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 WITNESS AND EXHIBIT LIST

COMES NOW, the Applicant, Dakota Access, LLC, by and through its attorneys of record, and hereby provides notice of proposed witnesses to appear and exhibits to be used at hearing.

Witness List:

1. Joey Mahmoud
2. Chuck Frey
3. John H. Edwards "Jack"
4. Monica Howard
5. Todd Stamm
6. Micah Rorie
7. Aaron DeJoia
8. Stacey Gerard

Exhibit List: In an effort to assist parties and limit the quantity of documents exchanged with this pleading, documents filed on the PUC website are not included herein.

1. Revised Dakota Access Pipeline Energy Transmission Facility: SDCL 49-41B Application – As filed with the PUC on 12/23/14
2. Exhibits A1, A2, A3, A4, A5 to the Energy Transmission Facility Application – As filed with the PUC on 9/21/15
3. Exhibit B to the Energy Transmission Facility Application – As filed with the PUC on 12/15/14

4. Exhibit C to the Energy Transmission Facility Application – Attached. Due to a change to the "Federal and State Listed Threatened and Endangered Species in South Dakota" chart, this exhibit is attached for ease of reference. This document will also be filed with the PUC under separate cover for placement on the docket page.
5. Exhibit D to the Energy Transmission Facility Application – As filed with the PUC on 12/15/14
6. Sunoco Pipeline L.P. – Facility Response Plan – As filed with the PUC on 7/8/15
7. **CONFIDENTIAL** South Dakota Spill Model – As filed with the PUC on 9/18/15 and served on parties subject to the PUC Protection Order
8. An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois –Attached.
9. Unanticipated Discoveries Plan: Cultural Resources, Human Remains, Paleontological Resources and Contaminated Media – Attached.
10. **CONFIDENTIAL** Addendum II to the Level III Intensive Cultural Resources Survey, Dated September 15, 2015 – Attached.
11. **CONFIDENTIAL** Management Summary: Level III Intensive Cultural Resources, Dated November 25, 2014 – Attached.
12. September 8, 2015 Correspondence from the SD State Historical Society.
13. **CONFIDENTIAL** Addendum I to the Level III Intensive Cultural Resources Survey, Dated July 31, 2015 – Attached.
14. SHPO Scope of Work
15. Geoarchaeological Assessment Scope of Work
16. SD SHPO Trenching Approval dated 6/5/15
17. DRA First Discovery Reply dated 5/1/15 – Attached
18. DRA Second Discovery Reply dated 6/22/15 – Attached
19. RST First Discovery Reply dated 4/29/15 - Attached
20. RST Supplemental Discovery Reply dated 6/15/15 - Attached
21. RST Second Discovery Reply dated 6/15/15 - Attached
22. RST Third discovery Reply dated 9/1/15 - Attached

23. RST Fourth Discovery Reply dated 9/1/15 - Attached
24. IEN First Discovery Reply dated 5/1/15 - Attached
25. IEN Second Discovery Reply dated 6/22/15 - Attached
26. YST First Discovery Reply dated 5/22/15 - Attached
27. YST Second Discovery Reply dated 6/22/15 - Attached
28. YST Third Discovery Reply dated 8/21/15 - Attached
29. YST Fourth Discovery Reply dated 9/9/15 - Attached
30. Direct Testimony of Joey Mahmoud – As filed with the PUC
31. Direct Testimony of Chuck Frey – As filed with the PUC
32. Direct Testimony of Jack Edwards – As filed with the PUC
33. Direct Testimony of Monica Howard – As filed with the PUC
34. Direct Testimony of Todd Stamm – As filed with the PUC
35. Rebuttal Testimony of Micah Rorie – As filed with the PUC
36. Rebuttal Testimony of Joey Mahmoud – As filed with the PUC
37. Rebuttal Testimony of Chuck Frey – As filed with the PUC
38. Rebuttal Testimony of Monica Howard – As filed with the PUC
39. Rebuttal Testimony of Aaron DeJoia – As filed with the PUC
40. Rebuttal Testimony of Stacey Gerard- as filed with the PUC

Dated this 23rd day of September, 2015.

MAY, ADAM, GERDES & THOMPSON LLP

BY: /s/ Kara C. Semmler
BRETT KOENECKE
KARA C. SEMMLER
Attorneys for Defendant
503 South Pierre Street
PO Box 160
Pierre, SD 57501-0160
(605) 224-8803

CERTIFICATE OF SERVICE

Kara C. Semmler of May, Adam, Gerdes & Thompson LLP hereby certifies that on the 23rd day of September, 2015, she either electronically served or mailed via US Mail a true and correct copy of the foregoing in the above captioned action to the Service List in HP 14-002.

/s/ Kara C. Semmler
KARA C. SEMMLER

Listed Exhibit: 4

DAKOTA ACCESS, LLC

Exhibit C

Supplementary Tables

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Soil Characteristics for Each Soil Map Unit within the Project Area

Exhibit C
Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Pipeline										
Campbell County										
Tonka silt loam, undrained, 0 to 1 percent slopes	C001A	577	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Parnell silty clay loam, undrained, 0 to 1 percent slopes	C008A	375	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Heil silt loam, undrained, 0 to 1 percent slopes	C020A	488	Not Prime Farmland	Yes	High	Low	No	No	Yes	Low
Ludden silty clay loam, strongly saline, 0 to 1 percent slopes, occasionally flooded	C058A	168	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Zahl-Max loams, 15 to 25 percent slopes	C153E	1,556	Not Prime Farmland	Yes	High	High	No	No	No	Low
Vida very stony loam, 3 to 15 percent slopes	C172D	199	Not Prime Farmland	Yes	Moderate	Low	Yes	No	No	Low
Vida-Zahl loams, 6 to 9 percent slopes	C175C	14,532	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Low
Vida-Zahl loams, 6 to 15 percent slopes	C175D	328	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Low
Bowbells loam, 0 to 3 percent slopes	C201A	4,696	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Williams-Bowbells loams, 0 to 3 percent slopes	C210A	9,463	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Williams-Bowbells loams, 3 to 6 percent slopes	C210B	52,691	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Williams-Vida loams, 3 to 6 percent slopes	C212B	2,303	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Williams-Vida loams, 6 to 9 percent slopes	C212C	27,013	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate

Exhibit C

Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Hamerly loam, 0 to 3 percent slopes	C270A	970	Prime Farmland	Yes	High	Low	No	No	No	High
Farnuf loam, 0 to 2 percent slopes	C416A	897	Farmland of Statewide Importance	No	High	Low	No	No	No	High
Farnuf loam, 2 to 6 percent slopes	C416B	1,704	Farmland of Statewide Importance	No	High	Low	No	No	No	High
Straw-Fluvaquents channeled, complex, 0 to 2 percent slopes, frequently flooded	C491A	810	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Ranslo-Harriet loams, 0 to 2 percent slopes, occasionally flooded	C578A	1,049	Not Prime Farmland	Yes	High	Low	No	No	Yes	Low
Bryant silt loam, 2 to 6 percent slopes	C732B	1,175	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Bryant-Grassna silt loams, 0 to 2 percent slopes	C745A	953	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	High
Bryant-Grassna silt loams, 2 to 6 percent slopes	C745B	1,083	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	High
Williams-Noonan loams, 0 to 6 percent slopes	C772B	567	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Bowdle loam, 0 to 2 percent slopes	C810A	2,581	Farmland of Statewide Importance	No	High	Moderate	No	No	No	High
Bowdle loam, 2 to 6 percent slopes	C810B	5,755	Farmland of Statewide Importance	No	High	Moderate	No	No	No	High
Lehr loam, 0 to 2 percent slopes	C816A	3,710	Not Prime Farmland	Yes	High	Moderate	No	No	No	Moderate

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Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Lehr loam, 2 to 6 percent slopes	C816B	6,321	Not Prime Farmland	Yes	High	Moderate	No	No	No	Moderate
Vida very stony loam, 3 to 15 percent slopes	C819B	8,786	Not Prime Farmland	Yes	High	Moderate	No	No	No	Moderate
Wabek-Lehr-Appam complex, 9 to 25 percent slopes	C870E	203	Not Prime Farmland	Yes	High	High	Yes	No	No	Low
Wabek-Appam complex, 6 to 9 percent slopes	C874C	563	Not Prime Farmland	Yes	Moderate	High	No	No	No	Low
Wabek-Lehr complex, 6 to 9 percent slopes	C877C	1,993	Not Prime Farmland	Yes	Moderate	High	No	No	No	Low
Pits, gravel and sand, 0 to 60 percent slopes	C990F	243	Not Prime Farmland	No	Not Rated	High	Yes	No	No	Low
McPherson County										
Tonka-Nishon silt loams, 0 to 1 percent slopes	C004A	228	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Heil silt loam, undrained, 0 to 1 percent slopes	C020A	238	Not Prime Farmland	Yes	High	Low	No	No	Yes	Low
Vallers loam, undrained, 0 to 1 percent slopes	C022A	112	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Nishon-Heil silt loams, 0 to 1 percent slopes	C031A	326	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Vida-Williams loams, 3 to 6 percent slopes	C136B	1,364	Farmland of Statewide Importance	Yes	High	Moderate	No	No	No	High
Williams-Bowbells-Tonka, undrained complex, 0 to 6 percent slopes	C150B	1,730	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Vida-Williams-Bowbells loams, 3 to 15 percent slopes	C177D	1,294	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Moderate
Bowbells loam, 3 to 6 percent slopes	C201B	987	Prime Farmland	Yes	High	Low	No	No	No	High

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Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Williams-Bowbells loams, 0 to 3 percent slopes	C210A	1,622	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Williams-Bowbells loams, 3 to 6 percent slopes	C210B	7821	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Niobell-Noonan loams, 3 to 6 percent slopes	C661B	1,295	Not Prime Farmland	Yes	High	Moderate	No	No	No	Moderate
Bryant-Grassna silt loams, 0 to 2 percent slopes	C745A	5,121	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Bryant-Grassna silt loams, 2 to 6 percent slopes	C745B	7,395	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Bowdle loam, 0 to 2 percent slopes	C810A	2,317	Farmland of Statewide Importance	No	High	Low	No	No	No	Moderate
Lehr loam, 0 to 2 percent slopes	C816A	909	Not Prime Farmland	No	High	Moderate	No	No	No	Moderate
Lehr loam, 2 to 6 percent slopes	C816B	617	Not Prime Farmland	No	High	Moderate	No	No	No	Moderate
Lehr-Bowdle loams, 2 to 6 percent slopes	C817B	1,592	Not Prime Farmland	No	High	Moderate	No	No	No	Moderate
Edmunds County										
Tonka-Nishon silt loams, 0 to 1 percent slopes	C004A	3,290	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Parnell silty clay loam, undrained, 0 to 1 percent slopes	C008A	989	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Heil silt loam, undrained, 0 to 1 percent slopes	C020A	346	Not Prime Farmland	Yes	High	Low	No	No	Yes	Low
Williams-Bowbells-Tonka, undrained complex, 0 to 6 percent slopes	C150B	68,424	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High

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Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Vida-Zahl loams, 6 to 9 percent slopes	C175C	5,016	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Moderate
Vida-Williams-Bowbells loams, 3 to 15 percent slopes	C177D	147	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Moderate
Williams-Bowbells loams, 3 to 6 percent slopes	C210B	76,709	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Williams-Bowbells loams, 6 to 9 percent slopes	C210C	4,705	Farmland of Statewide Importance	Yes	Moderate	Moderate	No	No	No	High
Mondamin silty clay loam, 0 to 2 percent slopes	C420A	5,463	Prime Farmland if Irrigated	Yes	Low	Low	No	No	No	Moderate
Mondamin silty clay loam, 2 to 6 percent slopes	C420B	5,103	Prime Farmland if Irrigated	Yes	Low	Moderate	No	No	No	Moderate
Mondamin-Heil complex, 0 to 2 percent slopes	C430A	1,423	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Grassna silt loam, 0 to 2 percent slopes	C457A	174	Prime Farmland	Yes	High	Low	No	No	No	High
Niobell-Noonan loams, 3 to 6 percent slopes	C661B	1,379	Not Prime Farmland	Yes	High	Moderate	No	No	No	Moderate
Bowbells-Niobell loams, 0 to 3 percent slopes	C670A	5,584	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Bryant silt loam, 0 to 2 percent slopes	C732A	278	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Bryant silt loam, 2 to 6 percent slopes	C732B	6,955	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High

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Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Temvik-Bryant complex, 2 to 6 percent slopes	C741B	1,463	Prime Farmland if Irrigated	Yes	Moderate	Low	No	No	No	Moderate
Temvik-Grassna silt loams, 2 to 6 percent slopes	C742B	1,209	Prime Farmland if Irrigated	Yes	Moderate	Low	No	No	No	Moderate
Bryant-Grassna silt loams, 2 to 6 percent slopes	C745B	2.062	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Bowdle loam, 2 to 6 percent slopes	C810B	138	Farmland of Statewide Importance	No	High	Moderate	No	No	No	High
Faulk County										
Tonka-Nishon silt loams, 0 to 1 percent slopes	C004A	3,707	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Parnell silty clay loam, undrained, 0 to 1 percent slopes	C008A	151	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Nishon silt loam, 0 to 1 percent slopes	C030A	2,964	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Zahl-Williams-Zahill complex, 6 to 9 percent slopes	C135C	538	Not Prime Farmland	Yes	High	Moderate	No	No	No	Moderate
Vida-Williams-Bowbells loams, 3 to 9 percent slopes	C138C	3.601	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Zahill-Straw complex, 2 to 25 percent slopes	C139E	697	Not Prime Farmland	Yes	High	High	Yes	No	No	Low
Williams-Bowbells-Tonka, undrained complex, 0 to 6 percent slopes	C150B	21,122	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Max-Arnegard loams, 0 to 3 percent slopes	C167A	666	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate

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Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Max-Arnegard-Zahl loams, 0 to 6 percent slopes	C168B	13,494	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Williams-Zahill-Bowbells loams, 3 to 15 percent slopes	C173D	4,654	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Low
Bowbells loam, 0 to 3 percent slopes	C201A	317	Prime Farmland	Yes	High	Low	No	No	No	High
Williams-Bowbells loams, 0 to 3 percent slopes	C210A	30,402	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Williams-Bowbells loams, 3 to 6 percent slopes	C210B	21,107	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Straw loam, 0 to 2 percent slopes	C490A	1,357	Prime Farmland	Yes	High	Low	No	No	No	High
Straw-Fluvaquents channeled, complex, 0 to 2 percent slopes, frequently flooded	C491A	2,050	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Noonan-Miranda loams, 0 to 6 percent slopes	C556B	4,199	Not Prime Farmland	Yes	High	Low	No	No	Yes	Moderate
Ranslo-Harriet loams, 0 to 2 percent slopes, occasionally flooded	C578A	1,095	Not Prime Farmland	Yes	High	Low	No	No	Yes	Moderate
Harriet loam, 0 to 2 percent slopes	C584A	426	Not Prime Farmland	Yes	High	Low	No	No	Yes	Moderate
Niobell-Noonan-Max loams, 0 to 3 percent slopes	C650A	4,985	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Niobell-Noonan loams, 0 to 3 percent slopes	C661A	3,790	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Williams-Niobell loams, 3 to 6 percent slopes	C667B	5,076	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Max-Niobell-Noonan loams, 3 to 6 percent slope	C672B	8,195	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate

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Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Bryant-Grassna silt loams, 0 to 2 percent slopes	C745A	3,180	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Tally fine sandy loam, 0 to 2 percent slopes	C769A	2.932	Prime Farmland if Irrigated	Yes	High	Moderate	No	No	No	Moderate
Tally fine sandy loam, 2 to 6 percent slopes	C769B	203	Prime Farmland if Irrigated	Yes	High	Moderate	No	No	No	Moderate
Williams-Bowbells-Noonan loams. 0 to 3 percent slopes	C773A	2,567	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Bowdle loam, 0 to 2 percent slopes	C810A	2,814	Farmland of Statewide Importance	No	Low	Low	No	No	No	High
Lehr loam, 0 to 2 percent slopes	C816A	273	Not Prime Farmland	No	Low	Low	No	No	No	Moderate
Lehr loam, 2 to 6 percent slopes	C816B	212	Not Prime Farmland	No	High	Moderate	No	No	No	Moderate
Pits, gravel and sand, 0 to 60 percent slopes	C990F	540	Not Prime Farmland	No	Not Rated	Low	Yes	No	No	Low
Spink County										
Beadle-Stickney complex, 0 to 2 percent slopes	BeA	38,081	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Beadle-Stickney complex, 0 to 2 percent slopes, very stony	BfA	2,639	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Tonka silt loam, undrained, 0 to 1 percent slopes	C001A	272	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Tonka-Rimlap silt loams, 0 to 1 percent slopes	C010A	477	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Heil silt loam, undrained, 0 to 1 percent slopes	C020A	274	Not Prime Farmland	Yes	High	Low	No	No	Yes	Moderate

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Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Lowe loam, 0 to 2 percent slopes, occassionally flooded	C054A	2,460	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Zahl-Zahill loams, 15 to 40 percent slopes	C058A	479	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Zahl-Zahill complex, 15 to 40 percent slopes	C133F	164	Not Prime Farmland	Yes	High	High	Yes	No	No	Low
Williams-Niobell-Tonka complex, 0 to 6 percent slopes	C147B	6,410	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Max-Arnegard loams, 0 to 3 percent slopes	C167A	8,850	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Max-Arnegard-Zahl loams, 0 to 6 percent slopes	C168B	27,589	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Max-Zahl-Arnegard loams, 3 to 9 percent slopes	C168C	697	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Noonan-Miranda loams, 0 to 6 percent slopes	C556B	3,317	Not Prime Farmland	Yes	High	Low	No	No	Yes	Moderate
Miranda-Heil complex, 0 to 3 percent slopes	C558A	1,150	Not Prime Farmland	Yes	High	Low	No	No	Yes	Moderate
Ranslo loam, 0 to 2 percent slopes	C575A	610	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Niobell-Noonan loams, 0 to 3 percent slopes	C661A	2,409	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Williams-Niobell loams, 0 to 3 percent slopes	C667A	8,100	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Williams-Niobell loams, 3 to 6 percent slopes	C667B	498	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Niobell-Noonan-Heil complex, 0 to 3 percent slopes	C668A	2,647	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate

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Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Crossplain-Tetonka complex, 0 to 1 percent slopes	Ct	619	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Delmont-Enet loams, 0 to 2 percent slopes	DeA	1,854	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Dudley-Jerauld silt loams, 0 to 2 percent slopes	Du	3,827	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Ethan-Hand loams, 9 to 20 percent slopes	EnD	3,203	Not Prime Farmland	Yes	High	High	No	No	No	Moderate
Cresbard-Cavour loams, 0 to 3 percent slopes	G124A	1,658	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Cavour-Ferney loams, 0 to 3 percent slopes	G129A	2,097	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Ferney-Heil, till substratum complex, 0 to 3 percent slopes	G133A	1,017	Not Prime Farmland	Yes	High	Low	No	No	Yes	Moderate
Forman-Cresbard-Tonka complex, 0 to 3 percent slopes	G136A	219	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Forman-Cresbard loams, 0 to 3 percent slopes	G139A	1,409	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Forman-Buse-Aastad loams, 1 to 6 percent slopes	G190B	5,910	Prime Farmland	Yes	High	Low	No	No	No	High
Forman-Buse-Aastad loams, 3 to 9 percent slopes	G190C	704	Farmland of Statewide Importance	Yes	High	Moderate	No	No	No	High
Aastad-Forman loams, 0 to 3 percent slopes	G193A	627	Prime Farmland	Yes	High	Low	No	No	No	High
Buse-Vida, moist-Forman loams, 9 to 25 percent slopes	G193E	514	Not Prime Farmland	Yes	High	High	Yes	No	No	Low
Aastad-Tonka complex, 0 to 3 percent slopes	G195A	375	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate

Exhibit C
Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Bearden silt loam, saline, 0 to 2 percent slopes	G453A	484	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Aberdeen-Nahon-Heil silt loams, till substratum, 0 to 2 percent slopes	G476A	517	Not Prime Farmland .	Yes	High	Low	No	No	No	Moderate
Lowe loam, very poorly drained, 0 to 1 percent slopes, frequently flooded	G522A	238	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Lamoure silty clay loam, somewhat poorly drained, 0 to 1 percent slopes, frequently flooded	G533A	243	Prime Farmland if Drained	Yes	High	Moderate	No	No	No	Moderate
Playmoor silty clay loam, 0 to 2 percent slopes, frequently flooded	G543A	67	Not Prime Farmland	Yes	High	High	No	No	No	Low
Ranslo-Harriet loams, 0 to 2 percent slopes, occasionally flooded	G553A	903	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Ranslo silty clay loam, 0 to 1 percent slopes, occasionally flooded	G557A	605	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Great Bend-Beotia silt loams, 0 to 2 percent slopes	G720A	1,509	Prime Farmland	Yes	High	Low	No	No	No	High
Great Bend-Beotia silt loams, till substratum, 0 to 2 percent slopes	G721A	2,642	Prime Farmland	Yes	High	Low	No	No	No	High
Great Bend-Zell silt loams, 2 to 6 percent slopes	G722B	2,538	Prime Farmland	Yes	High	Low	No	No	No	High
Kranzburg-Cresbard silt loams, 0 to 2 percent slopes	G796A	1,657	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Harmony-Beotia silt loams, till substratum, 0 to 2 percent slopes	G863A	2,598	Prime Farmland	Yes	High	Low	No	No	No	High

Exhibit C
Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Harmony-Aberdeen silt loams, till substratum, 0 to 2 percent slopes	G865A	5,387	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Beotia-Rondell silt loams, 0 to 2 percent slopes	G872A	169	Prime Farmland	Yes	High	Low	No	No	No	High
Beotia-Winship silt loams, till substratum, 0 to 2 percent slopes	G874A	457	Prime Farmland	Yes	High	Low	No	No	No	High
Hand-Bonilla loams, 0 to 3 percent slopes	HcA	1,804	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Hand-Carthage fine sandy loams, 0 to 3 percent slopes	HdA	3,003	Prime Farmland if Irrigated	Yes	High	Moderate	No	No	No	Moderate
Hand-Ethan loams, 6 to 9 percent slopes	HfC	1,296	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	High
Hand-Ethan-Bonilla loams, 1 to 6 percent slopes	HgB	6,550	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Hand-Ethan-Bonilla loams, 2 to 9 percent slopes	HgC	700	Farmland of Statewide Importance	Yes	High	Moderate	No	No	No	High
Hand-Ethan-Carthage complex, 1 to 6 percent slopes	HhB	2,318	Prime Farmland if Irrigated	Yes	High	Moderate	No	No	No	Moderate
Hand-Talmo complex, 2 to 6 percent slopes	HjB	6,866	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Hand-Talmo complex, 6 to 9 percent slopes	HjC	2,281	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Low
Houdek-Ethan-Prosper loams, 1 to 6 percent slopes	HtB	809	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate

Exhibit C

Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a, f]	Re-vegetation Potential
Houdek-Stickney complex, 0 to 2 percent slopes	HwA	1,497	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Houdek-Stickney-Tetonka complex, 0 to 2 percent slopes	HxA	3,053	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Hoven silt loam, 0 to 1 percent slopes	Hy	140	Not Prime Farmland	Yes	High	High	Low	No	No	Low
Jerauld-Hoven silt loams, 0 to 2 percent slopes	Jh	545	Not Prime Farmland	Yes	High	Low	No	No	Yes	Low
Stickney-Dudley silt loams, 0 to 2 percent slopes	St	2,314	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Stickney-Dudley-Hoven silt loams, 0 to 2 percent slopes	Su	5,628	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Tetonka silt loam, 0 to 1 percent slopes	Te	308	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Beadle County										
Beadle loam, 0 to 2 percent slopes	BaA	46,942	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Beadle loam, 2 to 6 percent slopes	BaB	18,082	Farmland of Statewide Importance	Yes	High	Moderate	No	No	No	High
Beadle loam, 6 to 9 percent slopes	BaC	3,832	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Beadle-Dudley complex, 0 to 2 percent slopes	BdA	13,192	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Betts stony loam, 6 to 40 percent slopes	BeD	2,667	Not Prime Farmland	No	High	Low	Yes	No	No	Low
Betts-Ethan loams, 9 to 21 percent slopes	BfD	3,993	Not Prime Farmland	No	High	High	Yes	No	No	Low

Exhibit C

Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Bon silt loam	Bo	1,508	Prime Farmland	Yes	High	Low	No	No	No	High
Bon silt loam, channeled	Bx	2,995	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Carthage fine sandy loam, 2 to 6 percent slopes	CaB	126	Farmland of Statewide Importance	Yes	Moderate	Moderate	No	No	No	High
Carthage fine sandy loam, 6 to 9 percent slopes	CaC	363	Farmland of Statewide Importance	Yes	Moderate	Moderate	Yes	No	No	Moderate
Carthage-Blendon fine sandy loams, 0 to 2 percent slopes	CbA	1,155	Farmland of Statewide Importance	Yes	Moderate	Moderate	No	No	No	Moderate
Davis loam, 2 to 9 percent slopes	DaB	2,881	Farmland of Statewide Importance	No	High	Low	No	No	No	High
Delmont loam, 0 to 2 percent slopes	DeA	181	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Dudley-Stickney silt loams, 0 to 3 percent slopes	DsA	10,617	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Dudley-Tetonka silt loams	DtA	2,573	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Egas silty clay loam	Eg	624	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Elsmere loamy fine sand, loamy substratum	Em	1,142	Not Prime Farmland	Yes	Moderate	Moderate	No	No	No	Moderate
Enet loam, 0 to 2 percent slopes	EnA	3,429	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Forestburg-Doger loamy fine sands, 0 to 3 percent slopes	FrA	996	Not Prime Farmland	Yes	High	Moderate	No	No	No	Moderate
Houdek-Prosper loams, 0 to 2 percent slopes	GbA	7,025	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High

Exhibit C
Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Bend-Edwin silt loams, 2 to 6 percent slopes	GzB	2,962	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Houdek-Ethan loams, 6 to 9 percent slopes	HeC	1,801	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Houdek-Prosper loams, 0 to 2 percent slopes	HoA	8,703	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Houdek-Prosper loams, 2 to 6 percent slopes	HoB	3,513	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Hoven silt loam	Hv	460	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
LaDelle silt loam	La	1,415	Prime Farmland	Yes	High	Low	No	No	No	High
Lane silt loam, 0 to 2 percent slopes	LnA	3,091	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Prosper-Davison loams, 0 to 3 percent slopes	PrA	1,570	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Shue loamy fine sand	Sh	380	Not Prime Farmland	Yes	Moderate	Moderate	No	No	No	Moderate
Spottswood loam	Sp	878	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Tetonka-Hoven silt loams	Te	721	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Edwin silt loam, 6 to 12 percent slopes	ZeC	529	Not Prime Farmland	No	High	High	Yes	No	No	Low
Kingsbury County										

Exhibit C

Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Beadle loam, 2 to 6 percent slopes	BdB	692	Prime Farmland if Irrigated	Yes	High	Moderate	No	No	No	Moderate
Beadle-Dudley complex, 0 to 2 percent slopes	BeA	1,629	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Bon loam	Bn	991	Prime Farmland	Yes	High	Low	No	No	No	High
Bon loam, channeled	Bo	1,229	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Clarno-Bonilla loams, 0 to 2 percent slopes	CbA	19,702	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Clarno-Ethan-Bonilla loams, 1 to 6 percent slopes	CeB	19,022	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Clarno-Ethan-Bonilla loams, 2 to 9 percent slopes	CeC	385	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Crossplain-Tetonka complex	Ct	5,894	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Delmont-Talmo loams, 2 to 6 percent slopes	DtB	605	Not Prime Farmland	Yes	High	Moderate	No	No	No	Moderate
Ethan-Bon, channeled, loams, 0 to 20 percent slopes	EoD	2,540	Not Prime Farmland	No	High	High	Yes	No	No	Low
Ethan-Clarno loams, 9 to 15 percent slopes	EtD	1,376	Not Prime Farmland	No	High	High	Yes	No	No	Low
Houdek-Prosper loams, 1 to 6 percent slopes	HpB	1,373	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Houdek-Stickney complex, 0 to 2 percent slopes	HsA	28,613	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High

Exhibit C
Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Houdek-Stickney complex, 2 to 6 percent slopes	HsB	2,344	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Houdek-Stickney-Tetonka complex	Ht	22,045	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Stickney-Dudley silt loams	St	368	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Stickney-Dudley-Hoven silt loams	Sv	6,524	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Miner County										
Arlo clay loam	Ar	265	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Baltic silty clay loam	Ba	597	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Bon silt loam	Bo	1,002	Prime Farmland	Yes	High	Low	No	No	No	High
Clarno-Bonilla loams, 0 to 3 percent slopes	CfA	17,587	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Clarno-Bonilla loams, 1 to 6 percent slopes	CfB	8,985	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Clarno-Crossplain loams, 0 to 2 percent slopes	CgA	30,699	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Clarno-Ethan complex, 2 to 6 percent slopes	CkB	1,159	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Clarno-Stickney-Tetonka complex, 0 to 2 percent slopes	CnA	152	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High

Exhibit C

Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Crossplain-Tetonka complex	Ct	10,595	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Enet-Delmont loams. 0 to 4 percent slopes	EdA	2,439	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Ethan-Clarno complex, 6 to 9 percent slopes	EgC	331	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Clarno-Stickney-Tetonka complex, 0 to 2 percent slopes	La	411	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Tetonka silt loam	Te	504	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Lake County										
Badus silty clay loam	Ba	974	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Clarno-Ethan loams, 9 to 16 percent slopes	Bc	346	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Beadle-Dudley complex, 0 to 2 percent slopes	BdA	144	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Clarno loam, 0 to 2 percent slopes	CaA	778	Prime Farmland	Yes	High	Low	No	No	No	High
Clarno loam, 2 to 6 percent slopes	CaB	6,891	Prime Farmland	Yes	High	Low	No	No	No	High
Clarno loam, 6 to 9 percent slopes	CaC	1,817	Farmland of Statewide Importance	Yes	High	Moderate	No	No	No	High
Clarno-Ethan loams, 2 to 6 percent slopes	CeB	649	Prime Farmland	Yes	High	Low	No	No	No	High

Exhibit C
Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Clarno-Ethan loams, 6 to 9 percent slopes	CeC	7,462	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Clarno-Ethan loams, 9 to 16 percent slopes	CeD	3,138	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Low
Egan silty clay loam, 6 to 9 percent slopes	EaC	3,206	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Egan-Beadle complex, 0 to 2 percent slopes	EbA	969	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Beadle complex, 2 to 6 percent slopes	EbB	10,790	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Beadle complex, 6 to 9 percent slopes	EbC	3,995	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Egan-Ethan complex, 2 to 6 percent slopes	Eeb	1,985	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Ethan complex, 6 to 9 percent slopes, eroded	EeC2	4,220	Not Prime Farmland	Yes	High	Moderate	Yes	No	No	Low
Egan-Viborg silty clay loams, 0 to 3 percent slopes	EgA	1,306	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Wentworth silty clay loams, 2 to 6 percent slopes	EhB	13,703	Prime Farmland	Yes	High	Low	No	No	No	High
Ethan-Betts loams, 21 to 40 percent slopes	EoF	249	Not Prime Farmland	No	High	High	Yes	No	No	Low
Ethan-Clarno loams, 16 to 21 percent slopes	ErE	652	Not Prime Farmland	No	High	High	Yes	No	No	Low
Ethan-Davis stony complex, 3 to 21 percent slopes	EsE	3,708	Not Prime Farmland	Yes	High	Low	Yes	No	No	Low
Ethan-Davis stony complex, 3 to 21 percent slopes	EtD	1,033	Not Prime Farmland	Yes	High	Low	Yes	No	No	Low
Houdek-Prosper loams, 0 to 3 percent slopes	HpA	2,050	Prime Farmland	Yes	High	Low	No	No	No	High

Exhibit C
Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Lamo silty clay loam	La	407	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Worthing silty clay loam, ponded	Mar	302	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Prosper loam, 0 to 2 percent slopes	PrA	2,209	Prime Farmland	Yes	High	Low	No	No	No	High
Rauville silty clay loam	Ra	753	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Huntimer silty clay loam, 0 to 2 percent slopes	ScA	3,781	Prime Farmland	Yes	High	Low	No	No	No	High
Huntimer silty clay loam, 2 to 6 percent slopes	SdB	5,537	Prime Farmland	Yes	High	Low	No	No	No	High
Stickney-Tetonka complex, 0 to 2 percent slopes	StA	503	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Talmo-Delmont loams, 6 to 21 percent slopes	TdE	205	Not Prime Farmland	Yes	High	High	Yes	No	No	Moderate
Tetonka silt loam	Te	1,505	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Viborg silty clay loam, 0 to 2 percent slopes	VbA	2,825	Prime Farmland	Yes	High	Low	No	No	No	High
Viborg-Egan silty clay loams, 2 to 6 percent slopes	VgB	1,984	Prime Farmland	Yes	High	Low	No	No	No	High
Wentworth-Egan silty clay loams, 0 to 2 percent slopes	WeA	406	Prime Farmland	Yes	High	Low	No	No	No	High
Whitewood silty clay loam	Wh	5,997	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Worthing silty clay loam	Wo	2,130	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
McCook County										

Exhibit C

Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Egan-Ethan complex, 5 to 9 percent slopes	EaC	2,041	Farmland of Statewide Importance	Yes	High	Moderate	No	No	No	High
Huntimer silty clay loam, 0 to 2 percent slopes	HuA	560	Prime Farmland	Yes	High	Low	No	No	No	High
Wentworth silty clay loam, 0 to 2 percent slopes	WaA	1,081	Prime Farmland	Yes	High	Low	No	No	No	High
Wentworth silty clay loam, 2 to 5 percent slopes	WbB	1,067	Prime Farmland	Yes	High	Low	No	No	No	High
Wentworth-Ethan complex, 2 to 5 percent slopes	WcB	1,190	Prime Farmland	Yes	High	Low	No	No	No	High
Whitewood silt loam	Wh	393	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Worthing silty clay loam	Wo	2,746	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Minnehaha County										
Alcester silty clay loam, 2 to 6 percent slopes	AcB	400	Prime Farmland	No	High	Low	No	No	No	High
Baltic silty clay loam, 0 to 1 percent slopes	Ba	1,191	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Betts-Ethan loams, 15 to 40 percent slopes	BeE	140	Not Prime Farmland	Yes	High	High	Yes	No	No	Low
Chancellor silty clay loam, 0 to 1 percent slopes	Cb	621	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Chancellor-Tetonka complex, 0 to 1 percent slopes	Cc	6,775	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Davison-Crossplain clay loams, 0 to 2 percent slopes	Dd	4,335	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Egan-Ethan complex, 2 to 6 percent slopes	EaB	1,400	Prime Farmland	Yes	High	Low	No	No	No	High

Exhibit C
Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Egan-Ethan-Trent complex, 1 to 6 percent slopes	EeB	52,056	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Trent silty clay loams, 0 to 2 percent slopes	EfA	1,243	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Wentworth-Trent silty clay loams, 1 to 6 percent slopes	EgB	9,562	Prime Farmland	Yes	High	Low	No	No	No	High
Ethan-Betts loams, 9 to 15 percent slopes	EpD	688	Not Prime Farmland	Yes	High	High	Yes	No	No	Low
Ethan-Clarno loams, 6 to 25 percent slopes, very stony	EsE	1,302	Not Prime Farmland	Yes	High	Low	Yes	No	No	Low
Ethan-Clarno loams, 9 to 15 percent slopes	EtD	7,427	Not Prime Farmland	Yes	High	High	Yes	No	No	Low
Ethan-Egan complex, 6 to 9 percent slopes	EuC	25,140	Farmland of Statewide Importance	Yes	High	Moderate	Yes	No	No	Moderate
Ethan, very stony-Egan complex, 2 to 9 percent slopes	ExC	915	Not Prime Farmland	Yes	High	High	Yes	No	No	Low
Huntimer silty clay loam, 0 to 2 percent slopes	HuA	5,483	Prime Farmland	Yes	High	Low	No	No	No	High
Huntimer silty clay loam, 2 to 6 percent slopes	HuB	2,576	Prime Farmland	Yes	High	Low	No	No	No	High
Lamo silty clay loam, 0 to 1 percent slopes	La	174	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Obert silty clay loam, 0 to 1 percent slopes	Ob	350	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Salmo silty clay loam, 0 to 1 percent slopes	Sa	1,139	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Tetonka silt loam, 0 to 1 percent slopes	Te	209	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate

Exhibit C

Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a,c]	Steep Slopes [a,d]	Shallow Bedrock [a,e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Wakonda-Chancellor silty clay loams, 0 to 2 percent slopes	Wa	2,824	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Wentworth-Chancellor-Wakonda silty clay loams, 0 to 2 percent slopes	WcA	1947	Prime Farmland	Yes	High	Low	No	No	No	High
Wentworth-Trent silty clay loams, 0 to 2 percent slopes	WhA	862	Prime Farmland	Yes	High	Low	No	No	No	High
Whitewood silty clay loam, 0 to 2 percent slopes	Wk	462	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Worthing silty clay loam, 0 to 1 percent slopes	Wo	1,482	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Worthing-Davison complex, 0 to 2 percent slopes	Wr	4,981	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Turner County										
Baltic silty clay loam, 0 to 1 percent slopes	Ba	1,134	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Chancellor-Tetonka silty clay loams	Ca	206	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Delmont-Enet loams, 2 to 6 percent slopes	DeB	278	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Dempster-Graceville silty clay loams, 1 to 5 percent slopes	DgB	72	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Ethan complex, 2 to 6 percent slopes	EeB	2,733	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Wentworth-Trent silty clay loams, 1 to 6 percent slopes	EgB	4,986	Prime Farmland	Yes	High	Low	No	No	No	High
Ethan-Egan complex, 5 to 9 percent slopes	EtC	824	Farmland of Statewide Importance	Yes	High	Moderate	No	No	No	High

Exhibit C Soil Characteristics for Each Soil Map Unit within the Project area										
Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a,f]	Re-vegetation Potential
Huntimer silty clay loam, 0 to 2 percent slopes	HuA	923	Prime Farmland	Yes	High	Low	No	No	No	High
Tetonka silt loam	Te	489	Prime Farmland if Drained	No	High	Low	No	No	No	Moderate
Lincoln County										
Alcester silty clay loam, 0 to 2 percent slopes	AcA	262	Prime Farmland	Yes	High	Low	No	No	No	High
Bon soils, frequently flooded	Bo	849	Not Prime Farmland	No	High	Low	No	No	No	Moderate
Chancellor-Tetonka silty clay loams	Ca	12,119	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Chancellor-Viborg silty clay loams	Cd	10,857	Prime Farmland if Drained	Yes	High	Low	No	No	No	Moderate
Chancellor-Wakonda-Tetonka complex	Ch	1,141	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Davis loam	Da	868	Prime Farmland	Yes	High	Low	No	No	No	High
Delmont loam, 2 to 6 percent slopes	DeB	1,108	Prime Farmland if Irrigated	Yes	High	Low	No	No	No	Moderate
Delmont and Talmo soils, 2 to 9 percent slopes	DkB	585	Not Prime Farmland	Yes	High	Low	No	No	No	Moderate
Egan silty clay loam, 3 to 6 percent slopes	EaB	11,345	Prime Farmland	Yes	High	Low	No	No	No	High
Egan-Chancellor silty clay loams, 0 to 4 percent slopes	EcB	4,508	Farmland of Statewide Importance	Yes	High	Low	No	No	No	High
Egan-Shindler complex, 2 to 6 percent slopes	EsB	9,013	Prime Farmland	Yes	High	Low	No	No	No	High

Exhibit C

Soil Characteristics for Each Soil Map Unit within the Project area

Map Unit Name	Map Unit Symbol [a]	Pipeline Crossing Length (feet)	Prime Farmland [a]	Hydric Soils [a]	Compaction Potential [a]	Erosion Potential [a, c]	Steep Slopes [a, d]	Shallow Bedrock [a, e]	Shallow Natric Layer [a, f]	Re-vegetation Potential

[a] As designated by the Natural Resources Conservation Service.
[b] Represents total length (in feet) crossed by the pipeline facilities.
[c] Erosion Potential – Based on land capability class and subclass: High (subclass Ve-VIIIe), Moderate (subclass IIIe-IVe). and Low (remaining subclasses).
[d] Steep Slopes - Represents soils with slopes greater than 8 percent.
[e] Shallow bedrock – Represents soils with unconsolidated rock 60 inches or less from the surface.
[e] Shallow Natric layers – Represents subsoil layers with a large accumulation of sodium salts that can reduce plant growth within 18 inches or less from the surface.

Waterbodies Crossed by the Project

Exhibit C

Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
Campbell County					
210.6	Unnamed Tributary of Lake Pocasse	Ephemeral	-	-	Yes
211.0	Unnamed Tributary of Lake Pocasse	Ephemeral	-	-	Yes
211.7	Unnamed Tributary of Spring Creek	Ephemeral	-	-	Yes
212.6	Unnamed Tributary of Spring Creek	Ephemeral	-	-	Yes
212.8	Unnamed Tributary of Spring Creek	Ephemeral	-	-	Yes
212.9	Unnamed Tributary of Spring Creek	Intermittent	-	-	Yes
213.6	Unnamed Tributary of Spring Creek	Ephemeral	-	-	Yes
214.0	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
214.3	Unnamed Pond	Open water	-	-	No
215.0	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
215.8	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
216.1	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
216.1	Unnamed Pond	Open water	-	-	No
216.7	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
216.8	Unnamed Tributary of Spring Creek	Ephemeral	-	-	Yes
217.6	Unnamed Tributary of Spring Creek	Ephemeral	-	-	Yes
218.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
218.5	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
219.0	Spring Creek	Perennial	-	-	Yes
219.5	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
219.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
222.0	Unnamed Pond	Open water	-	-	Yes
222.2	Unnamed Tributary of McClarem Lake	Ephemeral	-	-	Yes
223.7	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
224.7	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes

Exhibit C

Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
226.1	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
228.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
229.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
232.7	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
234.1	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
238.8	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
McPherson County					
243.5	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
Edmunds County					
247.1	Unnamed Pond	Open water	-	-	No
251.4	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
254.3	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
255.4	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
257.6	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
257.9	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
267.9	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
276.1	Unnamed Tributary of Stafford Dam	Ephemeral	-	-	Yes
277.7	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
280.6	Unnamed Tributary of North Fork Snake Creek	Ephemeral	-	-	Yes
281.5	Unnamed Tributary of North Fork Snake Creek	Ephemeral	-	-	Yes
Faulk County					
283.5	Unnamed Tributary of North Fork Snake Creek	Intermittent	-	-	Yes
287.3	Unnamed Tributary of North Fork Snake Creek	Ephemeral	-	-	Yes
288.9	Unnamed Tributary of North Fork Snake Creek	Intermittent	-	-	Yes
291.0	Unnamed Tributary of North Fork Snake Creek	Intermittent	-	-	Yes
292.3	Unnamed Tributary of North Fork Snake Creek	Ephemeral	-	-	Yes

Exhibit C
Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
292.7	Unnamed Tributary of North Fork Snake Creek	Intermittent	-	-	Yes
293.0	Unnamed Tributary of North Fork Snake Creek	Ephemeral	-	-	Yes
293.8	Unnamed Pond	Intermittent	-	-	No
293.9	North Fork Snake Creek	Perennial	-	-	Yes
300.3	Unnamed Tributary of South Fork Snake Creek	Intermittent	-	-	Yes
301.7	Unnamed Pond	Open water	-	-	No
302.1	Unnamed Tributary of South Fork Snake Creek	Intermittent	-	-	No
302.6	Unnamed Tributary of South Fork Snake Creek	Intermittent	-	-	Yes
303.3	Unnamed Tributary of South Fork Snake Creek	Intermittent	-	-	Yes
305.0	Unnamed Tributary of South Fork Snake Creek	Ephemeral	-	-	Yes
305.0	Unnamed Pond	Open water	-	-	No
305.9	South Fork Snake Creek	Perennial	-	-	Yes
305.9	Unnamed Tributary of South Fork Snake Creek	Ephemeral	-	-	Yes
Spink County					
315.9	Dove Creek	Perennial	-	-	Yes
321.2	Agricultural Ditch	Ephemeral	-	-	Yes
322.4	Turtle Creek	Perennial	Fish/Wildlife Prop, Rec, Stock; Irrigation Waters; Limited Contract Recreation; Warmwater Marginal Fish Life	Full Support; Full Support; Nonsupport; Non Support	HDD[b]
324.5	Unnamed Tributary of Turtle Creek	Intermittent	-	-	Yes
328.7	Unnamed Pond	Open water	-	-	No
335.7	Unnamed Tributary of James River	Intermittent	-	-	Yes
A0.7	Unnamed Tributary of James River	Intermittent	-	-	Yes
A1.7	Unnamed Tributary of James River	Intermittent	-	-	Yes
A2.9	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
A4.7	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes

Exhibit C
Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
Beadle County					
348.0	James River	Perennial	Fish/Wildlife Prop, Red, Stock; Irrigation Waters; Limited Contact Recreation; Warmwater Semipermanent Fish Life	Full Support; Full Support Nonsupport Nonsupport	HDD[b]
348.2	Unnamed Tributary of James River	Intermittent	-	-	Yes
349.4	Unnamed Tributary of James River	Intermittent	-	-	Yes
351.1	Unnamed Tributary of James River	Ephemeral	-	-	Yes
352.1	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
352.5	Foster Creek	Perennial	-	-	Yes
353.2	Unnamed Tributary of Foster Creek	Intermittent	-	-	Yes
353.8	Unnamed Tributary of Foster Creek	Intermittent	-	-	Yes
356.1	Unnamed Tributary of Lake Byron	Intermittent	-	-	Yes
357.8	Unnamed Tributary of Lake Byron	Intermittent	-	-	Yes
358.4	Unnamed Tributary of Lake Byron	Ephemeral	-	-	Yes
358.7	Unnamed Tributary of Lake Byron	Intermittent	-	-	Yes
359.0	Unnamed Tributary of Lake Byron	Intermittent	-	-	Yes
360.2	Unnamed Pond	Open water	-	-	No
361.9	Unnamed Tributary of Unnamed lake	Intermittent	-	-	Yes
363.0	Shue Creek	Perennial	-	-	Yes
363.7	Unnamed Tributary of Shue Creek	Ephemeral	-	-	No
364.7	Unnamed Tributary of Shue Creek	Ephemeral	-	-	Yes
364.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
365.1	Unnamed Tributary of Shue Creek	Intermittent	-	-	Yes
366.5	Unnamed Tributary of Shue Creek	Intermittent	-	-	Yes
367.9	Pearl Creek	Intermittent	-	-	Yes
369.0	Unnamed Pond	Open water	-	-	No

Exhibit C

Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
371.0	Middle Pearl Creek	Intermittent	-	-	Yes
372.2	Unnamed Tributary of Middle Pearl Creak	Intermittent	-	-	Yes
373.2	Unnamed Tributary of Middle Pearl Creek	Intermittent	-	-	Yes
373.8	Unnamed Tributary of Middle Pearl Creek	Intermittent	-	-	Yes
374.0	Unnamed Pond	Open water	-	-	No
Kingsbury County					
375.3	South Fork Pearl Creek	Intermittent	-	-	Yes
375.4	South Fork Pearl Creak	Intermittent	-	-	No
375.5	Unnamed Tributary of South Fork Pearl Creek	Intermittent	-	-	Yes
377.2	Unnamed Tributary of South Fork Pearl Creek	Intermittent	-	-	Yes
378.4	Unnamed Pond	Open water	-	-	No
378.8	Unnamed Tributary of Lake Iroquois	Intermittent	-	-	Yes
379.7	Unnamed Tributary of Lake Iroquois	Intermittent	-	-	Yes
385.8	Red Stone Creek	Intermittent	-	-	Yes
387.5	Unnamed Tributary of Red Stone Creek	Intermittent	-	-	Yes
388.6	Unnamed Tributary of Red Stone Creek	Intermittent	-	-	Yes
389.3	Unnamed Pond	Open water	-	-	No
391.5	Rock Creek	Intermittent	-	-	No
391.7	Rock Creek	Intermittent	-	-	Yes
392.4	Unnamed Tributary of Unnamed Pond	Intermittent	-	-	Yes
393.3	Unnamed Pond	Open water	-	-	Yes
395.0	West Fork Vermillion River	Intermittent	-	-	Yes
Miner County					
396.7	Unnamed Tributary of West Fork Vermillion River	Intermittent	-	-	Yes
398.6	Unnamed Tributary of West Fork Vermillion River	Intermittent	-	-	Yes
399.2	Unnamed Tributary of West Fork Vermillion River	Ephemeral	-	-	Yes

Exhibit C

Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
399.7	Unnamed Tributary of West Fork Vermillion River	Ephemeral	-	-	Yes
400.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
400.9	Unnamed Tributary of West Fork Vermillion River	Intermittent	-	-	Yes
401.6	Unnamed Tributary of West Fork Vermillion River	Ephemeral	-	-	Yes
401.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
402.0	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
402.5	Unnamed Stream	Intermittent	-	-	Yes
403.3	Unnamed Tributary of West Fork Vermillion River	Ephemeral	-	-	Yes
403.5	Unnamed Tributary of West Fork Vermillion River	Ephemeral	-	-	Yes
403.7	Unnamed Pond	Open water	-	-	No
403.9	Unnamed Tributary of West Fork Vermillion River	Ephemeral	-	-	Yes
404.0	Unnamed Tributary of West Fork Vermillion River	Ephemeral	-	-	Yes
404.5	Unnamed Tributary West Fork Vermillion River	Intermittent	-	-	Yes
404.8	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
407.6	Agricultural Irrigation ditch	Ephemeral	-	-	Yes
408.2	Unnamed Tributary of Otter Lake	Ephemeral	-	-	Yes
409.3	Unnamed Pond	Open water	-	-	No
409.6	Unnamed Tributary of Otter Lake	Ephemeral	-	-	Yes
410.4	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
Lake County					
410.7	Unnamed Pond	Open water	-	-	No
410.7	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
410.9	Unnamed Pond	Open water	-	-	No
410.9	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
411.0	Unnamed Pond	Open water	-	-	No
411.0	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes

Exhibit C
Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
411.1	Unnamed Pond	Open water	-	-	No
412.0	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
412.3	Unnamed Pond	Open water	-	-	No
412.6	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
412.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
412.9	Agricultural Irrigation Ditch	Ephemeral	-	-	No
413.0	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
413.3	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
413.3	Unnamed Pond	Open water	-	-	No
413.9	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
414.0	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
414.1	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
414.2	Agricultural Irrigation Ditch	Ephemeral		-	Yes
414.7	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
414.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
414.9	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
415.0	Unnamed Pond	Open water	-	-	No
415.0	Roadside Ditch	Ephemeral	-	-	Yes
415.2	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
415.3	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
415.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
415.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
415.6	Unnamed Tributary of East Fork Vermillion River	Intermittent	-	-	Yes
415.6	Unnamed Pond	Open water	-	-	No
415.7	East Fork Vermillion River	Perennial	-	-	Yes
415.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes

Exhibit C
Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
416.2	Unnamed Tributary of East Fork Vermillion River	Intermittent	-	-	Yes
416.4	Unnamed Tributary of East Fork Vermillion River	Intermittent	-	-	Yes
416.5	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
416.7	Unnamed Tributary of East Fork Vermillion River	Intermittent	-	-	Yes
416.9	Unnamed Tributary of Unnamed Pond	Intermittent	-	-	Yes
417.0	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
417.1	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
417.3	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
417.5	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
417.1	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
417.1	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
417.9	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
418.2	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
418.5	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
418.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
419.1	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
419.2	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
419.4	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
419.8	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
419.9	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes

Exhibit C
Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
420.2	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
420.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
420.5	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
421.5	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
421.6	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
421.8	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
422.2	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
424.0	Agricultural Irrigation Ditch	Ephemeral	-	-	No
424.2	Unnamed Tributary of Unnamed East Fork Vermillion River	Intermittent	-	-	Yes
424.8	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
425.1	Unnamed Tributary of Unnamed East Fork Vermillion River	Ephemeral	-	-	Yes
426.2	Unnamed Tributary of North Buffalo Creek	Ephemeral	-	-	Yes
426.9	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
427.6	Unnamed Tributary of North Buffalo Creek	Intermittent	-	-	Yes
427.7	Unnamed Tributary of North Buffalo Creek	Intermittent	-	-	Yes
428.9	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
429.1	Unnamed Tributary of Unnamed Pond	Ephemeral	-	-	Yes
McCook County					
430.1	Unnamed Tributary of Buffalo Lake	Intermittent	-	-	Yes
430.8	Unnamed Tributary of Buffalo Lake	Intermittent	-	-	Yes
Minnehaha County					
431.2	Unnamed Tributary of Buffalo Lake	Intermittent	-	-	Yes

Exhibit C
Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
431.8	Unnamed Tributary of Buffalo Lake	Intermittent	-	-	Yes
432.3	Unnamed Tributary of Buffalo Lake	Intermittent	-	-	Yes
433.3	Unnamed Tributary of West Branch Skunk Creek	Ephemeral	-	-	Yes
433.7	Unnamed Tributary of West Branch Skunk Creek	Ephemeral	-	-	Yes
434.2	Unnamed Tributary of West Branch Skunk Creek	Intermittent	-	-	Yes
434.9	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
435.2	Unnamed Tributary of West Branch Skunk Creek	Ephemeral	-	-	Yes
435.4	Unnamed Tributary of West Branch Skunk Creek	Ephemeral	-	-	Yes
435.8	Unnamed Tributary of West Branch Skunk Creek	Ephemeral	-	-	Yes
435.9	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
436.2	West Branch Skunk Creek	Intermittent	-	-	Yes
436.2	Unnamed Pond	Open water	-	-	No
436.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
437.2	Unnamed Tributary of West Branch Skunk Creek	Intermittent	-	-	Yes
439.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
439.5	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
439.7	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
440.7	Unnamed Tributary of West Branch Skunk Creek	Ephemeral	-	-	Yes
442.0	Unnamed Tributary of West Branch Skunk Creek	Intermittent	-	-	Yes
442.3	Unnamed Tributary of West Branch Skunk Creek	Intermittent	-	-	Yes
445.4	Unnamed Tributary of West Branch Skunk Creek	Intermittent	-	-	Yes
446.0	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
446.3	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
446.4	Unnamed Pond	Open water	-	-	No
447.1	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
447.8	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes

Exhibit C
Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
448.1	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
448.8	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
449.0	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
449.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
449.7	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
450.8	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
452.1	Unnamed Tributary of Wall Lake	Intermittent	-	-	Yes
452.4	Unnamed Tributary of Wall Lake	Intermittent	-	-	Yes
453.5	Unnamed Tributary of Wall Lake	Intermittent	-	-	Yes
453.9	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
454.0	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
454.6	Unnamed Tributary of Unnamed Pond	Intermittent	-	-	Yes
455.4	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
455.8	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
Turner County					
B0.1	Unnamed Tributary of Skunk Creek	Intermittent	-	-	Yes
Lincoln County					
472.2	Unnamed Tributary of Nine Mile Creek	Ephemeral	-	-	No
473.0	Agricultural Irrigation Ditch	Ephemeral	-	-	No
473.7	Unnamed Tributary of Nine Mile Creek	Intermittent	-	-	Yes
474.0	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
474.6	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
475.0	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
476.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
477.0	Unnamed Tributary of Big Sioux River	Intermittent	-	-	Yes
478.7	Agricultural Irrigation Ditch	Ephemeral	-	-	No

Exhibit C
Waterbodies Crossed by the Dakota Access Project

Approximate Milepost[a]	Waterbody Name	Flow Regime	State Classification	Supports Use Designation	Crosses Centerline
478.9	Unnamed Tributary of Big Sioux River	Intermittent	-	-	No
480.3	Unnamed Tributary of Big Sioux River	Intermittent	-	-	Yes
481.5	Unnamed Tributary of Big Sioux River	Ephemeral	-	-	Yes
481.6	Big Sioux River	Perennial	Fish/Wildlife Prop, Rec, Stock; Immersion Recreation; Irrigation Waters; Limited Contact Recreation, Warmwater Semipermanent fish life	Full Support; Nonsupport; Full Support; Nonsupport; Nonsupport	HDD[b]
B2.9	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B3.2	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
B4.3	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B4.4	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
B5.2	Unnamed Tributary of Beaver Creek	Ephemeral	-	-	Yes
B5.9	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B8.1	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B8.9	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B9.5	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B10.6	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B10.7	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B11.1	Agricultural Irrigation Ditch	Ephemeral	-	-	Yes
B11.5	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B12.9	Unnamed Tributary of Beaver Creek	Intermittent	-	-	Yes
B15.1	Unnamed Tributary of Nine Mile Creek	Intermittent	-	-	Yes
B15.4	Unnamed Tributary of Nine Mile Creek	Intermittent	-	-	Yes

[a] Mileposts proceeded with the letter A reference the reroute in Spink County, and mileposts proceeded with the letter B reference the reroute in Turner and Lincoln counties.
[b] HDD= Waterbody will be crossed via horizontal directional drill (HDD).

Federal and State Listed Threatened and Endangered Species in South Dakota

Federally Listed Threatened and Endangered Species in South Dakota						
Common Name	**Scientific Name**	**Federal Status**	**Federal County Listing**	**Potential Impact**	**Habitat Requirement**	**Determination of Effect**
Mammals						
Northern long-eared bat	*Myotis septentrionalis*	T	Beadle, Campbell, Edmunds, Faulk, Kingsbury, Lake, Lincoln, McCook, McPherson, Miner, Minnehaha, Spink, Turner	No effect	Summer roosting habitat underneath bark or in crevices of live and dead trees. Winter habitat includes caves and mines with large entrances.	The USFWS has issued an interim 4(d) rule. The implementation of the interim 4(d) rule for the northern long-eared bat exempts certain activities within the white nose syndrome (WNS) buffer zone – those areas within 150 miles of WNS-positive counties – provided certain conservation measures are implemented. In areas outside of the 150-mile WNS buffer zone, incidental take from lawful activities would be exempted. All of South Dakota is outside of the WNS 150-mile buffer zone; thus, construction and operation of the Project area within South Dakota would be exempt from the Endangered Species Act take prohibition.
Birds						
Interior least tern	*Sterna antillarum athalassos*	E	Campbell	No effect	Interior least tern nesting habitat includes open shorelines, riverine sandbars, and mudflats along Missouri and Mississippi Rivers drainages.	The Project does not cross the Missouri River within South Dakota. No suitable habitat within the Project area.
Piping plover	*Charadrius melodus*	T	Campbell, Kingsbury	No effect	Sandy or gravelly beaches and sandbars or alkaline wetlands.	No suitable nesting habitat was identified during Project field surveys. Critical habitat for the piping plover is along the Missouri River; the Project does not cross the Missouri River within South Dakota. This species is highly mobile and would likely avoid the construction area.
Red knot	*Calidris canutus rufa*	T	Beadle, Campbell, Edmunds, Faulk, Kingsbury, Lake, Lincoln, McCook, McPherson, Miner, Minnehaha, Spink, Turner	No effect	Breeds in the Arctic tundra areas, such as sparsely vegetated habitat. When non-breeding they prefer primarily intertidal, marine habitats, coastal inlets, estuaries, and bays.	No suitable habitat within the Project area.

Federally Listed Threatened and Endangered Species in South Dakota						
Common Name	**Scientific Name**	**Federal Status**	**Federal County Listing**	**Potential Impact**	**Habitat Requirement**	**Determination of Effect**
Sprague's pipit	*Anthus spragueii*	C	Campbell, McPherson	No effect	Prefer native grasslands of intermediate height and sparse to intermediate vegetation density, low forb density, and little bare ground but low litter depth. Introduced grasslands may be utilized, but to a much lesser extent. Nests on the ground from early May to mid-October.	Breeding habitat range is in the northern part of the state. Some of the Project area may be within this range; however, there are no occurrences documented within the Project area (SDNHP, 2014 and eBird, 2014)
Whooping crane	*Grus americana*	E	Beadle, Campbell, Clark, Edmunds, Faulk, Kingsbury, McCook, McPherson, Miner, Spink, Turner	No effect	During migration, this species utilizes wetlands and cropland ponds for feeding and roosting. Seasonal and semi-permanent wetlands are the most commonly used.	The Project area is within the migratory range of this species (Cornell Lab of Ornithology, 2014). Only one whooping crane occurrence record is located in Kingsbury County within one mile of the Project (SDNHP, 2014). This species is highly mobile and would likely avoid construction.
Fishes						
Pallid sturgeon	*Scaphirhynchus albus*	E	Campbell, Lincoln	May affect, not likely to adversely affect	Prefer a fast flowing turbid river with a firm sand or gravel bottom. Areas at the end of chutes or sandbars are commonly used for feeding.	The Missouri River (Campbell County) will not be crossed in South Dakota, and the Big Sioux River (Lincoln County) will be crossed via HDD. Dakota Access plans to withdraw water from the Big Sioux River for HDD installation activities and hydrostatic testing of the HDD segment. Dakota Access would implement conditions on permitted intake structures at the Big Sioux River as described in the USFWS Recovery Plan for the Pallid Sturgeon (USFWS, 2014). Potential indirect impacts on pallid sturgeon would be avoided and minimized through implementation of the HDD Contingency Plan.

Federally Listed Threatened and Endangered Species in South Dakota						
Common Name	**Scientific Name**	**Federal Status**	**Federal County Listing**	**Potential Impact**	**Habitat Requirement**	**Determination of Effect**
Topeka shiner	*Notropis topeka*	E	Beadle, Kingsbury, Lake, Lincoln, McCook, Miner, Minnehaha, Spink, Turner	May affect, likely to adversely affect	Found in small prairie streams that exhibit perennial or nearly perennial flow. Substrate usually is clean gravel, cobble, or sand.	Nine waterbodies crossed by the Project in South Dakota were identified by the USFWS as containing known occurrences (James River, Shue Creek, Pearl Creek, Middle Pearl Creek, Redstone Creek, Rock Creek, West Fork Vermillion River, East Fork Vermillion River, and Big Sioux River). Four waterbodies (James River, Pearl Creek, East Fork Vermillion River, and Big Sioux River) would be crossed using HDD construction methods, thus avoiding direct adverse effects at these locations. Field surveys of the remaining five waterbodies identified that one of these waterbodies, the West Fork Vermillion, would be crossed at the headwaters of the stream where it is an emergent wetland with no perennial flow. Therefore, the West Fork Vermillion River is not suitable habitat for the species. The four remaining streams (Shue Creek, Redstone Creek, Middle Pearl Creek, and Rock Creek) include known occurrences and potential suitable spawning habitat.
Invertebrates						
Dakota skipper	*Hesperia dacotae*	T	Edmunds, McPherson	No effect	Dakota skippers only utilize high quality undisturbed (i.e., remnant, uncultivated) prairie; including, wet tallgrass prairie and dry mixed grass prairie.	No native grasslands were identified within Edmunds and McPherson counties during field surveys.
Vascular Plants						
Western prairie fringed orchid	*Platanthera praeclara*	T	Lake, Lincoln, McCook, Miner, Minnehaha, Turner	No effect	Prefers moist tallgrass prairie and sedge meadows.	No western prairie fringed orchids were identified within the Project area based on field survey results. In addition, the species seems to have been extirpated from South Dakota (USFWS, 2015 and U.S. Geological Survey, 2014a).
E= Endangered T= Threatened C= Candidate						

State Listed Threatened and Endangered Species in South Dakota

Common Name	Scientific Name	State Status[a]	Potential Impact	Habitat Requirement	Determination of Effect
Mammals					
Black-footed ferret	*Mustela nigripes*	E	No impact anticipated	Associated exclusively with large (10,000 acres or more) prairie dog towns. Use burrows for shelter and feed on prairie dogs and other species within the habitat.	Historically, the species was present within the state; however, large prairie dog complexes needed to support a black-footed ferret population do not currently exist within the Project area.
Northern river otter	*Lontra canadensis*	T	No impact anticipated	Rivers with high quality water and an abundant food supply.	Within the Project area, this species has been documented within the Big Sioux River and James River watersheds (South Dakota Game, Fish, and Parks [SDGFP], 2014a and South Dakota Natural Heritage Program [SDNHP], 2014). However, both of these rivers will be crossed via HDD, therefore avoiding impacts to the riverine habitats utilized by the otter.
Swift fox	*Vulpes velox*	T	No impact anticipated	Prefer short or mixed grass prairies with flat to gently rolling terrain and sparse vegetation that allows for good mobility and visibility.	Although historically the range of this species was within the Project area, the species does not currently reside within the Project area (NatureServe, 2014).
Birds					
American dipper	*Cinclus mexicanus*	T	No impact anticipated	Cold and clear, fast-moving streams with gravel, stone, or sand bottoms which support invertebrates. Streams with structures over the water such as waterfalls, rocks and boulders are needed for nesting.	The range of this species is not within the Project area (Cornell Lab of Ornithology, 2014).
Bald eagle	*Haliaeetus leucocephalus*	T	No impact anticipated	Breeds and winters in areas close to a coast, river or lake. Prefers conifers for nesting and roosting and tends to avoid areas with high human traffic.	There are few forested areas along the pipeline route for nesting. Occurrence data from the SDNHP documented a nest approximately one mile from the Project area. Field surveys did not identify bald eagles within the Project area. This species is highly mobile and would likely avoid construction.
Eskimo curlew	*Numenius borealis*	E	No impact anticipated	Variety of grassland habitats.	The Project area is within the migratory range of this species (NatureServe, 2014). This species is highly mobile and would likely avoid construction.
Interior least tern	*Sterna antillarum athalassos*	E	No impact anticipated	Interior least tern nesting habitat includes open shorelines, riverine sandbars, and mudflats along Missouri and Mississippi Rivers drainages.	The Project does not cross the Missouri River within South Dakota. No suitable habitat within the Project area.
Osprey	*Pandion haliaetus*	T	No impact anticipated	Prefer habitat near water including, saltmarshes, rivers, ponds, and reservoirs. Osprey places their nest in open areas on poles, channel markers, and dead trees, often over water.	The Project area is within the migratory range of this species (Cornell Lab of Ornithology, 2014). This species is highly mobile and would likely avoid construction.

State Listed Threatened and Endangered Species in South Dakota					
Common Name	**Scientific Name**	**State Status[a]**	**Potential Impact**	**Habitat Requirement**	**Determination of Effect**
Peregrine falcon	*Falco peregrines*	E	No impact anticipated	Inhabits any open habitat with a wide view of the surrounding area, close proximity to water and rocky cliffs or even tall buildings available for nesting.	No nesting habitat is within the Project area (NatureServe, 2014). This species is highly mobile and would likely avoid the construction area.
Piping plover	*Charadrius melodus*	T	No impact anticipated	Sandy or gravelly beaches and sandbars or alkaline wetlands.	No suitable nesting habitat was identified during Project field surveys. Critical habitat for the piping plover is along the Missouri River; the Project does not cross the Missouri River within South Dakota. This species is highly mobile and would likely avoid the construction area.
Whooping crane	*Grus americana*	E	No impact anticipated	During migration, this species utilizes wetlands and cropland ponds for feeding and roosting. Seasonal and semi-permanent wetlands are the most commonly used.	The Project area is within the migratory range of this species (Cornell Lab of Ornithology, 2014). Only one whooping crane occurrence record is located in Kingsbury County within one mile of the Project (SDNHP, 2014). This species is highly mobile and would likely avoid construction.
Reptiles					
Eastern hognose snake	*Heterodon platirhinos*	T	No impact anticipated	Prefer woodlands with sandy soil, fields, farmland and coastal areas.	The range of this species is not located within the Project area (NatureServe, 2014).
False map turtle	*Graptemys pseudogeographica*	T	No impact anticipated	Inhabits slow moving rivers, river sloughs, oxbow lakes, lakes and reservoirs containing abundant aquatic vegetation and basking sites.	The range of this species within South Dakota is limited to the Missouri River area. The Project enters South Dakota east of the Missouri River (NatureServe, 2014).
Lined snake	*Tropidoclonion lineatum*	E	No impact anticipated	Prefers open prairie hillsides and rocky, woodland areas	The range of this species within South Dakota is limited to the southeast corner of the state. Suitable habitat may be present within the Project area; however, this species is highly mobile and would likely avoid construction.
Fishes					
Banded killifish	*Fundulus diaphanous*	E	No impact anticipated	Habitat ranges from quiet waters of lakes and ponds with ample vegetation to muddy streams without vegetation.	The current species habitat range is not located within the Project area (SDGFP, 2014b).
Blacknose shiner	*Notropis heterolepis*	E	No impact anticipated	Prefers clear, cool streams with sand and gravel beds, and deep pools with abundant vegetation both in the water and on lands bordering the streams. This species has only been found in two pristine streams located in south-central South Dakota.	No suitable habitat within the Project area.

State Listed Threatened and Endangered Species in South Dakota

Common Name	Scientific Name	State Status[a]	Potential Impact	Habitat Requirement	Determination of Effect
Finescale dace	*Chrosomus neogaeus*	E	No impact anticipated	Occur most often in cool, clear mountain streams and less often in lakes, reservoirs, or large rivers. Prefer moderate water velocities, associate with a variety of substrates.	The Project area is outside of the current species range (NatureServe, 2014).
Longnose sucker	*Catostomus catostomus*	T	No impact anticipated	Found in cool, spring-fed streams where it feeds on the bottom on crustaceans, snails, insect larvae, and larvae.	The Project area is outside of the current species range (NatureServe, 2014).
Northern pearl dace	*Margariscus nachtriebi*	T	No impact anticipated	Occurs in cool bogs, ponds, lakes, and clear streams.	The species distribution is not located within the Project area. Limited to Counties within southwestern South Dakota (U.S. Geological Survey, 2014b)
Northern redbelly dace	*Chrosomus eos*	T	No impact anticipated	Prefers areas with beds of aquatic vegetation in spring-fed streams.	Believed to be extirpated from the Big Sioux drainage (SDGFP, 2014c)
Pallid sturgeon	*Scaphirhynchus albus*	E	No impact anticipated	Prefer a fast flowing turbid river with a firm sand or gravel bottom. Areas at the end of chutes or sandbars are commonly used for feeding.	The Missouri River (Campbell County) will not be crossed in South Dakota, and the Big Sioux River (Lincoln County) will be crossed via HDD, therefore no impacts will occur to this species.
Sicklefin chub	*Macrhybopsis meeki*	E	No impact anticipated	Prefer large, turbid rivers with a diversity of depths and velocities forming braided channels, sand bars, sand flats, and gravel bars.	No suitable habitat within the Project area.
Sturgeon chub	*Macrhybopsis gelida*	T	No impact anticipated	Prefer large, turbid rivers with a range of depths and velocities forming braided channels, gravel bars, and sand flats and bars.	No suitable habitat within the Project area.

E= Endangered
T= Threatened
[a] South Dakota state listed species do not have county listings, they are listed state-wide.

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Listed Exhibit: 8

An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois

Prepared for
Dakota Access, LLC

Prepared by
Harvey Siegelman, Mike Lipsman and Dan Otto
Strategic Economics Group
West Des Moines, Iowa

November 12, 2014

0.0 Executive Summary

This report examines the economic and fiscal impacts of the Dakota Access Pipeline on the region and the four states through which it will be built (North Dakota, South Dakota, Iowa and Illinois). It involves a more than 1,100 mile[1] pipeline that will be built at a cost of more than $3.8 Billion. This pipeline will have a transportation capacity of over 450,000 barrels per day of crude oil from the Bakken oil fields of northwest North Dakota to a hub in Patoka, Illinois. The goal in building this pipeline is to move that crude oil to domestic refineries more safely and at a lower cost than the current alternatives.

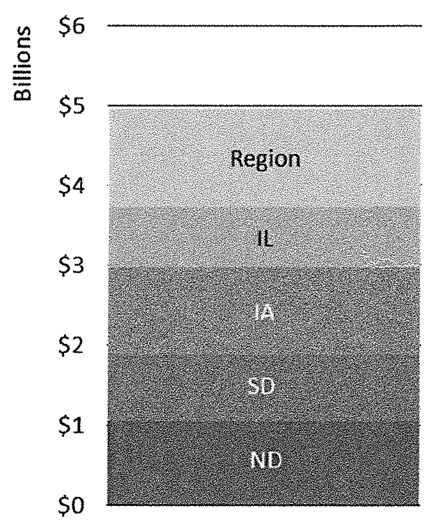
This report endeavors to estimate the economic and fiscal impacts of the pipeline project and to address these issues relating to crude oil transportation in the region.

0.1 Impact on the Region

During the construction stage, the four-state region will experience:

- An employment increase of nearly 33,000 job-years[2] resulting from the direct and the secondary impacts of the spending
- The average annual compensation for those jobs will exceed $57,000
- About 39% of the jobs will be construction jobs, engineering and architectural services will account for about 6% of that increase, followed by food services, real estate and employment services
- The increase in employment will generate a $1.9 Billion increase in labor income
- And a nearly $5 Billion increase in production and sales in the region[3]

Figure 1. DAPL Pipeline Output



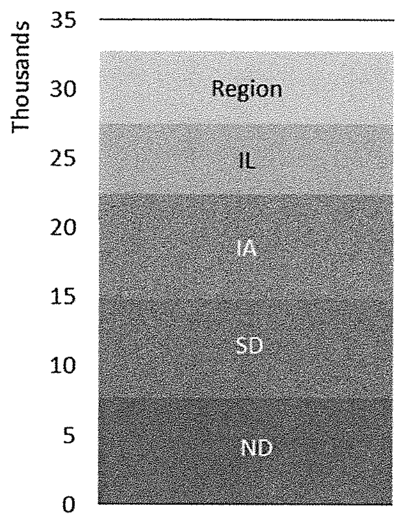
[1] The mileage numbers are approximations based on engineering plans

[2] The term *"job-year"* is used throughout this report to indicate the equivalent amount of work done by one person for one year. Much of the labor done by construction workers will be temporary, for seasonal periods less than a year or with substantial overtime hours. The 33,000 job-years of work is the full-time equivalent of 33,000 40 hours-per-week jobs for one year but will be distributed over the two-year construction stage or however long the construction stage requires.

[3] Not all workers, materials and equipment for this project can be provided within the four-state region. Some of the workers will come from outside of the region, some of the materials will be purchased from outside of the region. As a result, some of the economic impact will extend far beyond the boundaries of this region. While the analysis in this study only examines the impacts within the region and each of the four states, the economic impact

It is not possible to estimate the tax impacts for the region as a whole. This is no doubt larger than the sum of the state fiscal impacts, but the regional model does not provide a way to accurately allocate the extra taxes among the four states.

Figure 2. DAPL Pipeline Job-Years



After the pipeline is completed, the yearly impact of the operations and maintenance activities will add 160 ongoing jobs to the regional economy, generating $11 Million in labor income and more than $23 Million in new production and sales per year.

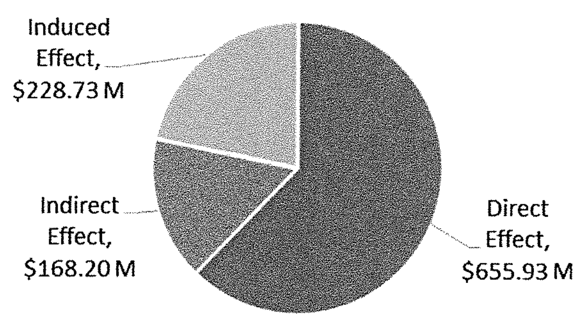
However, the most significant impact will be the felt by the annual taxes that the pipeline will generate for the state and local governments.

0.2 Impact on North Dakota

The cost to build the 346 mile North Dakota portion of the Dakota Access Pipeline is expected to be $1.4 Billion. Of that amount, an estimated $655.9 Million, or 47%, will result in direct purchases within North Dakota. Those direct purchases will cause an additional $397 Million in indirect and induced spending.

The 47% share of local spending that stays within the state is also called the 'local purchase percentage.' It acknowledges that the remaining 53% of the goods and service spending will be purchased from outside of North Dakota. That amount is called the economic 'leakage' and is described in more detail in Chapter 3. The IMPLAN Model local purchase percentages are based on historical data about industrial purchasing patterns and supply chain relationships.

Figure 3. North Dakota Output - $1.053 B



The total impact on spending in North Dakota during the construction stage is expected to

- add nearly 7,700 job-years of employment,
- generate more than $450 Million in labor income and
- add about $1.05 Billion to the production and sales within the state.

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on the nation will be more than 51,000 job-years, $3.1 Billion in labor income and more than $9.7 Billion in production and sales (output).

The increased economic activity that results during construction of the pipeline will

- generate additional sales, use, gross receipts, and lodging taxes of $32.9 Million for state government, plus
- $1.7 Million for local governments.
- In addition, the state will realize $5.9 Million more from individual income tax.

Once the pipeline goes into operation North Dakota state and local governments will realize ongoing annual sales, use, gross receipts, and lodging tax increases of about $158,000 and income tax increases of about $84,000. Also, during the first full year of operation the pipeline will generate about $13.1 Million in new property taxes for local governments.

One benefit of the pipeline is to relieve existing and anticipated future transportation capacity problems in the Bakken oil fields area of North Dakota. The production of oil in this area has increased from only 10,295 barrels per day at the beginning of 2007 to almost 1.05 million barrels per day during July 2014. This exceptional growth has taxed the transportation infrastructure of the area to the limit and has impacted grain and soybean farmers.

Oil shipments are currently competing with grain and soybean shipments for the limited rail lines, engines and rail personnel. This has already impacted farm commodity prices and farm income in North Dakota, South Dakota and Minnesota.

Currently, at least 70% of the oil extracted from the Bakken area moves to refineries by rail[4], which is more expensive than by pipeline. With oil production in the area expected to increase to more than 1.4 million barrels per day by 2017, additional transportation system capacity is needed.

0.3 Impact on South Dakota

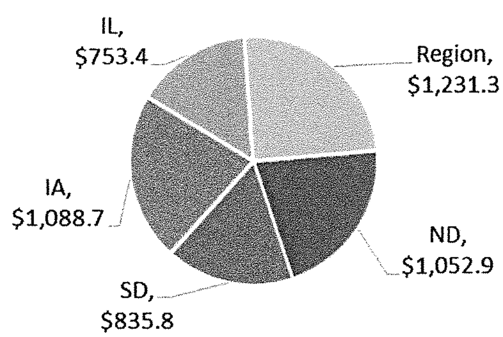
The South Dakota portion of the pipeline will be 267.4 miles long and is expected to cost $*819.6* Million. Of that amount, about 59%, or an estimated $485.6 Million, will result in direct spending in the South Dakota economy.

The direct spending within the state will cause indirect and induced spending of $168.2 Million and $186.2 Million.

The total impact on the South Dakota economy will be

- $835.8 Million increase in production and sales,
- $302.8 Million increase in labor income and

Figure 4. DAPL Construction Output ($Millions)



[4] http://www.fireengineering.com/articles/2014/07/crude-oil-by-rail-information-and-hazards.html

- more than 7,100 additional job-years of employment.

Once the pipeline has been built, the yearly operations and maintenance spending will add 31 permanent jobs, $1.9 Million in labor income and $4.2 Million in additional production and sales to the South Dakota economy.

The increased economic activity that results during construction of the pipeline will generate additional sales, use, gross receipts, and lodging taxes of $35.6 Million for state government, plus $2.9 Million for local governments.

Once the pipeline goes into operation South Dakota state and local governments will realize ongoing annual sales, use, gross receipts, and lodging tax increases of about $197,000. Also, during the first full year of operation the pipeline will generate an estimated $13.5 Million in new property taxes for local governments.

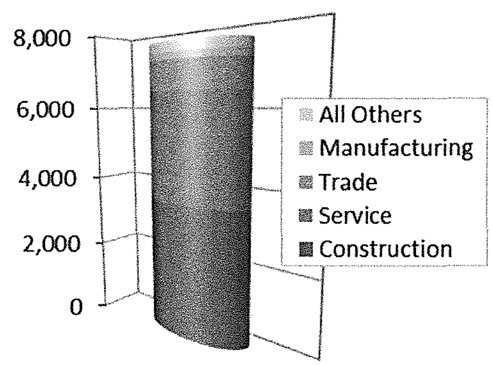
0.4 Impact on Iowa

The Iowa portion of the pipeline will extend for 343 miles. The cost to build it will be slightly over $1.04 Billion, of which $628.4 Million will circulate within the Iowa economy.

That direct impact will generate

- an estimated $386.8 Million in additional indirect and induced growth in production and sales
- adding more than a billion dollars to the Iowa economy.
- The pipeline will create an additional 7,623 job-years of employment during the two-year construction period, generating an additional $390 Million in income.

Figure 5. Pipeline Job-Years Created by Iowa Portion



Once the construction is completed, the Iowa portion of the pipeline will generate 25 permanent jobs, $1.7 Million in additional income and $3.7 Million in production and sales each year.

The increased economic activity that results during construction of the pipeline will generate additional Iowa sales, use, gross receipts, and lodging taxes of $33.1 Million for state government, plus $2.2 Million for local governments. In addition, the state will realize $14.6 Million more from individual income tax.

Once the pipeline goes into operation, Iowa state and local governments will realize ongoing annual sales, use, gross receipts, and lodging tax increases of about $190,000 and income tax increases of about $85,000. Also, during the first full year of operation the pipeline will generate an estimated $27.4 Million in new property taxes for local governments.

0.5 Impact on Illinois

At 177 miles, Illinois has the shortest segment of the pipeline. The cost to build the pipeline and connect it to the trunkline hub in Patoka is expected to be $515.8 Million. Because Illinois is the most industrialized state of the four in the region, about 71%, or $366.6 Million, of the construction spending inputs can be provided by manufacturers, vendors and workers within the state. The 71% is an aggregate local purchase percentage and the remaining 29% would be an estimate of how much would be purchased from outside of Illinois.

The construction stage of the pipeline is expected to provide Illinois with

- An estimated $753.4 Million in additional output, or production and sales,
- $303.4 Million in additional labor income and
- more than 5,000 additional job-years of employment.

Each year after the pipeline is placed in service, its operation and maintenance will create

- $3 Million in additional output, or production and sales,
- $1.5 Million in additional labor income and
- 20 permanent jobs.

The increased economic activity that results during construction of the pipeline segment in Illinois will generate additional sales, use, gross receipts, and lodging taxes of $16.4 Million for state government, plus $3.0 Million for local governments. In addition, the state will realize $7.7 Million more from individual income tax.

Once the pipeline goes into operation, Illinois state and local governments will realize ongoing annual sales, use, gross receipts, and lodging tax increases of about $50,000 and income tax increases of about $45,000. About $747,000 in additional property tax will be generated by the pipeline during its first year of operation because Illinois does not tax below ground infrastructure.

Table 1. Economic Impact of the Construction Stage

Project Area	Output ($Millions)	Labor Income ($Millions)	Job-Years
North Dakota	$1,052.86	$450.35	7,688
South Dakota	$835.84	$302.82	7,137
Iowa	$1,088.74	$390.34	7,623
Illinois	$753.35	$303.30	5,009
Region	$4,962.12	$1,934.39	32,721

Source: Strategic Economics Group

Table 2. Economic Impact of the Operations & Maintenance Stage

Project Area	Output ($Millions)	Labor Income ($Millions)	Jobs
North Dakota	$8.92	$4.42	66
South Dakota	$4.22	$1.95	32
Iowa	$3.67	$1.67	25
Illinois	$3.09	$1.51	20
Region	$23.13	$11.01	160

Source: Strategic Economics Group, IMPLAN Model

Table 3. State & Local Tax Receipts at the Construction Stage ($Million)

State	Income Taxes	Sales/Use, Lodging & Gross Receipts Tax	Property Taxes	Total State & Local Taxes
North Dakota	$5.90	$34.59	$0.00	$40.49
South Dakota	$0.00	$38.53	$0.00	$38.53
Iowa	$14.57	$35.33	$0.00	$49.90
Illinois	$7.68	$19.42	$0.00	$23.10
Total	$28.15	$127.86	$0.00	$156.01

Source: Strategic Economics Group

Table 4. Annual State/Local Tax Receipts at the Operations & Maintenance Stage ($Million)

State	Income Taxes	Sales/Use, Lodging & Gross Receipts Tax	Property Taxes	Total State & Local Taxes
North Dakota	$0.084	$0.158	$13.125	$13.367
South Dakota	$0.000	$0.197	$13.530	$13.727
Iowa	$0.085	$0.190	$27.409	$27.684
Illinois	$0.045	$0.050	$0.747	$0.842
Total	$0.214	$0.595	$54.811	$55.620

Source: Strategic Economics Group

Beyond the state and regional economic impacts that will result from the construction, operation and maintenance of the proposed Dakota Access Pipeline, there exists other transportation cost, safety, and macroeconomic considerations. Some findings related to these are:

- A large share of Bakken oil is currently being transported by railroad and it is affecting the farm economy in Montana, Minnesota and the Dakotas. Trains carry two-thirds of a million barrels of crude produced each day from the Bakken, where pipelines are scarce to refineries. These train engines, tracks and crews would otherwise be available to transport grain from the Dakotas and Minnesota to markets.

- The result is that grain transport has been delayed, freight rates have risen and farm revenue has fallen. Two studies have estimated the current farm revenue losses at between $66 Million in North Dakota and $99 Million in Minnesota. The rail issue has spread to West Central Iowa farmers. A North Dakota Daily News story concluded that, "creating a pipeline has arisen repeatedly by agricultural officials hoping to lessen the severity of the backlog."[5]

- The transportation of crude oil is generally less expensive by pipeline than by railroad. The cost of moving oil from the Bakken area of North Dakota to Gulf Coast refineries during 2013 cost between $1 and $3 per barrel less by pipeline than by railroad.

- During 2011 through 2013 price differentials between Brent and West Texas Intermediate (WTI) crude made it advantageous to ship oil by railroad to East and West Coast refineries rather than by pipeline to the Gulf Coast. During this period the price differential reached as high as $29.59 per barrel during September 2011. At least partially in response to this differential, railroad shipments of crude oil jumped by 255.4% during 2011 and by another 74.4% during 2012.

- A major reason for the large spread between Brent and WTI crude prices was a shipping bottleneck that developed in Cushing, OK, which is the largest storage hub for domestically produced oil. From 2009 to 2013 the amount of oil stored in Cushing rose from 34.5 Million to 51.9 Million barrels. This happened because the United States' pipeline infrastructure was developed to move oil north into Cushing rather than away from Cushing. This problem has now been resolved resulting in Cushing oil inventories dropping to 19.6 Million barrels. Correspondingly the Brent to WTI price differential has dropped to about $5 per barrel.

- Both pipelines and railroads have experienced some spectacular accidents in recent years. But overall the safety records of both modes of hazardous materials transportation are very good. Over the past five years pipeline spills have averaged only 82,000 barrels per year while delivering an average of 13.7 Billion barrels per year of hazardous liquids. Thus, 99.99% of crude oil transported by pipeline is delivered safely to its destination.

- The growth of domestic oil production has exerted significant downward pressure on world oil prices. As of mid-October both Brent and WTI crude are trading at less than $90 per barrel. These lower crude oil prices have flowed through to lower motor fuel and diesel fuel prices resulting in an annual savings of about $33 Billion for households and $11.2 Billion for businesses at current prices.

- Since 2005 U.S. oil imports have dropped by 27.7% and since 2011 U.S. expenditures on oil imports have dropped by 22.2%. These decreases are benefiting the country through reduced foreign trade deficits, a stronger dollar, and lower inflation.

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[5] Speidel, Karen, "Experts suggest a pipeline to relieve rail issues." Daily News, September 19,2014

1.0 Introduction

Dakota Access Pipeline, LLC proposes to build a 30-inch diameter crude oil pipeline originating in the Bakken Shale oil field in northwest North Dakota, passing through the states of North Dakota, South Dakota, Iowa and Illinois, and terminating at the trunkline hub in Patoka, Illinois.

1.1 Scope and Purpose of the Study

Dakota Access Pipeline retained Strategic Economics Group to estimate the economic and fiscal impacts associated with the construction of the pipeline on the four-state region and on each individual state. Strategic Economics Group used version 3.0 of the IMPLAN input/output model to estimate the economic impacts. This model and information from state revenue departments were used to estimate the fiscal impacts.

In addition, the analysis addresses the long-term economic and fiscal impacts associated with the operation and maintenance of the pipeline and other associated facilities.

Other issues investigated as part of the study include:

- How crude oil transportation costs differ between railroad and pipeline,
- Accident risks for railroads and pipelines, and
- Spillover economic impacts arising from transportation delays caused by railroads giving priority to crude oil shipments.

1.2 Report Content and Organization

Following this introduction the report consist of seven additional chapters.

- Chapter 2 provides an overall description of the proposed Dakota Access Pipeline project and information on the facilities that will be constructed in each of the four states.
- Chapter 3 explains the methodologies used to estimate the economic and fiscal impacts likely to arise from the construction of the pipeline and its operation. Also, this chapter describes the data sources used for the analysis.
- Chapter 4 presents and explains the estimated pipeline construction economic and fiscal impacts.
- Chapter 5 presents and explains the economic and fiscal impacts expected to arise from the future operation and maintenance of the pipeline.

- Chapter 6 examines issues associated with the transportation of the Bakken oil to refineries and markets. It discusses the impact that railroad shipments of oil is having on Midwest agriculture and ultimately on food prices.
- Chapter 7 discusses transportation cost, accident risk, and spillover impacts associated with the construction and operation of the Dakota Access Pipeline.
- Chapter 8 summarizes the results of the analysis.

2.0 Project Background

2.1 Overview Description of the Pipeline Project

The proposed pipeline will consist of about 991[6] mile 30-inch diameter crude oil trunkline extending from Johnson Corner, North Dakota, through South Dakota and Iowa, to Patoka, Illinois. In addition, in North Dakota a 143 mile in-field pipeline system and six operational storage facilities will be developed. The total estimated cost for the project equals $3.8 Billion. The following sections describe the pipeline and supporting facilities proposed for each of the four states. The pipeline will have an estimated initial capacity of greater than 450,000 barrels per day with the potential to increase its capacity to 570,000 barrels per day.

2.1.1 North Dakota

The proposed North Bank supply segment will be 142.6 miles long and consist of 12 to 30 inch diameter in-field pipelines plus six operational tank storage facilities located in Stanley, Ramberg, Epping, Trenton, Waterford City and Johnson's Corner in North Dakota. Table 3 specifies the pipeline segments that will connect these facilities.

Table 3. Dakota Access Supply Segment and North Dakota Portion

State	County	Crossing Length (Miles)
North Bank Supply Segment		
North Dakota	Montrail	23.3
North Dakota	Williams	69.8
North Dakota	McKenzie	49.5
Total (Stanley-Johnson Corner)		142.6
Mainline - North Dakota Segment		
North Dakota	McKenzie	11.1
North Dakota	Dunn	51.3
North Dakota	Mercer	26.1
North Dakota	Morton	71.4
North Dakota	Emmons	43.5
Total (Johnson Corner - ND/SD State Line)		203.4
Total North Dakota		346.0

Source: Dakota Access, LLC

It also presents lengths for each of the five counties in North Dakota that will be traversed by the trunkline portion of the pipeline. The total North Dakota in-field line and trunkline pipeline mileage

[6] The mileage numbers are subject to change.

equals 346 miles. In addition, one pumping station will be constructed in the state. However, the exact location for the pumping stations has not yet been determined.

The total estimated investment in North Dakota for the crude oil in-field pipelines, operational storage facilities, and construction of the trunkline pipeline, pumping stations, architectural, engineering and real estate services, easement payments and other support services will equal $1.4 billion. Excluding the cost of the pumping stations and tanks, the construction of the pipeline is expected to be $2.73 Million per mile.

2.1.2 South Dakota

The South Dakota section of the pipeline will extend 267.4 miles through 12 counties and cost about $819 Million. Table 4 shows the pipeline mileages for each of the 12 South Dakota counties. Excluding the cost of the pumping station, the construction cost of the South Dakota portion of the pipeline is expect to be $2.91 Million per mile.

Table 4. Dakota Access Mainline - South Dakota

State	County	Crossing Length (Miles)
South Dakota	Campbell	28.7
South Dakota	McPherson	6.6
South Dakota	Edmunds	35.9
South Dakota	Faulk	27.7
South Dakota	Spink	36.1
South Dakota	Beadle	28.5
South Dakota	Kingsbury	21.8
South Dakota	Miner	14.1
South Dakota	Lake	18.2
South Dakota	McCook	1.7
South Dakota	Minnehaha	27.9
South Dakota	Lincoln	20.3
Total (ND/SD State Line to SD/IA State Line)		267.4

Source: Dakota Access, LLC

2.1.3 Iowa

The Iowa section will extend through 18 counties for a total of 343.4 miles and this portion of the project is expected to cost $1.04 billion. Table 5 shows the pipeline mileage for each of the 18 Iowa counties. The expected cost to build the Iowa portion of the pipeline, excluding the cost of the pumping station, is $2.91 Million per mile.

Table 5. Dakota Access Mainline - Iowa

State	County	Crossing Length (Miles)
Iowa	Lyon	10.6
Iowa	Sioux	32.7
Iowa	O'Brien	10.9
Iowa	Cherokee	18.2
Iowa	Buena Vista	28.4
Iowa	Sac	0.3
Iowa	Calhoun	30.8
Iowa	Webster	19.1
Iowa	Boone	25.4
Iowa	Story	14.4
Iowa	Polk	8.6
Iowa	Jasper	33.7
Iowa	Mahaska	32.5
Iowa	Keokuk	6.0
Iowa	Wapello	10.9
Iowa	Jefferson	15.0
Iowa	Van Buren	15.9
Iowa	Lee	30.0
Total (SD/IA State Line - IA/IL State Line)		343.4

Source: Dakota Access, LLC

2.1.4 Illinois

Table 6. Dakota Access Mainline - Illinois

State	County	Crossing Length (Miles)
Illinois	Hancock	29.6
Illinois	Adams	4.8
Illinois	Schuyler	3.1
Illinois	Brown	24.3
Illinois	Pike	2.2
Illinois	Morgan	18.0
Illinois	Scott	14.5
Illinois	Macoupin	36.0
Illinois	Montgomery	15.8
Illinois	Bond	12.0
Illinois	Fayette	11.1
Illinois	Marion	5.9
Total (IL State Line - Patoka)		177.2

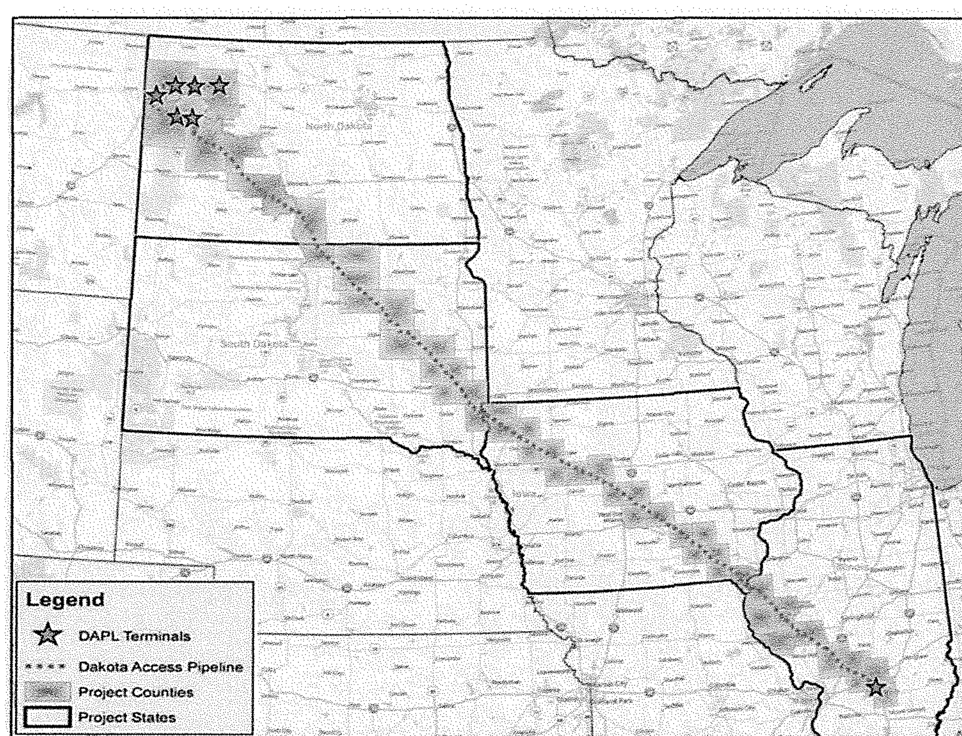
Source: Dakota Access, LLC

The Illinois section of the pipeline will extend for 177.2 miles through 12 counties and cost an estimated $515.8 Million. The Illinois section of the pipeline will not require a pump station. The cost to build the

Illinois portion of the pipeline is expected to be $2.91 Million per mile. Table 6 shows the pipeline mileage for each of the 12 Illinois counties.

Figure 6 shows the proposed path for the the pipeline from Johnson Corner, North Dakota to Patoka, Illinois.

Figure 6. Map of the Dakota Access Pipeline



Source: Dakota Access Pipeline, LLC

3.0 Economic and Fiscal Analysis Methodology

3.1 Data Sources

The data employed in this report includes the estimated costs to build, operate, and maintain a crude oil trunkline pipeline and in-field facilities that will connect the Bakken/Three Forks oil fields of northwestern North Dakota to the major crude oil terminal hub near Patoka, Illinois. This information was provided by Dakota Access, LLC and its affiliates. It includes estimates of the cost of materials, labor, and right-of-way easements and acquisition.

Additional data used in this analysis came from industry publications and from PennEnergy Research. The PennEnergy data was used to provide a basis for independently confirming the Dakota Access construction cost estimates. Among the data acquired from PennEnergy Research is a file of crude oil on-shore pipeline construction cost statistics that cover the years 1980 through 2013.

The analyses done for this report incorporate numerous assumptions. These are stated and explained in the report. The economic impact estimates are based on financial and other data provided by Dakota Access, LLC and obtained from other independent sources. It is important to remember that the analysis results presented in this report are ex-ante or before-the-event estimates. They are dependent on construction, operating, and maintenance costs estimates provided by Dakota Access, LLC.

3.2 The IMPLAN Input/output Model

The researchers built six economic models for this project:

- one model for the four-state region,
- one for each of the four individual states in the region and
- one model to capture the impact on the entire United States[7].

A comparison of the regional impacts to the sum of the four state impacts is intended to identify the interactivity of the economies within the region.

The models were built using version 3.0 of the IMPLAN system. IMPLAN is a product of MIG, Inc. (formerly Minnesota IMPLAN Group). The Acronym stands for *IM*pact analysis for *PLAN*ning.

"The IMPLAN System is a general input-output modeling software and data system that tracks every unique industry group in every level of the regional data, and is designed so almost all the data elements are available for customization. Sources for creation of the background IMPLAN data include BLS [U.S.

[7] The data generated by the IMPLAN Model for the U.S. was not included in this report but could be available from the authors by request.

Department of Labor, Bureau of Labor Statistics], BEA [U.S. Department of Commerce, Bureau of Economic Analysis], and Census.

"IMPLAN traces local impacts by looking back through the supply chain. These backward linkages provide IMPLAN with the information required to examine the iterations of local Indirect and Induced impacts until the initial spending is completely removed from the Study Area by leakage."[8]

3.3 The Mechanics of Linkages and Leakages

Economic impact models like IMPLAN are built on economic relationships that can be described by linkages and leakages. Linkages refer to the supply chain relationships for the materials and services employed in a project. The manufacturers and producers of those goods and services purchase their inputs from other manufacturers and service providers that in turn make purchases from other companies. This cycle of purchases continues until all of the initial expenditure dollars leak out of the region's economy.

The input-output model identifies, for a point in time, all of the relationships between the outputs of all producers and inputs that they buy from other producers (linkages). The IMPLAN model identifies the backward supply chain linkages for 528 industries. In a hypothetical closed economy where all of the suppliers within a region only buy from other suppliers within the same region, the spending loop would be infinite as the spending of one firm would be the income of another and the dollars would keep circulating. But, we do not live in a closed loop economy.

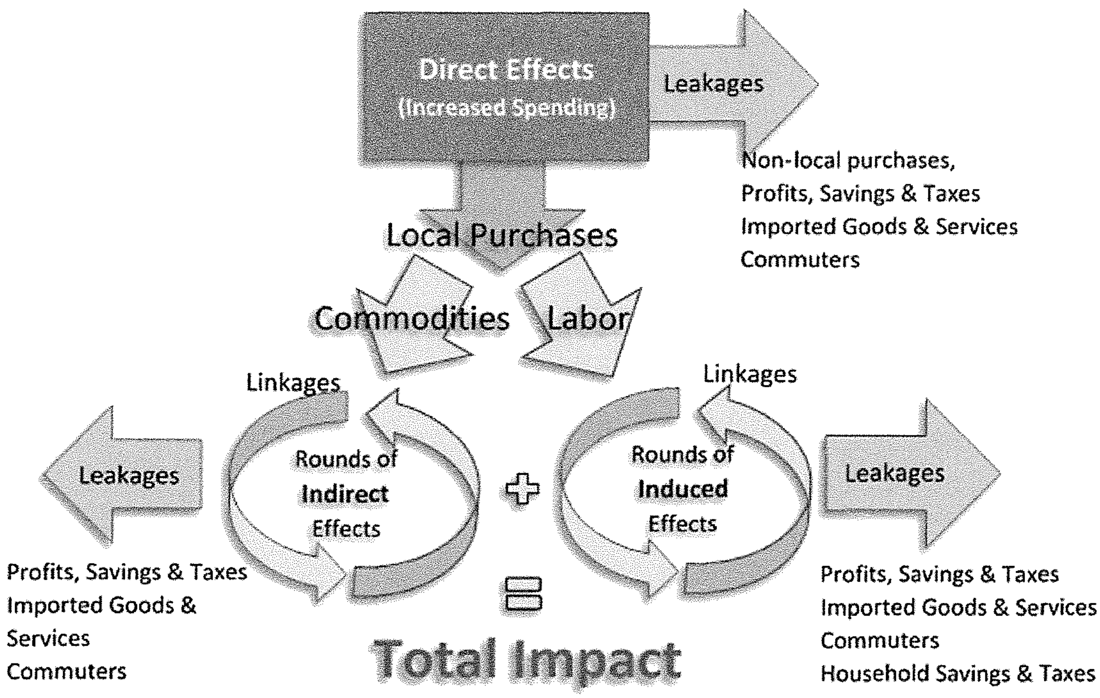
As producers purchase from suppliers that are located outside of the region, some of the spending leaks out of the system (leakages). Profits, savings, and net taxes are also part of the leakage. So, the initial infusion of spending will continue to generate economic activity within the region only until it is completely dissipated or leaked from the economy by imports (purchases from outside the region), profits (monies not spent within the region but paid to owners), savings, and net taxes (taxes minus government spending in the region).

Even a region as large as the entire United States will still experience leakages to the world economy. For an economic impact model to be meaningful, it is important to select a region that is small enough to bring the information to the relevant audience but large enough to minimize the amount of leakages.

In this analysis, the four-state region will undoubtedly have imports of steel and other materials not manufactured in the four target states. Similarly, many of the project work crews will be from outside of the four states. The researchers chose to use a region consisting of the four states rather than one including just the 50 counties through which the pipeline will pass. At the county level the leakages of spending would be too great to be of any meaningful value. Figure 2 illustrates the structure of the IMPLAN Model.

[8] Day, Frances, Principles of Impact Analysis and IMPLAN Applications, First Edition, p. 14.

Figure 7. Economic Impact Circular Flow Chart – Leakages and Linkages



3.4 What Will the Economic Analysis Tell Us?

The estimated impacts derived from each of the six economic models (US, region and four states) identify changes to the economy during the construction stage and the operations stage of the project. The economic analyses will include the sum the "consecutive rounds of inter-industry spending traveling back through the supply chain"[9] which we call the *Indirect Effects*. They are called this because they are indirectly stimulated by the initial increase in spending represented by the pipeline construction (or operations).

In addition to purchases of materials and manufactured inputs, there will be an initial increase in employment as a result of the pipeline construction (or operation). Indirect spending will also result in an increase of employment. "The spending of income earned by the employees, resulting from both directly and indirectly affected industries contributes to the *Induced Effect*. The Induced Effect, therefore is a measurement of employee spending of all employees of the directly affected industry, and

[9] Day, Frances, *ibid.* p. 6.

all the employees of subsequent indirectly impacted industries in the supply chain, as long as these employees live within the defined geography of the study."[10]

3.5 Fiscal Analysis Sources

Fiscal analysis involves the identification and estimation of the tax impacts resulting from Direct, Indirect, and Induced expenditures associated with the pipeline's construction and operation. The major types of taxes that will be impacted include:

- property taxes,
- state and local sales, use, and excise taxes, and
- income taxes.

The tax systems of the four states exhibit considerable variation. Therefore, the Revenue Departments of each state were contacted to obtain information on the taxes most likely to be impacted by the project. The tax revenue impact estimates are based on the state provided information and output measures derived from the IMPLAN models. The analysis presents separate tax impact estimates for the construction and operations stages of the project. The methodologies followed in estimating the construction stage fiscal impacts are described in Chapter 4 and those used to estimate operations stage fiscal impacts are described in Chapter 5.

[10] Day, Frances, *ibid*. p. 6.

4.0 Pipeline Construction Impact Analysis Results

4.1 The Construction Stage Inputs

The Construction stage consists of three parts: the in-field and operational storage facilities in the oil fields of North Dakota, the building of the pipeline through the four states and the construction of pumping stations in North Dakota, South Dakota and Iowa. For each of these parts there are required purchases of materials, equipment and labor. Dakota Access, LLC and its affiliates provided expenditure estimates by major category (i.e., construction, pipe, valves, fittings, bends, etc.), which Strategic Economics Group entered into IMPLAN models built to describe the industrial purchasing relationships of similar pipeline construction projects.

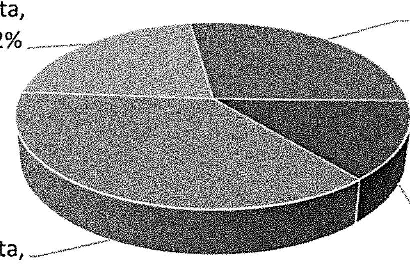
Table 7. IMPLAN Input Spending for the Construction Phase of the Pipeline ($Millions)

Component	IMPLAN Sector	North Dakota	South Dakota	Iowa	Illinois	Region
Pipeline						
Construction labor and land clearing	29	$30.62	$25.22	$32.39	$16.71	$104.95
Construction	36	$504.67	$415.68	$533.87	$275.46	$1,729.67
Pipe	171	$207.91	$171.25	$219.94	$113.49	$712.60
Valves, Fittings, Bends, etc.	198	$56.70	$46.71	$59.98	$30.95	$194.34
ROW Agents	247	$28.35	$23.35	$29.99	$15.48	$97.17
Engineering & Environmental	251	$34.59	$28.49	$36.59	$18.88	$118.55
Construction and Mill Inspection	360	$25.52	$21.02	$26.99	$13.93	$87.46
Easement & Damages	365	$56.70	$46.71	$59.98	$30.95	$194.34
Pumping Stations and Tanks						
Construction labor and land clearing	29	$7.46	$7.99	$7.99	$0.00	$23.44
Tankage	189	$422.30	$0.00	$0.00	$0.00	$422.30
Pumping Station Materials & Equip.	247	$14.50	$14.50	$14.50	$0.00	$43.50
Control and monitoring system	251	$4.70	$4.70	$4.70	$0.00	$14.10
Construction equipment	365	$12.92	$13.91	$13.91	$0.00	$40.74
Easement & Damages	HH	$0.05	$0.05	$0.05	$0.00	$0.15
Total Construction Phase		$1,407.00	$819.57	$1,040.90	$515.84	$3,783.30

Source: Dakota Access, LLC

Table 7 shows the values of the spending inputs estimated by Dakota Access, LLC for each state by the appropriate spending categories. Construction spending inputs amounted to nearly $3.8 Billion for the region with 37% being spent in North Dakota, 27% in Iowa, 22% in South Dakota and 14% in Illinois (Shown in Figure 8).

Figure 8. Construction Input Spending on the Dakota Access Pipeline ($Millions)



Source: Dakota Access Pipeline, LLC

Estimates of the number of workers necessary to build the pipelines were developed using:

- the amount budgeted for construction of the Dakota Access Pipeline,
- the imputed employee compensation for each state derived from the IMPLAN models, and
- the most recent estimated wage levels for construction and extractive services workers compiled by the U.S. Labor Department, Bureau of Labor Statistics.

The "Easement and Damages" category in Table 7 is treated in the IMPLAN model as direct household payments. These payments represent compensation for damage to and the repair of property associated with construction of the pipeline. In addition, they represent the purchase of a partial ownership interest in the property that provides the pipeline company with the right of access to the pipeline for the purposes of future maintenance and repair.

Table 8 shows the construction spending for which the IMPLAN models generate estimates of employee compensation for each state and for the region. For comparison, the average wage levels for the U.S. Department of Labor, Bureau of Labor Statistics[11] average wage levels for each state for the category "Construction and Extraction Occupations" is included. These estimates are a factor in determining the employee compensation inputs in the IMPLAN model for each state and the region.

[11] Department of Labor, Bureau of Labor Statistics, May 2013 Occupational Employment Statistics (OES) Survey occupation category

Table 8. Development of the Direct Pipeline Worker Estimates from Construction Spending

Category	North Dakota	South Dakota	Iowa	Illinois	Region
Construction Spending ($M)	$504.67	$415.68	$533.87	$275.46	$1,729.67
IMPLAN Employee Compensation ($M)	$127.56	$156.76	$196.01	$59.24	$603.65
BLS Survey Wages - Construction & Extractive Services (47-0000)	$47,650	$34,420	$41,240	$57,550	$46,387
Estimated number of Workers (FTE)	3,788	3,682	3,528	2,100	12,894
Estimated Worker Avg. Wages	$56,660	$33,025	$43,103	$50,364	$48,249

Source: Dakota Access, LLC.

Table 9 compares the estimated number of jobs expected to be created by the construction of the Keystone XL Pipeline[12] and the Dakota Access Pipeline. The Keystone project would entail 875 miles of pipeline through the rural areas of Montana, South Dakota and Nebraska. Much of the labor force for the project will need to be brought in from outside of the sparsely-populated worksite areas and housed in work camps.

Table 9. Comparison of Job-Years Impact of Two Projects

Area	Miles	Direct	Indirect & Induced	Total
Keystone Pipeline Project				
Total US Impact		16,100	26,000	42,100
Keystone Project Area	875	5,400	6,600	12,000
Montana	285	1,600	2,300	3,900
South Dakota	316	1,750	1,850	3,600
Nebraska	274	2,050	2,450	4,500
Dakota Access Pipeline Project				
Total US Impact		17,708	33,662	51,370
DAPL Project Area	1,133	15,879	16,843	32,721
North Dakota	346	4,565	3,123	7,688
South Dakota	267	4,199	2,937	7,137
Iowa	343	3,998	3,625	7,623
Illinois	177	2,482	2,527	5,009

Source: Strategic Economics Group, IMPLAN Model, Keystone XL final Report

Only 34% of the jobs created by the Keystone project are expected to be filled by residents of the three-state region. The Dakota Access Pipeline project will cover about 30% more miles than the Keystone project. It will also occur in rural areas, but will be built in more densely-populated states. The IMPLAN

[12] "Final Supplemental Environmental Impact Statement for the Keystone XL Project, Executive Summary", January 2014, United States Department of State, Bureau of Oceans and International Environmental and Scientific Affairs.

models estimate that the Dakota Access pipeline will result in about 90% of the direct jobs being filled by residents of the four-state region.[13] The indirect and induced impacts will also be greater for the Dakota Access Pipeline project as more material purchases will occur within the more industrialized and densely-populated region.

4.2 The Construction Stage Outputs

Tables 10, 11 and 12 summarize the impacts of the construction spending on each of the four states in the region. Also, they show the impact, separately calculated, on the entire four-state region. The impact on the region is greater than the sum of the impacts on the states within the region (by about 35%). Table 14 also shows this effect. This is because the spending leakages are greater at the state level compared to the region and at the region level compared to that nation as a whole.

Table 10. Production from Construction of the Project ($Millions)

Project Area	Direct	Indirect	Induced	Total
North Dakota	$655.93	$168.20	$228.73	$1,052.86
South Dakota	$485.62	$164.05	$186.17	$835.84
Iowa	$628.43	$209.77	$250.54	$1,088.74
Illinois	$366.57	$164.42	$222.36	$753.35
Region	$2,462.95	$1,092.11	$1,407.07	$4,962.12

Source: Strategic Economics Group, IMPLAN Model

Economists define Output as the value of industry production. In IMPLAN these are annual production estimates for the year of the study and are in producer prices. For manufacturers this would be sales plus/minus change in inventory. For service sectors it is equal to sales. For retail and wholesale trade, output is equal to gross margin. Using the spending inputs for the Dakota Access Pipeline provided by Dakota Access, LLC, the project is expected to generate an estimated $4.96 Billion for the four-state region including the indirect and induced effects. The amount of production that is expected to occur in Iowa is $1.09 Billion, in North Dakota is $1.05 Billion, in South Dakota is $836 Million and in Illinois is $753 Million.

Table 11. Labor Income from Construction of the Project ($Millions)

Project Area	Direct	Indirect	Induced	Total
North Dakota	$306.14	$66.93	$77.27	$450.35
South Dakota	$182.65	$58.59	$61.57	$302.82
Iowa	$229.82	$79.46	$81.06	$390.34
Illinois	$157.79	$64.47	$81.04	$303.30
Region	$1,016.83	$419.47	$498.10	$1,934.39

Source: Strategic Economics Group, IMPLAN Model

[13] Dakota Access Pipeline officials have indicated that they intend to fill at least 50% of the construction jobs in each state with residents of that state.

Labor income includes the value of all of the income received from employment, including employee compensation such as wages, salaries, benefits as well as the income received by sole proprietors. It excludes receipts that are not work related such as dividends, interest or rent.

Table 12. Employment from Construction of the Project (Job Years)

Project Area	Direct	Indirect	Induced	Total
North Dakota	4,565	1,157	1,966	7,688
South Dakota	4,199	1,291	1,646	7,137
Iowa	3,998	1,520	2,104	7,623
Illinois	2,482	919	1,608	5,009
Region	15,879	6,362	10,481	32,721

Source: Strategic Economics Group, IMPLAN Model

Table 12 shows that the employment impact of the pipeline construction will be more than 32,000 job years for the region. Some jobs may exist for more than a single year and that is why the employment impact is measured in job-years. Also, a job does not necessarily equate to an FTE (full-time equivalent) position. Some workers may be employed for less than 40 hours per week. However, for a construction project, like the one that is proposed, it is likely many workers will work a considerable amount of overtime.

Table 13. Top Employment Sectors in the Construction Phase of the Dakota Access Pipeline (Job Years)

IMPLAN Sector	Description	Direct	Indirect	Induced	Total	Share
0	Total	15,879	6,362	10,481	32,721	100%
36	Construction of other new nonresidential structures	12,856	0	0	12,856	39%
369	Architectural, engineering, and related services	827	1,020	21	1,868	6%
413	Food services and drinking places	0	244	1,184	1,428	4%
360	Real estate establishments	450	149	393	992	3%
382	Employment services	0	501	221	722	2%
29	Support activities for oil and gas operations	700	5	0	706	2%
319	Wholesale trade businesses	0	345	322	666	2%
397	Private hospitals	0	0	612	612	2%
394	Offices of physicians, dentists, and other health practitioners	0	0	549	549	2%
356	Securities, commodity contracts, investments, and related activities	0	207	235	442	1%
329	Retail Stores - General merchandise	0	66	372	438	1%
324	Retail Stores - Food and beverage	0	64	349	413	1%
398	Nursing and residential care facilities	0	0	413	413	1%
388	Services to buildings and dwellings	0	226	140	365	1%
189	Metal tank (heavy gauge) manufacturing	319	6	0	325	1%
380	All other miscellaneous professional, scientific, and technical services	261	48	12	321	1%
	All Others	465	3,482	5,659	9,607	29%

Source: Strategic Economics Group, IMPLAN Model

Table 13 shows that 39% of the estimated job years created in the region will be in the construction field. The table also shows the broad range of job titles associated with the construction stage of the pipeline project. Many of these positions are jobs that are affected by the indirect and induced spending associated with the project.

Table 14 shows a comparison of the employment impacts (in job years), labor income impacts and output impacts. It also illustrates how the size of the analysis area affects the degree of leakages, the multipliers and therefore the magnitude of the numbers.

Table 14. Comparison of Construction Impact on the Region and States

Impact Type	Employment	Labor Income ($Millions)	Output ($Millions)
Region			
Direct Effect	15,879	$1,016.83	$2,462.95
Indirect Effect	6,362	$419.47	$1,092.11
Induced Effect	10,481	$498.10	$1,407.07
Total Effect	32,721	$1,934.39	$4,962.12
North Dakota			
Direct Effect	4,565	$306.14	$655.93
Indirect Effect	1,157	$66.93	$168.20
Induced Effect	1,966	$77.27	$228.73
Total Effect	7,688	$450.35	$1,052.86
South Dakota			
Direct Effect	4,199	$182.65	$485.62
Indirect Effect	1,291	$58.59	$164.05
Induced Effect	1,646	$61.57	$186.17
Total Effect	7,137	$302.82	$835.84
Iowa			
Direct Effect	3,998	$229.82	$628.43
Indirect Effect	1,520	$79.46	$209.77
Induced Effect	2,104	$81.06	$250.54
Total Effect	7,623	$390.34	$1,088.74
Illinois			
Direct Effect	2,482	$157.79	$366.57
Indirect Effect	919	$64.47	$164.42
Induced Effect	1,608	$81.04	$222.36
Total Effect	5,009	$303.30	$753.35

Source: Strategic Economics Group, IMPLAN Model

The construction stage of the Dakota Access Pipeline is expected to generate $9.6 Billion in total output nationally but only about half of that, or $4.96 Billion in output (production and sales), will be captured within the four-state region. That is because many of the manufacturers of products that will ultimately be purchased for this project are located outside of the region. Similarly, the $4.96 Billion in output in the region is substantially greater than the sum of the impacts on the individual states, which adds up to

$3.73 Billion. This illustrates the leakages of purchasing dollars for materials and services that are imported from outside of the region and within the region from outside of each individual state. Also, some of the workers will come from other states to work on this project sending all or a portion of their paychecks to their home state.

The estimates of impacts for the region as a whole capture indirect and induced impacts associated with interactions among the economies of the four states, which the impact estimates for the four states individually exclude. For example, valves purchased for use on the pipeline in South Dakota may be manufactured in Iowa. The individual South Dakota model treats this as a leakage. Also, the Iowa model misses this expenditure because it is not generated by pipeline investment in Iowa. But the regional model captures this economic activity. For that reason, this analysis separately tracks each state as well as the region with a total of the five individual IMPLAN models (Region, North Dakota, South Dakota, Iowa and Illinois) developed for this purpose.

Table 15. IMPLAN Local Purchase Percentage (Share of In-Area Purchases)

Component	IMPLAN Sector	Region	North Dakota	South Dakota	Iowa	Illinois
Pipelines						
Construction labor and land clearing	29	99.8%	100.0%	55.3%	22.3%	69.3%
Construction	36	99.7%	100.0%	99.3%	99.9%	99.6%
Pipe	171	26.0%	2.0%	4.5%	9.4%	25.6%
Valves, Fittings, Bends, etc.	198	22.9%	0.5%	5.4%	9.6%	21.8%
ROW Agents	360	81.9%	48.2%	46.6%	68.1%	88.6%
Engineering & Environmental	369	87.6%	68.4%	69.6%	57.8%	98.8%
Construction and Mill Inspection	380	75.5%	75.2%	28.2%	23.4%	89.1%
Easements and Damages	HH	100.0%	100.0%	100.0%	100.0%	100.0%
Pumping Stations and Tanks						
Construction labor and land clearing	29	99.8%	100.0%	55.3%	22.3%	0.0%
Tankage	189	20.4%	11.0%	0.0%	0.0%	0.0%
Pumping Station Materials & Equip.	247	13.1%	4.6%	5.5%	1.5%	0.0%
Control and monitoring system	251	10.6%	4.5%	6.9%	5.0%	0.0%
Construction equipment	365	92.6%	100.0%	47.7%	68.3%	0.0%
Easements and Damages	HH	100.0%	100.0%	100.0%	100.0%	0.0%

Source: Strategic Economics Group, IMPLAN Model

Table 15 shows the estimated percentage of each input intended to be purchased for each state (or the region) that will actually be produced within that state (or region). For instance, while 26% of the pipe used in the construction of the entire pipeline is expected to be manufactured in the region, only 2% used in North Dakota will be manufactured in North Dakota, 4.5% of what is used in South Dakota will be manufactured in South Dakota, etc.. This table shows the Local Purchase Percentage for each category of construction inputs generated in the IMPLAN models. These factors were based on historical industry research on supply chain relationships.

4.3 Fiscal Impact of Pipeline Construction

The taxes impacted during construction of the Dakota Access Pipeline are sales and use tax, gross receipts tax, lodging tax, tourism tax, and individual income tax. Taxes impacted once the pipeline is in operation are sales and use tax, gross receipts tax, individual income tax, and property tax.

Each of the four states in which the pipeline will be constructed was contacted to obtain answers to the following questions:

- Are sales and use taxes owed on just materials used in the construction of the pipeline or on both materials and labor?
- What local option sales and use taxes apply to construction materials and/or labor?
- Under what conditions would non-resident workers have a tax liability in the state where the pipeline construction occurs?
- Under what conditions would pipeline owners have a state income tax liability?
- Are pipelines subject to property tax and how are pipeline valuations and tax levies determined?
- Are there any other taxes that would apply during construction or operation of the pipeline?

Other state tax information, such as tax rates, services subject to sales and use taxes, and withholding tax payment requirements, were obtained from state departments of revenue Internet sites and from the Federation of Tax Administrators Internet site.

4.3.1 Sales, Use, Gross Receipts, and Lodging Taxes

All four of the states impose sales and use taxes. In addition, North Dakota, Iowa, and Illinois impose lodging taxes, while South Dakota imposes a tourism tax. Also, all of the states allow local governments to impose sales taxes, and all the states allow local governments to impose lodging or tourism taxes. Table 16 summarizes these taxes.

The sales and use tax bases for construction related expenditures vary among the four states. Illinois, Iowa, and North Dakota impose these taxes only on materials used in construction projects. South Dakota taxes materials, labor, and equipment. State sales taxes are imposed on materials and on some services acquired from suppliers located within the state where the transaction occurs. State use taxes generally are imposed on the same types of transactions as sales taxes but apply to purchases from suppliers located outside the state where the purchaser is located. This distinction means that although a large share of the materials used in the construction of the pipeline will be acquired from suppliers located outside the state where they will be used taxes will be owned on these purchases.

Table 16. State and Local Sales, Use, Gross Receipt, and Lodging Tax Features

State	Sales and Use Taxes			Gross Receipts/ Lodging Taxes		
	State Tax Rate	Maximum Local Tax Rate	Tax Base	State Tax Rate	Maximum Local Tax Rate	Lodging & Tourism Tax Base
North Dakota	5.00%	3.00%*	Only Materials	6.00%	3.00%	Lodging, Restaurants & Bars
South Dakota	4.00%	2.00%	Materials, Labor, & Equipment	0.00%	1% Gross Receipts/1.5% Tourism	Food, Lodging & Amusements
Iowa	6.00%	1.00%	Only Materials	5.00%	7.00%	Lodging
Illinois	6.25%	3.75%**	Only Materials	5.64%**	10.00%	Lodging

Source: Strategic Economics Group

* Local governments in North Dakota can impose up to 2.0% sales and use tax and up to another 1.0% gross receipts tax. Only four cities have combined rates of over 2.0%.

** Local governments in Illinois can impose up to 3.75% tax on top of the state 6.25% tax. This makes the maximum combined tax rate equal to 10%. The state lodging tax rate is 6% on 94% of gross receipts.

There are a number of differences among the four states as to how state and local sales, use, gross receipts and lodging taxes apply. The major features of each state's taxes are summarized below:

- <u>North Dakota</u> imposes statewide sales and use taxes at a rate of 5%. Local governments may impose sales and use taxes of up to 2% on the same transactions covered by the state tax. In addition, cities and counties may impose a 1% gross receipts tax. According to the Tax Foundation, the average local option tax rate in North Dakota equals 1.55% in 2014. However, most unincorporated areas do not impose local option sales taxes, so the amount of local option taxes generated by the pipeline will likely be less than the statewide average. The state tax rate on lodging accommodations equals 6%. Cities may impose up to a 2% tax on lodging and up to an additional 1% tax on lodging, restaurant food, and liquor sales.

- <u>South Dakota</u> imposes a statewide sales and use tax at a rate of 4%. South Dakota has a much broader tax base than the other three states to compensate for not having individual or corporate income taxes. A 2% tax is imposed on the gross receipts of construction contractors. For construction projects materials and labor expenditures are both subject to the tax. Also, the tax is imposed on equipment used on construction projects even if purchased out-of-state and no older than seven years. A credit is provided for taxes paid on the equipment to other states. In addition, the state imposes a 1.5% tourism tax on lodging, amusement, entertainment, and other tourism related businesses. City governments may impose up to a 2% local option sales tax and up to a 1% gross receipts tax. The Tax Foundation estimates local option taxes average 1.83% in South Dakota.

- Iowa imposes a 6% statewide sales and use tax. Iowa exempts food for home consumption and prescription medications from sales and use tax. Also, Iowa exempts residential purchases of electricity, natural gas and other heating fuels. City and county governments may impose up to a 1% local option sales tax. There is no local option use tax. This means in most cases construction materials brought into Iowa from other states are not subject to the local option sales tax. For purchases to which local option sales tax applies the average rate in 2014 equals 0.78% according to the Tax Foundation. In addition the state imposes a 5% lodging tax and local governments may impose up to a 7% lodging tax.

- Illinois imposes a 6.25% statewide sales and use tax. Illinois taxes food for home consumption and prescription medications at a rate of only 1%. City and county governments may impose local option retailer's sales tax on businesses located within the jurisdiction at rates up to 3.75%. The Tax Foundation estimates the average local sales tax rate for Illinois equals 1.91%. Illinois imposes a statewide 6% lodging tax on 94% of gross room rental receipts. Municipalities may also impose lodging taxes. The highest local rates appear to be in Chicago at 10% and Galesburg at 9%. It appears that many of the smaller southern Illinois counties through which the pipeline will pass do not impose local lodging taxes. For the southern Illinois counties that have a lodging tax the rate averages about 6%.

Table 17 summarizes the estimated sales, use, gross receipts, and lodging taxes that will be owed to the four states as a result of the construction of the Dakota Access Pipeline and other supporting infrastructure. These estimates reflect taxes on purchases directly associated with construction of the pipeline and purchases associated with indirect and induced purchases arising from the pipeline's construction. The table presents the estimates for state and local taxes separately.

The estimated total amount of these taxes the will be generated by construction of the pipeline equals $127.9 million. The state and local shares equal $118.0 Million and $9.9 Million. Due to differences in the laws of the four states the tax burdens vary. For South Dakota the ratio of these taxes to the direct investment amount equals 4.7%. For North Dakota, Iowa, and Illinois the tax to investment ratios equal 2.5%, 3.4%, and 3.8%, respectively.

Table 17. Construction Stage Sales, Use, Gross Receipts, and Lodging Taxes ($ Million)

State	State	Local	Total
North Dakota	$32.88	$1.71	$34.59
South Dakota	$35.60	$2.93	$38.53
Iowa	$33.09	$2.24	$35.33
Illinois	$16.44	$2.98	$19.42
Total	$118.00	$9.86	$127.86

Source: Strategic Economics Group

4.3.2 Individual Income Tax

Illinois, Iowa, and North Dakota impose individual income taxes, but South Dakota does not impose this tax. Generally, individual income taxes are owed in the state where the income is earned. But some states have reciprocal agreements with border states, which means the state of residence has first claim on the tax and the work state only receives tax payments if the work state tax liability is higher than that of the residence state. Then the different between the two states' tax liabilities is owed to the work state.

Iowa and North Dakota have graduated rate structures, while the Illinois tax is imposed at a flat rate. Major features of the individual income tax structures for these three states are described below.

- **North Dakota**'s individual income tax has a graduated structure consisting of five income brackets with marginal rates going from 1.22% to 3.22%. The top marginal rate applies to taxable income over $405,100 in 2014. Different tax brackets apply to single, married joint, married-separate, and head-of-household filers. North Dakota has reciprocal agreements with Minnesota and Montana.

- **Iowa**'s individual income tax has a graduated structure consisting of nine income brackets with marginal rates going from 0.36% to 8.98%. The top marginal rate applies at a fairly low taxable income level ($68,175 in 2014). Iowa marginal tax rates may appear high, but this is because of the large number of credits, deductions, exclusions, and exemptions allowed. For example, Iowa is one of only three states that allow a 100% deduction for federal income tax payments. There is no marriage penalty associated with Iowa's tax. Iowa has a reciprocal agreement with Illinois.

- **Illinois** currently imposes individual income at a rate of 5%, but in 2015 the rate is scheduled to decrease to 3.75%. The definition of income for the Illinois tax is the same as for federal income tax. Illinois has reciprocal agreements with Iowa, Kentucky, Michigan, and Wisconsin. Illinois offers very few adjustments to income, such as credits, deductions, exclusions, and exemptions, compared to other states. This mean a high share of gross income is taxable.

Table 18 presents individual income tax liability estimates for wage and salary income and for proprietors' income. Tax liability estimates for these two sources of income are based on estimates of wage and salary income and proprietors' income derived from IMPLAN models developed for each state.

The estimates for taxes associated with wage and salary income involved a four step process. First, for each state the total wage and salary income estimates were divided by the total job creation estimates derived by the IMPLAN models by economic sector. Second, these average wage and salary income amounts were multiplied by taxable income percentages derived from U.S. Internal Revenue Service Statistics of Income data for each state. Third, the average tax amounts were derived by applying the state specific marginal tax rates to the average taxable income amounts. Last, the average tax liability estimates were multiplied by the estimated number of jobs created in each economic sector and then summed over all sectors.

The IMPLAN models provide estimates of proprietors' income for each state. The tax liability estimates for proprietors' income assume all of this income represents incremental growth over existing income. As such the tax liability is computed at the marginal tax rate that applies to the average level of proprietors' income for the state.

Table 18. Construction Stage Individual Income Tax ($Million)

State	Wage & Salary Income	Proprietors' Income	Total
North Dakota	$4.16	$1.74	$5.90
South Dakota	$0.00	$0.00	$0.00
Iowa	$7.98	$6.59	$14.57
Illinois	$5.81	$1.89	$7.68
Total	$17.95	$10.20	$28.15

Source: Strategic Economics Group

Additional income taxes may be generated from construction of the Dakota Access Pipeline. In at least some of the states, easement payments made to land owners may be treated as ordinary income. Also, some of the businesses involved in the construction of the pipeline and some businesses that provide goods and services to workers that received income as a result of the construction of the pipeline may be organized as C-corporations. Since corporate income tax marginal rates are greater than individual income tax rates in the three states with income taxes, the above estimates likely somewhat underestimate the state tax impacts. Finally, the above estimates do not reflect economic interactions among the four states arising from the project.

5.0 Operations and Maintenance Impact Analysis Results

5.1 The Operations and Maintenance Stage Inputs

The operations and maintenance stage consists of the on-going activities that will begin near the end of 2016. These activities will require some purchases of materials and equipment and the hiring of a relatively small pool of labor. Dakota Access, LLC provided expenditure estimates by major category (i.e., construction, pipe, valves, fittings, bends, etc.), which Strategic Economics Group entered into an additional set of IMPLAN models built to describe the industrial purchasing relationships similar to the pipeline construction projects. While the expenditures will be divided between project employees and contracted work, the impact on the economy will be the same.

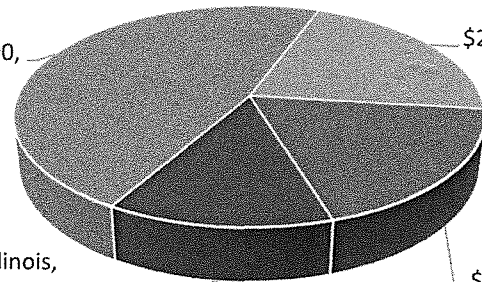
Table 19 shows the values of the spending inputs estimated by Dakota Access, LLC for each state by the appropriate spending categories. Operations and maintenance spending inputs will amount to nearly $13 Million each year for the region with 48% being spent in North Dakota, 21% in South Dakota, 18% in Iowa and 13% in Illinois (shown in Figure 9).

Table 19. IMPLAN Operations & Maintenance Stage Inputs for the Pipeline

Component	IMPLAN Sector	North Dakota	South Dakota	Iowa	Illinois	Region
DAPL Employees						
Number of Workers		27	12	8	6	53
Materials & Equipment ($Millions)	417	$3.45	$1.56	$1.18	$0.81	$6.99
Contracted Work						
Number of Workers		16	7	7	5	36
Materials & Equipment ($Millions)	417	$2.70	$1.20	$1.20	$0.90	$6.00
Total Operations & Maintenance						
Number of Workers		43	19	15	11	89
Materials & Equipment ($Millions)	417	$6.15	$2.76	$2.38	$1.71	$12.99

Source: Dakota Access, LLC

Figure 9. Operations & Maintenance Input Spending on the Dakota Access Pipeline



Source: Strategic Economics Group

5.2 The Operations and Maintenance Stage Outputs

Tables 20, 21 and 22 summarize the impacts of the operations and maintenance spending on each of the four states in the region. Also, they show the impact, separately calculated, on the entire four-state region. The impact on the region is greater than the sum of the state impacts within the region (by about 1.16 times). Just as in the construction stage, the reason for this is that spending leakages are greater at the state level compared to the region as a whole.

Table 20. Production Resulting from Operations of the Project ($Millions)

Project Area	Direct	Indirect	Induced	Total
North Dakota	$6.148	$0.792	$1.979	$8.920
South Dakota	$2.759	$0.432	$1.025	$4.217
Iowa	$2.378	$0.373	$0.916	$3.667
Illinois	$1.705	$0.399	$0.985	$3.090
Region	$12.991	$2.976	$7.164	$23.131

Source: Strategic Economics Group, IMPLAN Model

The estimated operations and maintenance spending inputs provided by Dakota Access, LLC are expected to generate an estimated $23.13 Million in additional output for the four-state region. The annual amount of additional production that is expected to occur in North Dakota is $8.92 Million, in South Dakota is $4.22 Million, in Iowa is $3.67 Million and in Illinois is $3.09 Million.

Table 21. Labor Income Resulting from Operations of the Project ($Millions)

Project Area	Direct	Indirect	Induced	Total
North Dakota	$3.478	$0.275	$0.669	$4.422
South Dakota	$1.469	$0.141	$0.339	$1.950
Iowa	$1.250	$0.127	$0.296	$1.673
Illinois	$0.995	$0.154	$0.359	$1.508
Region	$7.358	$1.114	$2.535	$11.007

Source: Strategic Economics Group, IMPLAN Model

Table 22. Employment from Operations of the Project (Jobs)

Project Area	Direct	Indirect	Induced	Total
North Dakota	43	6	17	66
South Dakota	19	7	6	32
Iowa	15	5	5	25
Illinois	11	2	7	20
Region	89	18	53	160

Source: Strategic Economics Group, IMPLAN Model

Table 22 shows that the employment impact of the pipeline's operations and maintenance will be 160 jobs per year for the region. Some workers may be employed for less than 40 hours per week and some workers may work a considerable amount of overtime.

Table 23 shows that about 56% of the annual jobs created in the region during the operations and maintenance stage will be machinery and equipment repair jobs. Just like Table 13, displayed for the construction stage, this table also shows the broad range of job titles directly or indirectly associated with the this stage of the pipeline project.

Table 23. Top Employment Sectors During the Operations & Maintenance Phase of the Pipeline

IMPLAN Sector	Description	Direct	Indirect	Induced	Total	Share
	Total	89	18	53	160	100%
417	Commercial and industrial machinery and equipment repair and maintenance	89	0	0	89	56%
413	Food services and drinking places	0	1	6	7	5%
382	Employment services	0	2	1	3	2%
397	Private hospitals	0	0	3	3	2%
360	Real estate establishments	0	1	2	3	2%
394	Offices of physicians, dentists, and other health practitioners	0	0	3	3	2%
319	Wholesale trade businesses	0	1	2	3	2%
398	Nursing and residential care facilities	0	0	2	2	1%
329	Retail Stores - General merchandise	0	0	2	2	1%
324	Retail Stores - Food and beverage	0	0	2	2	1%
	All Others	0	12	31	43	31%

Source: Strategic Economics Group, IMPLAN Model

Table 24 shows a comparison of the employment impacts (annual jobs), labor income impacts and output impacts. It also illustrates how the size of the analysis area affects the degree of leakages, the multipliers and the magnitude of the numbers.

Table 24. Comparison of Operations Impact on the Region and States

Impact Type	Employment	Labor Income ($Millions)	Output ($Millions)
Region			
Direct Effect	89	$7.358	$12.991
Indirect Effect	18	$1.114	$2.976
Induced Effect	53	$2.535	$7.164
Total Effect	160	$11.007	$23.131
North Dakota			
Direct Effect	43	$3.478	$6.148
Indirect Effect	6	$0.275	$0.792
Induced Effect	17	$0.669	$1.979
Total Effect	66	$4.422	$8.920
South Dakota			
Direct Effect	19	$1.469	$2.759
Indirect Effect	3	$0.141	$0.432
Induced Effect	9	$0.339	$1.025
Total Effect	31	$1.950	$4.217
Iowa			
Direct Effect	15	$1.250	$2.378
Indirect Effect	3	$0.127	$0.373
Induced Effect	8	$0.296	$0.916
Total Effect	25	$1.673	$3.667
Illinois			
Direct Effect	11	$0.995	$1.705
Indirect Effect	2	$0.154	$0.399
Induced Effect	7	$0.359	$0.985
Total Effect	20	$1.508	$3.090

Source: Strategic Economics Group, IMPLAN Model

5.3 Fiscal Impacts of Pipeline Operations and Maintenance

The operation and maintenance of the Dakota Access Pipeline will result in increases in state and local sales and use tax, state income tax, and local property tax collections in the four states through which it passes. All four of the states impose sales and use taxes, but not all in the same way. Illinois, Iowa, and North Dakota impose state individual income taxes. Local governments in Iowa, North Dakota, and South Dakota impose property taxes on all pipeline infrastructure. In Illinois property tax only applies to pipeline infrastructure that is above ground.

5.3.1 Sales, Use, and Gross Receipts Taxes

The basic features of sales, use, and gross receipts taxes for the four states are described in section 4.3.1. The only major difference between how these taxes apply to construction and to operation and maintenance activities occurs in Iowa. In Iowa only materials are subject to tax for new construction, but for maintenance and repair activities both materials and labor are subject to taxation.

Table 25 summarizes estimates the annual amounts of state and local sales, use, and gross receipts taxes that will be generated as a result of pipeline operation and maintenance activities and the indirect and induced expenditures arising from these activities.

Table 25. Annual Operations Sales, Use, and Gross Receipts Taxes ($Million)

State	State Tax	Local Tax	Total
North Dakota	$0.113	$0.045	$0.158
South Dakota	$0.135	$0.062	$0.197
Iowa	$0.163	$0.027	$0.190
Illinois	$0.038	$0.012	$0.050
Total	$0.449	$0.146	$0.595

Source: Strategic Economics Group

As these estimates show the amount of ongoing sales, use, and gross receipt tax receipts generated by the operation and maintenance of the Dakota Access Pipeline will likely average only about $0.6 million per year. This is because once the pipeline is placed in operation expenditures on taxable material and service purchases will be small unless significant repairs and upgrading of the pipeline or pumping station infrastructure are required. Such major expenditures are not anticipated for a considerable period of time after the pipeline goes into operation.

5.3.2 Individual Income Tax

The major features of the individual income taxes of Illinois, Iowa, and North Dakota are described in section 4.3.2. Estimates of the amounts of income tax that will be owed to these states on wages and salaries paid to workers hired for the operation and maintenance of the pipeline were made using two approaches. The income tax estimates for the workers that will be directly employed by Dakota Access or its contractors follow the same four step procedure used for all of the workers engaged both directly and indirectly in the construction of the pipeline.

For the additional wage and salary income that will result from indirect and induced expenditures arising from pipeline operations and maintenance taxes were computed by simply applying marginal tax rates assumed to be most appropriate. This second approach reflects the assumption that the income associated with indirect and induced activities represents incremental additions on top of other income.

All of the estimated growth in proprietors' income derived from the state IMPLAN models is assumed to be incremental income. Therefore, the margin tax rate applied to this income reflects the average proprietor's income for the state. The marginal tax rates used for these estimates are 3.75% for Illinois, 7.92% for Iowa, and 3.13% for North Dakota.

Table 26 presents annual estimates of additional individual income tax that Illinois, Iowa, and North Dakota may expect to collect as a result of the future operation and maintenance of the Dakota Access Pipeline. Because the future costs of hiring workers to operate and maintain the pipeline will be relatively low, these activities are not expected to generate much additional income tax revenue for these states. South Dakota will derive no additional revenue from this source because it does not impose an individual income tax.

One potential source of additional individual income tax revenue involves tax payments by the pipeline's owners. Because both the Dakota Access Pipeline and its parent, Energy Transfer Partners, are organized as "pass-through" entities, individuals with ownership interests in either entity may owe additional individual income tax. However, these potential additional tax revenues cannot be estimated at this time.

Table 26. Annual Operations Individual Income Tax ($Million)

State	Wage & Salary Income	Proprietors' Income	Total
North Dakota	$0.043	$0.041	$0.084
South Dakota	$0.000	$0.000	$0.000
Iowa	$0.043	$0.042	$0.085
Illinois	$0.022	$0.023	$0.045
Total	$0.108	$0.106	$0.214

Source: Strategic Economics Group

5.3.3 Property Tax

Property taxes represent the largest source of ongoing tax payments that will be received by governments in Iowa, North Dakota, and South Dakota. Because Illinois exempts pipeline infrastructure below ground from property tax, this is not expected to be a significant source of additional tax revenue for local governments.

Although Iowa, North Dakota, and South Dakota all impose property tax on pipeline infrastructure, the manner in which pipelines are assessed and taxes levied varies among the three states. The main features of the administration of the property tax systems of the three states as they apply to pipelines are described below:

- In **North Dakota** the state's Department of Revenue centrally assesses pipelines. The department computes a unitary assessed value for the entire pipeline company and then North Dakota's share of the unitary value is computed by taking the ratio of the value located in the state to the total value. For pipelines that have been in existence for more than three years valuations are determined by averaging the results of three approaches – replacement cost,

cost adjusted for economic obsolescence, and income. However, during the first three years of a new pipeline's existence the valuation is determined giving precedence to the replacement cost approach. By statute the assessed value for pipelines equals 50% of the total valuation. Also, by statute the taxable value for pipelines equals 10% of assessed value. Local governments set the tax levy rates. For FY 2013 and FY 2014 a 12% credit against taxes was in place. No decision has been made regarding extension of the credit. For FY 2012 the average tax levy equaled 19.98% of taxable value or 2.00% of assessed value.

- In **South Dakota** the state Department of Revenue centrally assesses pipeline property. The department uses three methods to determine the property's value – cost approach, market approach, and income approach. However, by necessity the cost approach takes precedence during the first few years of a new pipeline's existence. Within the state assessed valuations for each jurisdiction are based on the value of assets located within the jurisdiction rather than being determined by pipeline mileage located within each jurisdiction. This means the value of a pump station will be allocated to the jurisdiction where it is located rather than spread over all jurisdictions where the pipeline is located. The taxable value of pipeline property equals 85% of the total assessed value. For FY 2012 the average tax levy equaled 2.08% of taxable value.

- In **Iowa** the state Department of Revenue centrally assesses pipeline property. Pipelines are valued as a unit using three approaches – original cost less depreciation, income, and stock and debt. Valuing pipelines as a unit means the entire value of the operating property both inside and outside Iowa is taken into consideration and then Iowa's share of the total value of the property is determined. All assets, including pump stations, are included in the unit value. Iowa's share of the unit value is computed as a weighted average of the ratios of Iowa's share of gross operating property value to the total value and barrel miles of product transported through Iowa to the total for the entire pipeline. In Iowa pipelines are subject to tax on 100% of their assessed value. The levy rates are set by local governments. For assessment year 2013 the average tax levy for pipelines equaled 2.82% of assessed value.

- In **Illinois** most pipeline property is exempt from tax. Only property located above ground is taxable. The assessed value of taxable property in Illinois is set by statute at 33-1/3% of market value. The average tax rate for industrial property for 2012 equaled 2.80% of fair market value.

The estimation of the amounts of property tax the proposed pipeline will generate presents a dilemma due to the different methods used to estimate pipeline valuations. For the three states that impose property tax on all pipeline assets the preferred valuation method is the income approach. However, because income can fluctuate from year-to-year and reliable income data will not be available for several years after the pipeline goes into operation early year valuations by default rely on the cost method. In order a derive reasonable estimates of property taxes that the proposed pipeline will likely generate both construction cost based and income based estimates are presented below for the years 2017 through 2021.

The cost based assessed value estimates reflect construction costs for each of the three states and reflect statutory valuation language for each state. North Dakota and South Dakota have both indicated that assessments based on these cost may be somewhat high, but no written guidance was provided on the amounts by which cost based valuations may be reduced. Iowa did not provide any verbal or written guidance. Effective tax rates were derived using either published pipeline valuation and tax levy statistics or data provided by the state revenue departments.

Table 27 summarizes the cost based property tax estimates for the years 2017 through 2021. The estimates assume the value of the property will depreciate by 2% per year following the initial year of operation. The effect tax rates applied for each state are: North Dakota (2.00%), South Dakota (2.08%), Iowa (2.82%), and Illinois (2.80%).

Table 27. Annual Cost-Based Property Tax Liabilities, 2017 - 2021 ($ Million)

State	2017	2018	2019	2020	2021
North Dakota	$13.775	$13.494	$13.213	$12.931	$12.650
South Dakota	$14.200	$13.910	$13.621	$13.331	$13.041
Iowa	$28.766	$28.179	$27.592	$27.005	$26.418
Illinois	$0.851	$0.834	$0.817	$0.799	$0.782
Total	$57.592	$56.417	$55.242	$54.066	$52.891

Source: Strategic Economics Group

Table 28 summarizes the income based property tax estimates for the years 2017 through 2021. These estimates incorporate the following assumptions:

- The value of the pipeline will depreciate at a rate of 2% per year,
- The debt share of financing equals 62.4% of total cost,
- The interest rate paid on borrowed funds equals 6.5% per year,
- Beginning with the third year assessed values are computed using 3-year moving averages of company financial results,
- Assessed values assume a 9.5% capitalization rate, and
- The effective tax rates are the same as used in the cost based estimates.

One significance difference between the estimates derived by the two methods is the growth trends. The cost-based estimate reflects a reduction in the value of the pipeline over time due to straight line depreciation relative to a fixed amount of initial investment. The income-based approach incorporates revenue growth each of the first five years of the pipeline's operation. Similar to what is done by the states in computing assessed values for pipelines and other commercial property, Table 29 presents averages of the two estimation methods.

Table 28. Annual Income-Based Property Tax Liabilities, 2017 - 2021 ($ Million)

State	2017	2018	2019	2020	2021
North Dakota	$12.475	$12.706	$12.939	$13.430	$13.898
South Dakota	$12.860	$13.099	$13.339	$13.845	$14.327
Iowa	$26.052	$26.535	$27.021	$28.047	$29.023
Illinois	$0.642	$0.654	$0.666	$0.692	$0.716
Total	$52.029	$52.994	$53.965	$56.014	$57.964

Source: Strategic Economics Group

Table 29. Annual Property Tax Liabilities, 2017 - 2021 ($ Million)

State	2017	2018	2019	2020	2021
North Dakota	$13.125	$13.100	$13.076	$13.181	$13.274
South Dakota	$13.530	$13.505	$13.480	$13.588	$13.684
Iowa	$27.409	$27.357	$27.307	$27.526	$27.721
Illinois	$0.747	$0.744	$0.742	$0.746	$0.749
Total	$54.811	$54.706	$54.604	$55.040	$55.428

Source: Strategic Economics Group

There exist a variety of factors that may result in actual tax liabilities being either higher or lower than the estimates presented in Table 29. Some state revenue departments have indicated they may discount assessments based on the cost approach the first few years until several years of actual income data become available in order to not overvalue the property or to cause significant year-to-year variation in assessed values for the property. Neither approach incorporates any factor that recognizes that oil production from the Bakken area will likely only be maintained at peak levels for a short period of time supporting a shorter depreciable life. Some states may allow an adjustment to income to reflect such "economic obsolescence" on top of normal depreciation.

6.0 Transportation Issues that Impact the Regional Economy

A large share of Bakken oil is currently being transported by railroad and it is affecting the farm economy in Montana, Minnesota and the Dakotas. A Reuters story in May focused on the cause: "U.S. rail shipments of crude oil have surged 44-fold since 2008, much of them crisscrossing the heart of the High Plains wheat belt from North Dakota's Bakken oil fields to coastal refiners. Trains carry two-thirds of 1 million barrels of crude produced each day from the Bakken, where pipelines are scarce."[14]

In Tacoma, Washington, the destination for much of that oil, an editorial in the News Tribune reported that "about three trains of Bakken crude oil move through Pierce County every week. Each train consists of 90 to 120 tank cars; each car carries about 28,000 gallons. The amount could more than double by 2020."[15]

As a result: "the delays have contributed to an accumulation of huge stocks of grain, with North Dakota's corn stocks hitting a record of more than 192 million bushels on March 1 and wheat stocks at their largest in three years, government data showed."[16]

In early August, Shales Play Media reported that "the price to transport a bushel of wheat to the west coast ten years ago was about a dollar a bushel. Today that cost has nearly tripled. Market fluctuations and an increase in oil price over the past few years have driven the price up some, but competition from oil trains has been the main driver of the increased freight rates." And "the high wages paid by oil companies also forces elevator operators to increase their wages so that they can retain employees, further increasing freight prices."[17]

Minnesota Public Radio reported in March that "train delays have been chronic all winter at Agassiz Valley and across the Midwest. Engines are running five to 10 days late, creating an increasingly costly backup. Farmers can't haul grain from their farm storage to the elevator because the grain can't move to market."[18] Not only were farmers and grain elevators impacted, but also producers like General Mills, whose supply of grains were bottlenecked and whose commodity costs were rising.

In May, North Dakota U.S. Senator Heidi Heitkamp asked North Dakota State University (NDSU) to examine the impact that rail delays were having on the state's agricultural industry.[19] The assignment landed on the desk of NDSU crop economist and marketing specialist Frayne Olson. Olson applied an innovative method for preparing an estimate of the impact using changes in the basis of the three major commodities: corn, soybeans and hard red spring wheat.

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[14] Plume, Karl, "Trains for grain scarce on the U.S. Plains", Reuters New Service, May 14, 2014.
[15] Cronin, Mike, "Crops shouldn't take a back seat to oil shipments", The News Tribune, August 6, 2014
[16] *Ibid.*
[17] Deede, John, "Balancing oil and agriculture". Bakken.com, Shale Plays Media, August 1, 2014.
[18] Gunderson, Dan, "Farmers, elevators fume at costly train delays; oil trains to blame". March 26, 2014.
[19] Olson, Frayne, "Effects of 2013/14 rail transportation problems on North Dakota farm income",

Olson compared the basis from terminals to nearby markets for the agricultural commodities and compared current levels to a reference period to determine the revenue loss to North Dakota farmers.

According to Olson, "there has been an approximately $66.6 million dollar loss in North Dakota farm level revenue for crops that were sold from January through April, 2014." He projected "the potential for an additional $95.4 million dollars in lost farm revenue, from the sale of on-farm grain stocks, if crop basis levels remain at current levels."[20]

Olson compared the historical basis levels to a base year (2009-2010). The basis is the difference between the cash price at the local terminals and elevators and the future contracts prices at nearby markets. He then estimated how much of the difference could be due to the inventory buildups that resulted from rail delays or higher rail costs.[21]

Olson's report was cited on September 4, 2014 by North Dakota Governor Jack Dalrymple addressing the National Surface Transportation Board in Fargo regarding the rail situation. Governor Dalrymple told the members of the Board that corn, soybeans and wheat acres are at record levels in the Dakotas and Minnesota, but there's no place to move it. In North Dakota alone, more than 15 percent of the 2013 grain is still in storage.

The Associated Press coverage of the hearings indicated that "farmers and some politicians believe that increased crude oil and freight shipments from North Dakota's western oil fields are largely the cause of shipping delays."[22] A representative of the railroads denied that they favor one sector over another.

On September 12, 2014, the University withdrew the Olson report as an official publication. NDSU Professor William Wilson was quoted as stating that the conclusions in the Olson study was done too hastily and was "probably not appropriate or defendable".[23] However, Wilson said, "There was nothing radically wrong with the study, but this is a study that should have taken six or 12 months. It's a serious question, it's a serious issue, and it's probably deserving of a serious study."[24] Two weeks later, additional farm price and income data substantiated the Olson conclusions.

On September 25, 2014, Professor Olson indicated that he still stands by the conclusions of his study, given the assumptions and the timing.[25] The issues of rail delays, the buildup of grain inventories at terminals, erratic farm prices and farm revenue losses are complex. According to Professor Olson, the issue is driven by the rail infrastructure.

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[20] Olson, Frayne, "Effects of 2013/14 rail transportation problems on North Dakota farm Income."
[21] Knutson, Jonathan, "NDSU Economist defends withdrawn rail impact study." Inforum, September 21, 2014.
[22] Kolpack, Dave, "Officials ask federal board to help on rail delays." Associated Press, September 4, 2014.
[23] Kolpack, Dave, "NDSU withdraws study cited by public officials in hearings on the impacts of rail delays on ag." Daily Reporter, September 12, 2014.
[24] Ibid.
[25] Telephone conversation with Dr. Frayne Olson, September 25, 2014.

The rail system in Montana and the Dakotas is characterized by four factors:

1. a shortage of grain hopper rail cars
2. the lack of sufficient crews - drawn down during the recession years
3. competition for power units (engines) between the oil shippers and the grain producers
4. the limitation of track time in sparsely-populated states

While Bakken oil does not compete with the grain terminals for rail cars because grain hopper cars cannot be used to haul oil, they do compete for the limited number of rail crews, power units and track capacity. Two major rail carriers serve those states, Burlington Northern Santa Fe (BNSF) and Canadian Pacific (CP). Since the Olson study was released and hearings were held by the federal Surface Transportation Board, backlogs have been reduced.

"Dakota Mill & Grain, and the other shippers in the state — accustomed to timely arrivals of hopper cars — saw deliveries last winter fall behind, with rail car backlogs swelling to more than three months at their peak. The impact was immediate: Purchases were delayed because elevators ran out of room to store the commodity, leaving farmers to hold onto crops longer than expected. The cost to ship grain by rail soared, and farmers received less money."[26]

In the short run, rail carriers can hire more crews and in the intermediate term can order the purchase of more power units. However, the available track capacity will continue to be an infrastructure impediment.

"BNSF has been the most active in trying to relieve the problem, working towards adding railways and hiring more workers. However, it is unclear if additional rail capacity will be available this year. The huge backlog of shipments combined with what is expected to be a plentiful harvest in North Dakota makes another winter with strained rails seem likely."[27]

In July, 2014 University of Minnesota economist Edward Usset used the same methodology as Olson to estimate the impact of railroad service delays on farm income.[28] Usset employed the Basis-based analysis to identify the impact that the recent rail transportation bottleneck had on Minnesota grain farmers. Table 30 shows the comparable measures for the Olson and Usset studies.

While Olson estimated the loss to North Dakota grain farmers at $66.6 Million for the previous crop and $95.4 Million for the crop still on the ground, Usset estimated the same measures for Minnesota at $99.3 Million and $147.7 Million.

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[26] Doering, Christopher, "Ag bracing for railroad delays as record harvest looms." www.Argusleader.com, September 15, 2014.
[27] Deede, John, "Crop shipments still stranded in North Dakota as oil-by-rail dominates", Bakken.com, August 26, 2014.
[28] Usset, Edward, "Minnesota Basis Analysis". University of Minnesota Center for Farm Financial Management, July 10, 2014.

Table 30. Farm Revenue Loss on Basis in 2014

Commodity	Location	
	North Dakota	Minnesota
Soybeans		
Est. Basis Difference ($/bu.)	$0.37	$0.405
Est. Farm Revenue Loss	$11,746,350	$18,830,000
Est. Farm loss On-Farm Inv.	$911,310	$23,895,000
Corn		
Est. Basis Difference ($/bu.)	$0.41	$0.37
Est. Farm Revenue Loss	$17,344,800	$72,000,000
Est. Farm loss On-Farm Inv.	$36,170,200	$122,100,000
Hard Red Spring Wheat		
Est. Basis Difference ($/bu.)	$0.81	$0.41
Est. Farm Revenue Loss	$37,544,813	$8,500,000
Est. Farm loss On-Farm Inv.	$58,274,438	$1,700,000
Total Farm Revenue Loss		
Previous Crop	$66,635,963	$99,330,000
On-Farm Inventory	$95,355,948	$147,695,000

Source: Frayne Olson, North Dakota State University, Edward Usset, University of Minnesota.

Even in western Iowa, farmer-owned cooperatives have begun to feel the pressure. In a Des Moines Register story, "the Corn Belt was pummeled by a brutal winter, and competing demands among coal, oil, grain and other commodities for space on the country's clogged rail network left railroads such as Canadian Pacific Railway and BNSF Railway struggling to ferry cars around the region."[29] Author Doering wrote, "West Central [a farmer-owned cooperative] – accustomed to waiting a few days to receive hopper cars - had to wait a week, with delays extending to more than six weeks." The cost to lease a rail car this year nearly doubled to more than $12,500. This will likely get worse with the 2014 bumper crop of corn and soybeans.

In Minnesota, the Star Tribune reported in August that, "the Canadian Pacific Railway, one of two key railroads that serve Minnesota farmers, isn't making enough progress in shipping a huge backlog of grain."[30] The USDA reported that, "Grain elevators in some locations, such as South Dakota and Minnesota, could run out of storage capacity during the upcoming harvest, requiring grain be stored on the ground and running the risk of spoiling. The projected size of the upcoming harvest creates a high potential for loss in the affected states."[31]

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[29] Doering, Christopher, "Farmers, ag businesses brace for rail delays" Des Moines Register, September 13, 2014
[30] Hughlett, Mike, "Grain shipments from Midwest remain slow." StarTribune, August 11, 2014.
[31] *Ibid.*

Farmers and grain elevators in Illinois are watching the rail buildup of inventories this year. The Decatur newspaper reported in early September that, "the 2014 grain crop will exceed U.S. grain storage capacity by 694 million bushels. That is based on current USDA yield projections." USDA Deputy Administrator Arthur Neal said, "South Dakota will not have any storage space for 20 percent of its 2014 corn, soybean and wheat crops."[32]

According to the Neal, South Dakota isn't the only state with a storage shortage. Illinois is one of five other states where grain will be piled on the ground this fall because there is more than can be stored in grain bins either on the farm or at elevators. In fact, 3 percent of the Illinois crop will be in temporary storage on the ground, in a state that is a leader in having grain bins. Indiana and Missouri will be short of storage for 15 percent of their crops. Ohio, Michigan and Kentucky all will be putting 6 percent to 7 percent of their grain on the ground because of insufficient storage space."

One solution to this growing problem is to build refineries near the oil fields, but that would only change the need from transporting crude oil to transporting processed oil. Another possible solution would be to expand the rail infrastructure. A third solution would be to build a pipeline to carry much of the Bakken oil to the refineries and free up rail system.

The Wahpeton, North Dakota Daily News story on September 9, 2012 pointed out that, "Some within the ag industry are calling for a pipeline to be built to take the stress off the overburdened rail lines. Last Thursday the Surface Transportation Board held a public hearing in Fargo to provide the opportunity for people and businesses to report on service problems within the U.S. rail network. The question of creating a pipeline has arisen repeatedly by agricultural officials hoping to lessen the severity of the backlog."[33]

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[32] Ellis, Stu, "Farmers' loss is foreign market's gain." Herald and Review, September 17, 2014.
[33] Speidel, Karen, "Experts suggest a pipeline to relieve rail issues." Daily News, September 19,2014

7.0 Transportation Cost, Accident Risk, and Other Considerations

7.1 Transportation Cost Differences between Pipeline and Railroad

The rapid pace at which oil production ramped up in North Dakota rising from only 10,297 barrels per day at the beginning of 2007 to over a million barrels per day by June 2014 has put a great strain on the state's transportation infrastructure.[34] Existing pipeline capacity equaled only 583,000 barrels per day at the end of 2013.[35] This has forced oil producers to rely on rail to handle over 60% of shipments out of the state.[36]

Also, only limited refinery capacity exists in North Dakota at the present time, and this is not likely to change for the foreseeable future. The Tesoro Mandan refinery located near Bismarck can process up to 60,000 barrels per day. Two new 20,000 barrels per day capacity refineries are planned at Trenton and Dakota Prairie, but these are intended to produce only diesel and kerosene to satisfy local demands.[37] Generally, the transportation of crude oil by pipeline is less expensive than by railroad on a per barrel mile basis. But market opportunities as well as cost and capacity constraints influence transportation choices made by oil producers in the Bakken region.

According to transportation cost information included in a February 2014 investors' presentation by Kodiak Oil & Gas, it costs $5 per barrel to transport crude oil from North Dakota to Cushing, OK by pipeline and from Cushing to the Gulf it cost another $4 per barrel via the Seaway pipeline. At the same time it cost between $10 and $12 per barrel to move oil by railroad from North Dakota to the Gulf. So, last February pipeline offered a $1 to $3 per barrel savings over railroad for this particular movement of oil.[38]

Other information included in this presentation shows that rail transport from North Dakota to Anacortes, WA costs $9 to $10 per barrel, from North Dakota to the East Coast cost $14 to $17 per barrel, and North Dakota to California cost between $13 and $15 per barrel. Beyond the shipping costs oil movements by railroad incur additional costs associated with terminal charges ($2 per barrel), tank car leases ($2 per barrel), and shrinkage ($1 per barrel).[39]

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[34] North Dakota Industrial Commission, Oil and Gas Division, historical monthly oil production statistics (accessed on October 17, 2014 at https://www.dmr.nd.gov/oilgas/stats/statisticsvw.asp)
[35] North Dakota Pipeline Authority, US Williston Basin Crude Oil Export Options (accessed on October 17, 2014 at http://northdakotapipelines.com/datastatistics/)
[36] Energy Information Administration, "Rail deliveries of U.S. oil to increase in 2014" (August 28, 2014).
[37] Energy Information Administration, "Rising North Dakota oil production and demand spur two new refineries" (March 27, 2013).
[38] Kodiak Oil & Gas, Investor presentation (February 2014), p. 15; Callum Turcan, "Is a major derailment looming for our nation's railroads," The Motley Fool (April 12, 2014)
[39] Sandy Fielden, "Crude loves rock'n'rail – Brent, WTI and the impact on Bakken netbacks," RBN Energy (May 5, 2013).

Truck transportation plays a limited but important role in moving crude oil from production areas to rail terminals. During 2013 trucks handled about 64% of this gathering function, while pipelines handled the remaining 36%. These truck movements cost about $3 per barrel compared to $2 per barrel for pipeline.[40]

One reason railroads became an attractive transportation alternative for North Dakota oil producers has to do with differences in the prices of West Texas Intermediate (WTI) and Brent crude. Due to transportation bottlenecks at Cushing, OK a large differential existed between the Brent and WTI prices from the beginning of 2011 through the first quarter of 2013.[41] For example, during all of 2012 the differential equaled $17.61 per barrel and reached as high as $24.87 per barrel during October of that year. Nationwide railroad carloads of crude oil jumped from 65,751 during 2011 to 233,698 (a 255.4% increase) during 2012 and to 407,761 (another 74.4% increase) during 2013.[42]

From December 2009 to January 2013 inventories of crude stored at Cushing, OK rose from 34.5 million barrels to 51.9 million barrels. Over the same period the differential between Brent and WTI (Brent minus WTI price) crude went from -$1.48 per barrel to $23.19 per barrel. Since peaking Cushing, OK crude inventories have dropped to about 21 million barrels at the end of October 2014, and the Brent to WTI price differential has dropped to around $5 per barrel.[43]

One major reason for the changes is the completion of the repurposing of the Seaway crude pipeline from Cushing to Freeport, Texas. Previously this pipeline moved oil into Cushing. Now it moves oil away from Cushing. This repurposed pipeline went into service in June 2012 with a capacity of 150,000 barrels per day. Following pumping station additions and modifications the capacity increased to 400,000 barrels per day at the beginning of 2013. Further improvements will raise capacity to about 850,000 barrels per day.[44] Another pipeline project by TransCanada (Gulf Coast Pipeline) will add up to an additional 830,000 barrels per day of capacity for moving crude from Cushing, OK to Nederland, Texas.[45] These improvements should reduce the likelihood of future shipping bottlenecks at Cushing and minimize this as a factor for growth in the Brent – WTI price differential.

When the Brent – WTI price differential falls below $5 per barrel, East and West Coast refineries served

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[40] Sandy Fielden, "Crude loves rock'n'rail – Brent, WTI and the Impact on Bakken netbacks," RBN Energy (May 5, 2013)

[41] Cushing, OK serves as the pricing location for West Texas Intermediate (WTI) crude. This is because Cushing hosts that largest amount of oil storage facilities in the county totaling 46.3 million barrels. For this reason Cushing is a major transportation hub for oil shipments, particularly for pipelines.

[42] Association of American Railroads, "Moving crude oil by rail," (September 2014), p. 4.

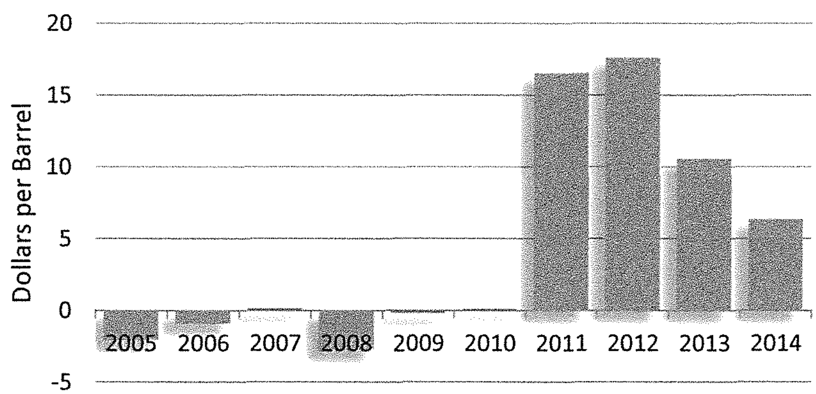
[43] Brent and WTI prices are from the Federal Reserve Bank of St. Louis FRED Economic data internet site accessed November 9, 2014 (http://research.stlouisfed.org/fred2/).; Cushing, OK crude oil inventory data are from the Energy Information Administration Internet site accessed November 9, 2014 (http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPC0_SAX_YCUOK_MBBL&f=W).

[44] "About Seaway," accessed on October 18,2014 (http://www.seawaypipeline.com/)

[45] TransCanada, "About Gulf Coast Pipeline Project," accessed November 9, 2014 (http://www.gulf-coast-pipeline.com/about/the-projects/)

by railroad become less attractive to Bakken oil producers than do Gulf Coast refineries served by pipeline.[46] Figure 10 shows the historical Brent – WTI price differential from 2005 through 2014 year-to-date.

Figure 10. Historical Brent-to-WTI Crude Oil Price Differentials



Source: Energy Information Administration, Strategic Economics Group

7.2 Pipeline and Railroad Accident Risk

Both pipelines and railroads have experienced major accidents involving large spills of crude oil in recent years. The most damaging pipeline accident in recent years occurred in Marshall, MI during July 2010 when a 30-inch pipeline owned by Enbridge Energy ruptured spilling 843,000 gallons of heavy crude (diluted bitumen). Cleanup costs associated with this spill totaled approximately $1 Billion.[47]
The most spectacular of the railroad accidents involving crude oil occurred on July 6, 2013 on Lac-Megantic, Quebec. This accident involved 72 tanks cars each loaded with 30,000 gallons of Bakken crude oil. The accident claimed 47 lives and destroyed 30 buildings. The cleanup from this accident is expected to take 5 years.[48]

In spite of some catastrophic accidents both pipelines and railroads generally have good records carrying hazardous materials. The Association of American Railroads on its Internet site states that 99.997% of hazardous materials shipments reach their destinations without incident.[49] Similarly, the American

[46] Sandy Fielden, "Crude Loves Rock'n'Rail – Brent, WTI and the Impact on Bakken Netbacks," (http://rbnenergy.com/taxonomy/term/107/feed).
[47] Rosemary Parker, "Enbridge oil cleanup on Kalamazoo Rover finished, all sections of the river open for public use," MLive.com (October 9, 2014).
[48] Wikipedia, "Lac-Megantic derailment" accessed October 19, 2014 (http://en.wikipedia.org/wiki/Lac-M%C3%A9gantic_derailment).
[49] Association of American Railroads, Internet site accessed on October 19, 2014 (https://www.aar.org/safety/Pages/default.aspx).

Pipeline Institute states that during 2013 99.999% of the 14 billion barrels of crude oil and petroleum products transported reached their destinations safely.[50] Accident rates involving crude oil have increased as domestic oil production has increased in recent years. But relative to the amount of product being moved, safety has improved.

Comparing the two modes of transportation, pipelines appear to be the safer mode. For example, statistics revealed by the U.S. Pipeline and Hazardous Materials Safety Administration shows that during 2013 the number of gallons of oil spilled by railroads exceeded the 800,000 gallons spilled during all the years from 1975 to 2010 in the railroad industry.[51] Federal regulators have proposed new standards for railroad tank cars to make them less likely to rupture in an accident. These regulations would raise railroad rates for crude oil movements from 2.2% to 3.6%.[52]

For pipelines the U.S. Pipeline and Hazardous Materials Safety Administration reports that during 2013 there were 401 reported incidents that involved 119,290 barrels of hazardous liquids and caused property damage totaling $266.7 million and resulted in one fatality and 5 injuries. Based on Federal Energy Regulatory Commission annual statistical reports hazardous liquid pipelines carried 8.1 Billion barrels of crude oil and 6.5 Billion barrels of petroleum products during 2013 and collected $15.7 billion in operating revenues on these shipments. Over the past five years (2009 to 2013) the number of pipeline incidents involving hazardous liquids equaled 361 resulting in spills averaging 81,971 barrels and damages of $348.3 Million. So, pipeline accidents involved a very small amount of the product moved.

Comparing accidents for pipelines and railroads finds that accident rates for both are low. With a few notable exceptions the average spill amounts for each incident are small. However, when catastrophic failures occur for pipelines the size of the spill can be large. However, monitoring equipment installed on newer pipelines makes the detection of leaks sooner than for older facilities. On the other hand, because railroads pass through cities and catastrophic accidents generally happen due to derailments while trains are in motion, property damage as well as fatality and injury counts are much greater than those that occur for pipeline accidents.

7.3 Other Economic Impacts

Beyond the localized impacts in areas where the extraction of oil has dramatically increased, the growth in domestic oil production is having significant impacts on the nation's overall economy. Since 2005 average monthly crude oil imports have dropped by 85.4 million barrels (27.7%). During 2005 crude oil imports averaged 308.0 Million barrel per month. Through the first seven months of 2014 the average

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[50] American Pipeline Institute, Internet site accessed October 19, 2014 (http://www.pipeline101.com/are-pipelines-safe/what-is-the-safety-record).
[51] "US railroad oil spills in 2013 surpassed previous four decades combined," RT.com (January 23,2014).
[52] Tom Bokowy, "DOT impact on crude by rail," Cost & Capital (July 2014), p. 4.

was down to 222.6 Million barrels per month.[53]

As the volume of oil imports has declined so has the flow of dollars out of the United States to pay for oil. Comparing the first eight months of 2011 and 2014 the cost of imported oil has dropped from $220.7 Billion to $171.7 Billion, which equals a decrease of $49.0 Billion (22.2%). This decrease has positive spillover impacts on the value of the dollar, domestic purchases of other goods and services, and on the rate of inflation.[54]

Increased pipeline capacity in the Bakken area of North Dakota will provide support for these positive trends associated with the growth of domestic oil production. For example, over the past year the average price of a gallon of regular gasoline has dropped from $3.31 to $3.07, and the price is likely to drop further. This current year-over-year drop in price means households are saving about $33 billion per year on motor fuel purchases. Similarly, businesses are benefiting from a 29-cent per gallon drop in the price of diesel fuel, which translates to about an $11.2 billion savings nationwide.

As additional pipeline capacity comes online in North Dakota increased market options and lower transportation costs will mean about another 10-cents per gallon decrease in motor fuel and diesel prices. At current levels of motor fuel sales (135.6 Billion gallons/year) and diesel fuel sales (38.5 Billion gallons/year) the additional savings will equal about $17.4 Billion nationally per year. Drivers in all states will benefit. These potential annual savings to the four states through which the Dakota Access Pipeline will pass equal $84.6 Million for North Dakota, $67.1 Million for South Dakota, $230.8 Million for Iowa, and $613.2 Million for Illinois.

[53] Energy Information Administration
[54] U.S. Census Bureau

8.0 Brief Summary of Findings

8.1 Construction Stage

During the two-year construction stage of the project the four-state region will experience an increase in production and sales of more than $4.9 Billion, an increase in personal income more than $1.9 Billion and an increase of nearly 33,000 job-years. The fiscal impact on the four states will collectively be about $128 Million in sales, use, gross receipts and lodging taxes and an increase in income taxes of nearly $28 Million.

Table 31. Summary Economic & Fiscal Impact Measures - Construction Stage

Measure	Region	North Dakota	South Dakota	Iowa	Illinois
Economic Measures					
Production and Sales ($Millions)	$4,962.12	$1,052.86	$835.84	$1,088.74	$753.35
Income ($Millions)	$1,934.39	$450.35	$302.82	$390.34	$303.30
Employment (Job-Years)	32,721	7,688	7,137	7,623	5,009
Fiscal Measures					
Sales, Gross Receipts and Lodging Taxes ($Millions)	$127.86	$34.59	$38.53	$35.33	$19.42
Individual Income Taxes ($Millions)	$28.15	$5.90	$0.00	$14.57	$7.68
Property Taxes ($Millions)	$0.00	$0.00	$0.00	$0.00	$0.00

Source: Strategic Economics Group

8.2 Operations and Maintenance Stage

Once the pipeline is in operation, after 2016, the economic impact will be small. The total impact on the four-state region will be an increase in production and sales of about $140 Million, generating an increase in personal income of about $11 Million and 160 permanent operations and maintenance jobs. However, the pipeline will generate considerable ongoing tax revenues. North Dakota, South Dakota and Iowa will see an increase in local property taxes. During the first year of operation these revenues are estimated at $13.1 Million, $13.5 Million and $27.4 Million, respectively. Illinois will realize less than $1 million per year in additional property taxes because it does not tax most pipeline infrastructure. Collectively, the four states will see an increase each year in sales, use, gross receipts and lodging taxes of about $595,000 and $214,000 in income taxes.[55]

[55] Except South Dakota which does have an income tax.

Table 32. Summary Economic & Fiscal Impact Measures - Operations & Maintenance Stage

Measure	Region	North Dakota	South Dakota	Iowa	Illinois
Economic Measures					
Production and Sales ($Millions)	$140.28	$29.53	$53.63	$44.08	$13.05
Income ($Millions)	$11.01	$4.42	$1.95	$1.67	$1.51
Employment (Jobs)	160	66	31	25	20
Fiscal Measures					
Sales, Gross Receipts and Lodging Taxes	$595,000	$158,000	$197,000	$190,000	$50,000
Individual Income Taxes	$214,000	$84,000	$0	$85,000	$45,000
Property Taxes ($Millions)	$55.62	$13.37	$13.73	$27.68	$0.84

Source: Strategic Economics Group

8.3 Other Factors that Will Be Impacted By the Pipeline

Transportation issues have created a substantial need for this pipeline.

- Currently, a large share of oil from the Bakken area is transported to refineries by railroad, causing a bottleneck in the Dakotas and Minnesota for farmers who need the same tracks and engines to take their crops to markets. As a result farm commodities have exceeded the local storage capacity, causing grain and soybean storage prices to rise or farm income to fall.

- Railroad bottlenecks have also been reflected in a price reduction for Bakken oil to account for the added transportation cost.

- The transportation of crude oil by is generally less expensive by pipeline than by railroad. The cost of moving oil from the Bakken area of North Dakota to Gulf Coast refineries during 2013 cost between $1 and $3 per barrel less by pipeline than by railroad.

- Both pipelines and railroads have experienced some spectacular accidents in recent years. But overall the safety records of both modes of hazardous materials transportation are very good. Over the past five years pipeline spills have averaged only about 82,000 barrels per year while delivering an average of 13.7 Billion barrels per year of hazardous liquids.

- The growth of domestic oil production has exerted significant downward pressure on world oil prices. As of mid-October both Brent and WTI crude are trading at less than $90 per barrel.

- Since 2005 U.S. oil imports of oil have dropped by 27.7% and since 2011 U.S. expenditures on oil imports have dropped by 22.2%. These decreases are benefiting the country through reduced foreign trade deficits, a stronger dollar, and lower inflation.

- As additional pipeline capacity comes online in North Dakota increased market options and lower transportation costs will mean additional decreases in motor fuel and diesel prices.

Appendix 1 – Glossary of Terms

Term	Definition
Backward linkage	The interconnection of an industry to other industries from which it purchases its inputs in order to produce its output. An industry has significant backward linkages when its production of output requires substantial intermediate inputs from many other industries. (BEA)
Compensation of employees	Compensation of employees is the total remuneration, in cash or in kind, payable by enterprises to employees in return for work done by the latter during the accounting period. (SNA) See Employee Compensation.
Direct effects	It is a series of production changes or expenditures made by producers/consumers as a result of an activity or policy. Applying these initial changes to the multipliers in an IMPLAN model will then display how the region will respond, economically to these initial changes.
Employee Compensation	Employee Compensation in IMPLAN is the total payroll cost of the employee paid by the employer. This includes wage and salary, all benefits (e.g., health, retirement) and payroll taxes (both sides of social security, unemployment taxes, etc.)
Employment multipliers	I-O multipliers used to estimate the total number of jobs (both full-time and part-time) throughout the economy that are needed, directly and indirectly, to deliver $1 million of final demand for a specific commodity. (BEA)
Earnings multipliers	I-O ratios that measure earnings paid to households by employment throughout the economy, directly and indirectly, in connection with delivery of $1 million of final demand for a specific commodity. (BEA)
Excise taxes	Taxes that are levied by units of government on the manufacture, sale, or consumption of specific items, usually on a per-unit basis rather than a percentage basis. For example, cigarettes are taxed by the pack or carton, alcoholic beverages are taxed by the bottle, and gasoline is taxed by the gallon. Excise taxes are a type of commodity tax. (BEA)
Final Demand	The value of goods & services produced and sold to final users (institutions) during the calendar year. This value is also equivalent to the Direct Effect of the impact.
Forward linkage	The interconnection of an industry to other industries to which it sells its outputs. It is measured as the row sum of the direct requirements table (direct forward linkage) or as the row sum of the total requirements table (total forward linkage). An industry has significant forward linkages when a substantial amount of its output is used by other industries as intermediate inputs to their production. (BEA)

Term	Definition
Indirect business taxes (IBT)	In general terms, IBT can currently be considered the combination of excise, sales and property taxes, as well as, fees, fines, licenses and permits.
Indirect effects	The impact of local industries buying goods and services from other local industries. The cycle of spending works its way backward through the supply chain until all money leaks from the local economy, either through imports or by payments to value added.
Induced effects	The response by an economy to an initial change (direct effect) that occurs through re-spending of income received by a component of value added. IMPLAN's default multiplier recognizes that labor income (employee compensation and proprietor income components of value added) is not a leakage to the regional economy. This money is recirculated through the household spending patterns causing further local economic activity.
I-O analysis	A type of applied economic analysis that tracks the interdependence among various producing and consuming sectors of an economy. More particularly, it measures the relationship between a given set of demands for final goods and services and the inputs required to satisfy those demands. (BEA)
Jobs	A job in IMPLAN = the annual average of monthly jobs in that industry (this is the same definition used by QCEW, BLS, and BEA nationally). Thus, 1 job lasting 12 months = 2 jobs lasting 6 months each = 3 jobs lasting 4 months each. A job can be either full-time or part-time.
Job-Year	Equals one full-time job lasting for one year.
Labor Income	All forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income.
Multipliers	It is the ratio of Total Production to initial Direct Inputs. Multipliers may be constructed for output, employment, and every component of Value Added.
Multi-regional Analysis	A method for determining economic impacts in two or more regions caused by sales to Final Demand in one region.
Output	Output represents the value of industry production. In IMPLAN these are annual production estimates for the year of the data set and are in producer prices. For manufacturers this would be sales plus/minus change in inventory. For service sectors production = sales. For Retail and wholesale trade, output = gross margin and not gross sales.

Output multipliers	Derived from the I-O total requirements tables, the output multipliers show the amount of output required to satisfy a given level of final-use expenditures. For the commodity-by-commodity total requirements table, it is the production required both directly and indirectly of the commodity at the beginning of each row per dollar of delivery to final use of the commodity at the top of the column. For the industry-by-commodity total requirements table, it is the industry output required to deliver a dollar of a commodity to final users. For the industry-by-industry total requirements table, it is the industry output required to deliver a dollar of industry output to final users. (BEA)
Proprietor income	Proprietor income consists of payments received by self-employed individuals and unincorporated business owners. This income also includes the capital consumption allowance and is recorded on Federal Tax form 1040C.
Regional Purchase Coefficient	A Regional Purchase Coefficient (RPC) is the proportion of the total demand for a commodity by all users in the Study Area that is supplied by producers located within the Study Area. For example, if the RPC for the commodity fish is 0.8, then 80% of the demand by local fish processors, fish wholesalers, and other fish consumers are met by local fish producers. Conversely, 20% (1.0-RPC) of the demand for fish is satisfied by imports. (IMPLAN)
Trade Flow	The flow of goods & services between or within counties, or user-defined study areas within the U.S.
Value added	The difference between total output of an industry or establishment and the cost of its intermediate inputs.

Source: IMPLAN Group LLC

Appendix 2 – Detailed Tables for the Four-State Region

The first four tables identify the economic impacts of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the region. All dollar amounts are in 2016 dollars.

Table 2.1 Pipeline Construction Economic Impact on the Region

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	15,879	$1,016.83	$2,462.95
Indirect Effect	6,362	$419.47	$1,092.11
Induced Effect	10,481	$498.10	$1,407.07
Total Effect	32,721	$1,934.39	$4,962.12
Sector			
Agriculture	37	$3.20	$10.10
Mining	778	$76.25	$145.29
Construction	13,030	$786.49	$1,747.87
Manufacturing	1,455	$109.61	$688.92
TIPU	651	$43.78	$141.85
Trade	2,995	$135.17	$306.26
Service	13,593	$764.95	$1,896.17
Government	182	$14.94	$25.65
Total	32,721	$1,934.39	$4,962.12

Source: Strategic Economics Group, IMPLAN Model

Table 2.2 Impact on Employment of Pipeline Construction in the Region

Description	Direct	Indirect	Induced	Total
Total	15,879	6,362	10,481	32,721
Agriculture	0	6	31	37
Mining	700	72	5	778
Construction	12,856	108	67	13,030
Manufacturing	666	619	171	1,455
TIPU	0	350	301	651
Trade	0	708	2,287	2,995
Service	1,657	4,444	7,492	13,593
Government	0	55	127	182

Source: Strategic Economics Group, IMPLAN Model

Table 2.3 Impact on Labor Income of Pipeline Construction in the Region ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$1,016.83	$419.47	$498.10	$1,934.39
Agriculture	$0.00	$0.65	$2.55	$3.20
Mining	$71.12	$4.91	$0.22	$76.25
Construction	$774.78	$6.79	$4.93	$786.49
Manufacturing	$49.59	$46.88	$13.14	$109.61
TIPU	$0.00	$23.30	$20.48	$43.78
Trade	$0.00	$43.03	$92.14	$135.17
Service	$121.34	$289.50	$354.11	$764.95
Government	$0.00	$4.40	$10.53	$14.94

Source: Strategic Economics Group, IMPLAN Model

Table 2.4 Impact on Output of Pipeline Construction in the Region ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$2,462.95	$1,092.11	$1,407.07	$4,962.12
Agriculture	$0.00	$1.58	$8.52	$10.10
Mining	$128.09	$15.83	$1.38	$145.29
Construction	$1,724.53	$13.07	$10.27	$1,747.87
Manufacturing	$323.16	$265.42	$100.35	$688.92
TIPU	$0.00	$73.26	$68.60	$141.85
Trade	$0.00	$101.25	$205.01	$306.26
Service	$287.17	$614.51	$994.49	$1,896.17
Government	$0.00	$7.19	$18.46	$25.65

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 2.5 Pipeline Operations Economic Impact of the Region

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	89	$7.358	$12.991
Indirect Effect	18	$1.114	$2.976
Induced Effect	53	$2.535	$7.164
Total Effect	160	$11.007	$23.131
Sector			
Agriculture	0	$0.014	$0.047
Mining	0	$0.002	$0.010
Construction	1	$0.046	$0.093
Manufacturing	2	$0.162	$1.009
TIPU	3	$0.172	$0.564
Trade	13	$0.563	$1.274
Service	141	$9.962	$19.983
Government	1	$0.087	$0.150
Total	160	$11.007	$23.131

Source: Strategic Economics Group, IMPLAN Model

Table 2.6 Employment Impact of the Pipeline Operations in the Region

Description	Direct	Indirect	Induced	Total
Total	89	18	53	160
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	1
Manufacturing	0	1	1	2
TIPU	0	1	2	3
Trade	0	1	12	13
Service	89	14	38	141
Government	0	0	1	1

Source: Strategic Economics Group, IMPLAN Model

Table 2.7 Labor Income of the Pipeline Operations in the Region

Description	Direct	Indirect	Induced	Total
Total	$7,358,042	$1,114,003	$2,535,443	$11,007,488
Agriculture	$0	$1,012	$12,995	$14,007
Mining	$0	$626	$1,113	$1,739
Construction	$0	$21,327	$25,093	$46,420
Manufacturing	$0	$94,921	$66,890	$161,811
TIPU	$0	$67,257	$104,479	$171,736
Trade	$0	$93,473	$469,404	$562,878
Service	$7,358,042	$801,870	$1,801,750	$9,961,662
Government	$0	$33,516	$53,718	$87,235

Source: Strategic Economics Group, IMPLAN Model

Table 2.8 Output Impact of the Pipeline Operations in the Region

Description	Direct	Indirect	Induced	Total
Total	$12,990,999	$2,975,933	$7,164,021	$23,130,953
Agriculture	$0	$3,310	$43,305	$46,615
Mining	$0	$3,349	$7,010	$10,359
Construction	$0	$40,995	$52,314	$93,309
Manufacturing	$0	$498,281	$510,809	$1,009,090
TIPU	$0	$213,956	$350,275	$564,231
Trade	$0	$229,640	$1,044,842	$1,274,482
Service	$12,990,999	$1,930,791	$5,061,240	$19,983,030
Government	$0	$55,612	$94,226	$149,837

Source: Strategic Economics Group, IMPLAN Model

Appendix 3 - Detail Tables for North Dakota

The first four tables identify the economic impact of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the state of North Dakota. All dollar amounts are in 2016 dollars.

Table 3.1 Pipeline Construction Economic Impact on North Dakota

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	4,565	$306.14	$655.93
Indirect Effect	1,157	$66.93	$168.20
Induced Effect	1,966	$77.27	$228.73
Total Effect	7,688	$450.35	$1,052.86
Sector			
Agriculture	6	$0.62	$1.39
Mining	212	$22.46	$39.58
Construction	3,828	$248.70	$509.95
Manufacturing	269	$17.18	$78.36
TIPU	105	$8.07	$24.21
Trade	663	$28.25	$66.26
Service	2,562	$122.58	$327.45
Government	44	$2.48	$5.65
Total	7,688	$450.35	$1,052.86

Source: Strategic Economics Group, IMPLAN Model

Table 3.2 Impact on Employment of Pipeline Construction in North Dakota

Description	Direct	Indirect	Induced	Total
Total	4,565	1,157	1,966	7,688
Agriculture	0	0	5	6
Mining	205	7	0	212
Construction	3,788	24	15	3,828
Manufacturing	179	78	12	269
TIPU	0	59	46	105
Trade	0	176	487	663
Service	393	800	1,369	2,562
Government	0	13	30	44

Source: Strategic Economics Group, IMPLAN Model

Table 3.3 Impact on Labor Income of Pipeline Construction in North Dakota ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$306.14	$66.93	$77.27	$450.35
Agriculture	$0.00	$0.04	$0.58	$0.62
Mining	$21.80	$0.64	$0.02	$22.46
Construction	$245.69	$1.68	$1.33	$248.70
Manufacturing	$11.84	$4.71	$0.63	$17.18
TIPU	$0.00	$4.67	$3.40	$8.07
Trade	$0.00	$9.60	$18.65	$28.25
Service	$26.81	$44.86	$50.91	$122.58
Government	$0.00	$0.73	$1.74	$2.48

Source: Strategic Economics Group, IMPLAN Model

Table 3.4 Impact on Output of Pipeline Construction in North Dakota ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$655.93	$168.20	$228.73	$1,052.86
Agriculture	$0.00	$0.12	$1.28	$1.39
Mining	$38.08	$1.44	$0.07	$39.58
Construction	$504.67	$2.95	$2.33	$509.95
Manufacturing	$51.53	$21.26	$5.57	$78.36
TIPU	$0.00	$13.32	$10.90	$24.21
Trade	$0.00	$23.35	$42.91	$66.26
Service	$61.66	$104.20	$161.59	$327.45
Government	$0.00	$1.57	$4.08	$5.65

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 3.5 Pipeline Operations Economic Impact on North Dakota

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	43	$3.478	$6.148
Indirect Effect	6	$0.275	$0.792
Induced Effect	17	$0.669	$1.979
Total Effect	66	$4.422	$8.920
Sector			
Agriculture	0	$0.005	$0.012
Mining	0	$0.000	$0.001
Construction	0	$0.024	$0.041
Manufacturing	0	$0.009	$0.069
TIPU	1	$0.051	$0.163
Trade	5	$0.201	$0.474
Service	59	$4.104	$8.098
Government	0	$0.028	$0.061
Total	66	$4.422	$8.920

Source: Strategic Economics Group, IMPLAN Model

Table 3.6 Employment Impact of the Pipeline Operations in North Dakota

Description	Direct	Indirect	Induced	Total
Total	43	6	17	66
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	0	0	0
TIPU	0	0	0	1
Trade	0	1	4	5
Service	43	5	12	59
Government	0	0	0	0

Source: Strategic Economics Group, IMPLAN Model

Table 3.7 Labor Income of the Pipeline Operations in North Dakota

Description	Direct	Indirect	Induced	Total
Total	$3,478,018	$275,468	$668,639	$4,422,125
Agriculture	$0	$212	$4,998	$5,210
Mining	$0	$185	$171	$357
Construction	$0	$11,969	$11,550	$23,519
Manufacturing	$0	$3,840	$5,446	$9,287
TIPU	$0	$21,433	$29,487	$50,919
Trade	$0	$39,409	$161,590	$201,000
Service	$3,478,018	$185,785	$440,260	$4,104,063
Government	$0	$12,634	$15,136	$27,770

Source: Strategic Economics Group, IMPLAN Model

Table 3.8 Output Impact of the Pipeline Operations in North Dakota

Description	Direct	Indirect	Induced	Total
Total	$6,148,500	$792,352	$1,978,792	$8,919,644
Agriculture	$0	$619	$11,048	$11,668
Mining	$0	$497	$591	$1,088
Construction	$0	$21,082	$20,212	$41,294
Manufacturing	$0	$21,256	$48,136	$69,392
TIPU	$0	$68,794	$94,679	$163,473
Trade	$0	$101,581	$371,984	$473,566
Service	$6,148,500	$552,538	$1,396,700	$8,097,738
Government	$0	$25,983	$35,442	$61,425

Source: Strategic Economics Group, IMPLAN Model

Appendix 4 – Detail Tables for South Dakota

The first four tables identify the economic impact of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the state of South Dakota. All dollar amounts are in 2016 dollars.

Table 4.1. Pipeline Construction Economic Impact on South Dakota

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	4,199	$182.65	$485.62
Indirect Effect	1,291	$58.59	$164.05
Induced Effect	1,646	$61.57	$186.17
Total Effect	7,137	$302.82	$835.84
Sector			
Agriculture	6	$0.79	$1.80
Mining	161	$4.20	$21.16
Construction	3,694	$163.71	$416.83
Manufacturing	135	$7.42	$41.26
TIPU	103	$5.82	$20.69
Trade	562	$21.61	$53.31
Service	2,425	$97.03	$275.90
Government	50	$2.23	$4.90
Total	7,137	$302.82	$835.84

Source: Strategic Economics Group, IMPLAN Model

Table 4.2 Impact on Employment of Pipeline Construction in South Dakota

Description	Direct	Indirect	Induced	Total
Total	4,199	1,291	1,646	7,137
Agriculture	0	2	4	6
Mining	147	14	1	161
Construction	3,656	25	14	3,694
Manufacturing	21	98	16	135
TIPU	0	64	39	103
Trade	0	173	389	562
Service	376	898	1,151	2,425
Government	0	17	33	50

Source: Strategic Economics Group, IMPLAN Model

Table 4.3 Impact on Labor Income of Pipeline Construction in South Dakota ()$Millions)

Description	Direct	Indirect	Induced	Total
Total	$182.65	$58.59	$61.57	$302.82
Agriculture	$0.00	$0.28	$0.51	$0.79
Mining	$3.53	$0.66	$0.01	$4.20
Construction	$161.73	$1.16	$0.82	$163.71
Manufacturing	$1.26	$5.31	$0.85	$7.42
TIPU	$0.00	$3.61	$2.22	$5.82
Trade	$0.00	$8.12	$13.48	$21.61
Service	$16.12	$38.65	$42.25	$97.03
Government	$0.00	$0.80	$1.43	$2.23

Source: Strategic Economics Group, IMPLAN Model

Table 4.4 Impact on Output of Pipeline Construction in South Dakota ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$485.62	$164.05	$186.17	$835.84
Agriculture	$0.00	$0.53	$1.26	$1.80
Mining	$18.36	$2.68	$0.11	$21.16
Construction	$412.71	$2.48	$1.64	$416.83
Manufacturing	$11.27	$24.37	$5.62	$41.26
TIPU	$0.00	$11.97	$8.72	$20.69
Trade	$0.00	$20.89	$32.41	$53.31
Service	$43.26	$99.50	$133.15	$275.90
Government	$0.00	$1.63	$3.26	$4.90

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 4.5 Pipeline Operations Economic Impact on South Dakota

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	19	$1.469	$2.759
Indirect Effect	3	$0.141	$0.432
Induced Effect	9	$0.339	$1.025
Total Effect	31	$1.950	$4.217
Sector			
Agriculture	0	$0.003	$0.007
Mining	0	$0.000	$0.001
Construction	0	$0.009	$0.019
Manufacturing	0	$0.009	$0.051
TIPU	0	$0.022	$0.086
Trade	2	$0.092	$0.229
Service	28	$1.799	$3.791
Government	0	$0.015	$0.032
Total	31	$1.950	$4.217

Source: Strategic Economics Group, IMPLAN Model

Table 4.6 Employment Impact of the Pipeline Operations in South Dakota

Description	Direct	Indirect	Induced	Total
Total	19	3	9	31
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	0	0	0
TIPU	0	0	0	0
Trade	0	0	2	2
Service	19	3	6	28
Government	0	0	0	0

Source: Strategic Economics Group, IMPLAN Model

Table 4.7 Labor Income of the Pipeline Operations in South Dakota

Description	Direct	Indirect	Induced	Total
Total	$1,469,452	$141,228	$339,219	$1,949,899
Agriculture	$0	$213	$2,805	$3,018
Mining	$0	$52	$77	$129
Construction	$0	$4,543	$4,496	$9,039
Manufacturing	$0	$4,205	$4,692	$8,898
TIPU	$0	$10,132	$12,234	$22,367
Trade	$0	$17,953	$74,391	$92,344
Service	$1,469,452	$97,296	$232,640	$1,799,388
Government	$0	$6,833	$7,884	$14,717

Source: Strategic Economics Group, IMPLAN Model

Table 4.8 Output Impact of the Pipeline Operations in South Dakota

Description	Direct	Indirect	Induced	Total
Total	$2,759,000	$432,305	$1,025,303	$4,216,608
Agriculture	$0	$500	$6,954	$7,454
Mining	$0	$412	$619	$1,031
Construction	$0	$9,749	$9,038	$18,787
Manufacturing	$0	$20,368	$30,923	$51,290
TIPU	$0	$37,766	$48,280	$86,046
Trade	$0	$49,917	$178,998	$228,915
Service	$2,759,000	$300,058	$732,433	$3,791,491
Government	$0	$13,535	$18,058	$31,593

Source: Strategic Economics Group, IMPLAN Model

Appendix 5 – Detail Tables for Iowa

The first four tables identify the economic impact of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the state of Iowa. All dollar amounts are in 2016 dollars.

Table 5.1 Pipeline Construction Economic Impact on Iowa

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	3,998	$229.82	$628.43
Indirect Effect	1,520	$79.46	$209.77
Induced Effect	2,104	$81.06	$250.54
Total Effect	7,623	$390.34	$1,088.74
Sector			
Agriculture	8	$0.63	$2.28
Mining	89	$3.77	$12.84
Construction	3,564	$206.80	$539.50
Manufacturing	185	$12.54	$76.26
TIPU	130	$7.50	$26.02
Trade	743	$28.66	$65.83
Service	2,866	$127.77	$360.51
Government	37	$2.66	$5.49
Total	7,623	$390.34	$1,088.74

Source: Strategic Economics Group, IMPLAN Model

Table 5.2 Impact on Employment of Pipeline Construction in Iowa

Description	Direct	Indirect	Induced	Total
Total	3,998	1,520	2,104	7,623
Agriculture	0	2	6	8
Mining	60	28	0	89
Construction	3,524	26	14	3,564
Manufacturing	39	121	25	185
TIPU	0	82	49	130
Trade	0	219	524	743
Service	374	1,030	1,461	2,866
Government	0	13	25	37

Source: Strategic Economics Group, IMPLAN Model

Table 5.3 Impact on Labor Income of Pipeline Construction in Iowa ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$229.82	$79.46	$81.06	$390.34
Agriculture	$0.00	$0.14	$0.49	$0.63
Mining	$2.07	$1.67	$0.02	$3.77
Construction	$204.45	$1.51	$0.85	$206.80
Manufacturing	$3.21	$7.80	$1.53	$12.54
TIPU	$0.00	$4.64	$2.87	$7.50
Trade	$0.00	$10.39	$18.27	$28.66
Service	$20.09	$52.39	$55.29	$127.77
Government	$0.00	$0.92	$1.73	$2.66

Source: Strategic Economics Group, IMPLAN Model

Table 5.4 Impact on Output of Pipeline Construction in Iowa ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$628.43	$209.77	$250.54	$1,088.74
Agriculture	$0.00	$0.42	$1.87	$2.28
Mining	$8.99	$3.78	$0.06	$12.84
Construction	$533.38	$3.50	$2.63	$539.50
Manufacturing	$26.84	$37.10	$12.32	$76.26
TIPU	$0.00	$15.36	$10.66	$26.02
Trade	$0.00	$24.92	$40.92	$65.83
Service	$59.22	$122.93	$178.36	$360.51
Government	$0.00	$1.77	$3.72	$5.49

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 5.5 Pipeline Operations Economic Impact on Iowa

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	15	$1.250	$2.378
Indirect Effect	3	$0.127	$0.373
Induced Effect	8	$0.296	$0.916
Total Effect	25	$1.673	$3.667
Sector			
Agriculture	0	$0.002	$0.007
Mining	0	$0.000	$0.000
Construction	0	$0.007	$0.018
Manufacturing	0	$0.012	$0.081
TIPU	0	$0.019	$0.069
Trade	2	$0.080	$0.184
Service	22	$1.542	$3.284
Government	0	$0.012	$0.024
Total	25	$1.673	$3.667

Source: Strategic Economics Group, IMPLAN Model

Table 5.6 Employment Impact of the Pipeline Operations in Iowa

Description	Direct	Indirect	Induced	Total
Total	15	3	8	25
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	0	0	0
TIPU	0	0	0	0
Trade	0	0	2	2
Service	15	2	5	22
Government	0	0	0	0

Source: Strategic Economics Group, IMPLAN Model

Table 5.7 Labor Income of the Pipeline Operations in Iowa

Description	Direct	Indirect	Induced	Total
Total	$1,250,133	$126,574	$296,129	$1,672,836
Agriculture	$0	$128	$1,789	$1,917
Mining	$0	$61	$87	$148
Construction	$0	$3,606	$3,120	$6,726
Manufacturing	$0	$6,090	$5,600	$11,690
TIPU	$0	$8,818	$10,503	$19,320
Trade	$0	$12,927	$66,835	$79,763
Service	$1,250,133	$89,553	$201,841	$1,541,527
Government	$0	$5,391	$6,354	$11,745

Source: Strategic Economics Group, IMPLAN Model

Table 5.8 Output Impact of the Pipeline Operations in Iowa

Description	Direct	Indirect	Induced	Total
Total	$2,378,000	$373,384	$915,701	$3,667,085
Agriculture	$0	$458	$6,820	$7,278
Mining	$0	$148	$235	$384
Construction	$0	$8,316	$9,613	$17,929
Manufacturing	$0	$35,990	$45,022	$81,012
TIPU	$0	$30,158	$39,181	$69,338
Trade	$0	$33,773	$149,797	$183,570
Service	$2,378,000	$254,579	$651,356	$3,283,935
Government	$0	$9,961	$13,677	$23,638

Appendix 6 – Detail Tables for Illinois

The first four tables identify the economic impact of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the state of Illinois. All dollar amounts are in 2016 dollars.

Table 6.1 Pipeline Construction Economic Impact on Illinois

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	2,482	$157.79	$366.57
Indirect Effect	919	$64.47	$164.42
Induced Effect	1,608	$81.04	$222.36
Total Effect	5,009	$303.30	$753.35
Sector			
Agriculture	3	$0.25	$0.74
Mining	86	$4.66	$14.34
Construction	2,115	$131.46	$277.39
Manufacturing	158	$13.24	$91.79
TIPU	97	$6.65	$21.44
Trade	431	$20.20	$45.18
Service	2,094	$124.50	$298.70
Government	25	$2.34	$3.77
Total	5,009	$303.30	$753.35

Source: Strategic Economics Group, IMPLAN Model

Table 6.2 Impact on Employment of Pipeline Construction in Illinois

Description	Direct	Indirect	Induced	Total
Total	2,482	919	1,608	5,009
Agriculture	0	1	3	3
Mining	76	9	1	86
Construction	2,092	14	9	2,115
Manufacturing	48	85	24	158
TIPU	0	49	47	97
Trade	0	96	335	431
Service	266	657	1,170	2,094
Government	0	7	18	25

Source: Strategic Economics Group, IMPLAN Model

Table 6.3 Impact on Labor Income of Pipeline Construction in Illinois ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$157.79	$64.47	$81.04	$303.30
Agriculture	$0.00	$0.05	$0.20	$0.25
Mining	$4.01	$0.62	$0.03	$4.66
Construction	$129.81	$0.94	$0.71	$131.46
Manufacturing	$4.23	$6.96	$2.04	$13.24
TIPU	$0.00	$3.34	$3.31	$6.65
Trade	$0.00	$6.06	$14.14	$20.20
Service	$19.74	$45.86	$58.90	$124.50
Government	$0.00	$0.64	$1.70	$2.34

Source: Strategic Economics Group, IMPLAN Model

Table 6.4 Impact on Output of Pipeline Construction in Illinois ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$366.57	$164.42	$222.36	$753.35
Agriculture	$0.00	$0.16	$0.58	$0.74
Mining	$11.59	$2.50	$0.25	$14.34
Construction	$274.43	$1.70	$1.26	$277.39
Manufacturing	$35.79	$40.49	$15.51	$91.79
TIPU	$0.00	$10.45	$10.99	$21.44
Trade	$0.00	$13.98	$31.19	$45.18
Service	$44.77	$94.16	$159.78	$298.70
Government	$0.00	$0.98	$2.79	$3.77

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 6.5 Pipeline Operations Economic Impact on Illinois

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	11	$0.995	$1.705
Indirect Effect	2	$0.154	$0.399
Induced Effect	7	$0.359	$0.985
Total Effect	20	$1.508	$3.090
Sector			
Agriculture	0	$0.001	$0.003
Mining	0	$0.000	$0.002
Construction	0	$0.006	$0.010
Manufacturing	0	$0.022	$0.136
TIPU	0	$0.024	$0.077
Trade	2	$0.075	$0.168
Service	18	$1.369	$2.675
Government	0	$0.012	$0.019
Total	20	$1.508	$3.090

Source: Strategic Economics Group, IMPLAN Model

Table 6.6 Employment Impact of the Pipeline Operations in Illinois

Description	Direct	Indirect	Induced	Total
Total	11	2	7	20
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	0	0	0
TIPU	0	0	0	0
Trade	0	0	1	2
Service	11	2	5	18
Government	0	0	0	0

Source: Strategic Economics Group, IMPLAN Model

Table 6.7 Labor Income of the Pipeline Operations in Illinois

Description	Direct	Indirect	Induced	Total
Total	$995,394	$154,090	$359,010	$1,508,493
Agriculture	$0	$60	$891	$952
Mining	$0	$66	$126	$192
Construction	$0	$2,630	$3,161	$5,791
Manufacturing	$0	$13,019	$9,049	$22,068
TIPU	$0	$8,979	$14,700	$23,679
Trade	$0	$12,262	$62,698	$74,960
Service	$995,394	$112,686	$260,833	$1,368,913
Government	$0	$4,387	$7,551	$11,939

Source: Strategic Economics Group, IMPLAN Model

Table 6.8 Output Impact of the Pipeline Operations in Illinois

Description	Direct	Indirect	Induced	Total
Total	$1,705,500	$399,022	$985,350	$3,089,873
Agriculture	$0	$223	$2,587	$2,810
Mining	$0	$473	$1,097	$1,570
Construction	$0	$4,768	$5,571	$10,339
Manufacturing	$0	$67,156	$68,721	$135,876
TIPU	$0	$28,251	$48,843	$77,094
Trade	$0	$29,474	$138,362	$167,836
Service	$1,705,500	$261,739	$707,770	$2,675,009
Government	$0	$6,939	$12,400	$19,338

Source: Strategic Economics Group, IMPLAN Model

Appendix 7 - Description of the IMPLAN Model[56]

IMPLAN is a widely-accepted and utilized software model. At the heart of the model is an input-output dollar flow table. For a specified region, the input-output table accounts for all dollar flows between different sectors of the economy. Using this information, IMPLAN models the way a dollar injected into one sector is spent and re-spent in other sectors of the economy, generating waves of economic activity, or so-called "economic multiplier" effects.

The model uses national industry data and county-level economic data to generate a series of multipliers which in turn estimate the total economic implications of economic activity. At the heart of the model is a national input-output dollar flow table called the Social Accounting Matrix (SAM). Unlike other static input-output models, which just measure the purchasing relationships between industry and household sectors, SAM also measures the economic relationships between government, industry, and household sectors, allowing IMPLAN to model transfer payments such as unemployment insurance. Thus, for the specified region, the input-output table accounts for all the dollar flows between the different sectors within the economy.

For this study, Strategic Economics Group used the most recent IMPLAN datasets for North Dakota, South Dakota, Iowa, Illinois and the United States.

[56] IMPLAN Pro User's Guide, 2000

Appendix 8 - About the Strategic Economics Group Research Team

Strategic Economics Group (SEG) is the region's only locally-owned economic research consulting firm. It has served businesses and government clients in Iowa and the Midwest since 2001. The SEG team develops economic impact studies, fiscal impact estimates, cost-benefit models, management information systems and forensic projections.

Harvey Siegelman is the President of Strategic Economics Group. In 2001, Mr. Siegelman retired as Iowa's longest-serving State Economist (1982-2001). He was also Adjunct Professor of Economics at Drake University. Siegelman earned his Master of Arts in Economics degree from Wichita State University. Prior to his appointment as State Economist, he was a professor of economics at University of Wisconsin-Whitewater Campus, University of Findlay (Ohio) and visiting professor at Wichita State University.

Michael Lipsman is a Senior Economic Analyst with Strategic Economics Group. Lipsman has earned a Masters in Community and Regional Planning and a Doctorate in Economics from Iowa State University. Over the course of a 31 year professional career in Iowa State government he has worked as a transportation planner, senior legislative analyst, and tax research analyst. From 2000 to 2011 he managed the Tax Research and Program Analysis Section of the Iowa Department of Revenue.

Daniel Otto is a Senior Economic Analyst with Strategic Economics Group. Otto is Emeritus Professor of Economics at Iowa State University. He received his doctorate in economics from Virginia Polytechnic Institute in 1981 and joined Iowa State University that same year as an Associate Professor and Extension Economist. His research areas include Community and Regional Economic Modeling and Policy Analysis, Economic and Fiscal Impact Analysis and Project Evaluation.

Additional details and contact information can be found on their website: www.economicsgroup.com.

Listed Exhibit: 9

APPENDIX J
UNANTICIPATED DISCOVERIES PLAN
CULTURAL RESOURCES, HUMAN REMAINS, PALEONTOLOGICAL RESOURCES & CONTAMINATED MEDIA

Dakota Access Pipeline Project (DAPL)

A. INTRODUCTION

Dakota Access, LLC is proposing to install approximately 1,100 miles of 12- to 30-inch pipeline from Stanley, North Dakota, crossing South Dakota and Iowa, to an existing tank hub near Patoka, Illinois crossing South Dakota and Iowa as well.

This document describes the procedures for dealing with unanticipated discoveries during the course of project construction. It is intended to:

- Maintain compliance with applicable Federal and State laws and regulations during construction of the Project;
- Describe to regulatory and review agencies the procedure the project or its representative will follow to prepare for and deal with unanticipated discoveries; and,
- Provide direction and guidance to project personnel as to the proper procedure to be followed should an unanticipated discovery occur.
- The plan will be implemented across all lands in the State of South Dakota regardless of ownership.

B. PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES

In the event that any member of the construction work force believes that a cultural resource discovery is encountered the following plan will be implemented:

1. All work within 100 feet both sides of the discovery will immediately stop and the Environmental Inspector (EI) will be notified. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the materials. A cultural resource can be prehistoric or historic and could consist of, but not limited to, for example:
   - An accumulation of shell, burned rocks, or other subsistence related materials
   - An area of charcoal or very dark soil with artifacts
   - Stone tools, arrowheads, or dense concentrations of stone artifacts
   - A cluster of bones in association with shell, charcoal, burned rocks, or stone artifacts
   - A historic structure or assemblage of historic materials older than 50 years

Prior to construction, the EI staff across the Project will be part of a comprehensive training program with construction and environmental staff on how to identify cultural resources and the type of cultural resources that might be identified. The EI's are instructed to cordon off the area and to call a professional archaeologist within 24 hours of discovery.

2. If the EI believes that the discovery is a cultural resource, the EI will take appropriate steps to protect the discovery site, including the following:
   - Flag the buffer zone around the find spot
   - Keep workers, press, and curiosity seekers, away from the find spot
   - Tarp the find spot
   - Have an individual stay at the location to prevent further disturbance until a qualified archaeologist has arrived

   Upon discovery, the EI will notify the environmental Project Manager and/or Company Representative. Work in the immediate area will not resume until treatment of the discovery has been completed.

3. Dakota Access or its representative will arrange for discoveries on all lands to be evaluated by a qualified archaeologist in accordance with applicable regulations. A qualified archaeologist is an archaeologist who meets or exceeds the Secretary of Interior's Qualification and Standards, as outlined in 36 CFR, Part 61.

4. If the discovery is within an area of federal jurisdiction, the appropriate federal agency will be consulted. If the discovery is determined to have the potential for eligibility, the archaeologist and Dakota access will also consult with the SHPO on how best to avoid, minimize, or otherwise mitigate further impacts. Treatment measures may include mapping, photography, sample collection, or excavation safety.

5. The archaeologist will implement the appropriate treatment measure(s) and provide a report on its methods and results as required. The investigation and technical report will be performed in compliance with the Secretary of Interior's Standards and Guidelines for Archaeological Documentation (48 CFR 44734—44737); the Advisory County on Historic Preservation (ACHP) publication "Treatment of Archaeological Properties" (ACHP 1980); and follow the guidelines set forth by the South Dakota State Historic Preservation Office.

C. PROCEDURES FOR THE DISCOVERY OF HUMAN REMAINS

In the event that human remains or funerary objects are inadvertently discovered during either construction or maintenance activities, the following steps will be taken pursuant to South Dakota Codified Law Chapter 34-27-25, 34-27-28, 32-27-31:

1. The On-site manager/Contractor (EI) shall immediately halt construction activities within a 150 foot radius from the point of discovery and implement measures to protect the discovery from looting and vandalism. No digging, collecting, or moving human remains or other items shall occur after the

initial discovery. Protection measures may include the following:

- Flag the buffer zone around the find spot.
- Keep workers, press, and curiosity seekers, away from the find spot.
- Tarp the find spot.
- Prohibit photography of the find unless requested by the agency official.
- Have an individual stay at the location to prevent further disturbance until a law enforcement officer arrives.

2. The On-Site manager/Contractor (EI) shall notify law enforcement, the Federal/State Agency responsible for the project and the South Dakota State Archaeologist (State Archaeologist) within forty-eight (48) hours of the discovery.

3. The Federal/State Agency responsible for the project shall notify the South Dakota State Historic Preservation Office (SHPO), Indian tribes, and other consulting parties within forty-eight (48) hours of the discovery.

4. If local law enforcement determines that the remains are not associated with a crime, the Federal/State Agency responsible for the project shall determine if it is prudent and feasible to avoid disturbing the remains. If the Federal/State Agency in consultation with the Project Proponent/Applicant/Contractor determine that disturbance cannot be avoided, the Federal/State Agency shall consult with the State Archaeologist, SHPO, Indian tribes, and other consulting parties to determine acceptable procedures for the removal, treatment and disposition of the burial or remains. The Federal/State Agency shall ensure that the Project Proponent/Applicant/Contractor implements the plan for removal, treatment and disposition of the burial or remains as authorized by the South Dakota State Archaeologist.

5. The Federal/State Agency shall notify the Project Proponent/Applicant/Contractor that they may resume construction activities in the area of discovery upon completion of the plan authorized by the State Archaeologist.

D. PROCEDURES FOR THE DISCOVERY OF PALEONTOLOGICAL RESOURCES

In the event that any member of the construction work force believes that a paleontological resource discovery is encountered the following plan will be implemented:

1. All work within 100 feet both sides of the discovery will immediately stop and the EI will be notified. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the materials. A paleontological resource would be expected to be in the form of fossils. In-situ fossils are usually found within layers of geologically old sediments and rocks where the creature lived, died, and became fossilized. However, through geologic, hydrologic, and marine activity, many fossils and parts of fossils have been carried into younger geologic areas.

2. If the EI believes that the discovery is a paleontological resource, the EI will take appropriate steps to protect the discovery site. This will include flagging the immediate area of discovery and stop work

or exclusion zone, as well as notifying the Environmental Project Manager and/or Company Representative. Work in the immediate area will not resume until treatment of the discovery has been completed.

3. The Project Environmental Manager will arrange for the discovery to be evaluated by a qualified geologist/paleontologist in accordance with applicable regulations. The geologist/paleontologist will evaluate the remains and provide recommendations for how to manage the resource.

4. If the find is on state land, the Project Environmental Manager will notify the land managing state agency and the South Dakota Geological Survey, pursuant to South Dakota's Codified Law 5-1-20, which addresses the need to obtain a permit to record, excavate, or collect paleontological resources on state land. If the find is on federal or municipal land, the Project Environmental Manager will inform the appropriate land managing agency of the find. Treatment measures may include mapping, photography, sample collection, or excavation activity. The geologist/paleontologist will implement the appropriate treatment measure(s) and provide a report on its methods and results as required.

E. PROCEDURES FOR THE DISCOVERY OF CONTAMINATED MEDIA

Indicators of possible contamination include, but are not limited to:

- Buried drums or containers, rusted or in otherwise poor condition
- Stained or otherwise discolored soil (in contrast to adjoining materials)
- Spoil material containing debris other than obvious construction material
- Chemical or hydrocarbon odors emanating from excavations
- Oily residues
- Visible sheen or other discoloration on groundwater
- Structures such as pipelines (concrete, PVC or steel) or underground storage tanks.

The EI and appropriate contractor personnel will be trained in hazard identification and worker protection and these topics will be discussed regularly in safety meetings. A desktop assessment for contaminated along the Project route indicated that contamination it not likely to be encountered during construction. In the unlikely event that contamination is encountered the following activities should take place:

1. Immediately cease construction activities within that area and notify the EI and Project Environmental Manager. Work in the immediate area will not resume until an assessment of the discovery has been completed and the Company has released the site. If safe to do so, the EI will take appropriate steps to mark (flag) off the area to identify the exclusion zone. Work in the immediate area will not resume until an assessment discovery has been completed.

2. If potentially contaminated groundwater or soil reaches (or has the potential to reach) surface waters, booms and/or absorbent materials shall be immediately deployed to contain and reduce downstream migration of the spilled material.

3. Upon notification, the Project Environmental Manager will perform or direct a hazard assessment to determine appropriate control measures to be implemented at the specific site. Activities may include sampling vapors, soil, sediments, groundwater, and/or wipe samples of materials.

4. If warranted by the assessment, the Project Environmental Manager will notify appropriate Federal, State and Local agencies.

5. Company or the designated person(s) will make appropriate notifications to regulating agencies as necessary. Upon evaluation of the sampling results, additional notifications may be made to coordinate a work plan for measures to be implemented in the contaminated area to resume activities in a safe, environmentally compliant, and effective manner. Measures may include additional personal protective equipment, segregation of contaminated media, treatment or off-site disposal of contaminated media.

6. All identification /characterization, handling, labeling, storage, manifesting, transportation, record keeping, and disposal of potentially contaminated materials shall be conducted in accordance with all applicable federal, state, and local regulations and guidance.

F. PROJECT CONTACTS

Environmental Inspector

Contact: TBD Prior to Construction
Telephone
Email:
Address:

Chief Inspector

Contact: TBD Prior to Construction
Telephone
Email:
Address:

DAPL Project Manager

Contact: Joe Malucci
Telephone (o) 713-989-7186 (c) 713-898-8222
Email: Joe.Malucci@energytransfer.com
Address: 1300 Main Street, Houston, TX 77002

DAPL Project Environmental Manager

Contact: Monica Howard
Telephone (o) 713-989-7186 (c) 713-898-8222
Email: Monica.howard@energytransfer.com
Address: 1300 Main Street, Houston, TX 77002

DAPL Retained Archeologist, Gray & Pape

Contact: Beth McCord
Telephone: (o) 317-541-8200
E-mail: bmccord@graypape.com
Address: 5807 North Post Road, Indianapolis, IN 46216

South Dakota State Historical Society

Contact: James K. Haug, State Archaeologist
Telephone: (605) 394-2936
E-mail: Jim.Haug@state.sd.us
Address: South Dakota State Historical Society
Archaeological Research Center
P.O. Box 1257
Rapid City, SD 57709

Contact: Katie Lamie, Repository Manager
Telephone: (605) 394-1936
E-mail: Katie.Lamie@state.sd.us
Address: South Dakota Historical Society
Archaeological Research Center
P.O. Box 1257
Rapid City, SD 57709

Contact: Paige Olson, Review and Compliance Coordinator
Telephone: (605) 773-3458
E-mail: Paige.Olson@state.sd.us
Address: South Dakota State Historical Society
State Historic Preservation Office
900 Governors Drive
Pierre, SD 57501

Contact: Amy Rubingh, Review and Compliance Archaeologist
Telephone: (605) 773-3548
E-mail: Amy.Rubingh@state.sd.us
Address: South Dakota State Historical Society
State Historic Preservation Office
900 Governors Drive
Pierre, SD 57501

South Dakota Geological Survey

Contact: Derric Iles, State Geologist
Telephone: (605) 677-5227
Email: diles@usd.edu
Address: Akeley-Lawrence Science Center
414 East Clark Street, Vermillion SD 57069

County Sherriff Department Contacts

County	Sherriff	Address	Phone	Fax
Campbell	Lacey Perman	P.O. Box 161, Mound City, SD 57646	605-955-335	605-955-3308
McPherson	David Ackerman	P.O. Box 158 Leola, SD 57456	605-439-3400	605-439-3632
Edmunds	Todd Holtz	P.O. Box Ipswich, SD 57451	605-426-6262	605-426-6257
Faulk	Kurt Hall	924 Lafoon Ave Faulton, SD 57438	605-598-6229	605-598-6620
Spink	Kevin Schurch	210 E 7th Ave, Suite 1 Redfield, SD 57469	605-472-4595	605-472-4599
Beadle	Doug Solem	455 4th St SW, Rm #100 Huron, SD 57350	605-353-8424	605-353-8427
Kingsbury	Kevin Scotting	P.O. Box 136 De Smet, SD 57231	605-854-3339	605-854-9307
Miner	Lanny Klinkhammer	P.O. Box 366 Howard, SD 57349	605-772-4501	605-772-4148
Lake	Tim Walburg	200 E Center St Madison, SD 57042	605-256-7615	605-256-7617
McCook	Mark Norris	P.O. Box 58 Salem, SD 57058	605-425-2761	605-425-3144
Minnehaha	Mike Milstead	320 W 4th St Sioux Falls, SD 57104	605-367-4300	605-367-7319
Turner	Byron Nogelmeier	P.O. Box 580 Parker, SD 57053	605-297-3225	605-297-3871
Lincoln	Dennis Johnson	128 N Main St, Suite 200 Canton, SD 57013	605-764-5651	605-764-2767