipeline crosses, among other factors. DAPL testimony states that the design for placement of the 40 valves was based on the PHMSA requirements for protection of high consequence area locations.

Q. Will Dakota Access be required to submit an IM Plan for Inspection?

A. Yes.

Q. What are Operator Qualification (OQ) Inspections?

A. In 2001, pipeline safety regulations were revised to require pipeline operators to document the training and qualifications of their employees. Operators are required to prepare a written operator qualification program that identifies employee positions that perform safety-sensitive operation or maintenance tasks. Employees in these positions must be trained and tested to ensure they have the necessary knowledge, skills and abilities to perform each task, as well as to recognize and react to emergencies that may arise while performing those tasks.

PHMSA and state inspections verify that operators have created acceptable OQ programs and identified all safety-sensitive employee positions. Inspectors also review records to verify that employees in these positions have been trained and tested. Operator employees performing operations and maintenance tasks are observed to ensure the tasks are completed in accordance with the operator's program.

Q. Will Dakota Access be subject to Operator Qualification Inspections?

A. Yes.

Q. What are Control Room Management (CRM) Inspections?

A. PHMSA amended the pipeline safety regulations to prescribe safety requirements for controllers, control rooms, and SCADA systems used to remotely monitor and control

pipeline operations. The regulations address human factors engineering and management solutions for the purpose of enhancing the performance reliability of operator personnel that control pipeline operations. This rule will generate significant public benefits by reducing the number and consequences of shortfalls in control room management practices and operator errors when remotely monitoring and controlling pipelines and responding to abnormal and emergency conditions. By improving control room management, it is expected that leaks or abnormal events can be identified and responded to at the soonest possible time, hopefully mitigating the consequences to a minimum event. For this critical new regulation that addresses human factors and human operational performance, the inspection guide for federal and state inspectors performing CRM inspections is 55 pages.

Q. Will Dakota Access be subject to Control Room Management Inspections?

A. Yes.

Q. What are New Construction Inspections?

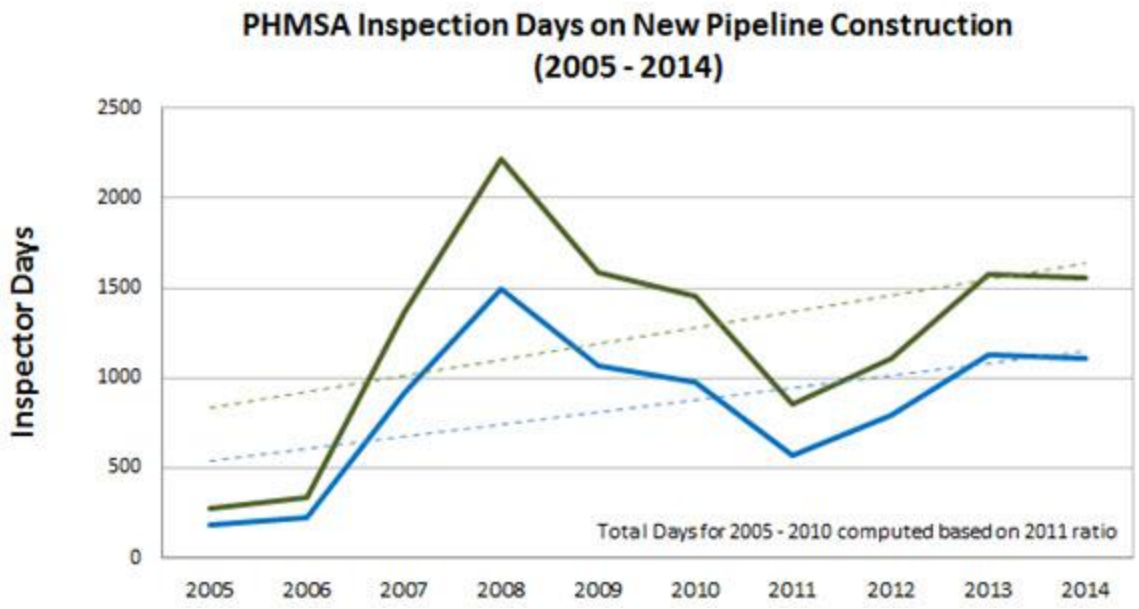
A. PHMSA's responsibility in pipeline construction is assuring that the pipeline will operate safely once it is placed in service. PHMSA has established regulations governing aspects of pipeline design and construction and conducts inspections of pipelines under construction in order to fulfill this responsibility.

Requirements related to pipeline design and construction are in Chapter 49 of the Code of Federal Regulations (CFR). 49 CFR Part 195 established requirements for hazardous liquid pipelines. Design requirements address such issues as the required strength of pipe for certain applications and the design of components that will be attached to the pipeline. Requirements specifically addressing construction issues include how welding must be

performed, limitations on pipe bending, installing pipe in the ditch, and the required depth of burial.

PHMSA inspects pipeline construction to assure compliance with these requirements. Inspectors review operator-prepared construction procedures to verify that they conform to regulatory requirements. Inspectors then observe construction activities in the field to assure that they are conducted in accordance with the procedures.

There has been a significant jump in the amount of pipeline under construction in the past few years. PHMSA has responded to this increase by devoting more of its inspector's time to performing construction inspections. The graph below shows the number of inspector-days per year devoted to inspecting pipeline construction.



		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	Total Days	277	333	1364	2221	1585	1450	853	1109	1581	1554
	Days AFO*	186	224	916	1492	1065	974	573	790	1127	1107

* Away from office

Data as of 02/26/2015

Since 2007, the pipeline industry has experienced unparalleled growth driven by the need to satisfy the Nation's energy demand and bring new sources of supply to the market. As a result, PHMSA has stepped up the number of new pipeline construction inspections performed each year. Through new construction inspections performed during the 2008 through 2010 pipeline construction seasons, PHMSA inspectors discovered issues requiring immediate operator remediation prior to the pipeline being placed in service or requiring pressure reduction to assure pipeline integrity. Issues discovered during PHMSA inspections have included poor quality control and procedures for welding,

coating, fittings, hot bends, and pipe; as well as inadequate operator inspection and general construction practices.

PHMSA has met with operators constructing new pipelines on several occasions to discuss issues found during inspection. In an effort to reach out to all member of the pipeline industry, PHMSA hosted a workshop in collaboration with its State partners, the Federal Energy Regulatory Commission (FERC) and Canada's National Energy Board (NEB) in April 2009. The objective of the workshop was to inform the public, alert the industry, review lessons learned from inspections, and to improve new pipeline construction practices prior to the 2009 construction season.

In 2009, PHMSA challenged industry leaders to come up with a plan or practice to resolve these issues. A letter was sent by PHMSA to industry trade groups to encourage their members to have quality action plans in place for each new pipeline construction project. PHMSA has received responses from all the trades concerning their efforts to resolve new pipeline construction issues and enforce and maintain best practices including technical work groups that have developed improved practices to resolve these quality issues.

As reported in its recent budget, PHMSA knows how important it is to get pipeline construction right. PHMSA is aware of the potential impact on pipeline integrity that can occur should the pipeline not be constructed to the highest standard. PHMSA is committed to continue its focus on new pipeline construction and inspections.

PHMSA inspectors spent nearly ten times as many days on construction inspections in 2008 as they did in 2005. The number of inspection days has decreased from this peak,

but is still nearly six times the 2005 value. PHMSA has found that the procedures for most pipeline construction projects are adequate and reflect the recommendations of consensus standard and inspects to assure the procedures are followed.

Quality control (QC) is used on pipeline construction projects to assure that the quality of construction meets required specifications. It is an extra layer of defense beyond having adequate procedures and doing things correctly. QC can find problems which are indicative of problems in construction. The correct response from operators is to identify the reasons why the construction problems are occurring and correct them. The owners of pipeline projects are responsible for assuring that their construction personnel are adequately qualified. Pipeline operators need to assure that their specification are adequate. They must also assure that steel and pipe mills, fitting and manufacturers have and follow quality management programs design to ensure the production of quality materials. Finally, operators need to inspect the materials that they receive, including during manufacturing, to assure that their specifications have been met.

Q. Will Dakota Access be subject to New Construction Inspections?

A. Yes.

Q. What role does new technology play in making a new pipeline safer than pipelines constructed in past decades?

A. For many years, pipeline experts have conducted historical pipeline performance reviews. Both PHMSA and the industry are involved in funding these studies. Operators in most recent times have many advantages over operators of past decades by making improvements in pipe manufacturing, design, construction and maintenance.

Technological improvements increase safety performance and improve pipeline resistance to forces that contribute to leak or failure.

The improvements are in the people, the practices and the technology --- hardware and software. The pipelines built today are constructed with improved materials, better construction management practices, better installation, greater depth of cover, improved backfilling practices and higher quality coatings. All such improvements make the pipe more resistant and able to withstand penetration and stresses and help the coating stay adhered to steel.

In addition, corrosion prevention, including cathodic protection technology, is more advanced. We now have the myriad of diagnostic techniques better able to discriminate and characterize defects to help operators evaluate pipe condition and prioritize repair and corrosion program adjustment. Better mapping and information management and data integration also help operators with risk management and decision making. Other improvement have been made in the area of aggressive damage prevention programs. Such programs include right of way marking, the support of one call centers and creation of 811, (call before you dig).

Leak detection technologies are improving along with control room management and monitoring systems. Valve design, placement and automation work better to respond more rapidly in the event of a release. New standards are in place for safety management systems designed to bring leadership, management and safety assurance practices to a higher level of performance. These mechanical and technological advances, along with the focus on a culture of safety, cause for a better safety management systems.

Q. Do PHMSA regulation speak to the concerns of South Dakota landowners about a possible future decommissioning of the DAPL?

A. Yes. Should DAPL decide to decommission or deactivate their pipeline, DAPL would be required to report to PHMSA. Such a report includes: the date of abandonment, pipe diameter, method of abandonment and certification that, to the best of the operator's knowledge, all of the reasonable information requested was provided and that the abandonment was completed in accordance with applicable laws. Abandonment includes safe disconnection from an operating pipeline system, purging of combustibles and sealing abandoned facilities left in place to minimize safety and environmental hazards. This requirement applies to onshore pipeline operators that cross over, under or through commercially navigable waterways. I believe in this case, the DAPL crosses the Sioux River, portions of which are classified as federally "navigable." Pipe is either considered active or abandoned. If the pipe is standing idle, not currently being used to move hazardous liquid, but could be put in service at a later date, then the idle pipeline is still subject to the integrity management rule.

Q. Does this conclude your testimony?

A. Yes.

Dated this _____ day of August, 2015

_____

Stacey Gerard

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE PROJECT	))))))	HP14-002

REBUTTAL TESTIMONY OF

AARON DEJOIA

ON BEHALF OF

DAKOTA ACCESS, LLC

DAKOTA ACCESS EXHIBIT

August 14, 2015

Q. Please state your name, present position and business address.

A. My name is Aaron DeJoia. My business address is: 4626 CR 65 Keenesburg, Colorado 80643. I am employed by Duraroot, LLC as a Principal Soil Scientist/Agronomist.

Q. What is your educational and professional background?

A. I have a BS degree in Agriculture (Agronomy) and a MS degree in Agronomy (Soil Fertility) from Kansas State University.

I have worked as an environmental soil scientist since 2000. Currently I am a Principal Soil Scientist/Agronomist with Duraroot, LLC based in Colorado. A majority of my work since 2004 has been focused on the reclamation of drastically, disturbed lands in agricultural, prime farmland, and rangeland/pasture settings throughout the United States. I have studied the effects of various restoration techniques and helped to design and implement successful reclamation plans for oil and gas exploration pads, pipeline right-of-ways, mines, and roadways. I have particular expertise in agricultural land and saline/sodic soil restoration.

Q. What professional credentials do you hold?

A. I am a Certified Professional Soil Scientist, through the Soil Science Society of America, Certified Professional Agronomist and Certified Crop Advisor, through the American Society of Agronomy, and a Certified Inspector Sediment and Erosion Control. All of these certification programs have required me to take and pass written tests and show education and professional experience in the chosen industry. I have had to sign ethics pledges for all three certification that require me to provide ethical services to my clients and the greater community. I have also passed the practical field examination for being licensed as a soil classifier in the state of North Dakota and am currently in the process of

providing the required paper work and work history to the Professional Soil Classifier Board in North Dakota. The certification that I currently hold are the highest certifications that can be obtained for Soil Scientists and Agronomists in the United States.

Q. Have you previously submitted or prepared testimony in this proceeding in South Dakota?

A. No.

Q. What is the purpose of your testimony?

A. My testimony is in response, or to rebut, direct testimony filed by various interveners, and expert witness, Brian Top. In addition, I will address concerns PUC Staff Expert witnesses raise. I will testify specifically address issues within my area of expertise; which includes soil, water, vegetation, agronomic and reclamation related issues.

Q. Did you read testimony in preparation for your written rebuttal?

A. Yes.

Q. What fact witness, or intervener, testimony did you read?

A. I read testimony submitted by the following individuals: Corliss Faye Wiebers, Delores Assid, Devona Smith, Janice Elaine Petterson, Kevin John Schoffelman, Linda Ann Goulet, Margaret Hilt, Marilyn Murray, Matthew Anderson, Mavis Parry, Nancy Stofferhan, Peggy Hoogestraat, Rod and Joy Hohn, Ron Stofferhan, Shirley Oltmanns, Tom Stofferhan, Ruth Arends, Allen Arends, Lorrie Bacon and Sherrie Fines, Orrin Geide, Kent Moeckly, Sue Sibson and Laurie Kunzelman.

Q. Are you aware that, aside from Kent Moeckly and Sue Sibson, the listed fact witnesses either own land or have a strong connection to land along the proposed Dakota Access Project?

A. Yes

Q. Based on the work you do, do you understand the concerns of these land owners have?

A. Absolutely. Having grown up in a small rural community in North Central Kansas that is supported by the local agricultural community, I appreciate how important the land is to those that depend on it for their livelihood. In addition, I read about the family and historical connection these land owners have to their land. Their concerns are well received and I am glad for this opportunity to respond to those concerns.

Q. Did you note several common concerns among the land owners? If so, what were they.

A. I did notice several common concerns. I will address each of them individually:

I. NATURAL WATER WAY RECONSTRUCTION

Natural waterway reconstruction after pipeline installation is an important aspect for any well-functioning ecosystem. It is very important for the natural waterways crossed by the right-of way to be reconstructed properly to protect both the sensitive environment and valuable pipeline asset. The slopes approaching the natural waterways will need to be returned to the natural contours and stabilized using appropriate erosion control devices and seeded with appropriate seed mixes. The use of erosion control devices will stabilize the slopes until the newly planted vegetation can establish. In the actual waterway it is

critical that the pre-construction channel slope is returned so that the natural stream habitat and natural flow process are not altered.

II. AFFECT ON STOCK DAMS

In my opinion, the Dakota Access pipeline will have no effects on dams that are either not crossed or are in close proximity of the pipeline right-of-way if erosion control devices are properly placed and maintained during construction as outlined in the Storm Water Pollution Prevention Plan.

III. PRODUCTION ABILITY OF AFFECTED TILLABLE ACRES

The yield potential of tillable lands after pipeline right-of-way restoration is required to be at least equal to pre-disturbance yield potential levels. I have worked on many pipeline projects throughout the nation, including some of the best farmland in North America, and in all cases that I know of these lands have been as productive following pipeline construction as they were prior to construction of the pipeline. Pipeline projects that I have worked on and have helped or observed the return of farmland to its original state of productivity include Rockies Express (Nebraska, Kansas, Missouri, Illinois, and Indiana), Bison Pipeline (Montana, and North Dakota), Alliance Pipeline (Iowa) and others. In a very few instances some of the farmland did take longer than the allotted crop loss payment period to return years but these were a very few areas that had special circumstances that were returned to pre-disturbance yields once limiting factors were addressed

Pipeline construction is not always completed during optimal site conditions however if a good plan is utilized and proper reclamation techniques are implemented returning the

productivity of the sites can be accomplished. Time is a critical element for returning farmland productivity to it pre-disturbance productivity.

Based on my experience if proper reclamation techniques are utilized and landowners/tenants work with the pipeline company productivity can be returned to pre-disturbance conditions within 3 years. However, if the landowner/tenant interrupt the reclamation process good intention practices such as, additional unnecessary tillage, can short circuit the process and cause productivity lags for extended periods. However it should be recognized, the reclamation process is conducted on natural, dynamic systems and I have witnessed isolated areas where it has taken longer than 3 years to return crop productivity to pre-disturbance conditions. Keep in mind, these have been very isolated and typically it was due to a variety of site-specific situations, but in all instances the land was eventually returned to full productivity at the end of the project.

IV. REHABILITATION OF GRAZING/PASTURE GROUND

The rehabilitation (revegetation) of grazing/pasture land takes time, effort and science but certainly can be accomplished if an appropriate revegetation plan is used. As with all revegetation of disturbed areas the soils are the foundation and must be managed appropriately during the construction and revegetation process. Dakota Access is addressing this very important resource by segregating topsoil during the construction phase.

Once the soil is protected, an appropriate seed mixture is required to effectively protect the replaced soil and begin to redevelop the natural vegetative community. Dakota Access is in the process of working with the NRCS and landowner/tenants to develop appropriate and desired seed mixtures for the construction areas. Proper restoration can

only be achieved if the planted seed mixture and resulting crop has a non-compacted root zone to explore and obtain required water and nutrients. Compaction can occur when the soil compresses and soil porosity is decreased by forces exerted by heavy equipment such as tractors, grain carts, combines, dozers and other construction equipment travel across the soil surface. Decompaction is the process of physically removing the induced from the soil. Decompaction can be performed by either mechanical or natural processes. The mechanical process typically used in agricultural setting to remove soil compaction is deep ripping. Deep ripping generally is a process where the soil is lifted and shattered. Crop roots are the primary natural process to alleviate soil compaction the crop roots travel through the pore space and as they grow they widen the pore spaces and decrease soil compaction. Natural process take longer to remove compaction therefore to enhance the restoration processes mechanical decompaction is the preferred alternative. Dakota Access is committed to all best management practices, including rooting zone decompaction in areas where decompaction would help promote growth and sustainability.

Finally, replanting of grazing/pastureland must be performed in an appropriate manner that provides a conducive environment for germination plant, establishment and growth. The seeds must be planted at the right depth, right time and into an appropriate seed bed. Dakota Access is currently working with the local county, state, and federal agencies to develop appropriate seed mixes for the project. The use of reclamation techniques and seed mixes such as those developed and being developed on by Dakota Access will provide the rehabilitation success that is expected for this project.

V. REHABILITATION OF SOIL STRUCTURE

With any soil excavation procedure soil structure (pores) will be damaged and some soil structure will definitely be destroyed during the construction process. However, it should be noted that a majority of soil structure loss is due to the excavation and movement of the soil material and compaction. Research indicates that the soil structure and associated pores can quickly redevelop in the soil profile. Sencindiver and Ammons (2000) and Haering et al. (1993) indicate that in mine soils, soil structure in the surface horizons have developed soil structure within 1 to 2 years. The time it takes for the surface horizon to begin to redevelop soil structure has been anticipated and is one of the reasons Dakota Access is offering crop loss payments for multiple years post construction. The development of soil structure in the subsurface horizons can take longer depending on the degree of decompaction and root growth that can be established. Dakota Access Agricultural Mitigation Plan includes soil compaction relief of the subsoil to ensure that rooting is not limited by soil compaction.

VI. REHABILITATION OF LAND'S NATURAL CONTOUR AND SLOPES

According to all documents that I have reviewed Dakota Access is committed to returning the land back to original contour and slopes.

VII. WEED CONTROL IN AFFECTED AREAS

Weed management of a pipeline right-of-way is necessary to achieve reclamation success. The use of Integrated Weed management (IWM) is the most effective and appropriate weed management. IWM evaluates the uses cultural, biological, mechanical and chemical weed control methods based on weed pressure, weed type, reclamation time frame and establishing vegetation. It should be noted that IWM protocols understand that

a fully functioning rangeland or cropping system is the most effective manner to control weedy species.

Cultural practices may include limited access, or education to limit the spread of weedy species by construction personnel and equipment. Cultural practices are some of the most effective ways to inhibit the spread of noxious and invasive weeds along a pipeline right-of-way. Biological practices are usually of limited use along the right-of way due to limited options and time required for control. However, biological control of weedy species may be reviewed especially near sensitive resources and organic farms.

Mechanical control (i.e. Mowing, clipping, hand removal) of weeds is an effective manner of weed control during the beginning stages of right-of-way reclamation. Mechanical weed control general is effective against weedy annual species and certain perennial species (i.e. Canada Thistle) especially in the initial year or two of plant establishment in range or pasture land when the reclamation crop is susceptible to chemical applications. Mechanical methods allow for the newly establishing crops to continue their life cycle and start to outcompete the weedy species. Chemical methods (herbicides) of control will be evaluated on a site by site basis as with all other potential control methods. In certain instances the use of broadcast spraying may be utilized however the preferred chemical control method will be spot spraying. Spot spraying allows for a more directed application that will limit the potential damage to desired species that are within the right-of-way. In organic farming areas chemical weed control will not be utilized to ensure that the organic status of the land is maintained.

VIII. OVERALL SUCCESS OF RESTORATION

Restoration success will be evaluated on a site-by site review. In agricultural areas site restoration will be successful when the post-construction yield potential is equivalent to existing off-ROW areas. This determination will be conducted through visual and data review of crop growth and yields. In rangeland areas restoration success is initially achieved when the site is returned back to 70 percent of off-ROW coverage as defined in the Storm Water Pollution Prevention Plan.

Q. Did you read expert witness Brian Top's testimony?

A. Yes.

Q. Do you have any comments regarding his concerns for topsoil segregation and stockpiling?

A. Yes. Mr. Top is correct, separating topsoil and stockpiling topsoil must be done carefully and correctly.

Q. Explain whether Dakota Access' plans for soil separation and stockpiling are adequate to protect the soil.

A. The method for topsoil and subsoil removal and segregation is outlined in Dakota Access' Agricultural Mitigation Plan. According to Dakota Access' plan all topsoil and subsoil will be separated and segregated in separate stockpiles. Topsoil will be salvaged to a depth of up to 12 inches. The top 12 inches of topsoil contain the most plant nutrients and microbial life and is critical for successful reclamation. After the pipeline is installed and all drain tiles are fixed the segregated subsoil stockpile will be returned to the trench. Once the trench line is replaced the subsoil will be decompacted to 18 inches or to a little less than the depth of the drain tiles, as to not compromise the drain tile integrity. After

the subsoil is decompacted the topsoil will be replaced and smoothed with a tillage implement, if necessary.

The topsoil and subsoil methods outlined in Dakota Access' agricultural mitigation plan is a common and successful practice in the pipeline industry. This method of topsoil salvage and segregation is the most successful and scientifically proven method to protect the soil resource and return the soil to 100 percent yield potential as quickly as possible. In addition, this method of topsoil segregation provide the highest level of protection for the topsoil and is intended not to allow for mixing of the topsoil and subsoil resources.

Q. Mr. Top testified that pores in subsoil will be destroyed. Do you agree?

A. To a point. With any soil excavation procedure soil structure (pores) will be damaged and some soil structure will definitely be destroyed during the construction process. However, it should be noted that a majority of soil structure loss is due to the excavation and movement of the soil material and compaction. To limit this decrease in soil structure from excavation processes Dakota Access will only remove the topsoil, up to 12 inches, and only the subsoil directly over the trench line. Research indicates that the soil structure and associated pores can quickly redevelop in the soil profile. Sencindiver and Ammons (2000) and Haering et al. (1993) indicate that in mine soils, soil structure in the surface horizons have developed soil structure within 1 to 2 years. The time it takes for the surface horizon to begin to redevelop soil structure has been anticipated and is one of the reasons Dakota Access is offering crop loss payments for multiple years post construction. The development of soil structure in the subsurface horizons can take longer depending on the degree of decompaction and root growth that can be established.

Dakota Access Agricultural Mitigation Plan includes soil compaction relief of the subsoil to ensure that rooting is not limited by soil compaction.

Q. Mr. Top testified that it will take ten years or longer for the soil to regain its productivity. Do you agree? Why or why not.

A. No. I have been on many pipeline projects that crossed agricultural fields and have seen most of the sites that used reclamation techniques similar to those identified in Dakota Access' Agricultural Mitigation Plan, back to full productivity in 3 growing seasons post-construction. The sites that were not back to full productivity within the first 3 growing seasons, that I have reviewed and evaluated, the potential problems were addressed and remedied and within 1 to 2 growing seasons, after solving the identified issues and productivity was returned to pre-disturbance levels.

Q. Mr. Top testified that it will take 20 years or more for soil compaction issues to be remedied. Do you agree? Why or why not.

A. No. Soil compaction is a physical condition of the soil where the soil is compressed and the voids are removed due to a force exerted on the soil surface. Compaction is a common problem in agricultural fields due to tractors, loaded grain carts, combines and other equipment passing over the site. The installation of a pipeline is likely going to cause soil compaction however Dakota Access' Agricultural Mitigation Plan aggressively addresses the removal of this potential compaction. The use of mechanical equipment is the initial step for alleviating soil compaction. Such mechanical equipment, is primarily a deep ripping implement that lifts and shatters the soil, creating channels that roots and water can follow to help further decompact the soil and begin the process of increasing soil structure. It is important to note that once decompacted, traffic on the ROW should

be kept to a minimum for the following year. Planting an appropriate crop such as alfalfa, corn, cover crops or other deep rooted crops following deep ripping is important to keep the newly created voids open. Note, excessive tillage or use of the ROW could easily decrease the beneficial effects of the previously completed ripping.

Depending on freeze-thaw cycles to decompact a soil is a common misconception. To be effective you must have multiple freeze-thaw cycles within a given year. In South Dakota multiple freeze-thaw cycles likely only occur in the upper 8 to 12 inches of the soil profile, the remainder of the soil profile typically does not have multiple freeze-thaw cycles. Below the very upper portion of the soil profile soil temperature fluctuates very little over a course of a day or week and once frozen in the fall the soil will likely not thaw again until the spring at which time it likely will not refreeze until the following fall. This is why in pipeline reclamation we actively manage the decompaction and use the proper equipment to speed up the natural decompaction processes. The use of an active management allows us to achieve and maintain decompaction within the initial 1 to 2 growing season post-construction.

Q. Mr. Top testified that insects and diseases will survive winter due to the increase in heat surrounding the pipeline. Do you agree? Why or why not.

A. No. There have been a limited number of studies reviewing soil temperature changes due to pipeline installation. The research indicated that soil warming from heated cables, buried at 36 inches and heated to 96 degree Fahrenheit, increased soil temperature by less than 5 degrees Fehrenheit (Rykbost et al., 1975). The Dakota Access pipeline will be

buried at least a foot deeper than the cables in the Rykbost et al. study, thus, logically indicating that surface soil warming will be less than that identified in the study. Rykbost et al. also indicated that corn yields were increased due to this slight soil warming. Dunn et al. (2008) found that yields were not affected by an increase in soil temperature due to pipeline heat. Although none of these studies directly measured insects and disease persistence due to pipeline heating it is apparent that yields were not negatively impacted. In my professional career as an agronomist working on pipelines throughout the country I have never seen an increase in insect or disease pressure on a pipeline ROW compared to off-ROW conditions.

Q. Is it possible to rehabilitate and re-vegetate native prairie ground? Are Dakota Access' plans in this regard adequate?

A. Yes, and Yes once seed mixes are developed for this area.

Q. Did you read testimony written by PUC Staff expert witness Andrea Thornton?

A. Yes

Q. Do you have any comment, question or take issue with any of her testimony?

A. It is my opinion that Ms. Thornton provides a good assessment of the revegetation and erosion control plan. Ms. Thornton's two, most significant, requests are for Dakota Access to provide a winter construction plan and an in/out crossing table of soil limitations. Ms. Thornton's requests are requirements for a Federal Energy Regulatory Commission (FERC) applications. The Dakota Access pipeline is not a FERC regulated project and those requirements are not applicable to this project. In addition, the preparation of an in/out crossing table of soil limitations is only as accurate as the soil survey from which it is developed. South Dakota soil surveys were developed as Order 2

soil surveys which typically has a minimum delineation of about 1.4 acres. This means that potentially different soil series can exist within each delineated soil map unit. Therefore the in/out tables could be incorrect and existence of soil series with more or less limitations could exist through the pipeline ROW. These tables can create a belief that conditions exist that are not actually present on the ground. Dakota Access will employee qualified, professional EIs who will be responsible for making site specific decisions based on actual field conditions. It is my opinion that the use of in/out tables would decrease the ability of the EIs to make the best field-based erosion control decisions and will decrease environmental protections. The inclusion of a Winter Construction Plan may be warranted if a large portion of the ROW will be constructed during winter. However by utilizing qualified, professional EIs in the field, their experience and knowledge of site specific conditions will likely be more protective of the environment than a broadly written Winter Construction Plan. Further, to my knowledge, winter mainline construction is not anticipated.

Ms. Thornton also requests that a more quantifiable measurement to determining revegetation success is identified. Ms. Thornton suggests that "sufficient coverage in upland areas is defined when vegetation has a uniform 70 percent vegetative coverage". Dakota Access has a defined vegetative metric *of 70 percent cover relative to undisturbed areas* in Section 5.0 of the filed SWPPP. The vegetative metric expressed by Dakota Access is the standard vegetative cover requirement promulgated by the EPA for termination of a Storm Water Pollution Prevention Plan. Clearly, Dakota Access should

not be required to improve the vegetative coverage to greater levels than previously existed prior to construction activities.

Q. On page 5 of her testimony, she recommends "that the PUC require that pre-construction design efforts include best management practices specific to locations with higher erosion potential." Do you have a response or a position based on her proposed PUC condition?

A. Yes, The use or design of pre-construction best management practices are not necessary since the Dakota Access pipeline will be using qualified, professional and experienced EIs during construction. The construction activities will temporarily change the conditions of the ROW and by implementing site-specific pre-construction BMPs, this limits the EI's ability to quickly and effectively adjust to actual site conditions in the field. I would recommend that the potentially higher erosion potential areas be identified so the EI is aware that these areas may need additional erosion control devices installed but selection and placement of BMPs should be decided upon actual site conditions and the EIs field experience.

Q. Also on page 5, Ms. Thornton recommends "the PUC require a mile post in/out table showing the areas that are more prone to erosion so the environmental inspectors can have the data more readily accessible during construction and restoration to know where the more problem areas expected to be." Do you have any comments or concern regarding Ms. Thornton's recommendation?

A. Yes, It is my opinion that the EI should be aware of these potentially sensitive areas but the use of mile post in/out tables is one of multiple ways that these areas could be identified. In/out tables are not required for this project. The problem I have with mile

post in/out area is that the tables are created based on remote sensed data. Remoted sensed data is a place to start, but as every farmer/rancher knows you cannot not correctly manage and protect a natural resource from behind a desk. By using in/out tables it will install a sense of protection through paper, however to truly manage and protect a natural resource one must use real time in the field data. Remoted sensed data use can lead to larger problems during the construction phase by concentrating on areas that were identified as sensitive from a desk and not the areas that are being impacted by construction. It is recommended that the EIs be made aware of the potential problem areas in some manner so that they are aware of the potential problem but other methods such as advance scouting, GIS map layers, site inspections or other methods will provide better information to the EIs in the field.

Q. On page 5 of her testimony she recommends that the PUC "require a more quantifiable measurement to determine when re-vegetation is successful." Do you know if Dakota Access has a quantifiable standard? If so, what is that standard and do you believe it is sufficient?

A. Yes, Section 5.0 of the Storm Water Pollution Prevention Plan, Dakota Access has identified that the site will be considered "completely stabilized" when the perennial vegetative cover has reached a uniform cover of at least 70 percent of the pre-construction cover. As I mentioned above this is the industry and regulatory standard and is sufficient. This is a very quantifiable and sufficient criteria to identify successful re-vegetation.

Q. On page 6 of her testimony, Ms. Thornton expresses some concern regarding the seed mixture for re-vegetation in grassland areas. What does Dakota Access intend to use as a seed mix? Do you have any concern with Dakota Access' plan?

A. Yes, The current seed mixture in the Dakota Access Storm Water Pollution Prevention Plan indicates that German Foxtail Millett and Bermuda grass. Bermuda grass is not an appropriate grass for the South Dakota. Dakota Access is in the process of working with the NRCS in South Dakota to develop more appropriate seed mixtures for the area. Appropriate seed mixtures at correct rates are a critical aspect of any successful reclamation plan. In my opinion, if Dakota Access works with the NRCS and individual landowners/tenants on developing appropriate seed mixture then reclamation can be successful.

Q. Do you believe site specific measures should be developed at this point in the process as it pertains to fertilizer and agricultural lime?

A. No, I believe that site specific agricultural amendments should not be developed until the construction is underway on the ROW. Many farmers and ranchers have intense and calculated fertilizer and soil amendment programs. If site-specific plans are developed too early Dakota Access could negatively impact these on-going management programs. For instance, if the farmer is an a two year phosphorus program and just applied phosphorus this fall and Dakota Access samples immediately after that application but is performing construction during the next application period they may not apply the appropriate phosphorus during reclamation, and thus decrease crop yields due to phosphorus deficiencies not due to actual construction. Waiting for the construction to begin prior to developing site-specific reclamation plans will allow Dakota Access to

develop appropriate and accurate reclamation plans based on conditions that exist at the time of construction.

Q. Is a winter construction plan necessary? Why or why not?

A. No. I don't know of any South Dakota statute that requires a winter construction plan to be developed or submitted as part of the application. Furthermore, Dakota Access does not plan to engage in mainline conventional construction during the winter.

Q. Did you review the testimony of Ryan Ledin, staff expert?

A. Yes.

Q. Did you review Mr. Ledin's testimony and recommended changes for the SWPPP?

A. Yes

Q. What is your response?

A. Mr. Ledin states multiple times the Storm Water Pollution Prevention Plan is a living document and is intended to be modified in the field as site conditions warrant. Dakota Access is planning on using qualified, professional, and experienced EIs who are expected to understand erosion control and use proper BMPs as necessary. I do not feel as if the addition of standard spacings for these items in the Storm Water Pollution Prevention Plan are required or will enhance environmental compliance and success. Exhibit C as an appendix to the Storm Water Pollution Prevention Plan is not necessary since it is already available to the EIs. The addition of Exhibit C will create an extra layer of administration and could negatively affect the use of Exhibit C because if Exhibit C is updated or modified the document would need to be replaced in multiple documents. If the updates are not all performed on the same time-frame then confusion could occur which could lead to mistakes being made in the field. In my opinion as long as Exhibit C

is available to the EIs then adding it as an appendix to the Storm Water Pollution Prevention Plan is not required.

Mr. Ledin's recommendation that the application of straw mulch should not be delegated to the EI is not warranted. I firmly believe that the EIs are trained professionals and should have some latitude in the field as to when straw mulch is required. It is recommended that the EIs be provided guidance but no mandatory requirements be implemented. Straw mulching should be based on site-specific conditions and used when necessary regardless of the percent slope.

Q. Did you review the recommendation Mr. Ledin made on page 5 of his testimony regarding measures to minimize impacts to vegetation?

A. Yes

Q. What are your thoughts regarding his recommendations?

A. Weed management is always a consideration for pipelines and other disturbed areas. It is my opinion that the use of Integrated Weed Management (IWM) is appropriate for this project. Integrated Weed Management is intended to locate and identify weed populations, develop a treatment plan for noxious and invasive weed management and then implement prescribed treatment plans at appropriate timings to ensure adequate control of the possible undesirable weedy species. Integrated Weed Management evaluates the use of cultural (i.e., using certified straw, reseeding as quickly as possible), biological, mechanical (i.e., mowing, discing) and chemical controls (i.e., herbicides) based on weeds present and their abundance. All decisions under an IWM program are made on site specific conditions. Through the IWM approach it is understood that a

healthy and productive rangeland system is the most effective weed management tool available. Although not although not explicitly stated as such, IWM approaches are being described in section 16.1.1 of the PUC application.

Q. Did you review Mr Ledin's recommendations on page 5 of his testimony regarding mitigation measures to minimize impacts to water bodies?

A. Yes

Q. What are your thoughts regarding his recommendations?

A. Mr. Ledin's recommendations are not required as long as the EIs have access to the information from other sources. Addition of this table to the Storm Water Pollution Prevention Plan is a redundancy could cause inconsistencies, confusion and additional work as the table would need to be replaced in multiple places as updates are required.

Q. Does this conclude your testimony?

A. Yes.

Dated this _____ day of July, 2015

_____

Aaron DeJoia

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