Chris Nelson, Chairperson
Kristie Fiegen, Vice Chairperson
Gary Hanson, Commissioner

PUBLIC UTILITIES COMMISSION
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September 25, 2015

Patricia Van Gerpen, Executive Director
South Dakota Public Utilities Commission
500 East Capitol Ave.
Pierre, SD 57501

RE: HP14-002, In the Matter of the Application of Dakota Access, LLC for an Energy Facility Permit to Construct the Dakota Access Pipeline

Ms. Van Gerpen,

Attached for filing please find Staff's Prefiled Exhibits Staff 1 through Staff 17. Staff 18 contains confidential information subject to the protective agreement and was, therefore, served only on those parties who have executed the protective agreement.

By copy of this correspondence, on today's date, the foregoing was served upon all persons identified on the Commission's service list in the above-captioned docket. Thank you for your time and attention to this matter. Should you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

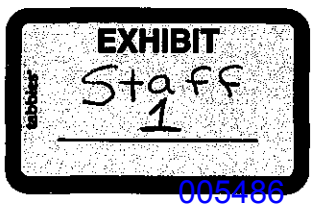
Kristen N. Edwards
Staff Attorney

BEFORE THE
PUBLIC UTILITIES COMMISSION
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

SD PUC DOCKET HP14-002

PREFILED TESTIMONY OF DARREN KEARNEY
ON BEHALF OF THE COMMISSION STAFF
July 6, 2015



Q. State your name.

A. Darren Kearney.

Q. State your employer and business address.

A. South Dakota Public Utilities Commission, 500 E Capitol Ave, Pierre, SD, 57501.

Q. State your position with the South Dakota Public Utilities Commission.

A. I am a Staff Analyst, which is also often referred to as a Utility Analyst.

Q. What is your educational background?

A. I hold a Bachelor's of Science degree, majoring in Biology, from the University of Minnesota. I also hold a Masters of Business Administration degree from the University of South Dakota.

Q. Please provide a brief explanation of your work experience.

A. I began my career in the utility industry working as contract biologist for Xcel Energy, where I conducted biological studies around various power plants, performed statistical analysis on the data collected, and authored reports in order to meet National Pollutant Discharge Elimination System (NPDES) permit requirements.

After two years of performing biological studies, I then transitioned into an environmental compliance function at Xcel Energy as a full time employee of the company and became responsible for ensuring Xcel's facilities maintained compliance with the Oil Pollution Act of 1990. This involved writing Spill Prevention Control and Countermeasure (SPCC) plans and also ensuring Xcel facilities maintained compliance with those plans. During this time I was also responsible for the company's Environmental Incident Response Program, which involved training Xcel employees on spill reporting and response, managing spill cleanups, and mobilizing in-house and

contract spill response resources. I was also responsible for aboveground storage tank permitting during this time.

I was in that role for approximately three years and then I transitioned to a coal-fired power plant at Xcel and became responsible for environmental permitting and compliance for the plant. Briefly, my responsibilities involved ensuring that the facility complied with all environmental permits at the plant, which included a Clean Air Act Title V Air Permit, a Clean Water Act NPDES permit, and a hazardous waste permit. I also submitted reports on the plant's operations to various agencies as required by permit or law. After three years at the power plant, I left Xcel Energy to work for the South Dakota Public Utilities Commission (SD PUC).

I have been at the SD PUC for over two years now. During this time I worked on a variety of matters in the telecom, natural gas, and electric industries. The major dockets that I worked on were transmission siting dockets, pipeline siting dockets, and energy efficiency dockets. I also attended a number of trainings on public utility policy issues, electric grid operations, regional transmission planning, electric wholesale markets, and utility ratemaking.

Q. On whose behalf was this testimony prepared?

A. This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission.

Q. When did Dakota Access, LLC file its Application for a permit to construct the Dakota Access Pipeline?

A: The original application was filed on December 15, 2014.

Q: Did you review Dakota Access, LLC's Application for a permit to construct the Dakota Access Pipeline?

A. Yes. I also reviewed the exhibits, revised application, revised exhibits, and discovery responses produced by all parties.

Q. Were other Staff involved in the review of this petition?

A. Yes. Staff Analyst Brian Rounds also assisted in reviewing the application.

Q. Explain, in your words, the main role of the SDPUC Staff in the Application proceedings.

A. After receiving the application filing, Staff completed a review of the contents of the Application as it relates to the Energy Facility Siting statutes, SDCL 49-41B, and Energy Facility Siting Rules, ARSD 20:10:22. Staff then identified information required by statute or rule that was either missing from the Application or unclear within the application. Staff then requested Dakota Access to provide the information that Staff believed to be missing or unclear.

Staff also subpoenaed experts from various State Agencies including the Department of Environment and Natural Resources, Game Fish and Parks, Historic Preservation Office, and Department of Revenue in order to have individuals knowledgeable in their associated fields assist with Staff's review. Staff facilitated the preparation of testimony from these experts by providing questions that Staff believed were relevant to the review of the Application. These experts then completed their review and authored their testimony as filed in this docket.

Further, Staff hired two consultants to assist with reviewing the Application. The first consultant, Natural Resources Group, has expertise with environmental permitting,

environmental impact analyses and mitigation, and socioeconomic impact analyses. The second consultant, REM Pipeline Consultants, LLC, has expertise with the Pipeline and Hazardous Materials Safety Administration regulations the pipeline will be subject to. Staff facilitated the preparation of testimony from these consultants by providing questions that Staff believed were relevant to the review of the Application. These experts then completed their review and authored their testimony as filed in this docket.

The State experts and consultants completed a review of the application, exhibits, and relevant discovery responses. Staff then relied on these individuals to identify any outstanding issues they found with the applications that falls under their areas of expertise. These issues will be addressed in their testimony and Staff will then work with the company to address the issues or provide mitigation measures for Commission consideration.

Finally, Staff assisted a number of intervenors and affected landowners by providing responses to numerous questions on the pipeline, the siting process at the PUC, and the opportunities available for these individuals to be heard by the Commission. If the landowners had specific concerns with the pipeline, Staff often recommended that those individuals file comments in the docket for the Commission's consideration. Where appropriate, Staff also included some of the landowners' questions or concerns in Staff's interrogatories sent to Dakota Access.

Q. Was Dakota Access, LLC's application considered complete at the time of filing?

A. At the time of the filing, the application was generally complete. However, as identified above, Staff requested further information, or clarification, from Dakota

Access, LLC which Staff believed were necessary in order to satisfy the requirements of SDCL 49-41B and ARSD 20:10:22. Dakota Access's responses to Staff's information requests are attached as Exhibit A. Staff's experts also sought information from Dakota Access and any outstanding information needs would be addressed in their prefiled testimony. Finally, I would also note that an Applicant supplementing its original application with additional information as requested by Staff is not unusual for siting dockets.

Q. How many parties were granted party status?

A. There were 49 individuals that were granted party status.

Q. Does Staff have any recommendations regarding an appropriate indemnity bond for road and bridge damages according to SDCL 49-41B-38?

A. Yes. In response to Staff's completeness review data request number 32, Dakota Access proposed an indemnity bond totaling $15 million. For both the first Keystone pipeline and Keystone XL pipeline, the Commission adopted an indemnity bond amount based on ten percent of the estimated value of construction in South Dakota for each year of construction. Within its Application, Dakota Access estimates that construction of the pipeline and facilities in South Dakota will cost $820 million. However, according to a report prepared on November 12, 2014, by Strategic Economics Group titled "An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, and Iowa," it is identified that of the $820 million approximately $485.6 million will result in direct spending in South Dakota. Therefore, Staff proposes that the bond amount be based on $485.6 million. Applying the same formula used for the Keystone and Keystone XL pipelines, this

results in a total bond amount of $48 million. Spreading the bond amount over two years of estimated construction (i.e. 2015 and 2016 as stated in the Application) would equate to a $24 million bond per year. As such, Staff recommends the Commission require an indemnity bond of $24 million for the year in which construction is to commence and a second bond in the amount of $24 million for the ensuing year, including any additional period until construction and repair has been completed. Finally, it should be noted that Staff would be willing to reconsider the recommended bond amount should Dakota Access identify that the expected value of construction in South Dakota will be less than the estimated direct spending in South Dakota as provided by Strategic Economics Group. In any event, it is Staff's opinion that the formula used to calculate the bond amount in this docket should be consistent with the formula used in past pipeline siting dockets.

Q. Does this conclude your testimony?

A. Yes.

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 1:

Per ARSD 20:10:22:05, please provide a list of each notification that is required to be made to any other governmental entity. If no notifications are required beyond those provided in Table 5.0-1 in the Revised Application, please provide such a statement.

Response:

Table 5.0-1 is inclusive of all required permits and notifications to governmental entities for the Project.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
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Data Request No. 2:

Per ARSD 20:10:22:07, please provide a complete description of the ownership structure of Dakota Access, LLC and DAPL-ETCO Operations Management, LLC.

Response:

Dakota Access, LLC is a Delaware limited liability company with its principal offices at 3738 Oak Lawn Avenue, Dallas, Texas 75219. The membership interest of Dakota Access, LLC is owned 75 percent by Dakota Access Holdings, LLC and 25 percent by Phillips 66 DAPL Holdings LLC.

(a) Dakota Access Holdings, LLC is owned 100 percent by Energy Transfer Partners, L.P. ("ETP"), a master limited partnership publicly traded on the New York Stock Exchange ("NYSE"). Energy Transfer Equity, L.P. ("ETE"), also a master limited partnership publicly traded on the NYSE, indirectly owns the general partner of ETP and certain of that partnership's limited partner units, and also owns the general partner of Regency Energy Partners, L.P. ("Regency") and certain of its limited partner units. (ETE and ETP are together referred to herein as "Energy Transfer"). Energy Transfer maintains its corporate headquarters at 3738 Oak Lawn Avenue, Dallas, Texas 75219.

(b) Phillips 66 DAPL Holdings LLC is owned 20 percent each by Phillips 66 DE Holdings 20A LLC, Phillips 66 DE Holdings 20B LLC, Phillips 66 DE Holdings 20C LLC, Phillips 66 DE Holdings 20D LLC, and Phillips 66 DE Holdings Primary LLC. The five Phillips 66 entities are owned 100 percent by Phillips 66 Project Development Inc. Phillips 66 Project Development Inc. is 100 percent owned by Phillips 66 Company. Phillips 66 Company is 100 percent owned by Phillips 66, a Delaware corporation. Phillips 66 maintains its corporate headquarters at 3010 Briarpark Drive, Houston, Texas 77042.

Operational services for the Dakota Access Pipeline will be provided by DAPL-ETCO Operations Management, LLC, a Delaware limited liability company, pursuant to an Operating Agreement. DAPL-ETCO Operations Management, LLC is 100 percent owned by La Grange Acquisition, L.P. La Grange Acquisition, L.P. is an indirect subsidiary of ETP.

Prepared By: Stephen Veatch
Title: Sr. Director Certificates

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
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Data Request No. 3:

Please provide the results of the "expansion open season" mentioned in Section 10.0 of the Revised Application. Further, do the long-term binding contracts that resulted from the open season include any clauses that would allow shippers to break the contract should demand for oil from the Bakken and Three Forks formations decrease?

Response:

Following the expansion open season, Dakota Access, LLC's entered into long-term binding contracts with customers that underpin a system capacity of not less than 467,500 bpd, with 90% of the system capacity allocated to committed shippers under the long-term binding contracts and 10% of the system capacity reserved for walk-up shippers.

The long-term binding contracts that Dakota Access, LLC has entered with customers do not include any clauses that would allow shippers to break the contract should demand for oil from the Bakken and Three Forks formations decrease.

Prepared By: Damon Rahbar Daniels
Title: Vice President – Commercial Operations

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 4:

Per ARSD 20:10:22:10, please provide a description of present and estimated crude oil demand of those customers to be directly served by the pipeline. Included with the description, please provide

a. all "data, data sources, assumptions, forecast methods or models, or other reasoning upon which the description is based";
b. information on the relative contribution to Bakken oil exports and U.S. refinery imports; and
c. a "statement on the consequences of delay or termination of the construction" of the pipeline.

Response:

Crude oil transported by Dakota Access, LLC will be capable of directly accessing a significant percentage of total U.S. refining capacity through the crude oil logistics infrastructure at the key crude oil terminalling hubs to which Dakota Access, LLC will provide service, whether solely or in conjunction with Energy Transfer Crude Oil Company LLC.

Accounting solely for pipeline connectivity,[¥] with respect to Dakota Access, LLC's deliveries to the "Patoka Hub" near Patoka, Illinois, the following refineries will have direct pipeline access to the Bakken and Three Forks production transported by Dakota Access, LLC to the Patoka Hub:

Refinery	Location	Capacity (barrels per day)
CITGO Lemont Refinery	Lemont, IL	172,045
Exxon Joliet Refinery	Joliet, IL	238,600
BP Whiting Refinery	Whiting, IN	413,500
Marathon Detroit Refinery	Detroit, MI	123,000
Husky Lima Refinery	Lima, OH	155,000
BP/Husky Toledo Refinery	Toledo, OH	135,000
PBF Toledo Refinery	Toledo, OH	160,000
Marathon Petroleum Canton Refinery	Canton, OH	80,000
Marathon Petroleum Robinson Refinery	Robinson, IL	212,000
Marathon Petroleum Catlettsburg Refinery	Catlettsburg, KY	242,000
WRB Wood River Refinery	Wood River, IL	336,000

With respect to Dakota Access, LLC's deliveries to the terminalling hub in the vicinity of Nederland, Texas, in conjunction with Energy Transfer Crude Oil Company LLC, the following refineries will have direct pipeline access to Bakken and Three Forks production transported by Dakota Access, LLC, again accounting solely for pipeline connectivity[¥]:

Refinery	Location	Capacity (barrels per day)
Exxon Beaumont Refinery	Beaumont, TX	330,000
Motiva Port Arthur Refinery	Port Arthur, TX	600,250
Total Port Arthur Refinery	Port Arthur, TX	225,000
Valero Port Arthur Refinery	Port Arthur, TX	330,000
Phillips 66 Lake Charles Refinery	Westlake, LA	239,400
CITGO Lake Charles Refinery	Lake Charles, LA	427,800

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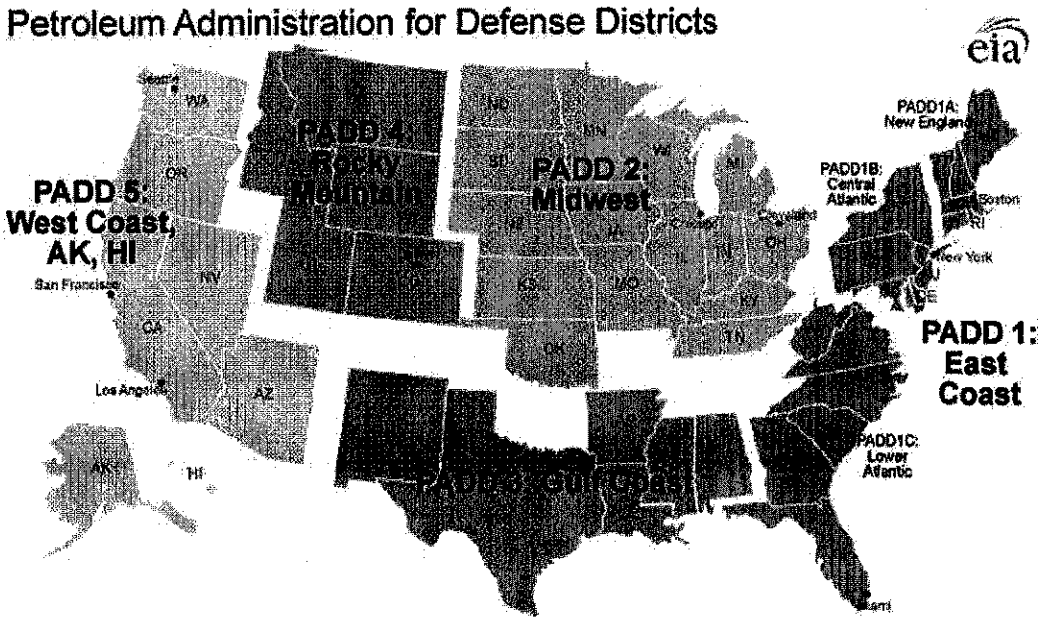
Calcasieu Refinery	Lake Charles, LA	78,000
Exxon-Mobil Baton Rouge Refinery	Baton Rouge, LA	502,500
Placid Refinery	Port Allen, LA	59,000
Motiva Convent Refinery	Convent, LA	235,000
Marathon Garyville Refinery	Garyville, LA	522,000
Motiva Norco Refinery	Norco, LA	238,000
Valero St. Charles Refinery	Destrehan, LA	205,000
Shell St. Rose Refinery	St. Rose, LA	45,000
Exxon-Mobil Chalmette Refinery	Chalmette, LA	192,500
Valero Meraux Refinery	Meraux, LA	125,000
Phillips 66 Alliance Refinery	Belle Chasse, LA	247,000

Crude oil can be moved by modes of transportation other than pipeline, such as truck, vessel, or rail. Thus, the market for Bakken and Three Forks production to be transported by Dakota Access, LLC is effectively even broader than what is represented by focusing on pipelines alone.

Companies regard as proprietary the details of the crude oil slates for their refineries, but all of these refineries have the capability to refine crude oil produced from the Bakken and Three Forks production region within their crude oil slates. Indeed, the significant demand for capacity on the Dakota Access Pipeline highlights that Dakota Access, LLC will enable Bakken and Three Forks production to reach markets where that production is desired.

The crude oil market in the U.S. is typically divided among five Petroleum Administration for Defense Districts (each, a "PADD"), which are defined by geographic areas within the U.S. as reflected by the following:



Source: U.S. Energy Information Administration

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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The Patoka Hub is located in PADD II, while the crude oil terminalling hub in the vicinity of Nederland, Texas, is located in PADD III. Below is the most recent data available from the EIA on imports into each PADD:

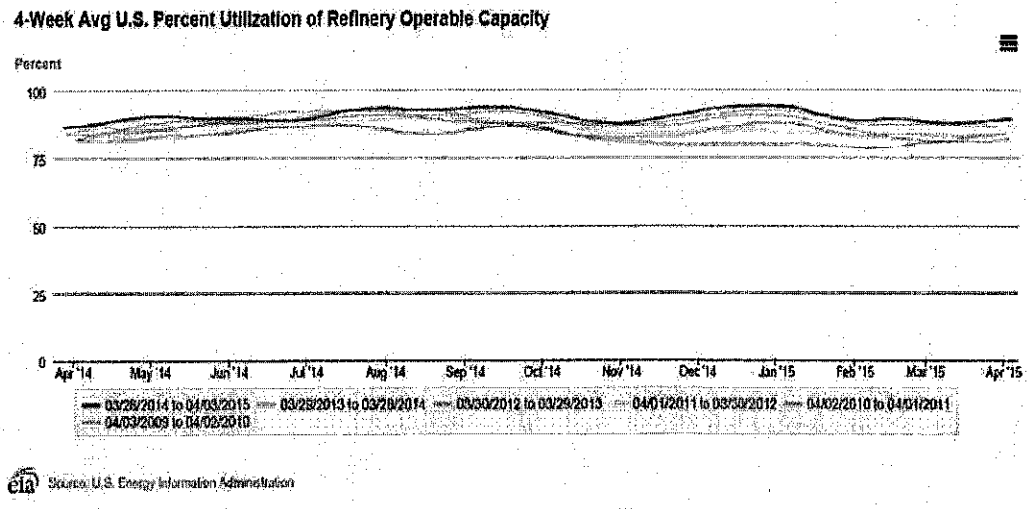
Table: PADD Imports (1,000 barrels per day)

	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15
PADD I	563	709	735	641	644	611
PADD II	2,005	2,142	2,058	1,859	2,224	2,006
PADD III	3,526	3,192	2,993	3,432	3,018	3,154
PADD IV	259	282	245	317	297	279
PADD V	1,118	1,183	1,099	1,025	1,027	1,099

Source: U.S. Energy Information Administration

This import data highlight that Dakota Access, LLC will establish a direct pipeline path for the delivery of Bakken and Three Forks crude oil production – domestically produced production – to reach the two PADDs that import the greatest volume of foreign crude oil.

Moreover, as reflected by the following chart, refineries in the U.S. are running at historically high utilization rates.



This high level of refinery demand is expected to continue in light of the strong margins in refining sector, driving continued demand for domestically produced crude oil like that from the Bakken and Three Forks production region.

Delay or termination of constructing the Dakota Access Pipeline would negatively impact the access that producers in the Bakken and Three Forks production region have to key U.S. refining markets. Likewise, it would restrict the availability of abundant supplies of domestically produced crude oil to the U.S. refineries that produce the petroleum products upon which the U.S. economy depends. These inefficiencies will negatively impact U.S. jobs in oil and gas production, as well as in domestic refining; result in greater dependence on foreign sources of crude oil; and impede greater efficiency in the domestic energy supply chain, which those in the U.S. depend upon to

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generate the wide array of petroleum products (*e.g.*, gasoline, diesel, and a wide array of chemicals) that are necessary to drive growth in U.S. jobs and the overall U.S. economy. Indeed, as reflected by the willingness of numerous shippers to make substantial contractual commitments to transport on the Dakota Access Pipeline, market participants believe that it is critical for the Dakota Access Pipeline to connect the Bakken and Three Forks production area to refineries in PADD II and PADD III refining markets in as timely a manner as possible..

Prepared By: Damon Rahbar Daniels
Title: Vice President – Commercial Operations

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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Data Request No. 5:

Please identify all high consequence areas (HCAs) located along the route.

Response:

There are no HCAs, as defined by PHMSA, located along the route within South Dakota.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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Data Request No. 6:

Please provide GIS shapefiles of the route and associated facilities.

Response:

GIS shapefiles provided are the latest route of the proposed pipeline. The provided route has minor changes from the filed route.
These minor changes were made;
Landowner Request
- Paralleling farm tiles
- Avoiding trees
- Avoiding water well
- Avoiding septic system

Culture Survey
- Cultural Site identified

Biological Survey
- Wetland avoidance

Constructability Issues

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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Data Request No. 7:

Per ARSD 20:10:22:11, please provide a map showing cemeteries, places of historical significance, transportation facilities and other public facilities adjacent to or abutting the pipeline.

Response:

Revised maps with the requested information are included within Appendix A. Publicly available datasets were added to the topographic map set including cemeteries, transportation facilities (roads and airports), hospitals, and schools. Based on publically available datasets and field reconnaissance along the route, no hospitals, schools, or recorded places of historical significance are within or adjacent to the Project footprint, therefore these datasets are not included within the map legend.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 8:

Regarding Section 12.1 (ARSD 20:10:22:12), please provide further explanation on the criteria used (and how such criteria were measured and weighted) in the route selection process to demonstrate the following:

a) The route will not pose a threat of serious injury to the environment;
b) The route will not pose a threat of serious injury to the social and economic conditions of inhabitants or expected inhabitants in the siting area;
c) The route will not substantially impair the health, safety or welfare of the inhabitants; and
d) The route will not unduly interfere with the orderly development of the region.

Response:

The GIS route selection/optimization program was described in Section 12.0 of the December 22, 2014 submittal. The tables below outline all of the datasets and the weighting utilized for each dataset in the GIS routing program. Based upon the 4 factor siting criteria, Dakota Access has either routed the pipeline to avoid sensitive areas to remove any conflicts with the 4 factors or has incorporated mitigation measures into the project to minimize and avoid any impacts. For example, mitigation measures such as depth of cover and Dakota Access's commitment to bury the pipeline a minimum of 48-inches to allow unobstructed and continued land use on top of the pipe has been incorporated in the project across all agricultural lands. Avoidance of sensitive habitats such as wetlands, state or Federal threatened or endangered species or cultural resources and populated areas have been taken into account as part of the project route. In instances where total avoidance is not feasible, mitigation and minimization measures have been or will be employed to not pose serious injury to the environment. Any such unavoidable impacts will be permitted by the various state and Federal resource agencies that have primary jurisdiction over the resources. Overall the pipeline is being designed, routed and will be constructed and operated in a manner to meet or exceed all state and Federal requirements which further minimizes and avoids impacts to the health, safety and the welfare of inhabitants located near the vicinity of the pipeline. Last and based upon consultation and communications with the multiple community leaders and planning groups located along the pipeline route, the pipe will not interfere with the development of the region. Dakota Access believes that factors a. – d. above have been addressed through this routing process and through subsequent feedback throughout the design and routing process.

In addition to these routing measures, Dakota Access has outlined a series of safety and design measures in Section 23.7 of their application, that will be implemented on the Project to help ensure that the environment, inhabitants in the siting area, and the development of the region will not be impacted by the proposed Project.

Prepared By: Monica Howard
Title: Director - Environmental Science

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GIS Criteria Assessed

Weighting
Preferred Routing (Low Risk)
Avoided Routing (Moderate Risk)
Excluded Routing (High Risk)

Engineering Datasets	Weighting
Existing Pipelines	Preferred- Collocation
Karst Topography	Avoid
Peak Ground Acceleration	Avoid Areas of Moderate to High PGA
Railroads	Avoid
Roads	Avoid
Side Hill Slope- Gradient	0-15% = Preferred ; 15-20% = Low Avoid ; 20-30% = Low Avoid ; 30-40% = Moderate Avoid ; >40% = Exclude
Utilities	Power Plants = Avoid ; Substations = Avoid ; Powerline Corridors = Preferred Collocation
Environmental Datasets	**Weighting**
Aquifers	Avoid Surficial / Critical Aquifers Where Applicable
Bird & Wildlife Trail Site	Avoid
Brownfield Agreement Site	Exclude at 2,640'
Commercially Navigable Waterways	Avoid
Conservation Easement/Tax Credit Property	Avoid
Critical Habitat	Exclude
EPA 303 (c & d) Impaired Waters	Avoid
EPA Sites of Interests	Avoid
Fault Area	Avoid
FEMA Floodplain- 100 Year Floodplain	Avoid
Fish Hatchery	Exclude at 2,640'
Fishing Water Quality	Avoid
Forest Stewardship Land	Exclude
Game Land	Avoid
Geologic Unit	Crossing Tables Only - Further Analysis After Crossings To Be Provided
Hazardous Waste Site	Exclude
High Quality Water Zone	Avoid
Landslide Risk	Avoid
Local Forest	Avoid
Mining - Abandoned Mine	Avoid
Active Mining - Operation	Exclude
Mining - Permit	Avoid
Mining - Refuse	Exclude
National Trail	Exclude
National Registry of Historic Places (SHPO)	Exclude
Nature Preserve	Exclude at 500'
NHD Flowlines- Streams & Rivers	Perennial- Avoid ; Intermittent- Avoid ; Ephemeral- Low Avoid
NHD Waterbodies	Perennial- Avoid ; Intermittent- Avoid ; Ephemeral- Low Avoid
National Pollutant Discharge Elimination	Exclude
NWI Wetlands	LUB = Avoid; LUS = Avoid; PFO = Avoid; PSS = Avoid; PEM = Low Avoid; PUB = Low Avoid; PUS = Avoid; RUB = Low Avoid
Oil & Gas Wells	Avoid
Private Conservation Land	Avoid
Protective Management Area	Exclude
Recreation Area	Exclude at 1,000'
Research Education Land	Avoid
Registered Heritage Area	Avoid
USACE Reservoir	Avoid
Sewer Pump	Exclude at 1,000'
Sewer Treatment Plant	Exclude at 1,000'
Stocked Trout Lake	Exclude at 1,000'

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SSURGO	Crossing Tables Only - Further Analysis After Crossings To Be Provided
STATSGO (Depth to Bedrock)	Crossing Tables Only - Further Analysis After Crossings To Be Provided
State Forest Ownership Boundaries	Avoid
PHMSA- Drinking Water	Avoid
PHMSA- Ecologically Sensitive Areas	Avoid
State Historic Site	Exclude
State Parks and Natural Area Preserve	Avoid
Surface Water Intake	Exclude at 500'
Swine Lagoon Site	Exclude at 1000'
Underground Storage Tank	Exclude at 500'
USFS National Forest Boundaries	Exclude
Water Distribution Intake	Exclude at 500'
Water Distribution Meter	Exclude at 500'
Water Distribution Pump	Exclude at 500'
Water Distribution Tank	Exclude at 1,000'
Water Distribution Treatment Plant	Exclude at 1,000'
Water Wells	Avoid at 200'
Wild & Scenic River	Exclude
Wilderness Area	Exclude
Wildlife Management Areas	Avoid
Land Datasets	**Weighting**
Address Point	Avoid at 400'
Airports	Exclude at 2,640'
Animal Operations	Avoid at 1,000'
Antenna/Cellular Structure	Exclude at 250'
Boat Access	Exclude at 1,000'
Bridge	Exclude at 500'
Cemetery	Exclude at 1,000'
Church	Exclude at 1,000'
Dam	Exclude at 1,000'
Emergency Operation Center	Exclude at 1,000'
Fire Department/Law Enforcement	Exclude at 1,000'
Gas Plant	Exclude at 1,000'
Gas Station	Exclude at 1,000'
Golf Course	Exclude at 1,000'
Government Building	Exclude at 1,000'
Hospitals	Exclude at 1,000'
Industrial/Office Building	Exclude at 1,000'
Industrial Park/Industrial Site Boundary	Exclude at 1,000'
Institution/Nursing Home	Exclude at 1,000'
Land Ownership (Typical)	Federal = Exclude ; State = Avoid ; Local = Avoid ; Nondesignated = Low Avoid ; Other Protected Land = Avoid
Landfill	Exclude at 2,640'
Landmark	Exclude
Local Structure	Avoid at 250'
Military Installation	Exclude
PHMSA - Highly Populated Area	Exclude
PHMSA - Other Populated Area	Avoid
Pipeline Meter	Avoid at 50'
Race Track	Exclude at 1,000'
Retail Center	Exclude at 1,000'
School	Exclude at 1,000'
Transportation Terminal	Avoid at 500'

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Response to South Dakota Public Utilities Commission
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Request Numbers: 1-33

Data Request No. 9:

In section 12.2 (ARSD 10:10:22:12), please provide a description of any alternative route corridors considered and justification for choosing the proposed route over the alternatives.

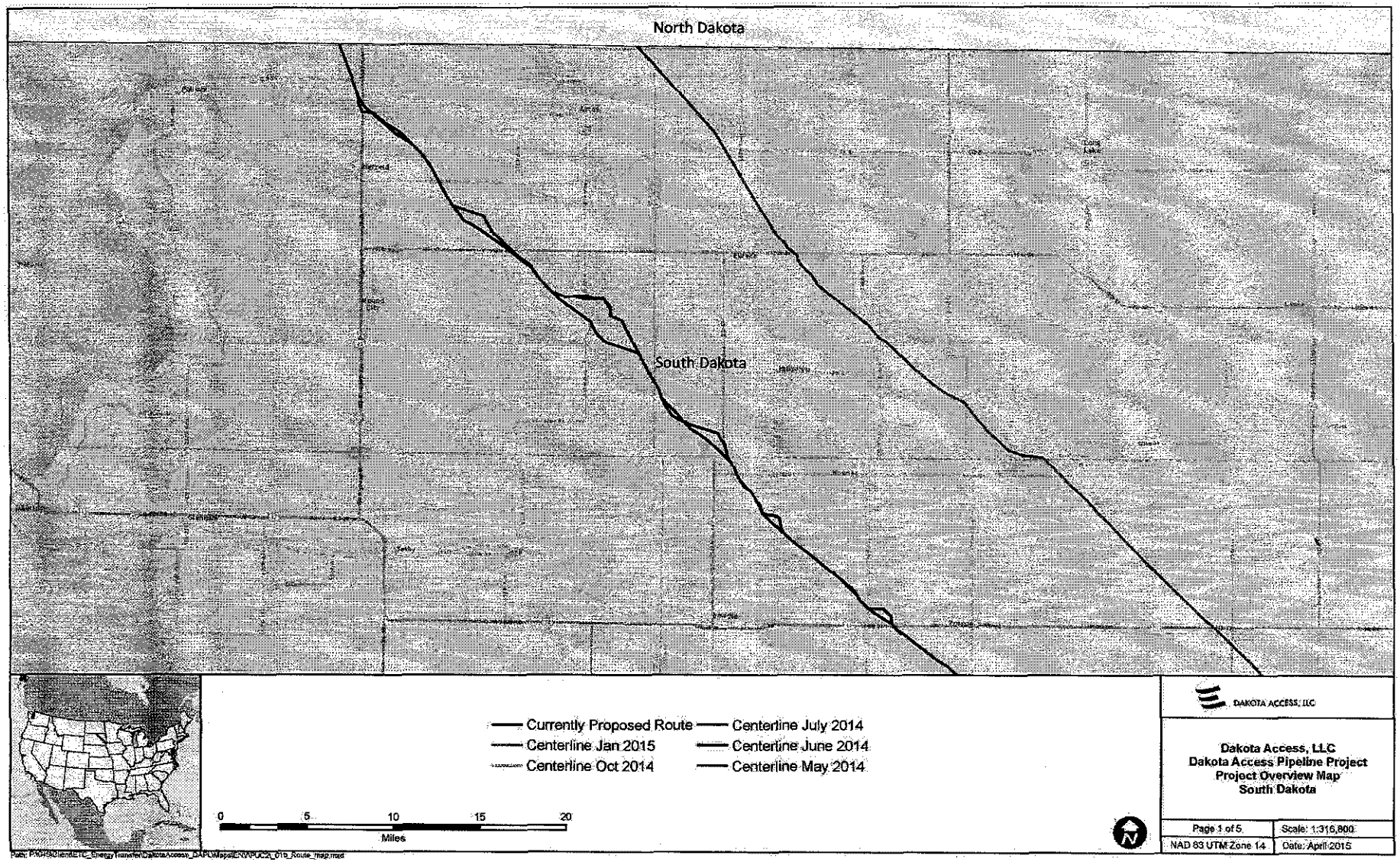
Response:

See Data Response No. 9 Map below to view the original proposed routes and the final proposed route. The original routes were developed largely via desktop routing by a team of pipeline professionals. These routes were then optimized through field investigations and the GIS routing program as discussed within Section 12.0 of the December 22, 2014 submittal, and within Data Response No. 8. The output of the GIS routing program, combined with field survey results and micro routing considerations for non-desktop information gathered by the project team (e.g. environmental resources, landowner feedback, government feed-back [planned developments], have led to the basis of the current proposed route.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33



Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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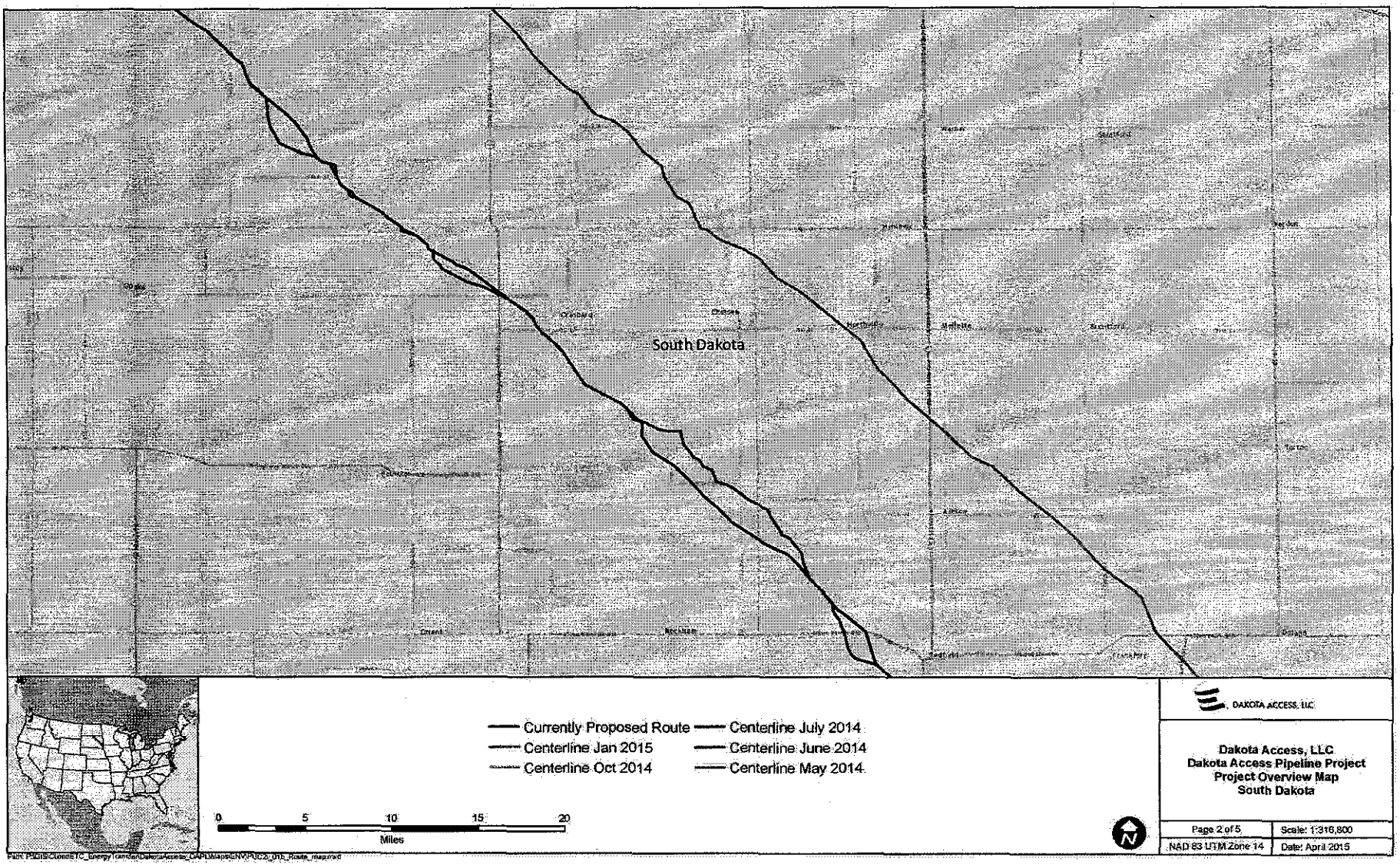
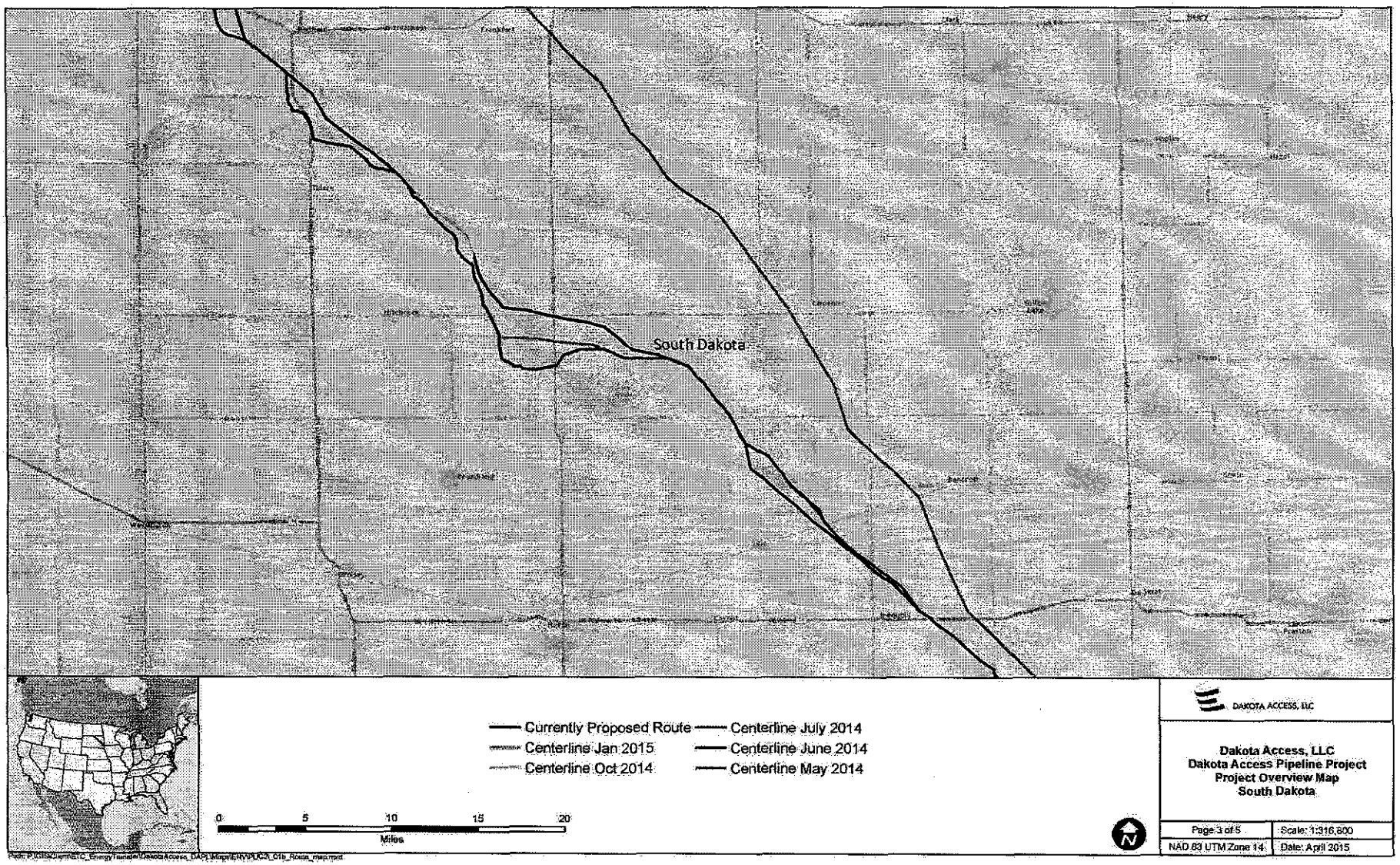
Request Numbers: 1-33



Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33



Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
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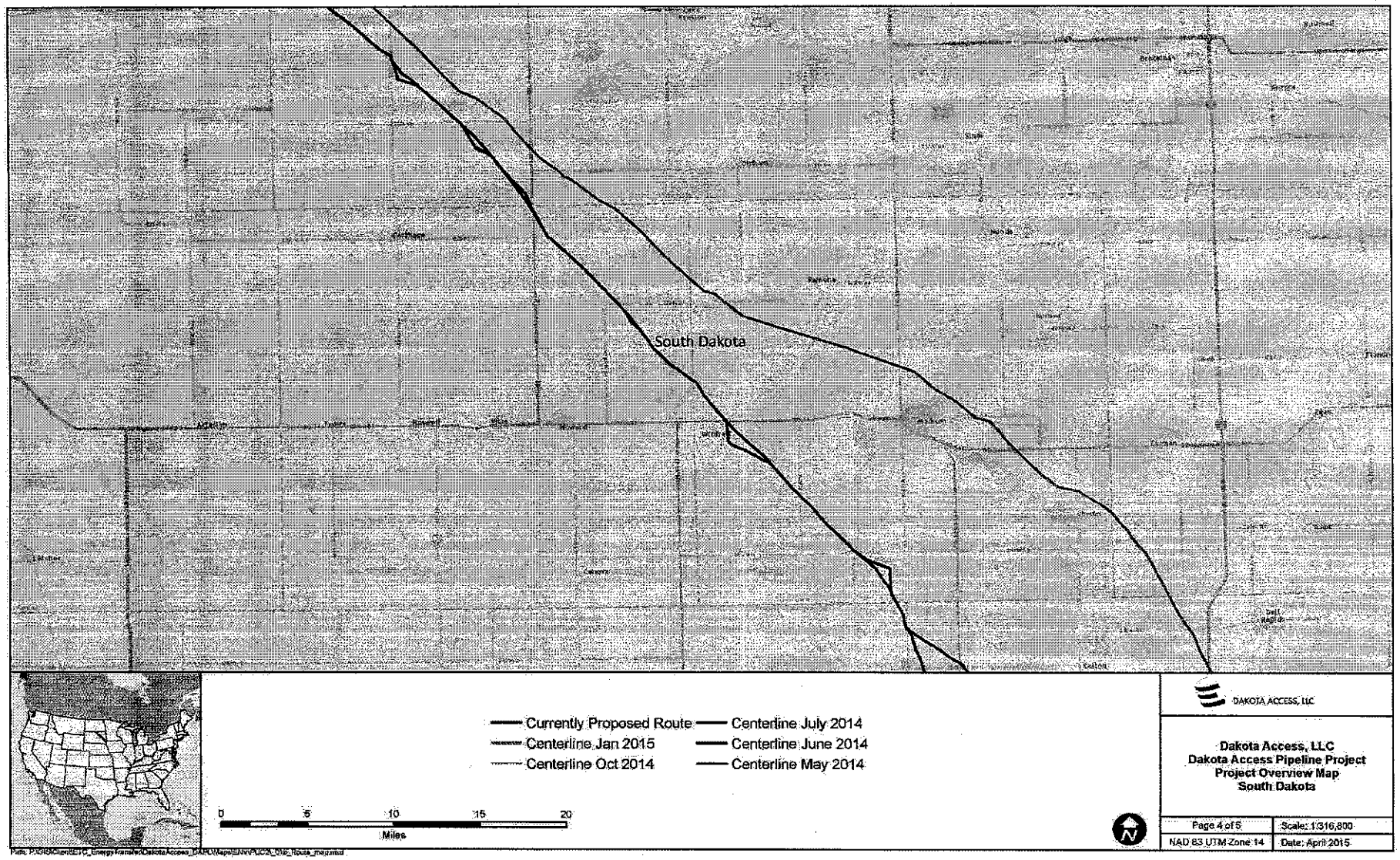
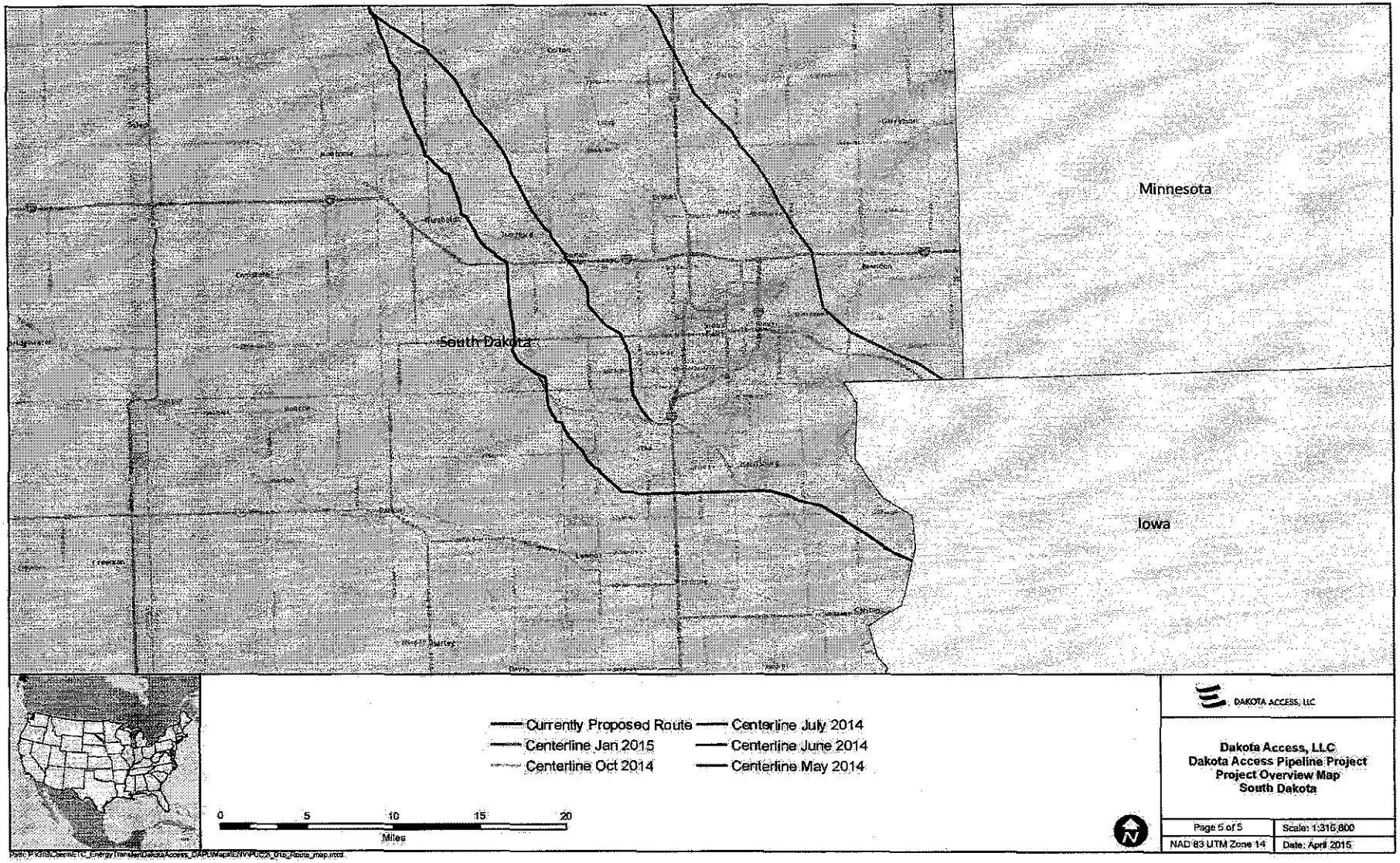


Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33



Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 10:

In accordance with ARSD 20:10:22:12(3), please include a detailed discussion of the extent to which reliance upon eminent domain powers could be reduced by use of an alternative site. Include a discussion specifically addressing whether or not alternative routes in Minnehaha, Turner, and Lincoln counties could reduce the reliance upon eminent domain powers.

Response:

The use of eminent domain is dependent upon a host of factors. The pipeline is a linear facility extending for hundreds of miles and by definition must be contiguous. The parcels of property required for the construction and operation of the pipeline are numerous, but none-the-less interdependent and interrelated as part of this request and one factor, constraint, or landowner hold out cannot interfere with the contiguous routing in which a gap can occur. The pipeline crosses literally hundreds of separate discrete parcels of real estate, numerous environmental and contractibility constraints that when all combined result or define a route that is feasible, but may not avoid or mitigate the need to rely upon eminent domain to ensure the route is ultimately contiguous. The goal is to avoid, minimize and then mitigate as much as possible all foreseeable constraints but not arbitrarily or unduly route the pipeline based upon landowner personal preference such that one landowner is more affected than another and no more unreasonably than another based upon demographic criteria such as economic capability to influence the route, political standing or affiliation, race or social standing (environmental justice considerations). Therefore the routing is strictly based upon minimization of impacts to environmental resources, regulated areas as defined or managed by regulatory considerations, the South Dakota four-factor criteria, constructibility considerations and by Dakota Access's ability to procure the right-of-way through reasonable negotiated communications and easements. Only after all considerations and reasonable compromises have been made, alternate routes considered and failed negotiations occurred to resolve any disputes where the pipeline cannot be reasonable rerouted would Dakota Access rely upon Eminent Domain. Based upon the studies, surveys and all the criteria considered to date, Dakota Access does not believe that there are any other routes or actions that could be taken other than a "no-action" alternative that would reduce the potential for eminent domain across Minnehaha, Turner and Lincoln Counties. Lastly, Dakota Access is currently negotiating with the affected landowners along the entire route and in particular Minnehaha, Turner and Lincoln Counties and is making good progress on purchasing voluntary easements across the state and those counties and Dakota Access feels confident that there will not be any higher percentage or reliance of eminent domain in those counties than anywhere else along the pipeline in South Dakota. Currently, Dakota Access has secured approximately 60% voluntary easements across the state of South Dakota and 42% across Minnehaha, Turner and Lincoln Counties.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 11:

Please provide cross sections of the bedrock geology and surficial geology to depict the major subsurface variations in accordance with ARSD 20:10:22:14(3).

Response:

See the attached response.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 12:

In sections 14.7 and 14.8 (ARSD 20:10:22:14(7) and (8)), it is identified that the project will cross approximately 47.5 miles of karst terrain. Please expand on the potential for subsidence to occur along the project route and whether or not the pipeline would be damaged as a result of subsidence.

Response:

See the response attached to Data Request No. 11.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 13:

In sections 14.8 (ARSD 20:10:22:14(8)), please expand on the steps Dakota Access will take to protect the pipeline from subsidence. Include a discussion on the known measures Dakota Access could take to protect the pipeline from subsidence.

Response:

See the response attached to Data Request No. 11.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 14:

How close is the pipeline to the Minnehaha County Wellhead Protection Area? Is this a sufficient distance in the event of a leak?

Response:

The closest point to the Minnehaha County Wellhead Protection Area is 0.43 mile. Spill models continue to be run and appropriate mitigation measures will be implemented to protect the water source.

Prepared By: Chuck Frey
Title: Vice President - Engineering

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 15:

Please provide a map of all Wellhead Protection Areas along the route.

Response:

The only Zone A Source Water and Wellhead Protection Area identified by the South Dakota Department of Environment and Natural Resources (SDDENR) located near the pipeline is the Minnehaha Wellhead Protection Area as provided in the December 22, 2015 application submittal, and as Exhibit A-1 to the March 2015 submittal. Included below is an email from the SDDENR confirming this information and a map to illustrate the entire route through South Dakota and the respective location of this feature.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Archived: Monday, April 06, 2015 10:29:20 AM
From: Walsh, Brian
Sent: Thursday, June 12, 2014 2:04:13 PM
To: Ashley Thompson
Cc: Walsh, Brian; Brandner, Tom
Subject: RE: Proposed Pipeline
Importance: Normal
Attachments:
Minnehaha_County_WHPA.dbf; Minnehaha_County_WHPA.prj; Minnehaha_County_WHPA.sbn; Minnehaha_County_WHPA.sbx; Minnehaha_County_WHPA.shp; Minnehaha_County_WHPA.shx; MinnehahaCo_ZoneA_SWPA.dbf; MinnehahaCo_ZoneA_SWPA.prj; MinnehahaCo_ZoneA_SWPA.sbn; MinnehahaCo_ZoneA_SWPA.sbx; MinnehahaCo_ZoneA_SWPA.shp; MinnehahaCo_ZoneA_SWPA.shp.xml; MinnehahaCo_ZoneA_SWPA.shx;

Hi Ashley,

We have reviewed the proposed route and, based on the information we have, it does not cross any Zone A (the most critical protection zones) Source Water or Well Head Protection areas except in Minnehaha County where it crosses the Minnehaha County Well Head Protection Area. Attached are shapefiles for the Zone A Well Head and the Source Water Protection areas in Minnehaha County.

It is DENR's recommendation that the pipeline be routed to avoid crossing any Zone A Well Head or Source Water Protection areas. Also, since the counties and communities are responsible for any management activities in these protection areas, DENR recommends you contact the affected counties to get the most up-to-date information about the protection areas and any ordinances or restrictions that may apply in those areas.

It is likely the proposed route will cross shallow aquifers not directly associated with Source Water or Well Head areas. If this occurs, DENR recommends the pipeline be designed, constructed and operated in a manner that protects these resources.

If you have any questions about this email or need additional information please let me know. Also, if the route changes let us know and we will be happy to re-evaluate it. For your information, below are several links to DENR's website and online databases that may be useful as you plan this project.

http://www.sdgs.usd.edu/	(South Dakota Geological Survey)
http://denr.sd.gov/des/wr/dbwrsearch.aspx	(Water Rights / Wells)
http://denr.sd.gov/des/wr/dblogsearch.aspx	(Well Driller's Logs)
http://denr.sd.gov/boards/pipelinetf.aspx	(SD Underground Pipeline Task Force Report)

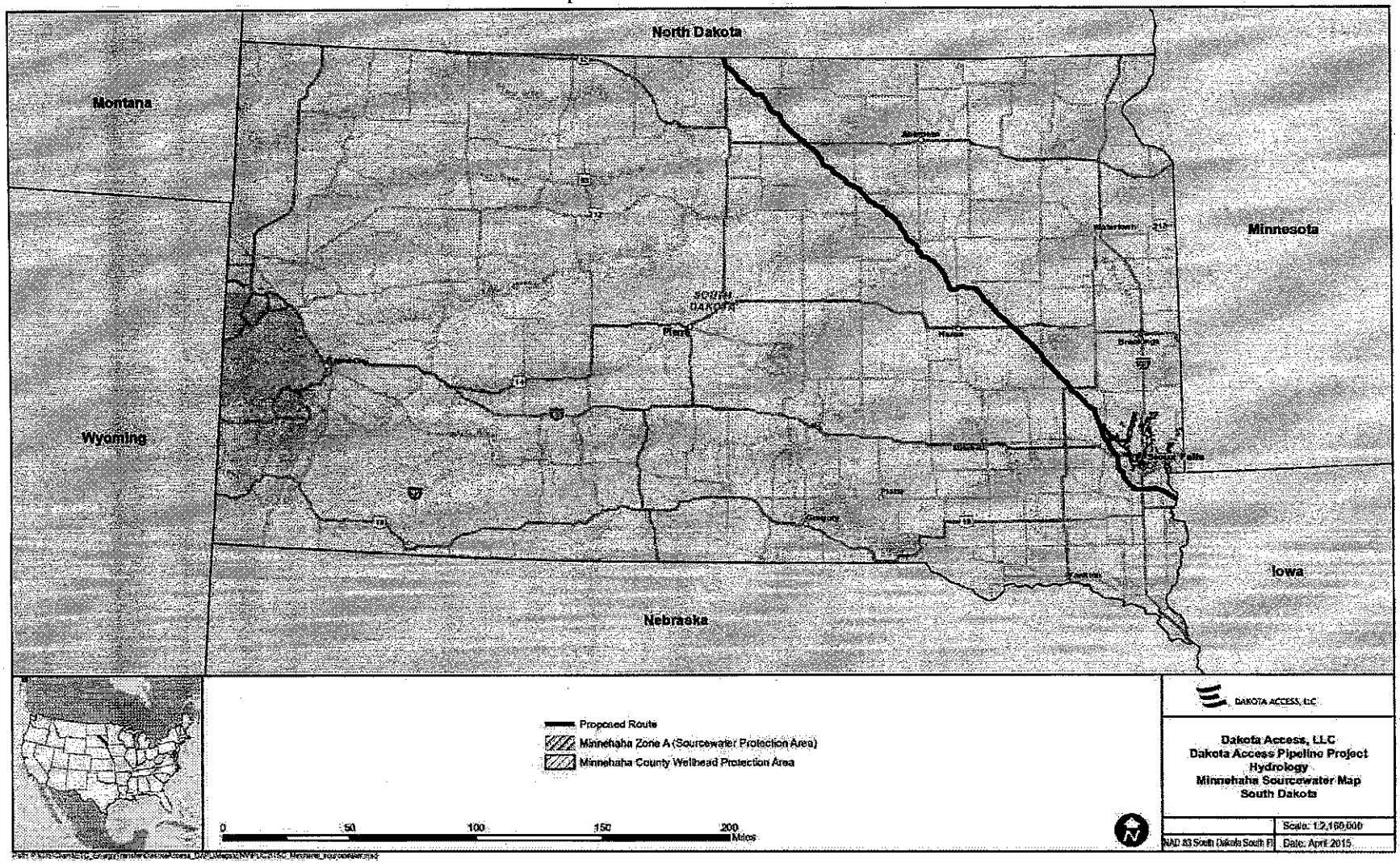
Finally, some of this information is sensitive so please keep that in mind and restrict its use to those who need the data to develop the pipeline project.

Sincerely,

Brian J. Walsh
Environmental Scientist III
SD DENR
523 E. Capitol Ave.
Pierre SD 57501
605.773.3296
Fax: 605.773.6035
brian.walsh@state.sd.us

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33



Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 16:

On the maps provided in Revised Exhibit A4, waterbodies and streams are shown; however, drainage patterns are not shown. Please provide updated maps that show the surface water drainage patterns before and anticipated after construction as required by ARSD 20:10:22:15(1).

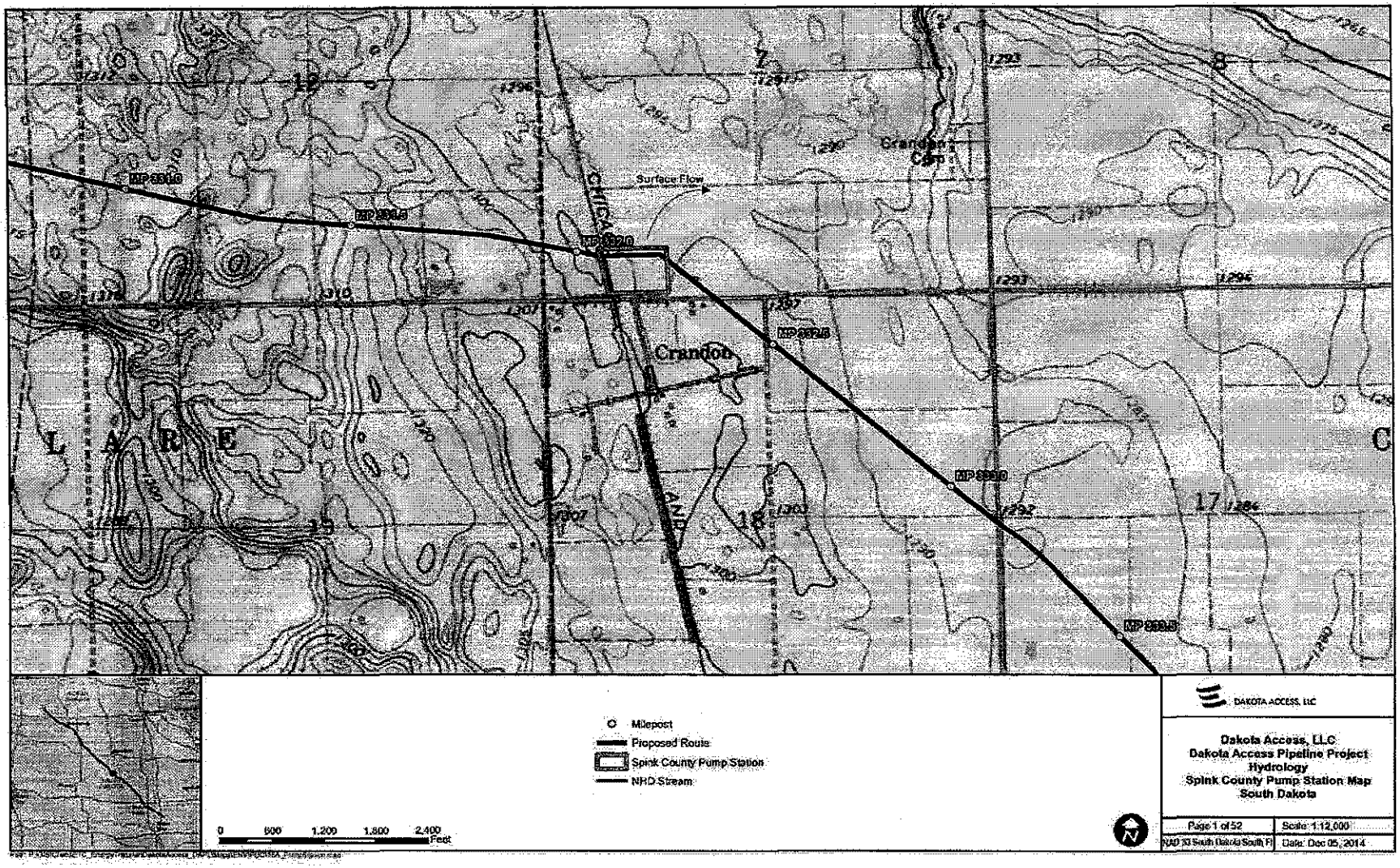
Response:

As stated in Section 15.1 of the December 22, 2014 application submittal, the pipeline is a below ground facility where after construction the right-of-way will be restored to pre-construction contours and elevations and no change to the drainage patterns are expected as a result of pipeline construction. The pump station in Spink County is the only aboveground facility of any significance with the potential to interfere with drainage patterns. While construction plans have not been finalized for this facility, Dakota Access is committed to maintaining current drainage patterns at this site. Below is the map of the current surface flow at the Spink County pump station that was provided with the December 22, 2014 application submittal.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33



Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 17:

Regarding section 15.5 (ARSD 20:10:22:15(5)), does Dakota Access expect the discharge of heated water to occur as a result of the project?

Response:

No discharge of heated water will occur.

Prepared By: Chris Srubar
Title: Associate Engineer

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 18:

Per ARSD 20:10:22:16, please provide an analysis of the impacts of the pipeline's construction and operation on the breeding times and places and pathways of migration of terrestrial fauna, if any. Include in the analysis a discussion on Dakota Access's plans for stripping vegetation along the entire pipeline route before the start of breading season in mid-April in order to ensure ground nesting birds avoid the project area (as inferred from section 16.2.1).

Response:

In theory, construction of the pipeline could result in very localized and temporary displacement impacts to terrestrial fauna along the Project route through South Dakota. A majority of the species are mobile in nature, and the proposed ROW is roughly 150 feet wide, therefore along very minor compared to the entire landscape and available adjacent similar habitat it is theoretical that localized displacement of species will occur throughout the construction period at any given location and will reestablish following construction activities and restoration of the ROW. That said, given the large percentage of agricultural development along the Project ROW, existing species that may utilize the Project area are likely very accustomed to seasonal vegetation impacts on a far greater scale than this Project will cause. As such, Dakota Access does not believe there will be any measurable impacts to terrestrial fauna.

To ensure mobility and mitigate any impacts to the migration of terrestrial fauna across areas of active work, trench plugs will be installed at visible wildlife game trails, as identified by an EI or wildlife agency, and at livestock watering trails, as identified by the landowner, that intersect the trench line. Gaps will be left in spoil and topsoil stockpiles at all trench plugs to permit unimpeded movement of wildlife and livestock. Suitable ramps will be installed from the bottom of trench to the top with a minimum of 5-foot wide open path across the trench plug. A corresponding gap in the welded pipe string will be left at each trench plug.

Dakota Access has not made a commitment to strip vegetation along the entire pipeline route before mid-April but anticipates that large portions of the ROW will have ground disturbance by that point in time. As indicated in Section 16.2.1, we expect that construction activities will begin well in advance of the breeding season and accordingly ground nesting birds would choose other areas when locating their nests for the season. Even if the vegetation has not been stripped, there will be pre-construction activities associated with surveys which will cause an increased human presence thus likely making other areas more desirable as a nesting place.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 19:

Please provide all professional opinions and recommendations received from USFWS, SDG&P, SDDENR, and SHPO for the project.

Response:

Ongoing coordination has been occurring on a regular basis with federal and state agencies in South Dakota (including the aforementioned agencies); however, formal professional opinions or recommendations have been limited to date as the permitting/consultation process is on-going.

Dakota Access is working with the USFWS in relation to the crossing of easements under the USFWS's control. Additional coordination is ongoing with the USFWS as part of the USACE permitting process. Through such process, Dakota Access has consulted the USFWS regarding routing and assessment protocols for listed species that may be affected by the Dakota Access. The only protected species of potential concern in South Dakota is the Topeka shiner at 4 waterbody crossing locations. As surveys are still ongoing, an official opinion or recommendation has not been provided, but it is expected that a not likely to adversely affect determination will be concurred or issued by the USFWS.

Dakota Access has been in contact with the SDFG&P regarding Project impacts under their jurisdiction. It has been confirmed that no formal permit or approval from the agency, outside of their participation in the PUC process. The response provided in Data Response 18 above further addresses the determination Dakota Access has made regarding minor or negligible impacts to wildlife and the environment as a result of the Project.

Dakota Access has also been in contact with the SDDENR at times throughout development of the Project. It has been confirmed that, based on the communicated scope of the project, there is no formal permit or approval required from the agency and that the project Facility Response Plan will be submitted in accordance with regulation prior to operation.

Provided below is the South Dakota SHPO's formal comments on Dakota Access' cultural resource survey protocol, which were incorporated into the scope of work. Like the USFWS, the SHPO will also be formally consulted through the USACE permitting process for the Project.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Monday, August 18, 2014 6:56 PM
To: Olson, Paige
Cc: Abby Peyton; Patrick Trader
Subject: RE: DAPL proposed SOW

Paige,

Thanks for your review. I think we can incorporate each of your suggestions. We will use a 1 x 1m unit at sites to provide better information on integrity. We will keep you informed of changes to the survey methods if/or when we would like to refine them. We will GPS all shovel tests (and units). For the last comment the sentence should read "Should *a potentially* eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." We would use this for sites that need an evaluation of significance.

Please let me know if you have any additional concerns.

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

From: Olson, Paige [mailto:Paige.Olson@state.sd.us]
Sent: Monday, August 18, 2014 11:43 AM
To: Beth McCord
Cc: Abby Peyton
Subject: RE: DAPL proposed SOW

Good morning,

Thank you for the opportunity to review the proposed scope of work. I do have several comments that I hope can be taken into consideration.

1. My first comment concerns the use of at least one shovel test to provide information on a site's integrity. If the goal is to determine a site's integrity (vs. presence / absence) I would recommend using a 1x1 in an area with the best potential for intact subsurface deposits.
2. Is it possible to be informed when your survey methods are refined based on what you're seeing in the field?
3. I recommend gathering GPS coordinates for all shovel tests, not just positive shovel tests.
4. On the second page, 8th paragraph, last sentence, "Should an eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." Can you please explain why testing will be conducted if the sites determined eligible?

Finally, the Archaeological Research Center's database should reflect the most up to date information from the mortuary surveys. If you find that this is not the case please let me know.

Thanks,
Paige

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Friday, August 15, 2014 1:40 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: DAPL proposed SOW

Paige,

Thanks for meeting with us. We certainly benefitted from the conversation. I wanted to present our proposed scope of work for your comment based on our meeting. I have attached it for your review. Our approach is to run this as a Section 106-like project. Please let me know if you have any comments or require clarification on these procedures. We are hopeful that this approach will satisfy the SHPO.

I also wanted to inquire on how we might receive copies of the recent mound surveys you mentioned. We will be crossing Beadle, Campbell, Edmunds, Faulk, Kingsbury, Lake, Lincoln, McCook, Minnehaha, Miner, McPherson, and Spink counties. Any information from these counties would be great.

We look forward to working with you.

Thank you,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 20:

Per the applicant's statement on page 32 of the Revised Application, please explain why four land use types "were not documented". If these land use types do not exist along the route, please provide a statement as such. If these land use types do exist, please provide a map showing their locations.

Response:

Baseline surveys and desktop analysis for land use occurred during 2014 to classify land uses along the proposed pipeline route using classifications listed in Section 22:20:10:18 of the South Dakota Administrative Rules. Four land use types (i.e. existing and potential extractive nonrenewable resources; other major industries; municipal water supply and water sources for organized rural water systems; and noise sensitive land uses) were not identified along the proposed route, and therefore were not documented in the summary tables and Project mapping provided in the December 22, 2014 submittal.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 21:

Referring to section 19.0 (ARSD 20:10:22:19), are there any local land use controls that Dakota Access took into consideration for the proposed route in Minnehaha, Turner, and Lincoln counties? In addition, please explain how the project will affect the Lincoln County Comprehensive Growth Plan.

Response:

The project considered the growth plan maps of the cities of Sioux Falls, Tea and Harrisburg. The list of data sets accounted for during the initial routing optimization process is provided in Data Request 8 above. Local land use considerations were taken into consideration once they were made available to Dakota Access. With respect to Minnehaha, Turner, and Lincoln counties, the details and results were provided in the March 19, 2015 submittal to the PUC. Additionally, we have reviewed the Lincoln County, South Dakota Comprehensive Growth Plan as amended and do not find any inconsistencies or incompatibilities therein.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 22:

Please provide documentation to support the economic benefits cited in Section 23.1 of the Revised Application.

Response:

The documentation to support the economic benefits cited in Section 23.1 of the Revised Application can be found in the report on the impacts of the Dakota Access Pipeline prepared by the Strategic Economics Group of West Des Moines, Iowa entitled (*"An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois"*) dated November 12, 2014. The full report is available at the following link:

http://www.economicsgroup.com/reports/DAPL%20Report.pdf.

A copy of the full report is also attached to the response.

Prepared By: Stephen Veatch
Title: Sr. Director Certificates

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 23:

In section 23.1, please provide support for the claim that "property values are not usually affected by the installation or presence of a pipeline in rural areas."

Response:

A brief review of the literature supports this conclusion. See for example:

"Pipelines and Property Values: A Review of the Academic Literature" Somerville, and Wetzel, 2014.
"Natural Gas Pipeline Impact Study" INGAA Foundation, Inc., 2001.

"Pipelines and Property Values: An Eclectic Review of the Literature" Wilde, Loos and Williamson, 2012.

"Pipeline and Power Easements: How will they Impact Ranch Land Cost, Usage?"Stalcup *The Cattleman* March 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 24:

Per ARSD 20:10:22:23(1), please provide a forecast of the impact on land values where residential or commercial development is likely.

Response:

Literature on the topic shows that the existence of a pipeline has no impact on land values that can be discerned. Additionally, it would be impossible to forecast an impact on land values where residential or commercial development is likely without knowing the likelihood of the development, the timeline and other information.

A brief review of the literature supports this conclusion. See for example:

"Pipelines and Property Values: A Review of the Academic Literature" Somerville, and Wetzel, 2014.
"Natural Gas Pipeline Impact Study" INGAA Foundation, Inc., 2001.

"Pipelines and Property Values: An Eclectic Review of the Literature" Wilde, Loos and Williamson, 2012.

"Pipeline and Power Easements: How will they Impact Ranch Land Cost, Usage?"Stalcup *The Cattleman* March 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 25:

Per ARSD 20:10:22:23(1), please explain any long-term electric energy required to operate the pipeline pump station and other pipeline equipment. Further, please describe any new electric facilities that may be required for the pump station.

Response:

The South Dakota pump station will require approximately 15 Megawatts of electrical power to operate the pump motors and ancillary equipment. This power will be served by high voltage electrical lines and purchased from local electric supplier.

The pump station will require electrical transformers, located within an on-site substation, to transform the incoming high voltage to the appropriate voltage level needed to operate the pump motors. The substation will also contain circuit breakers, insulators, disconnect switches, communications and protective equipment needed to safely and remotely operate the facility.

The local electric supplier will be responsible for engineering and design of the substation, tapping the adjacent high voltage electrical line, constructing approximately 300-feet of power line and the on-site substation in its entirety, as well as operating and maintaining the substation facility once the pump station is in-service.

Prepared By: Chris Srubar
Title: Associate Engineer

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 26:

Per ARSD 20:10:22:23(1), please provide a forecast of the impact on schools and other community and government facilities or services.

Response:

Overall the pipeline will be constructed in a relatively short period of time, potentially extending for a duration of 8 to 12 months across the entire state of South Dakota and more likely 2 to 4 months on any particular parcel of land. With that said, Dakota Access's construction will include a traveling set of construction staff that will move up and down the right-of-way where the majority of the construction staff will be transient or and will be in a given location for only the construction period. As such, the impact to any community services or facilities and schools will be temporary in nature. When evaluating the potential for the location of the construction staff within the region during construction, they will most likely group within the larger communities where existing governmental services or infrastructure exists. Furthermore, this level of influx is estimated to be a max of approximately 4,000 people, which 1/2 of those are expected to already live within the local communities or surrounding region. Therefore, there is a potential for around 2,000 additional people to be located across the state of South Dakota for approximately 8 to 12 months.

When considering the approximate 2,000 additional people within the region who will most likely choose to temporarily live within the larger communities located along the pipeline right-of-way, Dakota Access does not foresee any negative impacts to the local resources that cannot be accommodated by existing governmental services or facilities. In the event and in situations where there are no communities that have governmental or public type services, Dakota Access will require the contractor to provide those services or needs for the construction workforce (e.g. ambulatory services, access to doctors or nursing services, law enforcement - temporary security or traffic control, etc..).

Negative impacts to schools are not anticipated due to the short term nature of the construction. Most of the construction workforce will not relocate their families for the short duration and those that do will likely be very few and could be accommodated by the local school system. Until and such time the contractor workforce mobilizes to the project, it is unknown the number of children that would temporarily relocate to the project area, However any relocations would be temporary. For the construction workers who live in the communities, no changes are expected to result as these workers and their families already live within the communities.

Although the impact from a person count will largely be minor (less than 2,000 additional people), the economic impact to South Dakota and local communities from a tax perspective and purchasing of secondary goods and services will be tremendous both short and long term. In accordance with the economic analysis conducted by Strategic Economic Group (attached as part of the response to Request No. 22) and the spending projections by Dakota Access, the project value or cost in South Dakota is expected to be $820 million in project direct spending on materials that will be utilized and taxed in South Dakota, an additional $168.2 million in indirect spending from the construction work force and local purchasing of materials that will be utilized on the pipeline and lastly, approximately $186.2 million in induced spending or what is often referred to as spending or respending resulting from the direct spending. The result of this additional revenue that will be realized in South Dakota is an influx of revenue to the state and local governments from taxes. Based upon current tax laws and Dakota Access's initial projections during construction, approximately $35.6 million will be generated in state sales taxes ($29 million on materials alone for the pipeline and pump station)

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throughout construction and approximately $2.9 million will be generated and paid to the local governments where the proposed pipeline or its facilities traverse local taxing authorities.

In addition to sales tax benefits, the pipeline will generate long term property taxes that will benefit the state and in theory the local governments once the tax revenue is distributed to the local communities. Dakota Access year 1 property tax estimate is $12.34 million. This value may be less or more in subsequent tax years depending upon the prevailing tax laws and the methodology utilized to determine the applicable property tax accessed against the pipeline.

Lastly, after construction and into operations, Dakota Access is projecting to add up to 12 new direct permanent employees that will live and pay taxes within South Dakota and who will contribute to the tax base that will have a long term positive impact on the schools and other government services and facilities within the state.

For the one permanent above ground facility or pump station located in Spink County associated with Dakota Access, it is anticipated that a maximum of 8 to 10 permanent employees and their families will be located within the county, contributing to the tax base as well as to the local purchasing of goods and services associated with normal and expected living expenses. The addition of these permanent employees is not anticipated to negatively impact the communities and if anything will provide additional tax revenue to add to and support the existing governmental services, facilities and schools.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

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Data Request No. 27:

Per ARSD 20:10:22:23(2), please provide a detailed forecast of the "long-range impact of property…taxes of the affected taxing jurisdictions".

Response:

Based upon South Dakota current tax laws as promulgated by Chapter 10-37 of the South Dakota Codified Laws, the proposed pipeline's taxes will be assessed centrally at the state level by the South Dakota Department of Revenue and Regulation utilizing what is referred to as real property ad valorem taxation of the real value of the property rather than on the quantity or some other form of measure.

At this time, the only measure Dakota Access has to determine an approximate ad valorem tax value is to estimate the actual cost of the pipeline for the first year tax value as there is no operational or company data available to generate the "value" of the pipeline, company or revenues or losses to determine the value of the company. After year 1, the operational data coupled with the depreciated value of the facilities and further coupled with the value of Dakota Access as a company compared to the portion of the company within South Dakota will be accessed to determine the ad valorem taxes that will be paid is subsequent years. Since there is not adequate data to provide a true estimate or basis of the long term tax benefits, Dakota Access is estimating it will pay approximately $12.34 million in ad valorem taxes for year 1 based strictly upon the cost of the pipeline and asset in South Dakota. Since any other data in subsequent years would be purely speculative at this time, estimates beyond year 1 are not reasonable or provided herein.

Prepared By: Megan McKavanagh
Title: Manager – Property Tax

Dakota Access, LLC
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Data Request No. 28:

Please provide more specific employment estimates, as specified in ARSD 20:10:22:24.

Response:

During construction, Dakota Access anticipates that there will be three mainline construction spreads. These spreads will include approximately 700 to 1,000 persons per spread for a total for 2,100 to 3,000 persons for the pipeline portion of the project. There will be one additional contractor for the pump station who will have approximately 400 to 600 persons. Total Approximate labor will be no less than 2,500 to a maximum of 3,600 persons. Of these persons and based upon commitments from the various trade unions as part of the Pipe Line Contractors Association, roughly 50 percent of the labor will come from South Dakota or from the labor halls that service South Dakota
Based upon these labor estimates, Dakota Access anticipates paying approximately $155 million in labor payments.

During operations of the pipeline, Dakota Access estimates it will hire and permanently staff 10 to 12 employees in South Dakota, with the majority located within Spink County. This includes:

Employees would work at the pipeline facility in Spink County, SD

1 - Supervisor, Pipeline Operations
1 - Administrative Assistant
6 - Pipeliners
2 - Electrical Technicians
2 - Mechanical Technicians

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
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Data Request No. 29:

Please revise section 4 of the Agriculture Impact Mitigation Plan to include that landowner representative's and EI's email addresses will be provided to landowners.

Response:

The Agriculture Impact Mitigation Plan has been revised to state that email addresses will also be provided. The modified document is included as Appendix B.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 30:

In section 5 of the Agriculture Impact Mitigation Plan, what is the company's definition of "substantial disturbance" when used in the definition of pipeline construction?

Response:

In the context of defining pipeline construction impacts to agricultural areas, "substantial disturbance" would be defined as normal construction activities to include topsoil stripping, trenching, heavy equipment traffic, and other related ground disturbing activities associated with installing the pipeline.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 31:

Regarding Section 6.e of the Agriculture Impact Mitigation Plan, will all trench and pit dewatering activities occur within the right of way? If not, how will Dakota Access ensure landowners approve of the discharge on their property and repair any damage that may result from the discharge?

Response:

Dakota Access intends to locate dewatering discharge points within the Project right-of-way. While the discharged water would not necessarily be contained within the right-of-way, discharge activities would be monitored and adjusted as necessary to avoid property damage (e.g. excessive flooding of a field that would impact crops, scouring or erosion, offsite deposition of sediment, etc). In some cases, site specific conditions may prohibit the discharge point from being within the right-of-way and alternative discharge locations would be required. In any location where discharge points would be required outside of the Project right-of-way, landowner approval will be obtained prior to the activity and the area would be restored to pre-construction conditions.

The Agriculture Impact Mitigation Plan has been modified to clarify this and is attached as Appendix B.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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Data Request No. 32:

Please propose an indemnity bond amount, as will be required per SDCL 49-41B-38.

Response:

Dakota Access proposes an indemnity road bond totaling $15 million.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Dakota Access, LLC
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Data Request No. 33:

Per SDCL 49-41B-5.2, please describe how the applicant carried out the required notice, specifically addressing concerns brought up at public hearings and in comments filed within the docket.

Response:

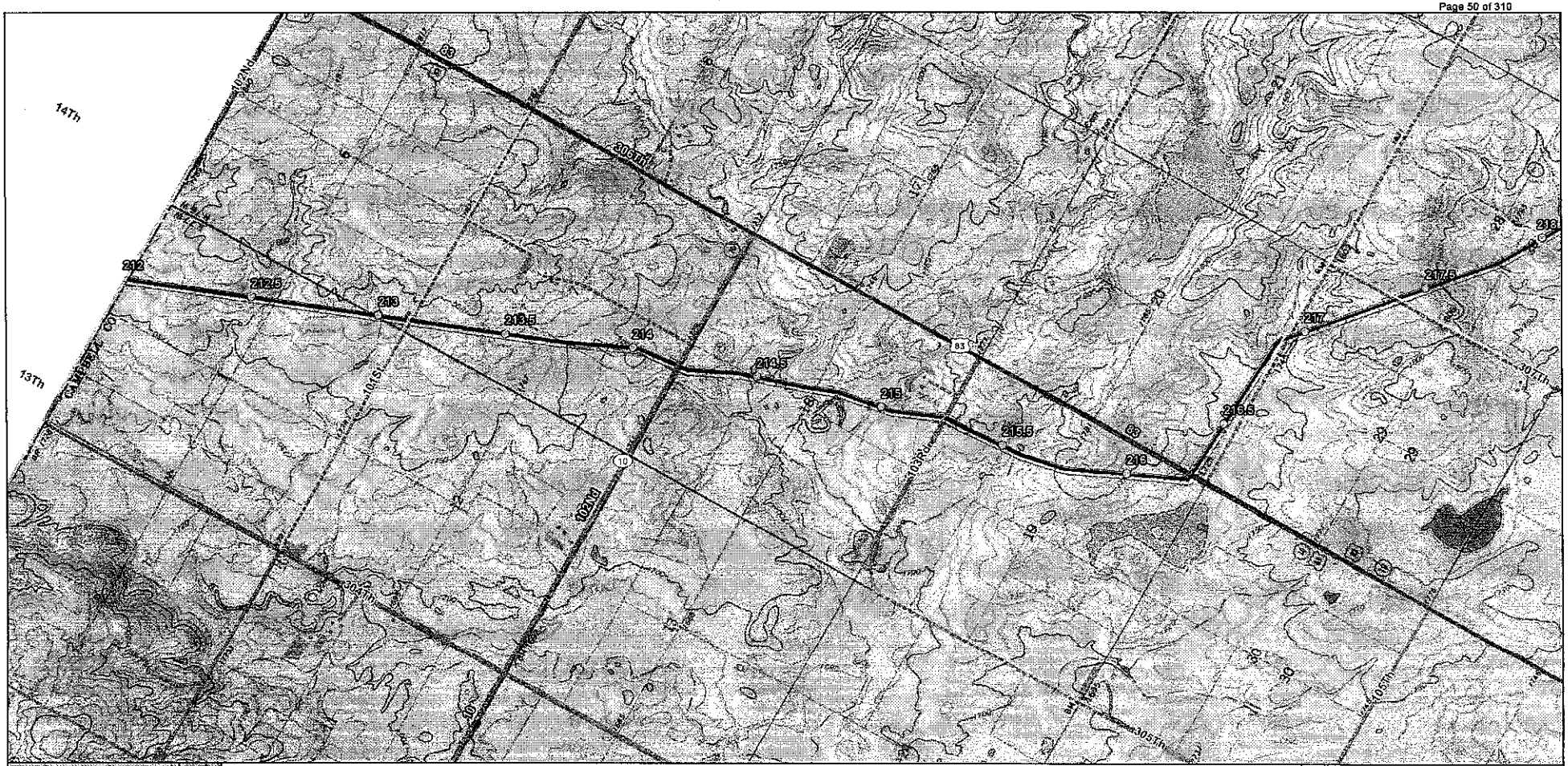
Applicant developed a list of all traversed and abutting landowners located within one half mile of the proposed pipeline centerline by obtaining the ownership lists from the county tax records for property ownership. This ownership data was cross-referenced against the county property delineation maps and also verified as much as possible by civil survey, public property data bases and landowner records and property title records that could be reasonable accomplished/reviewed ahead of the notice period. Therefore the data and notices were based upon public data as maintained by each respective county tax office for counties traversed by the pipeline.

Once the data was obtained from the tax office, the Applicant created a spreadsheet of parcels crossed by the proposed pipeline. The spreadsheet contained names and addresses of owners of record of the parcels. Applicant's attorneys, once application was made and public meetings schedule obtained from the Commission, sent notice by registered mail to those owners of record as delineated by the tax offices. Applicants also caused notice to be published in legal newspapers in each county in which the pipeline route was located.

Notice was sent by registered mail during the week of December 15, 2014. Publishing in the newspapers was conducted that week and in subsequent weeks starting on December 17, 2014 and concluding on December 26, 2014.

Applicant filed an amended application with a different route on December 23, 2014. Notice of the public meetings was mailed to landowners on that route as delineated by the tax office records during the week of January 7, 2015. Applicant's attorneys filed proof of notice on January 14, 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota



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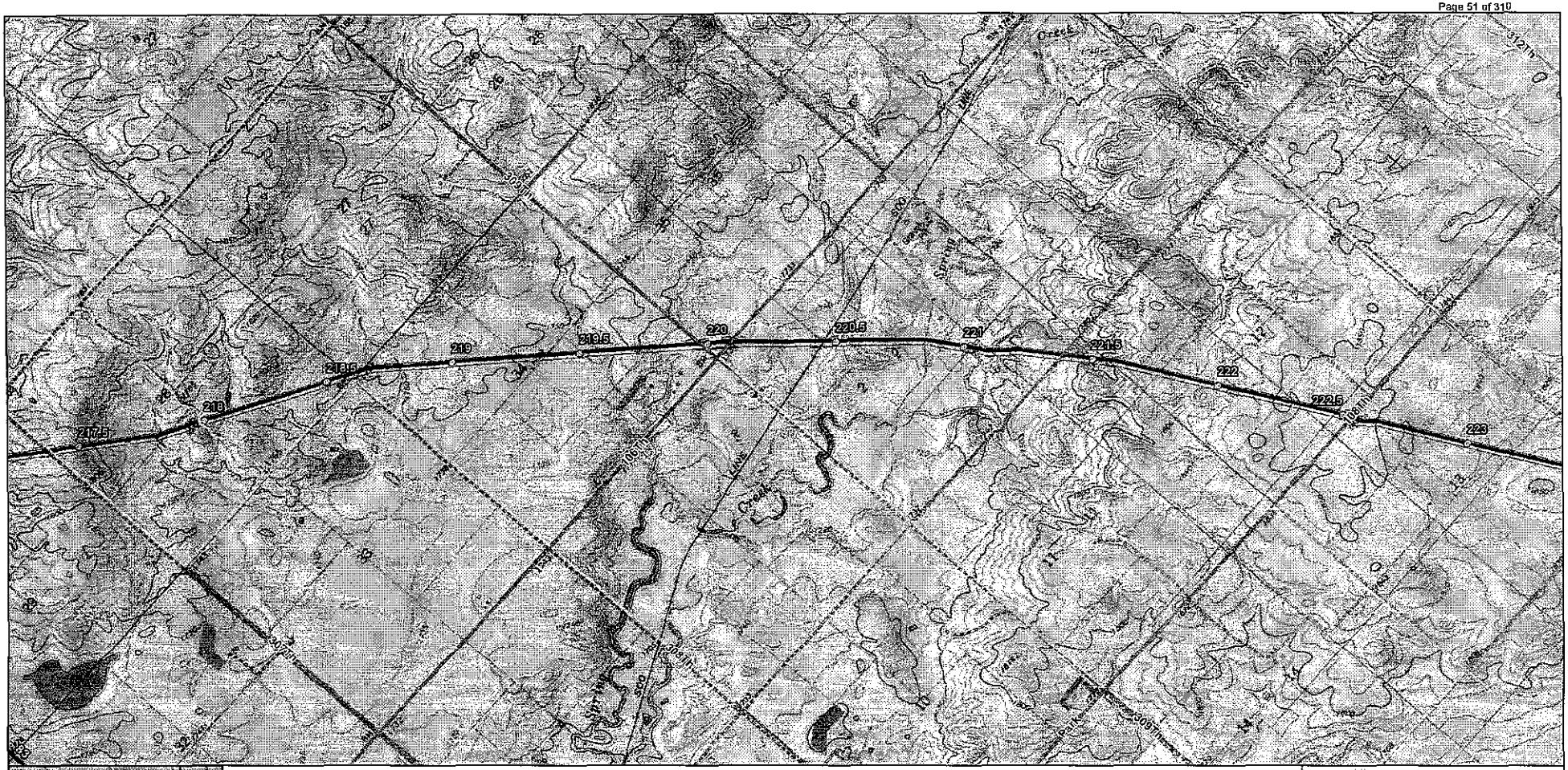

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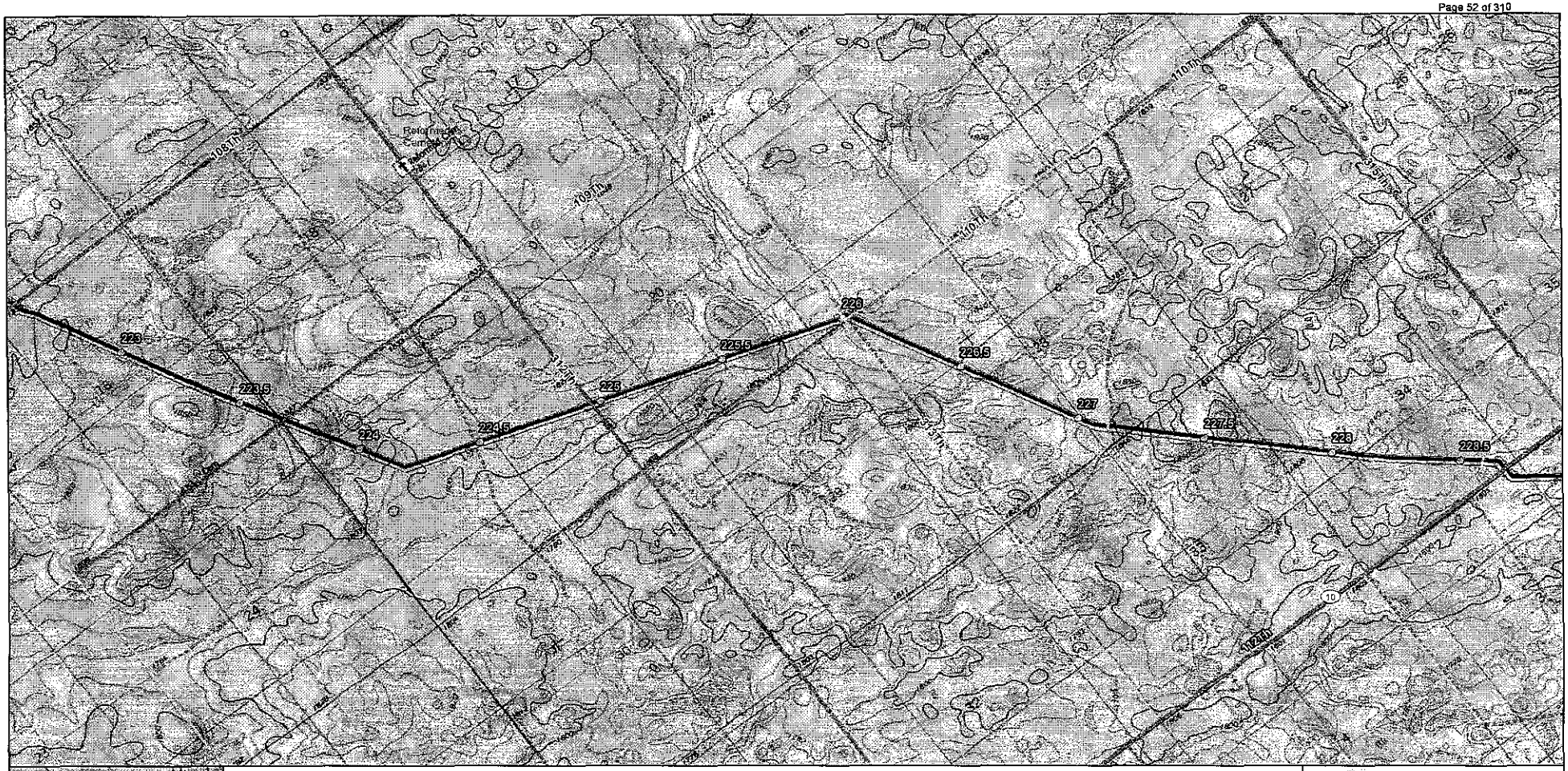

Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

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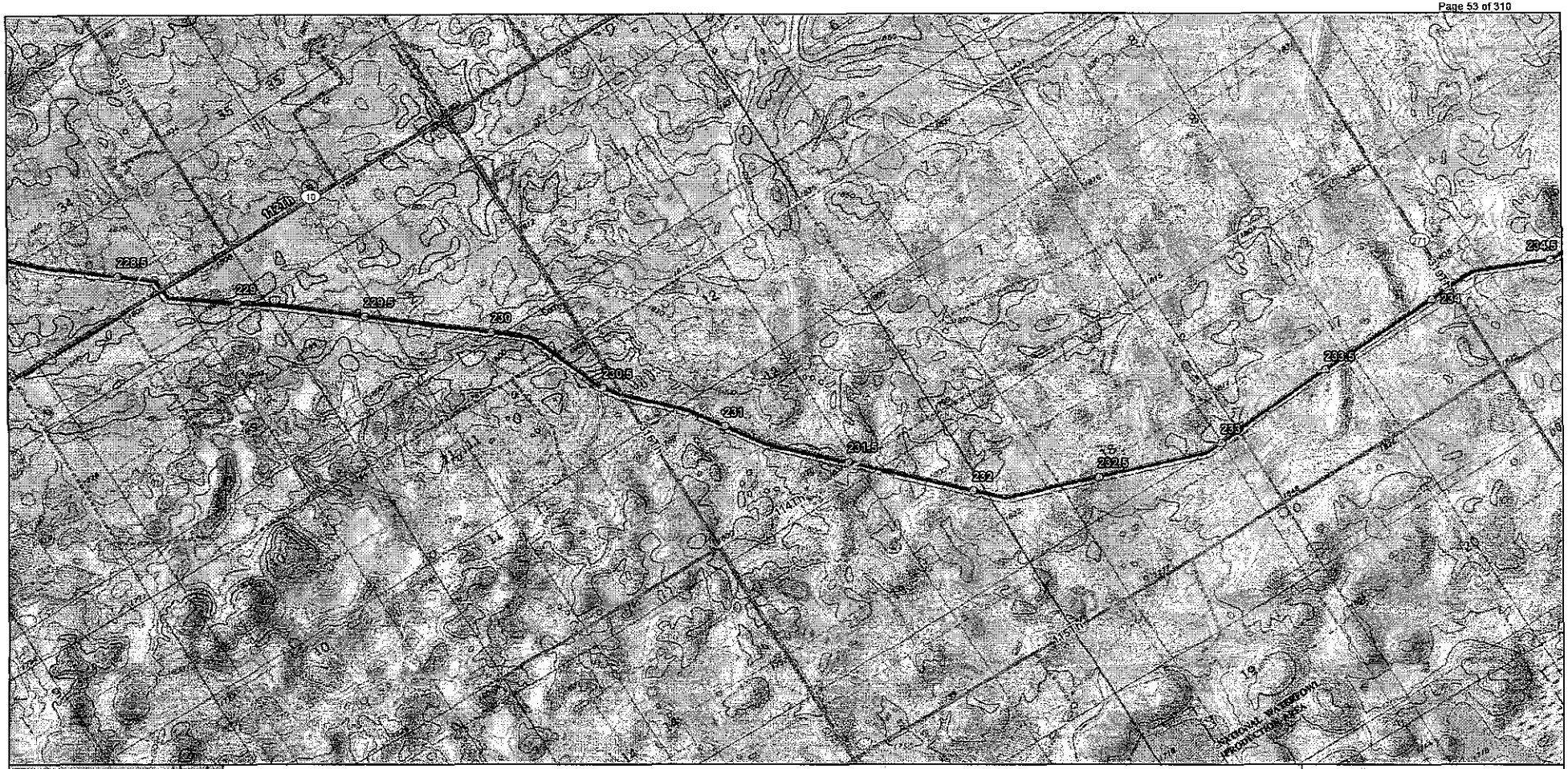

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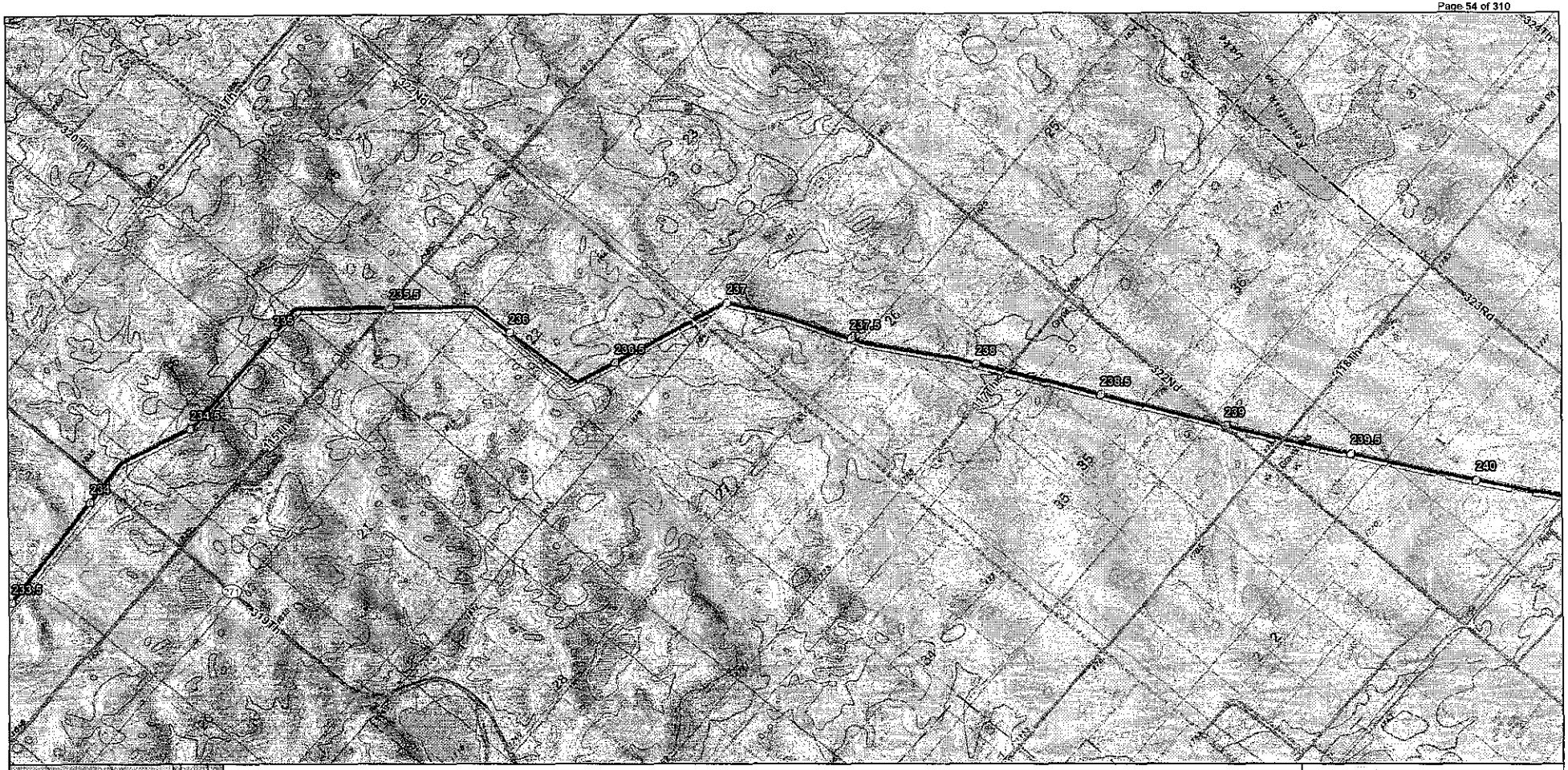
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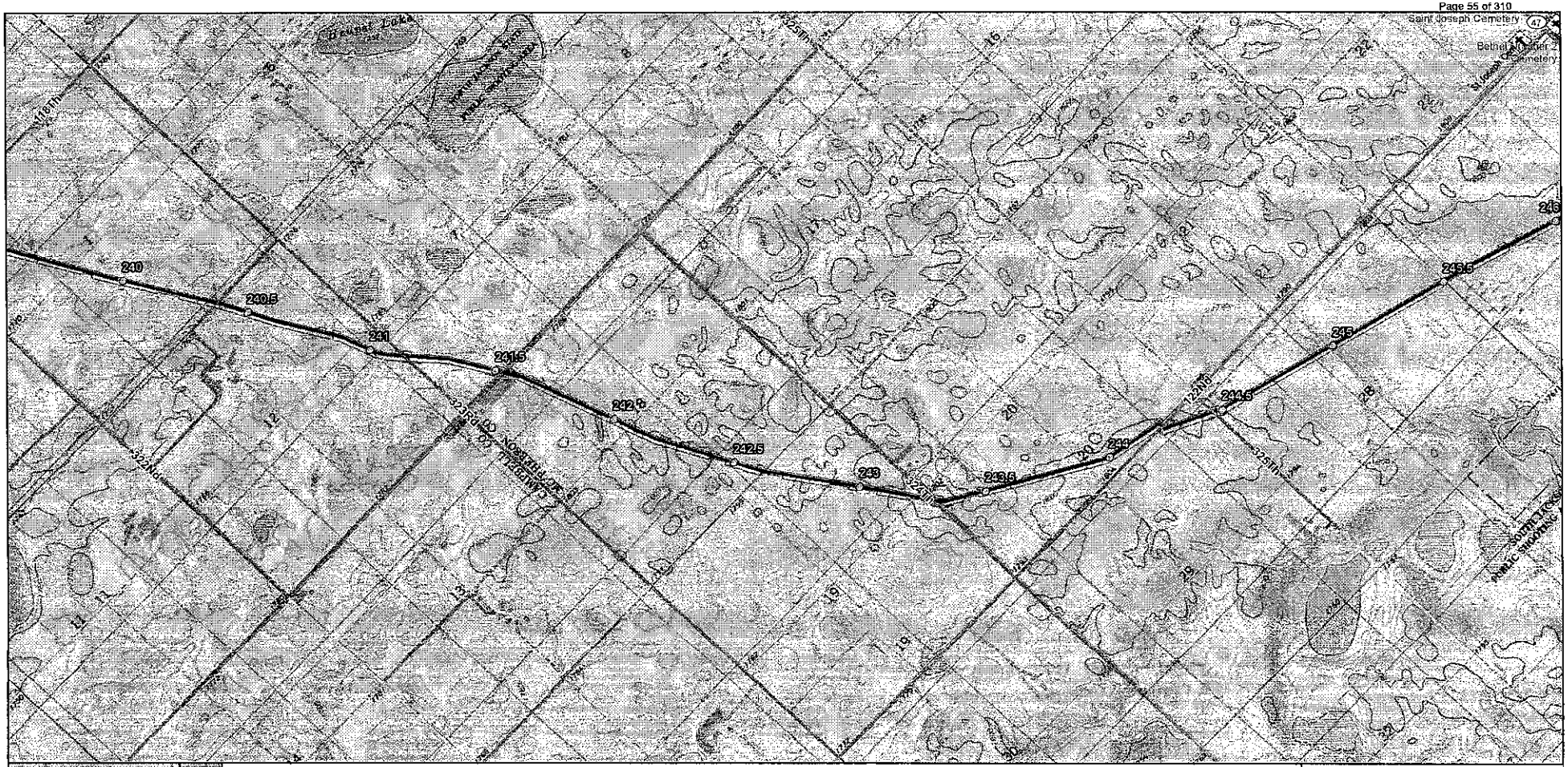

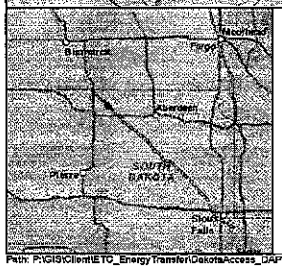

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Saint Joseph Cemetery
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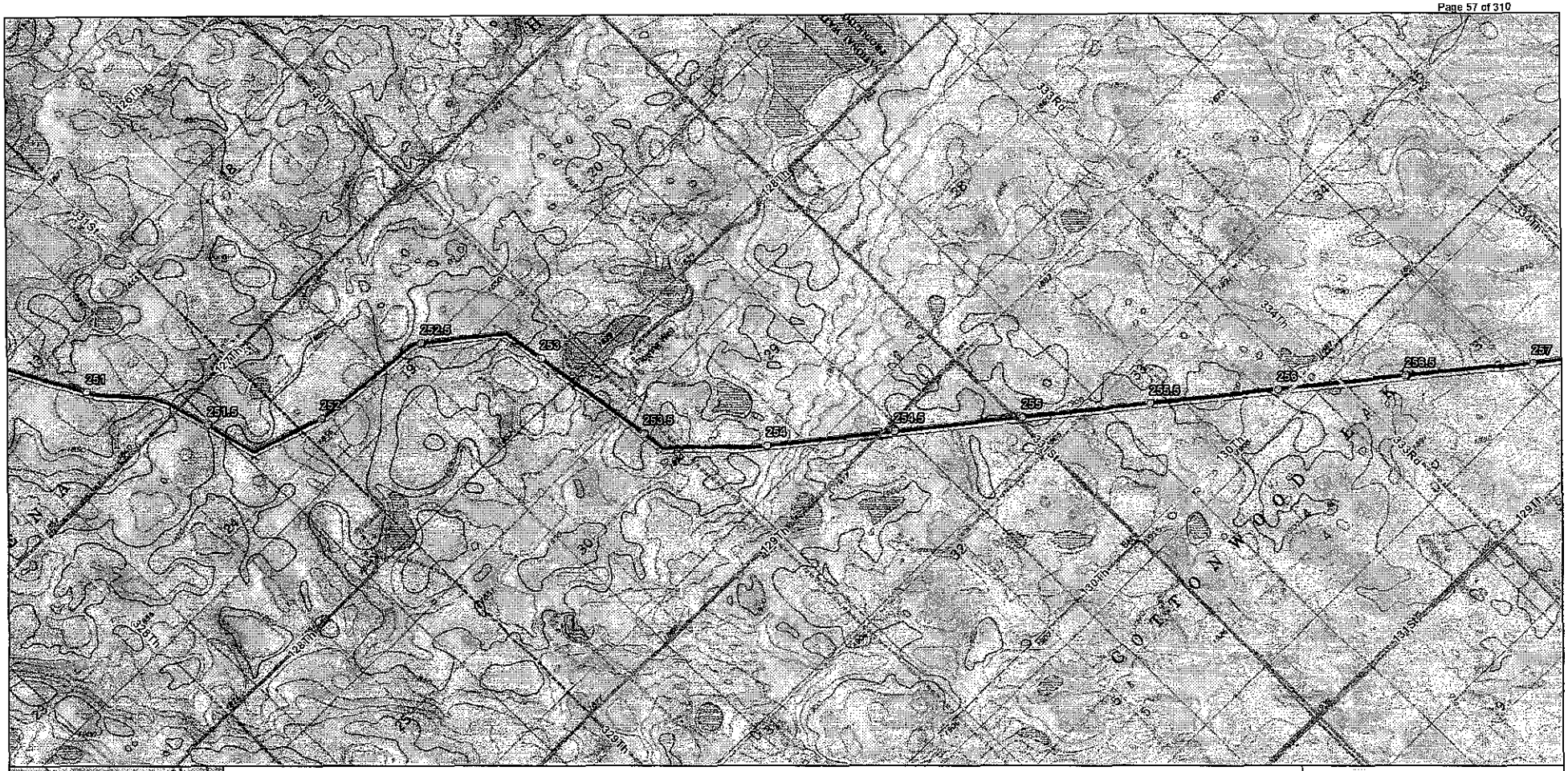

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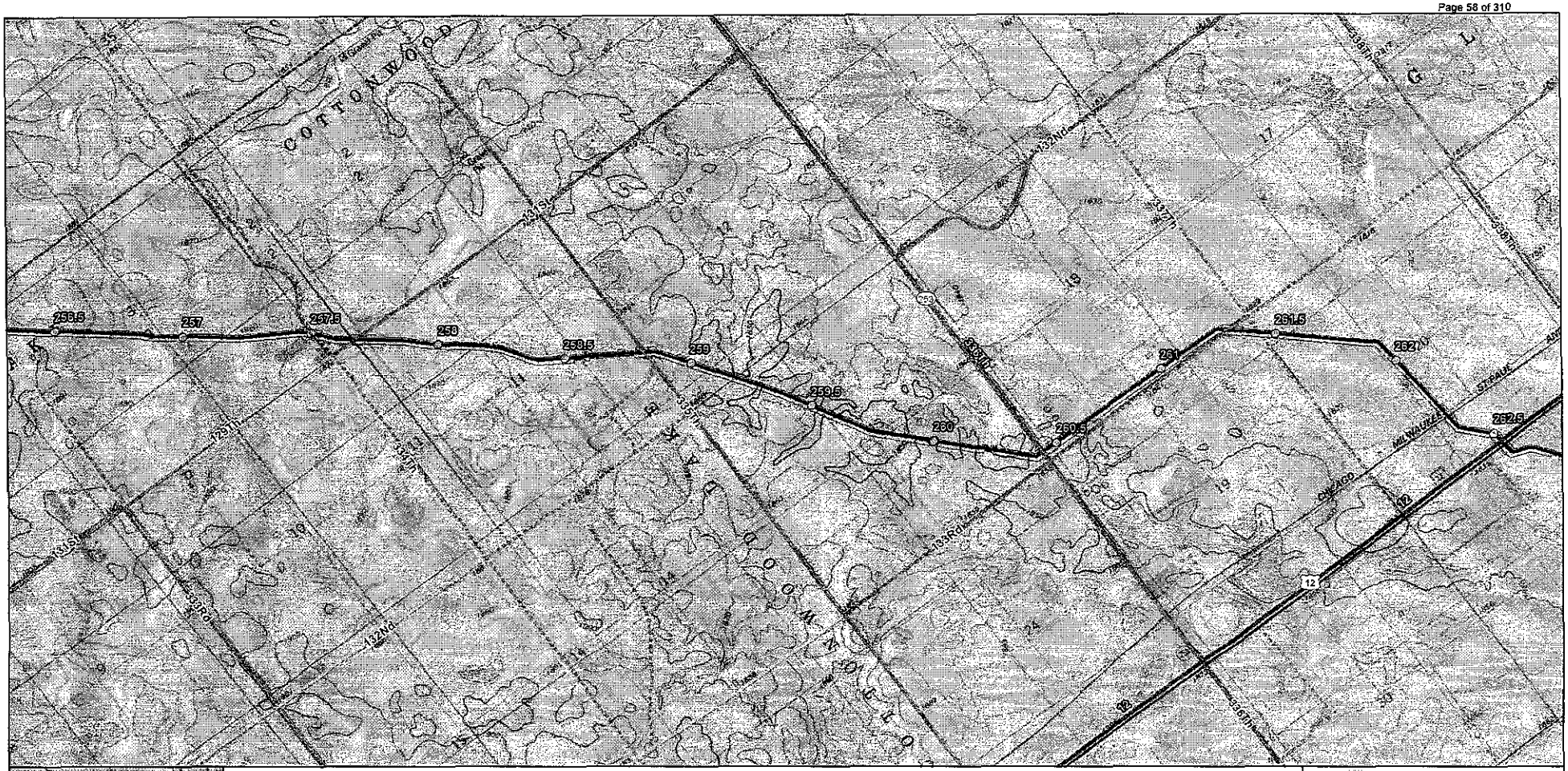

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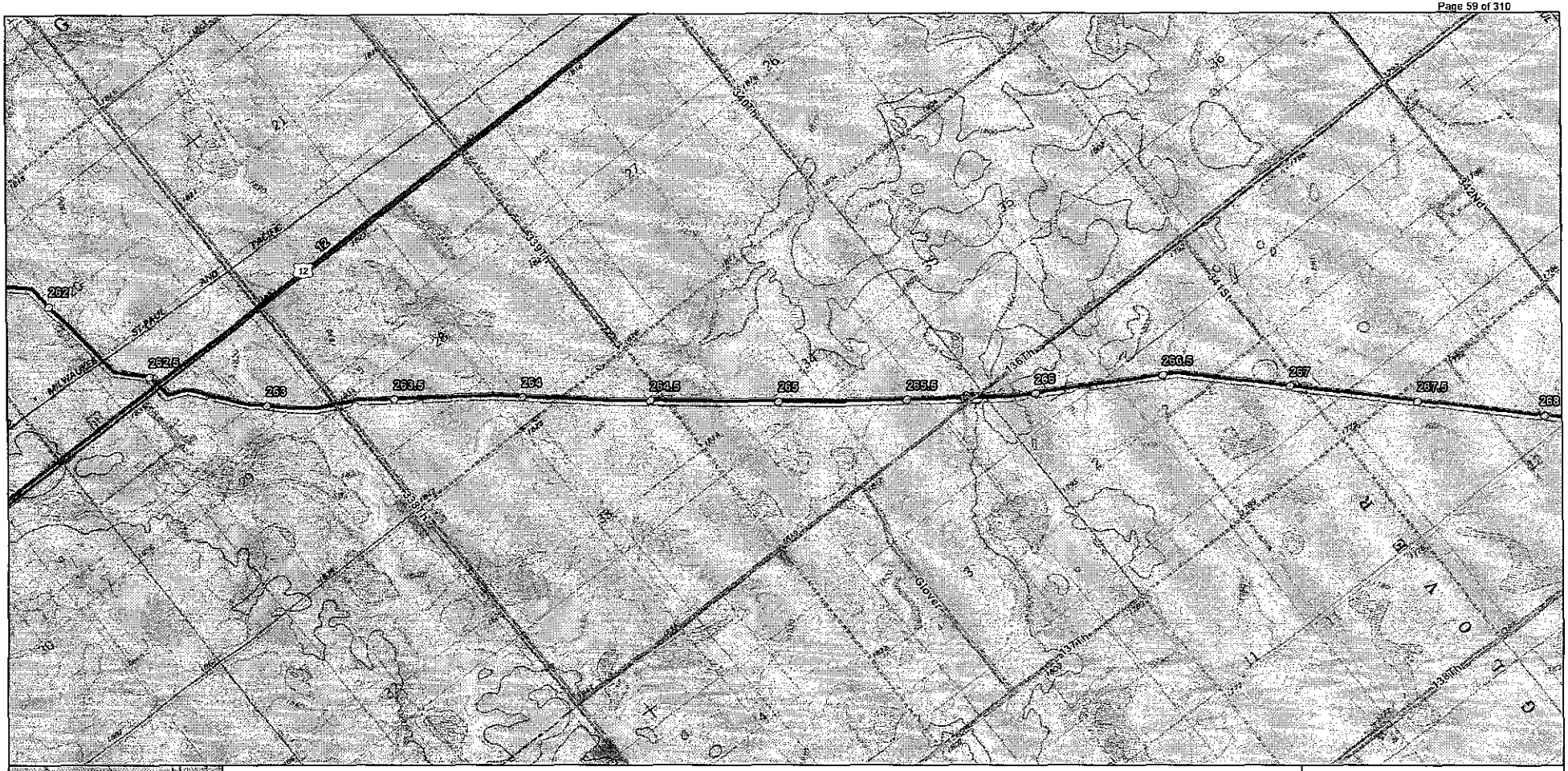

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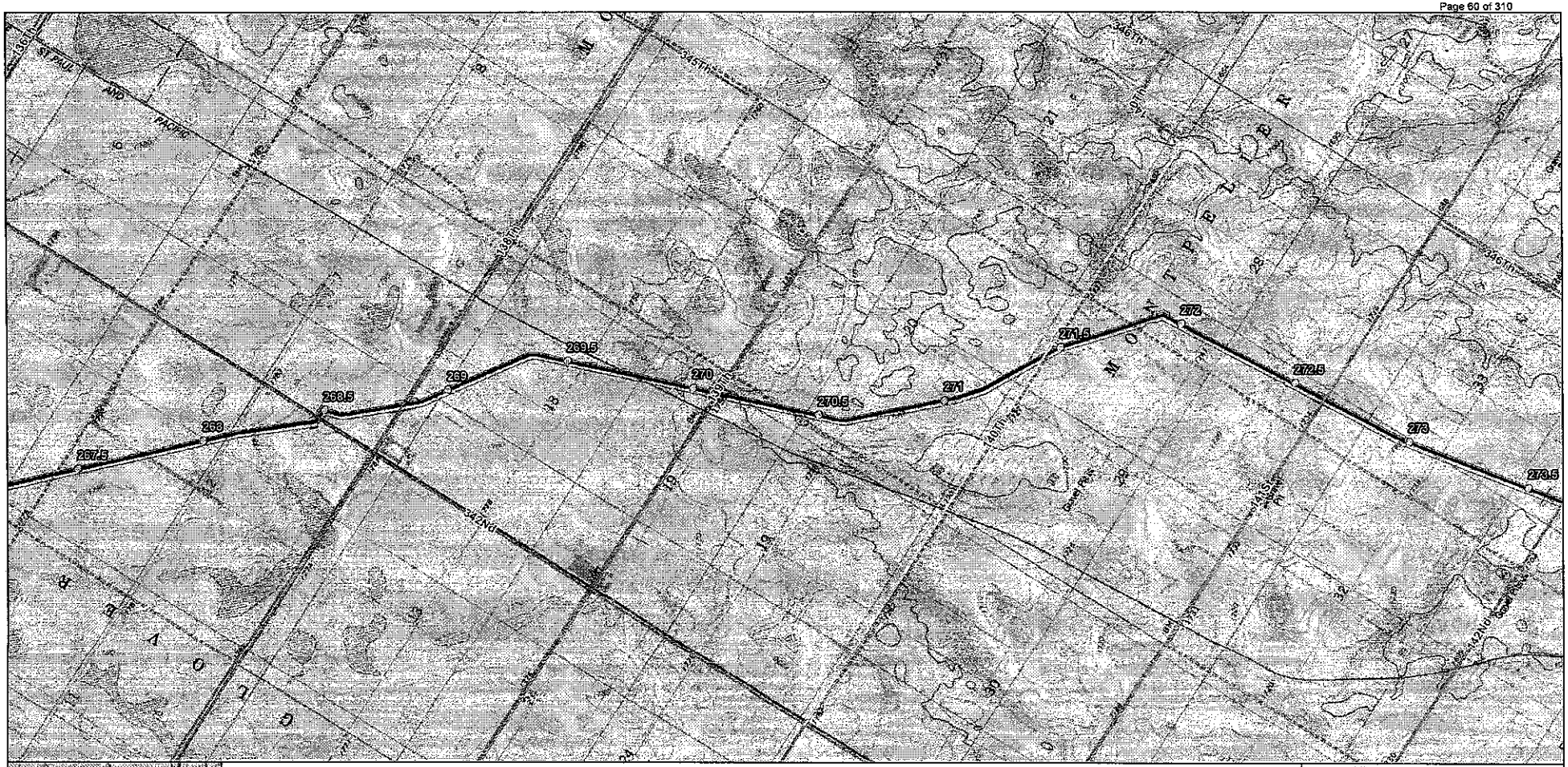

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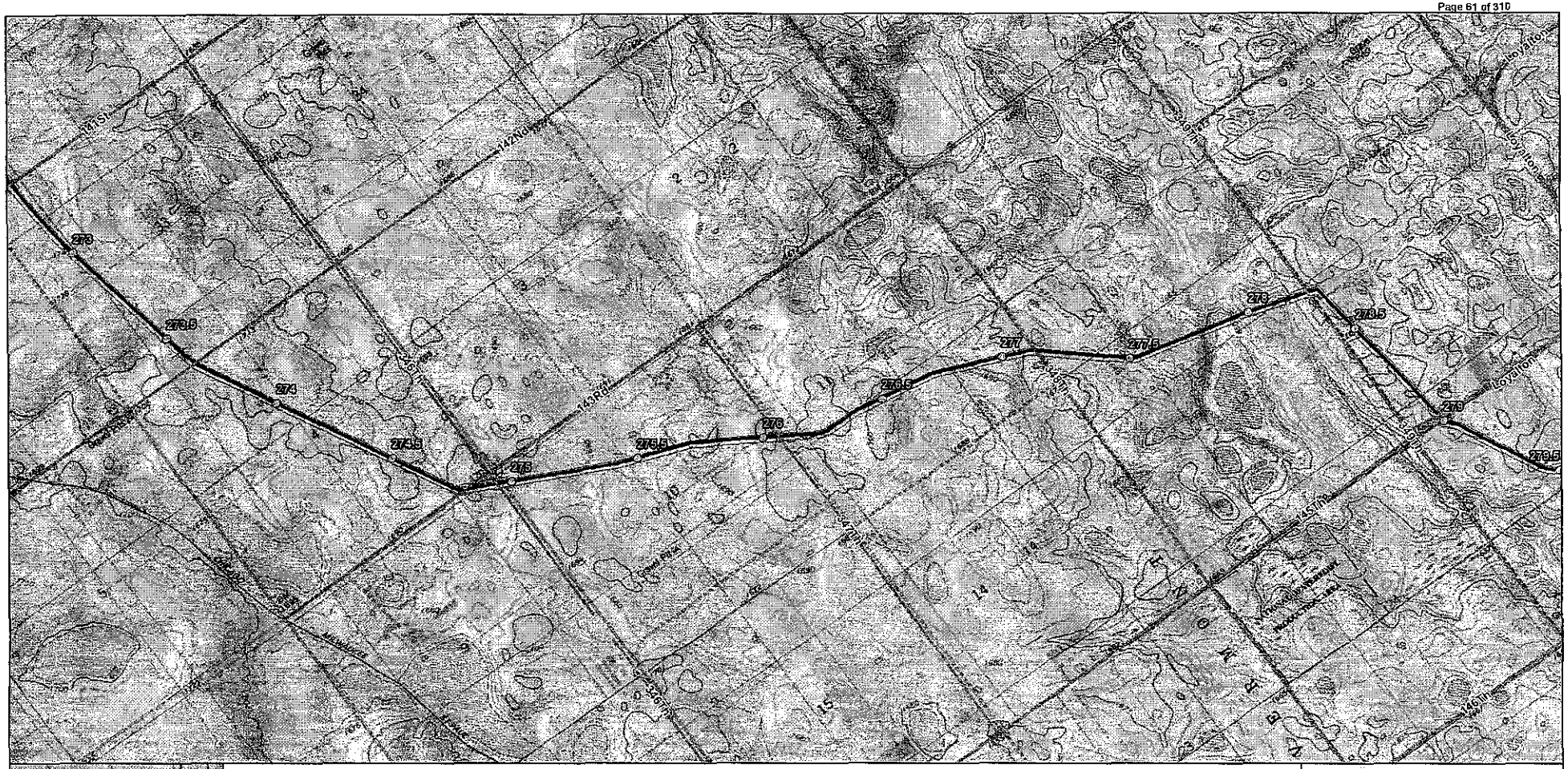

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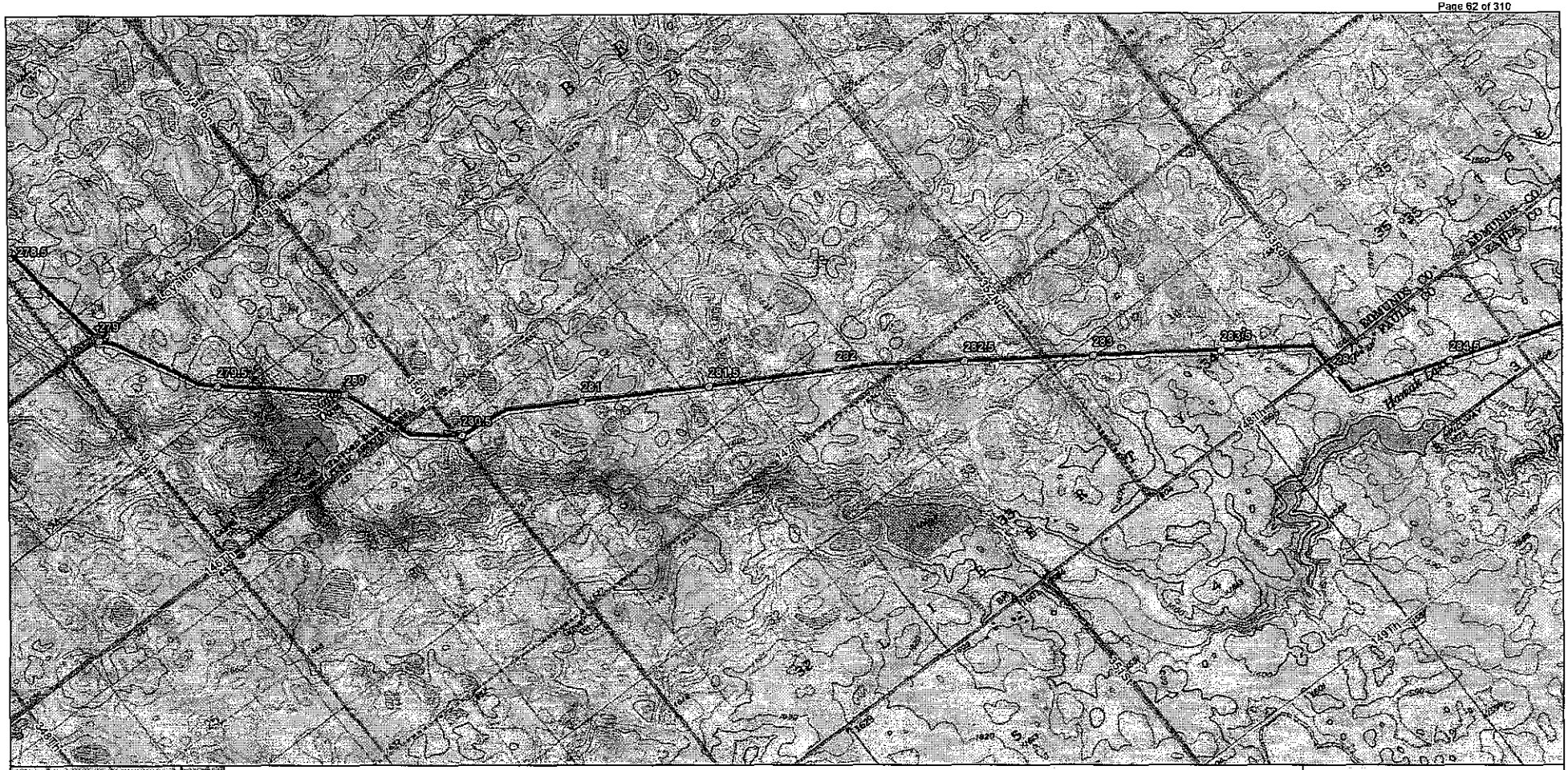

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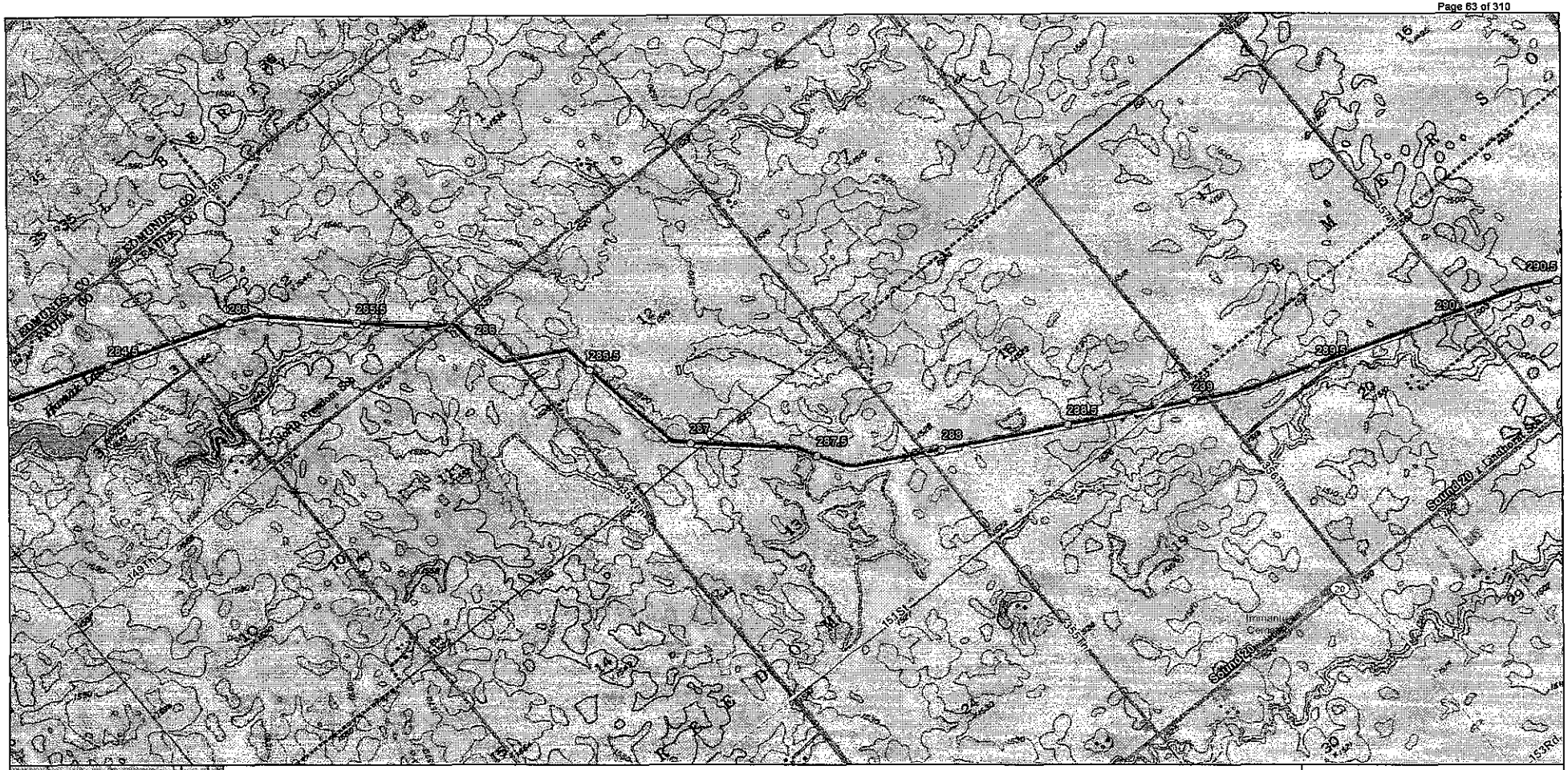

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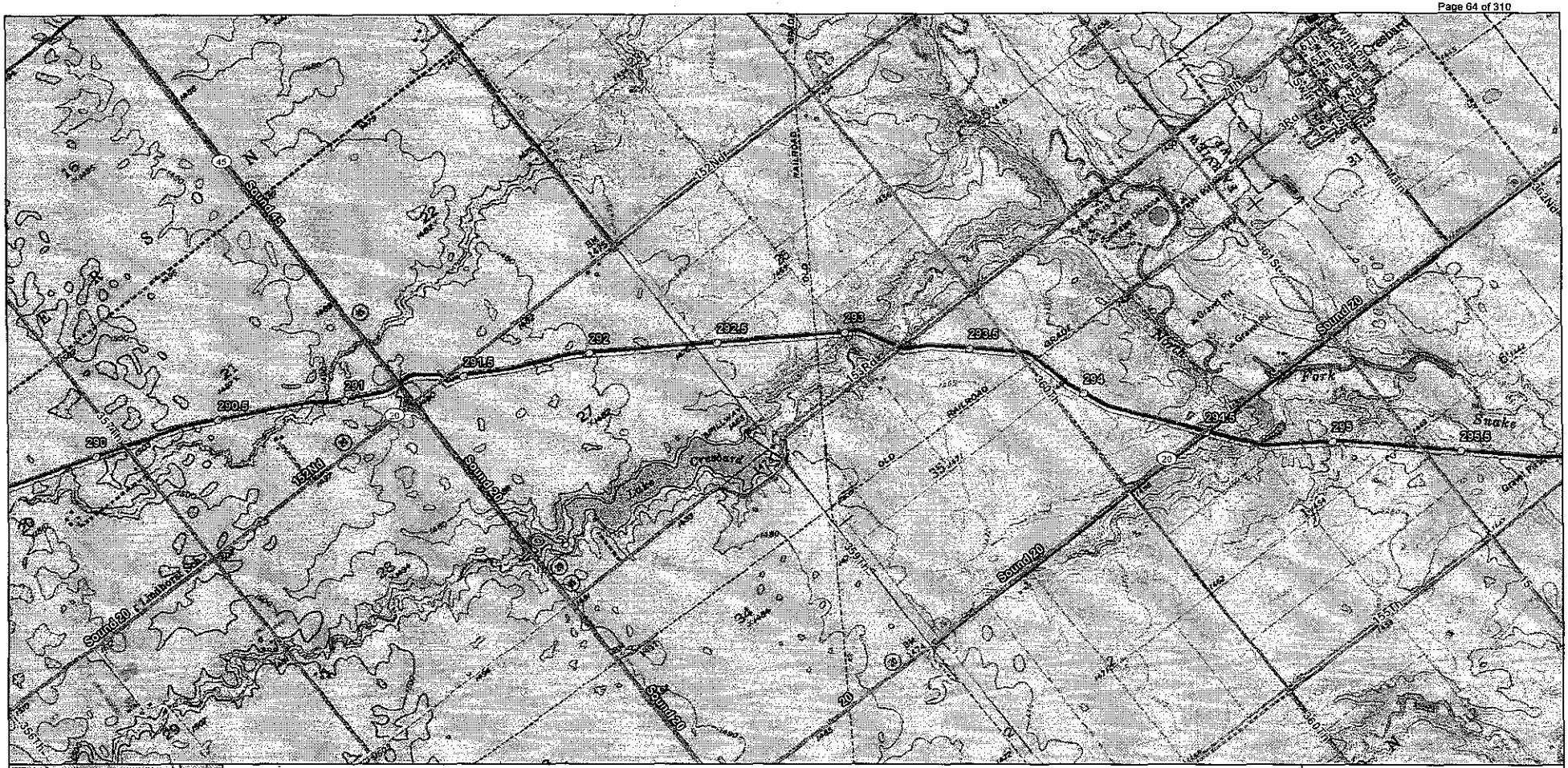
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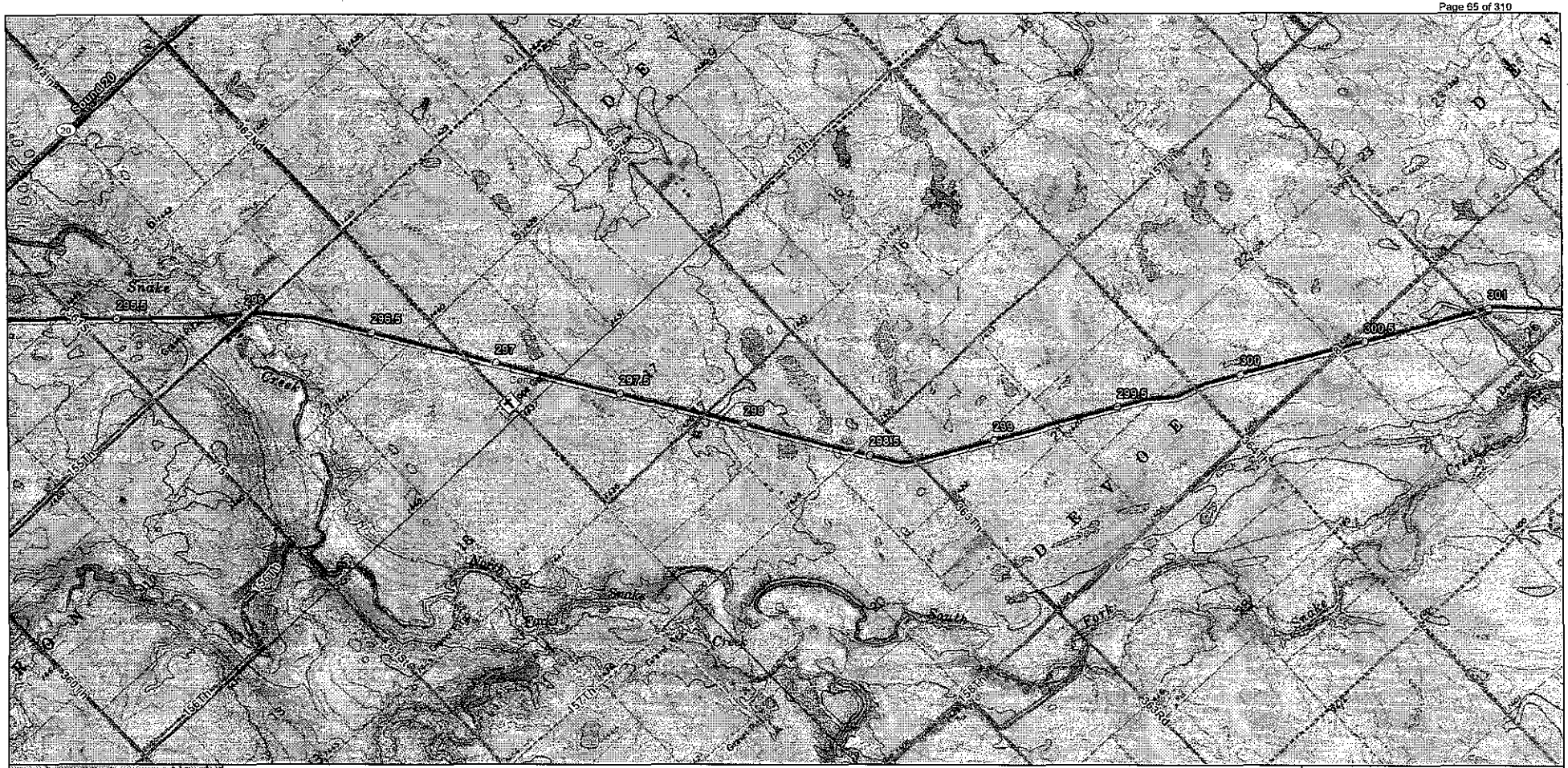
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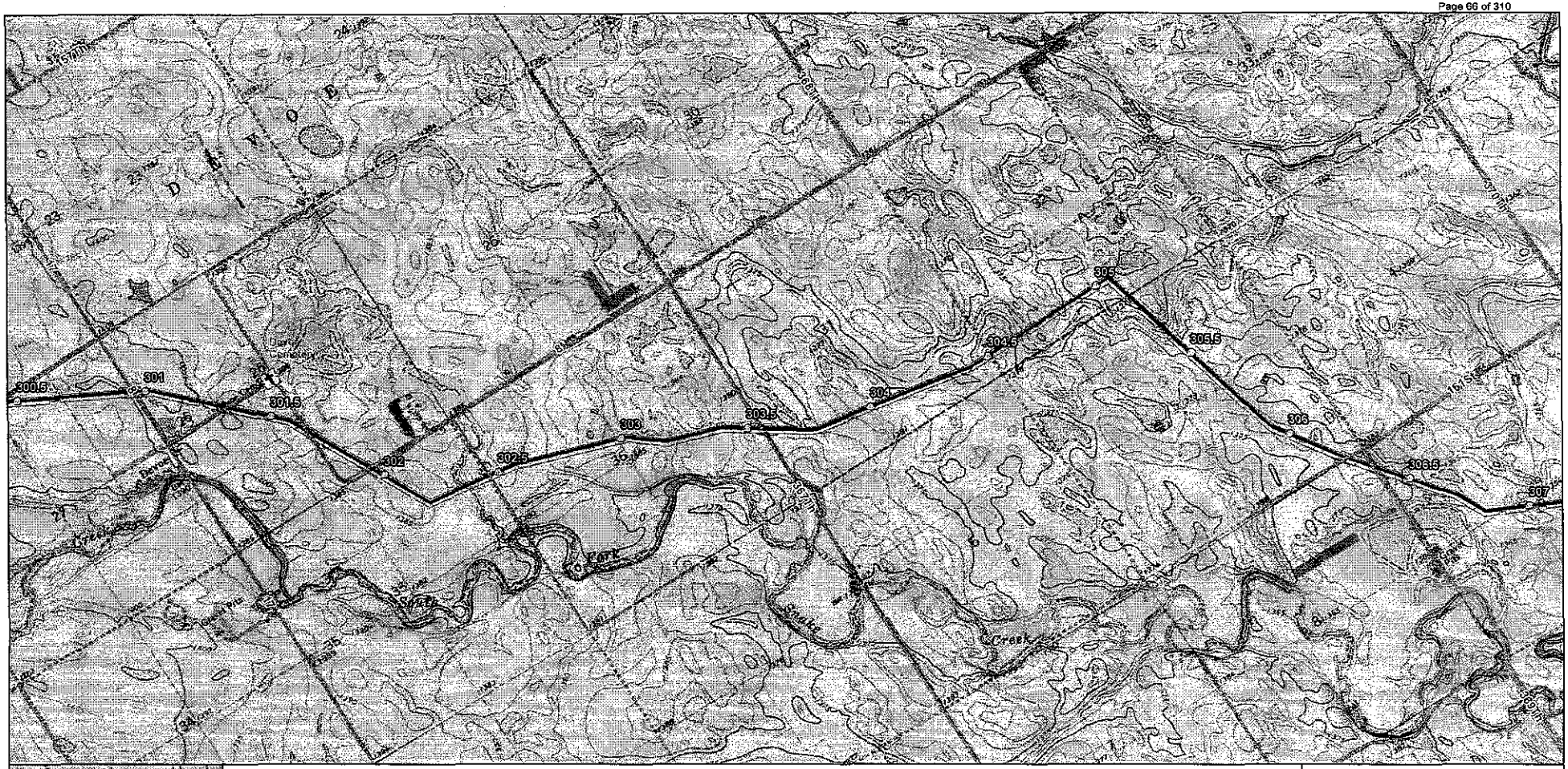

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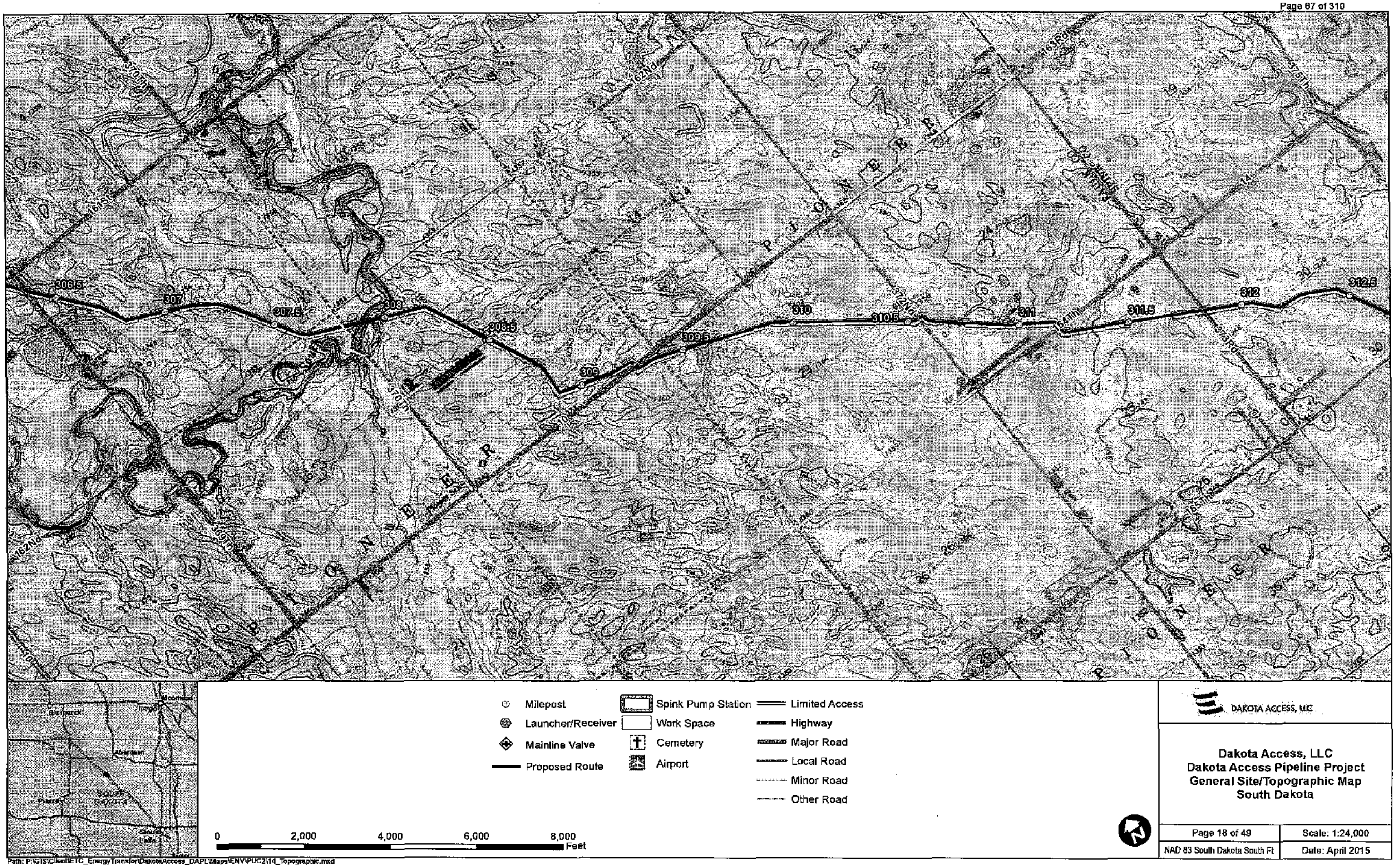

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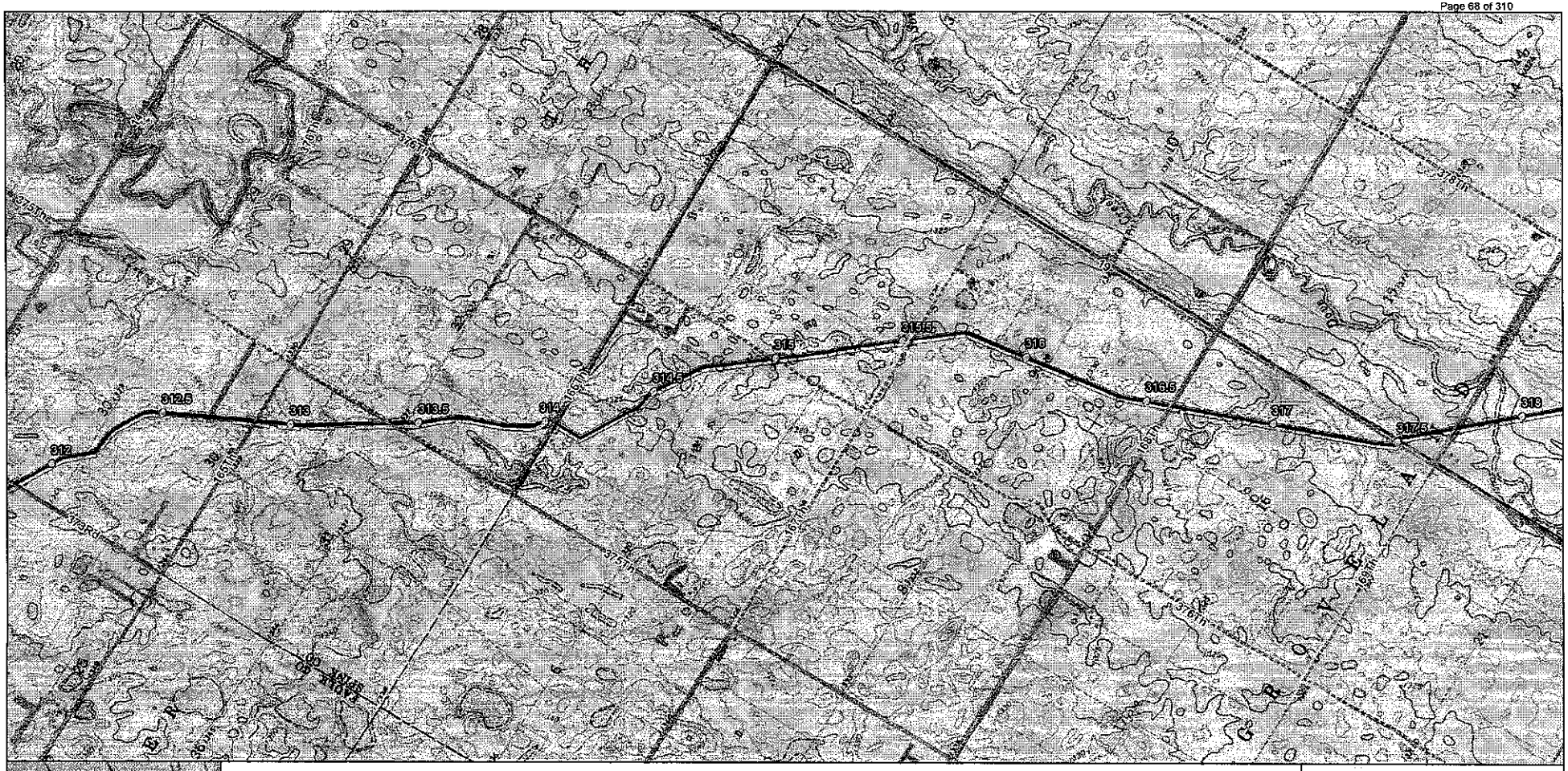

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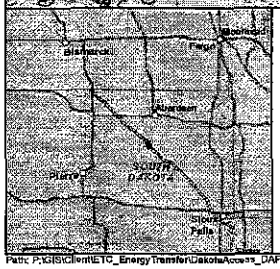

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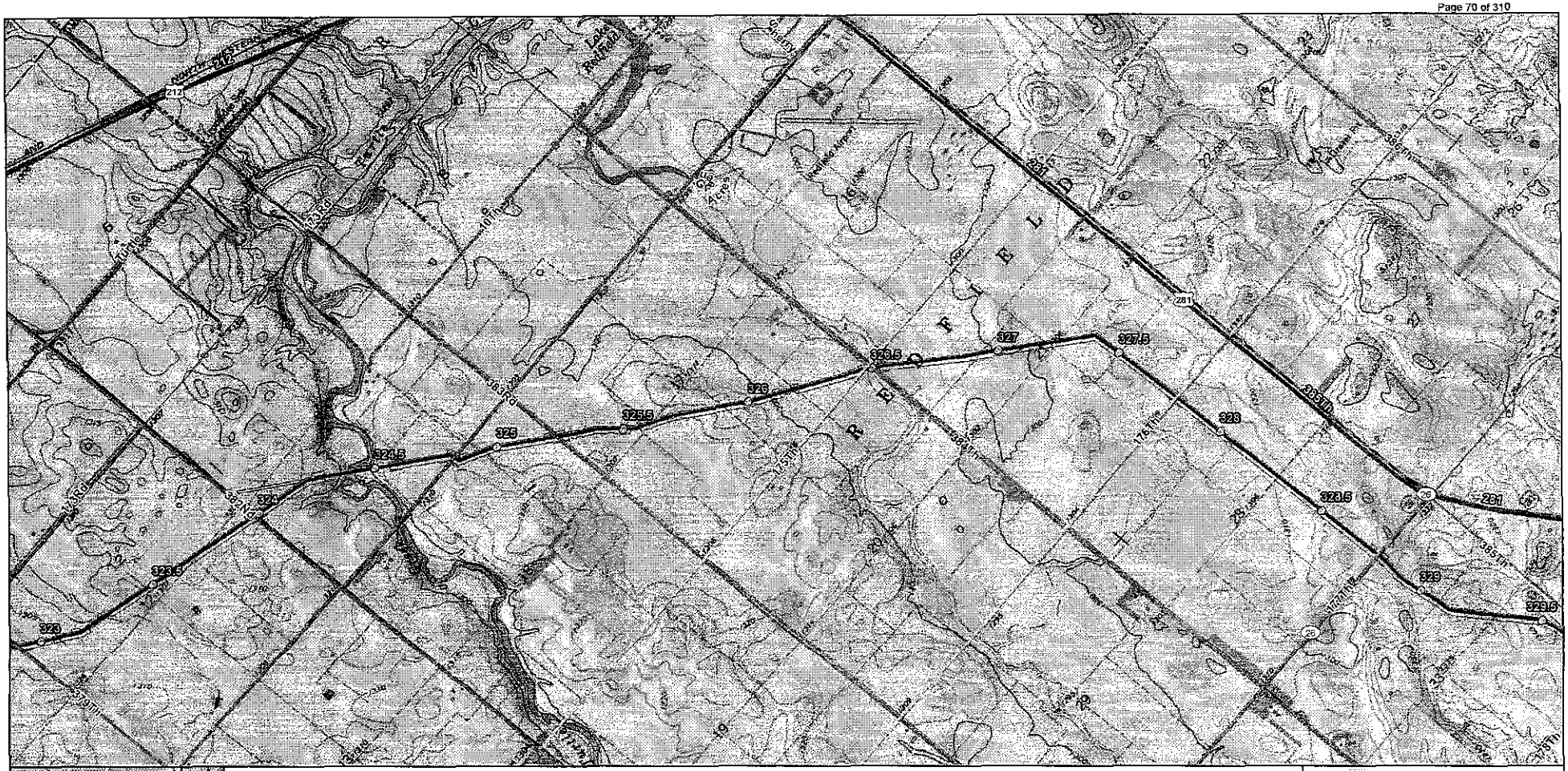

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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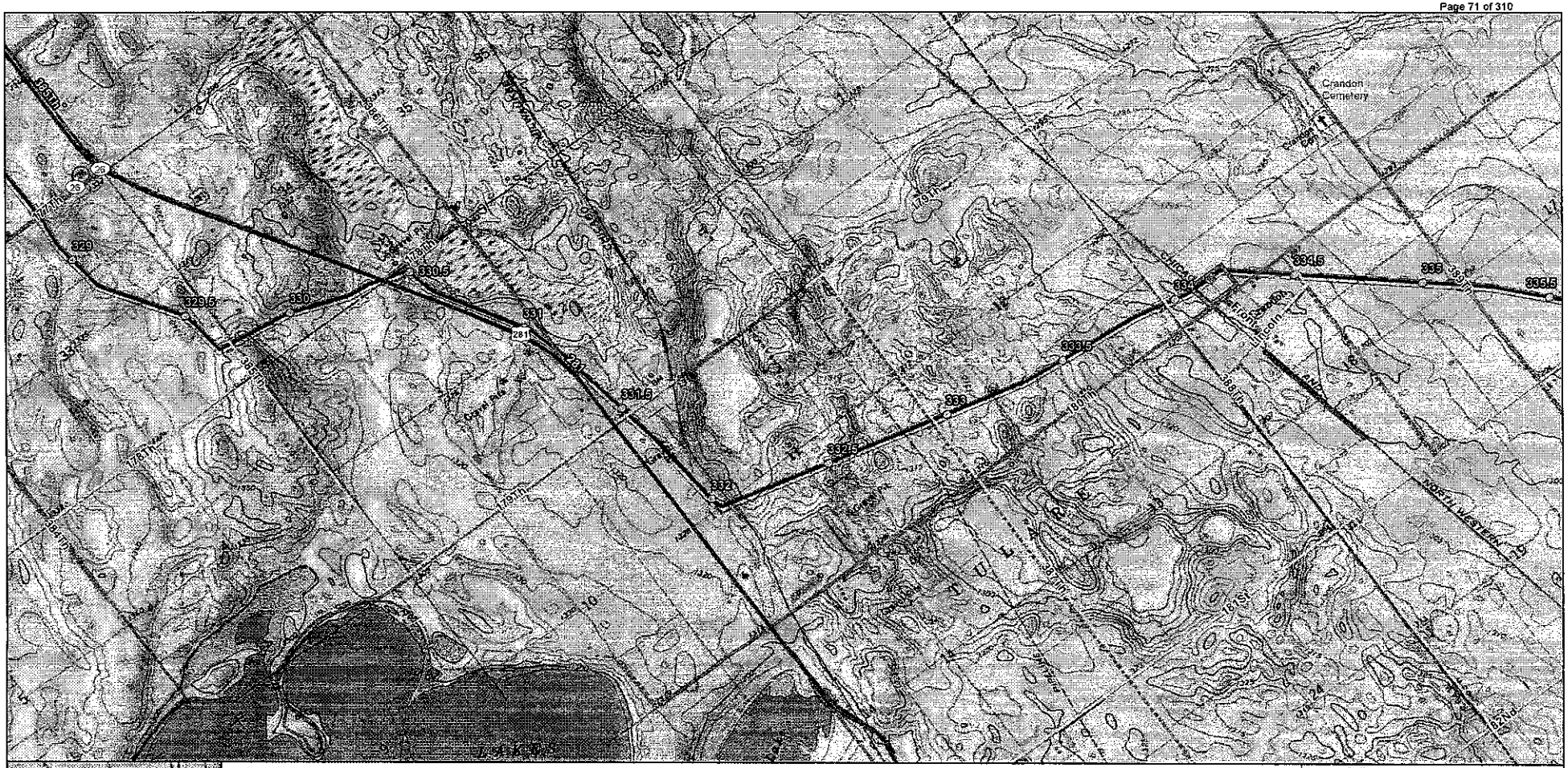

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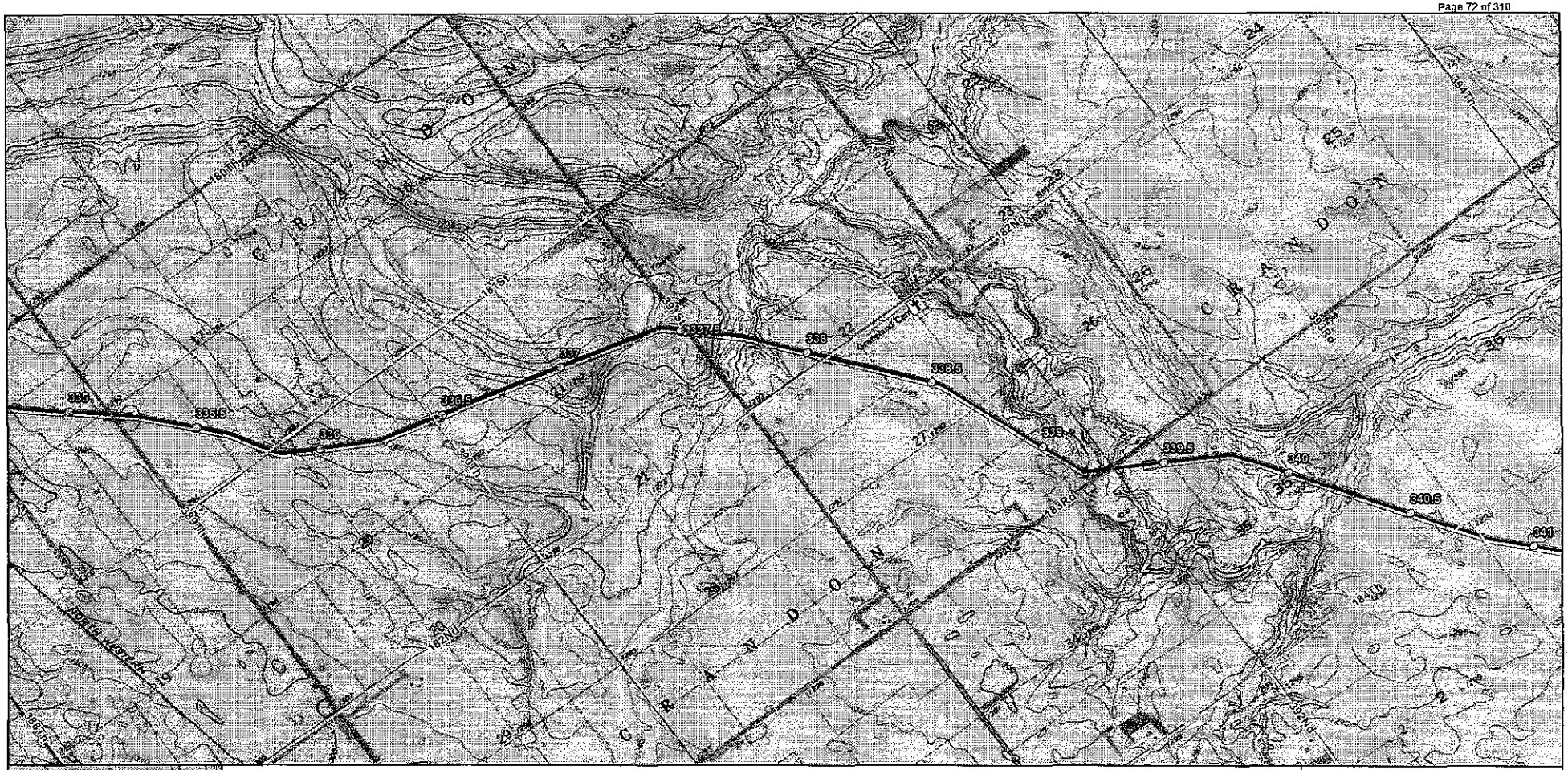

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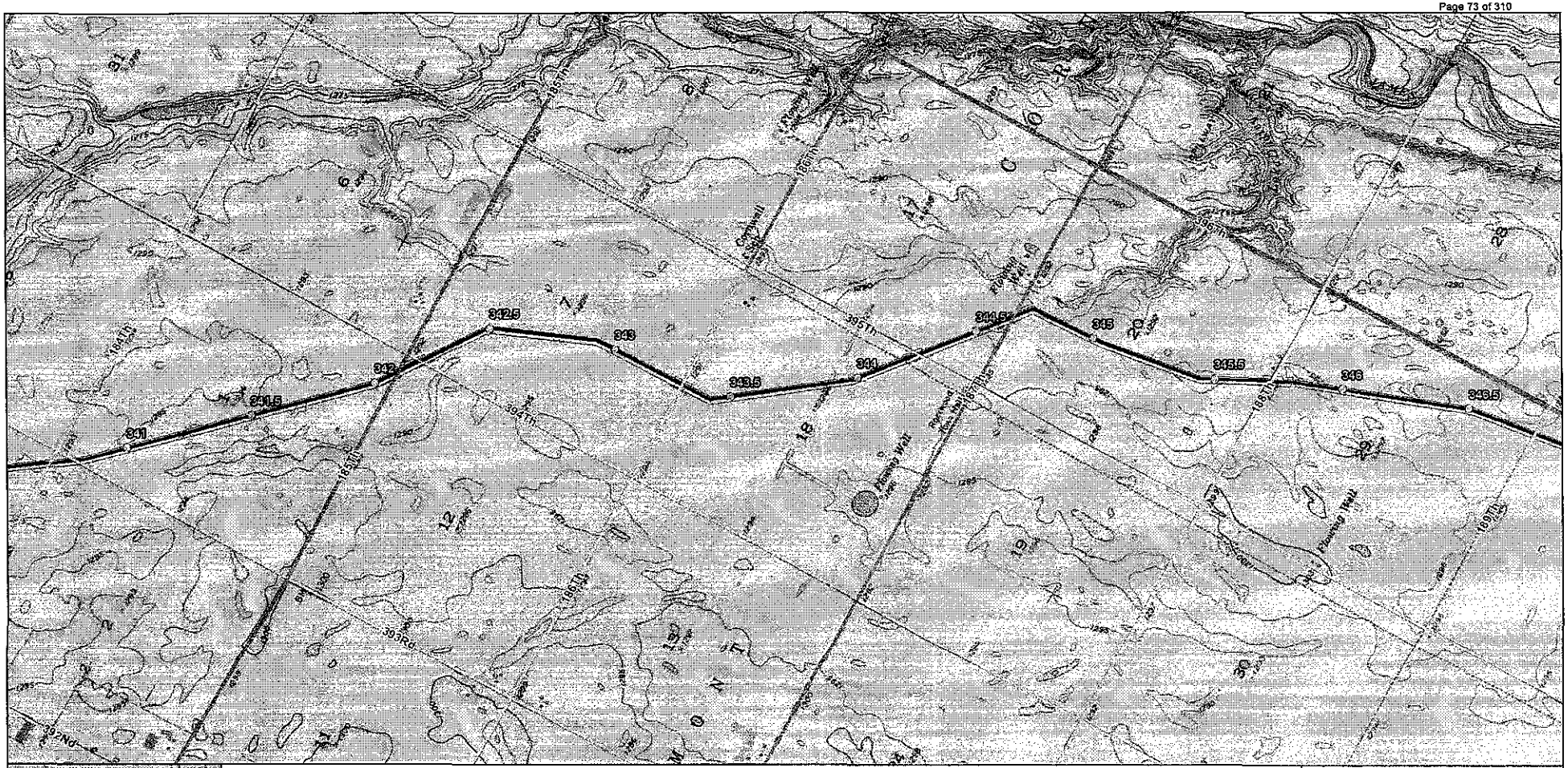

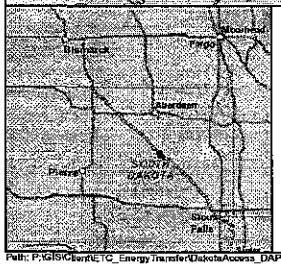

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Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

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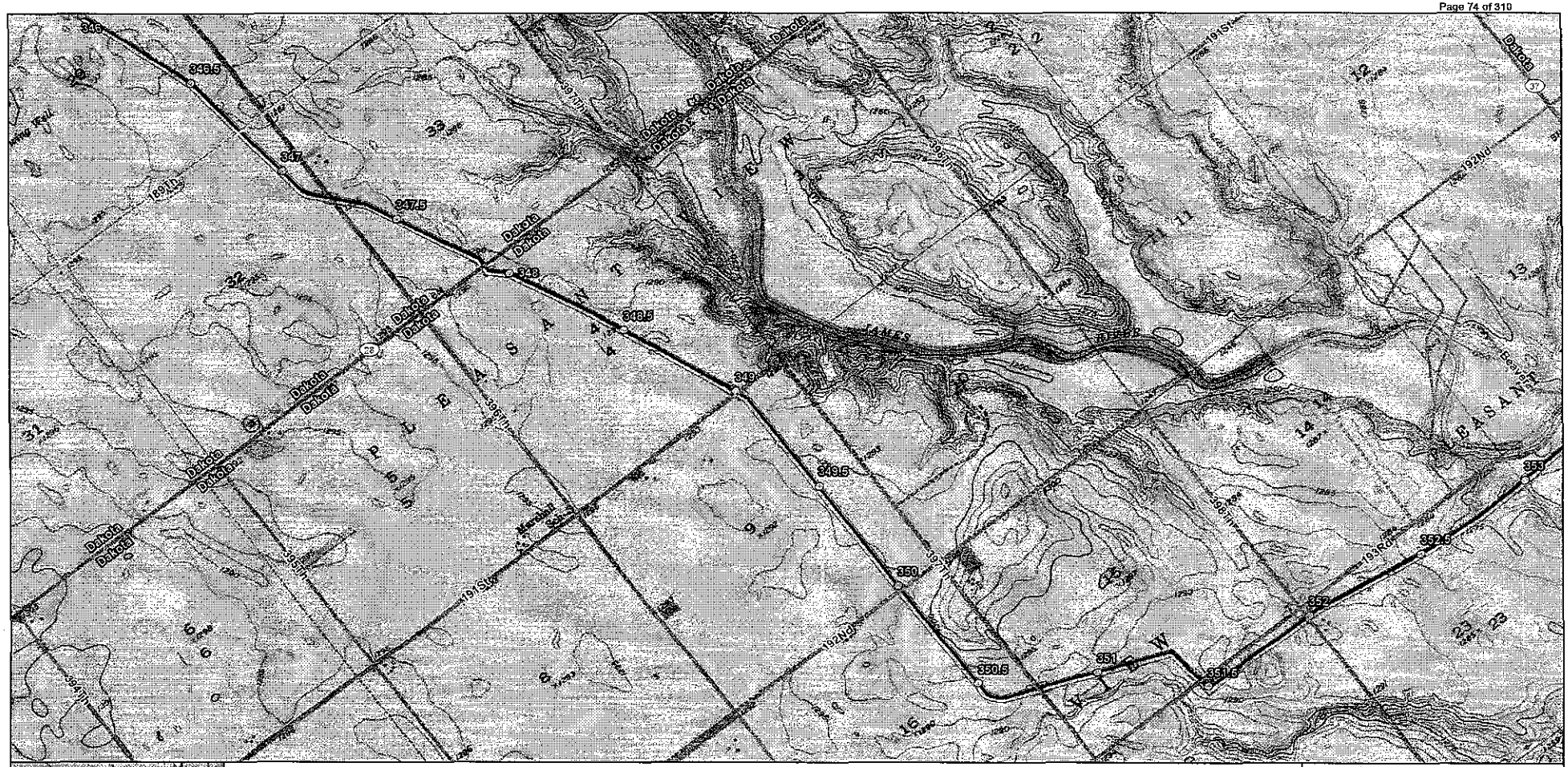

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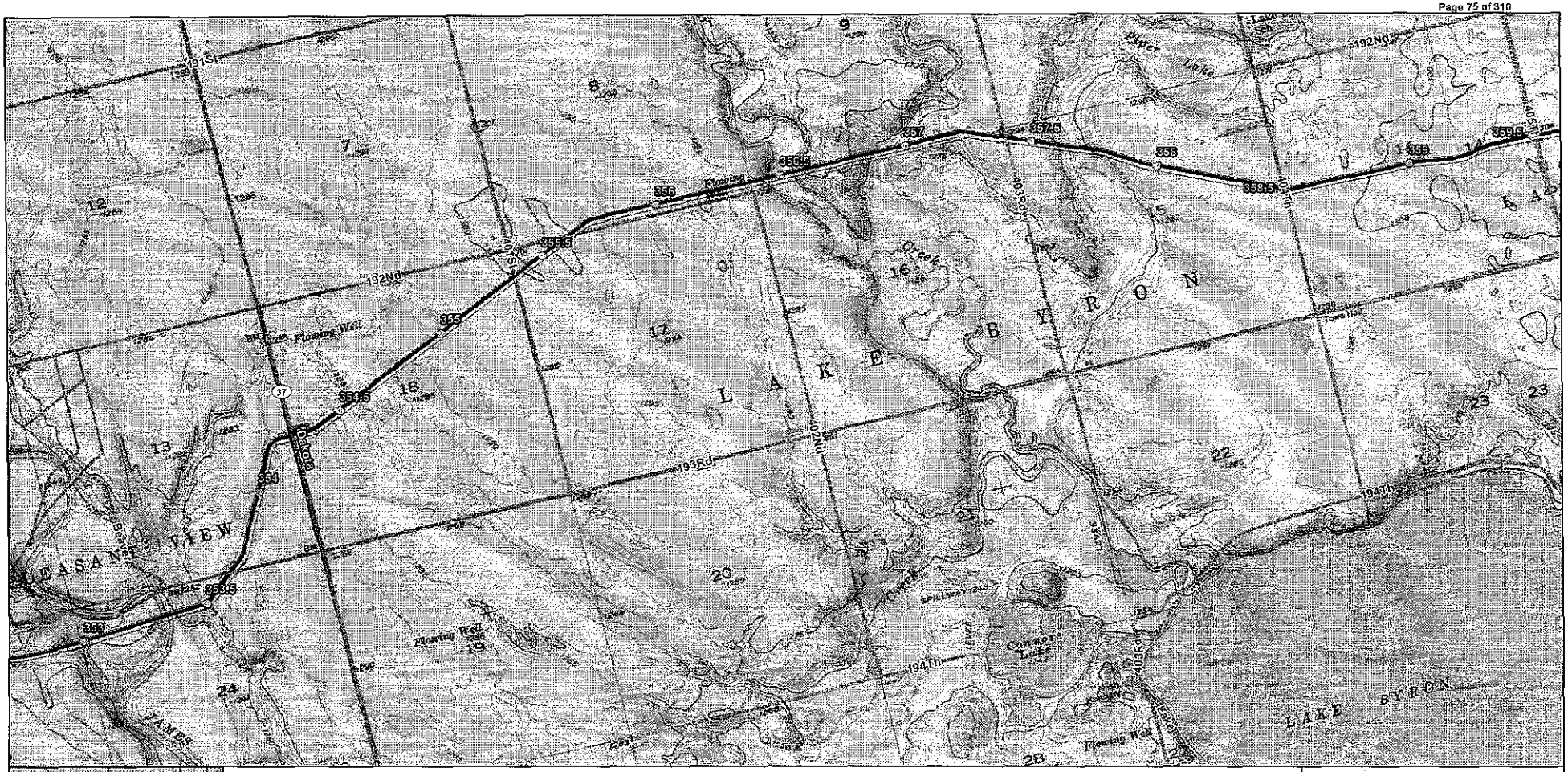

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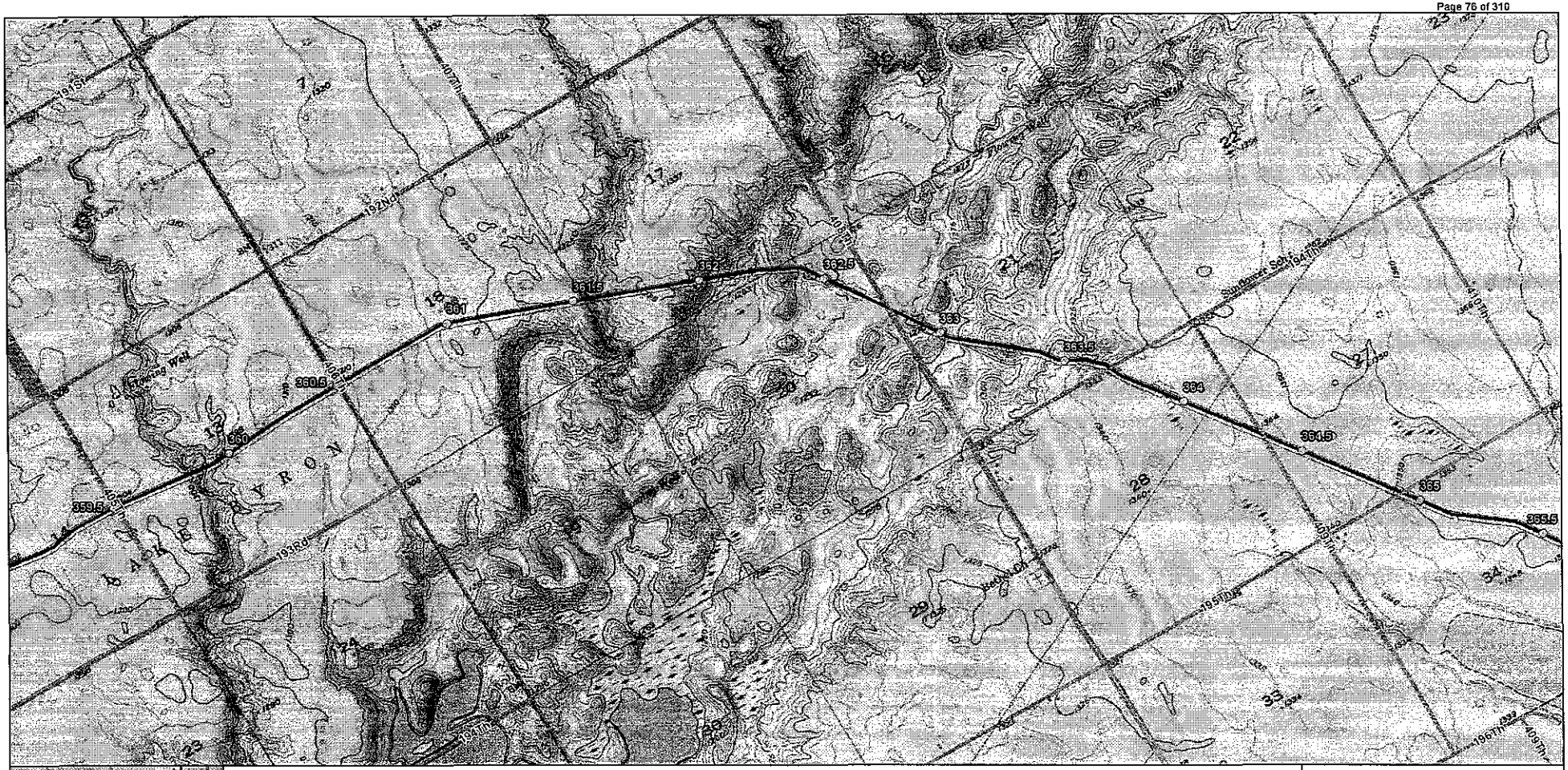

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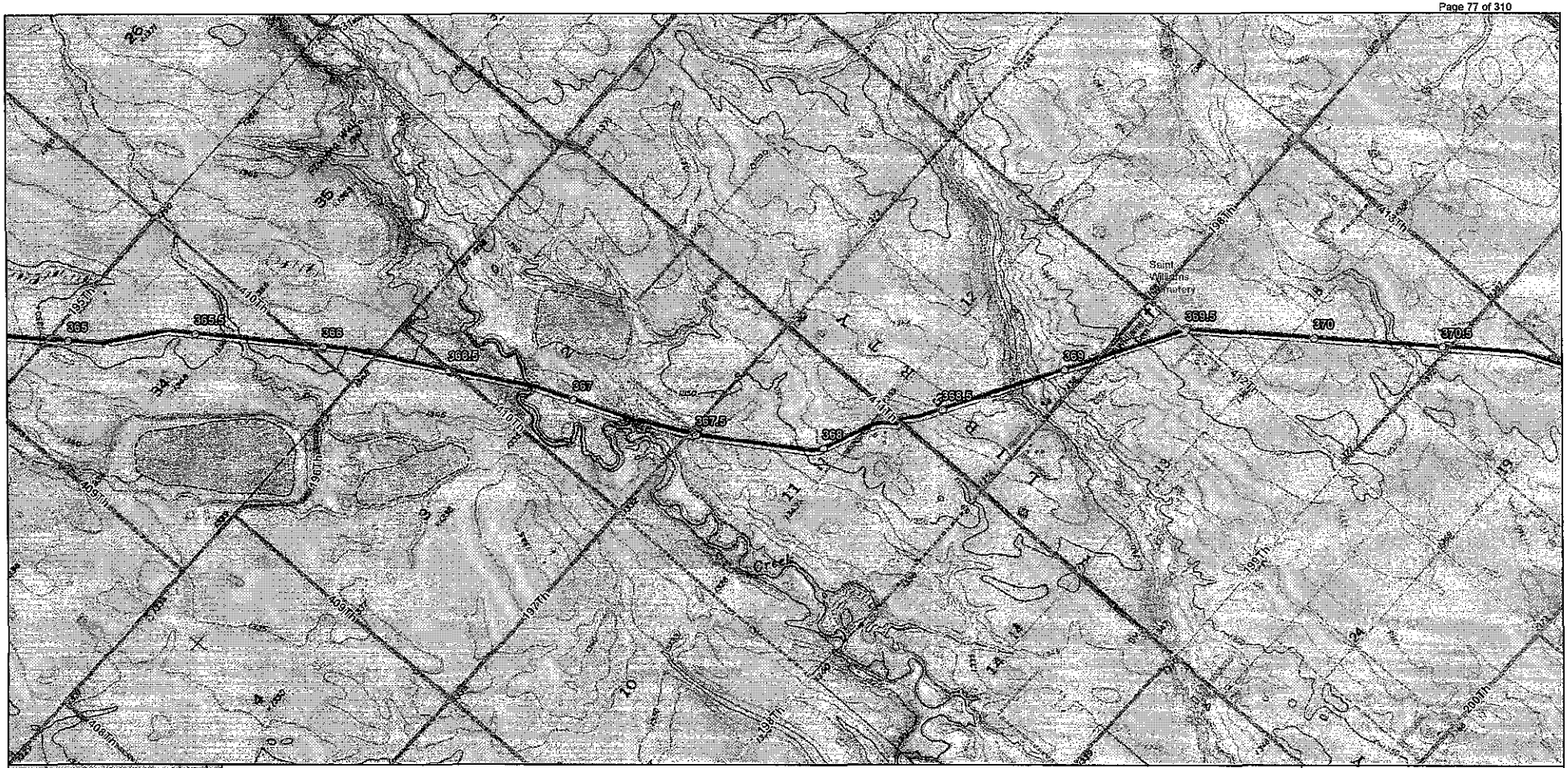

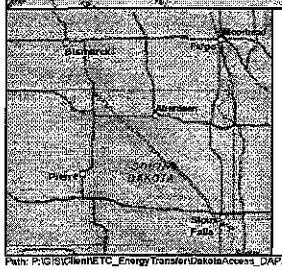

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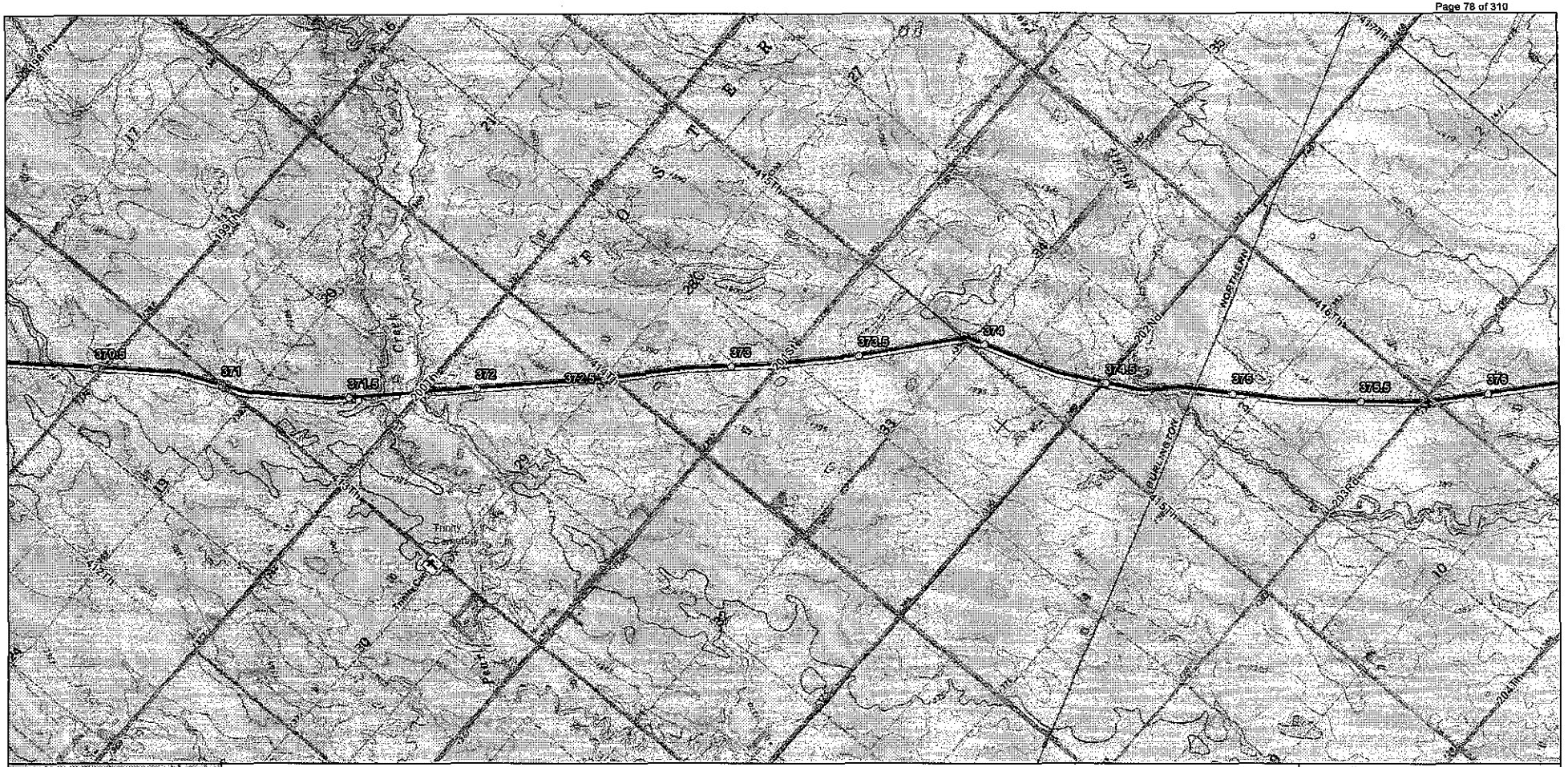

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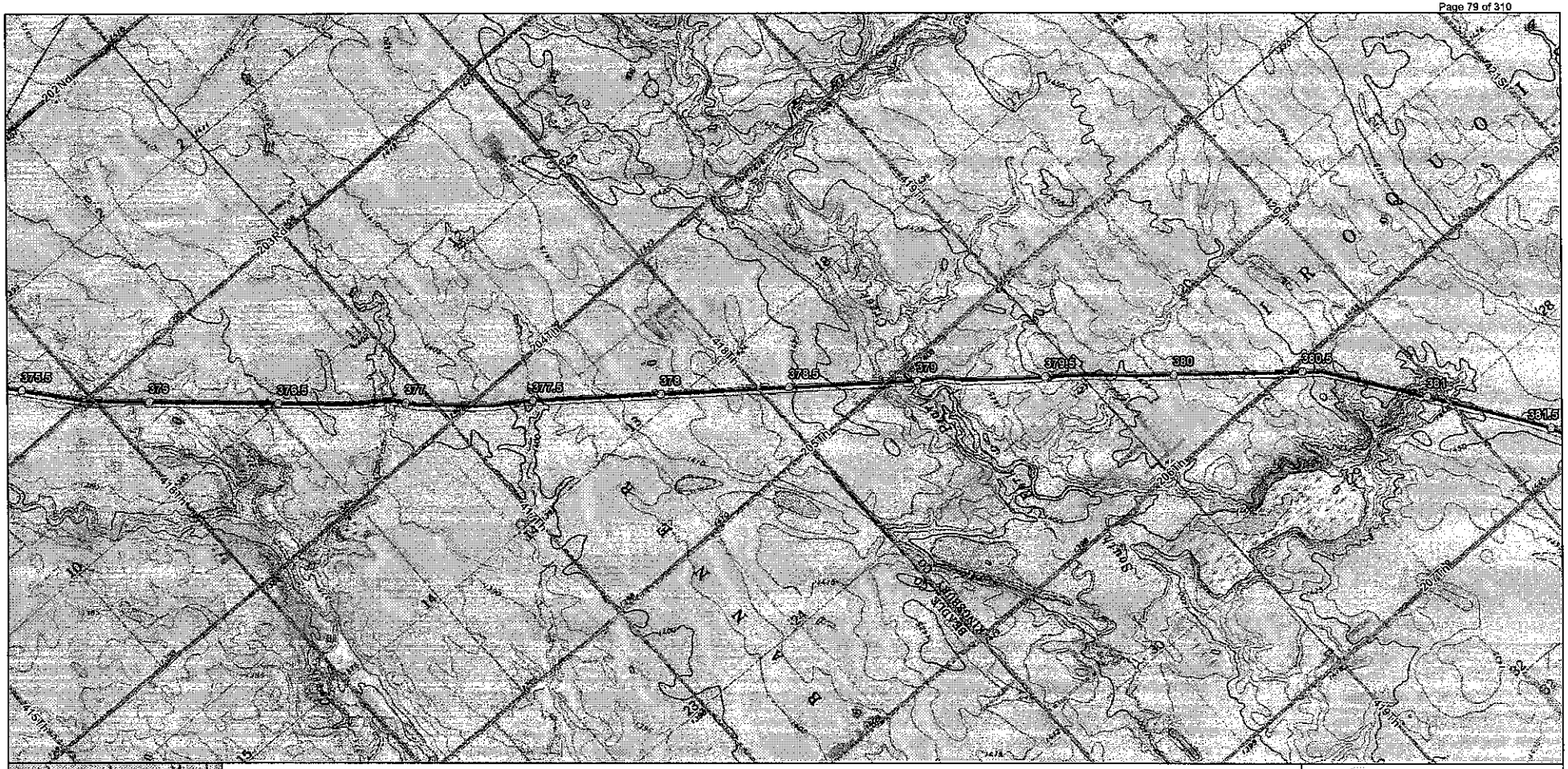
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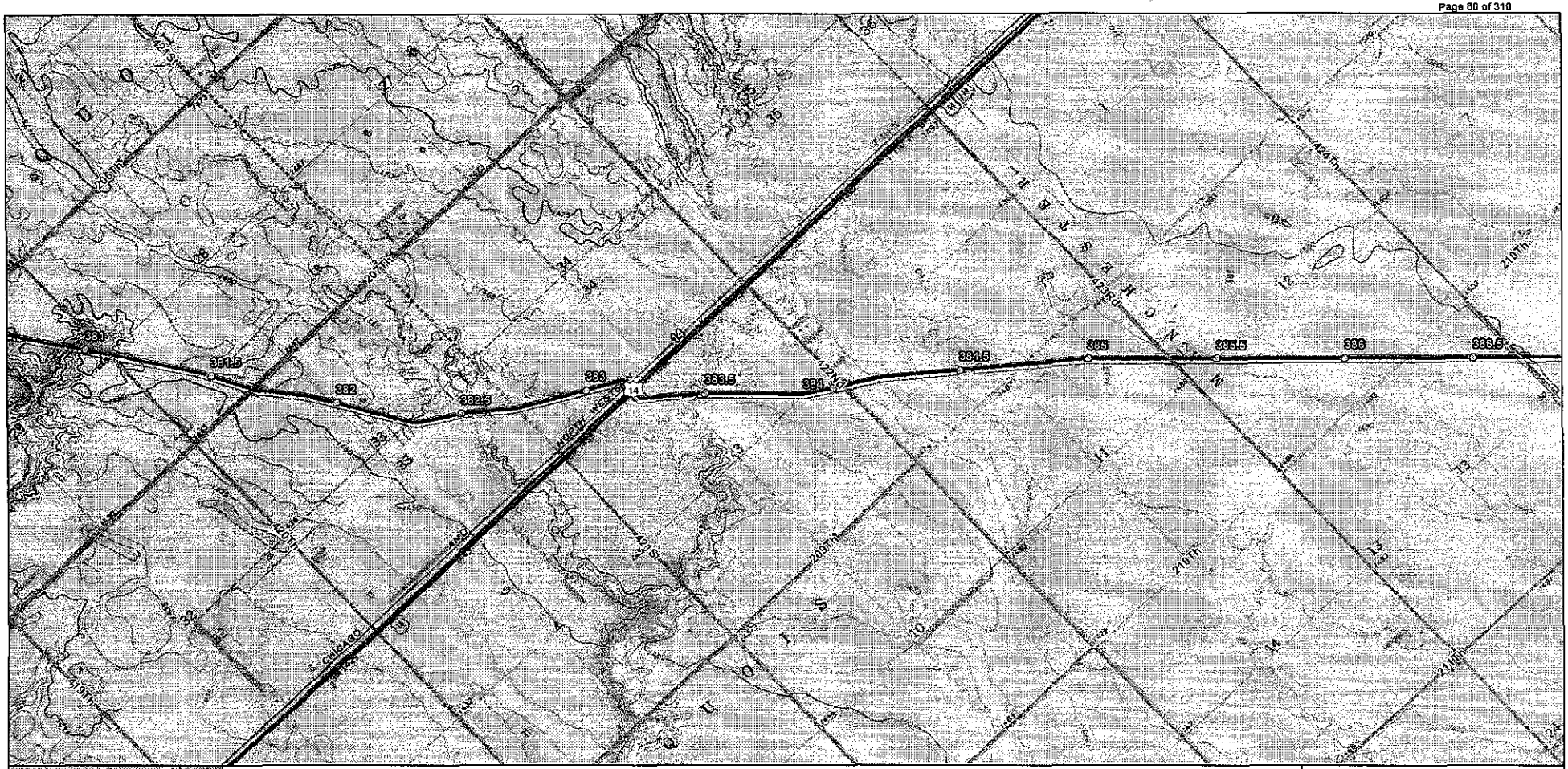
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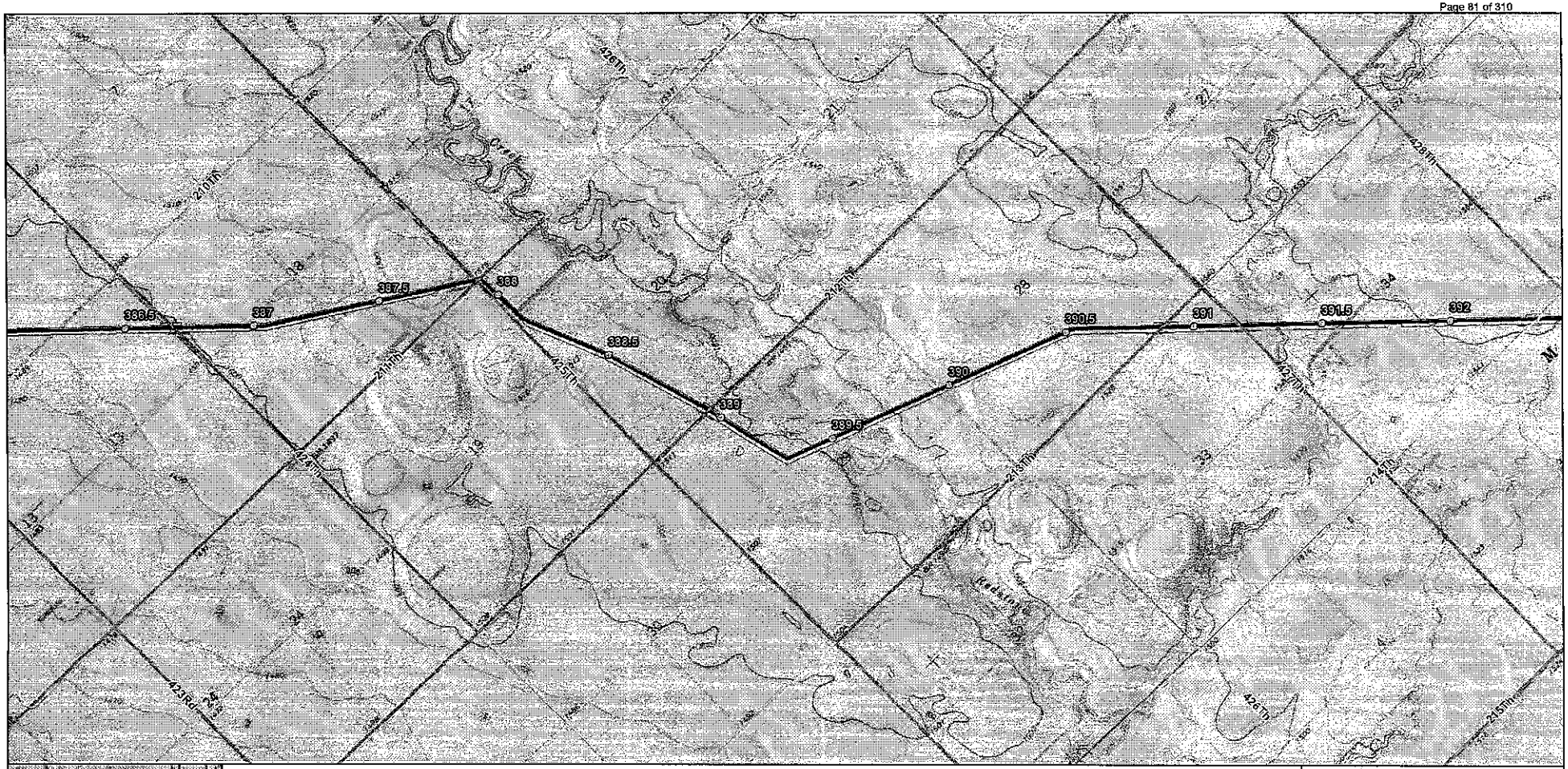

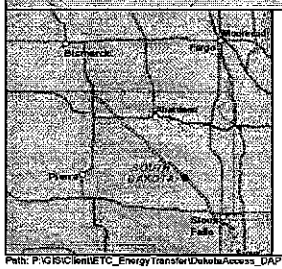

Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
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Local Road
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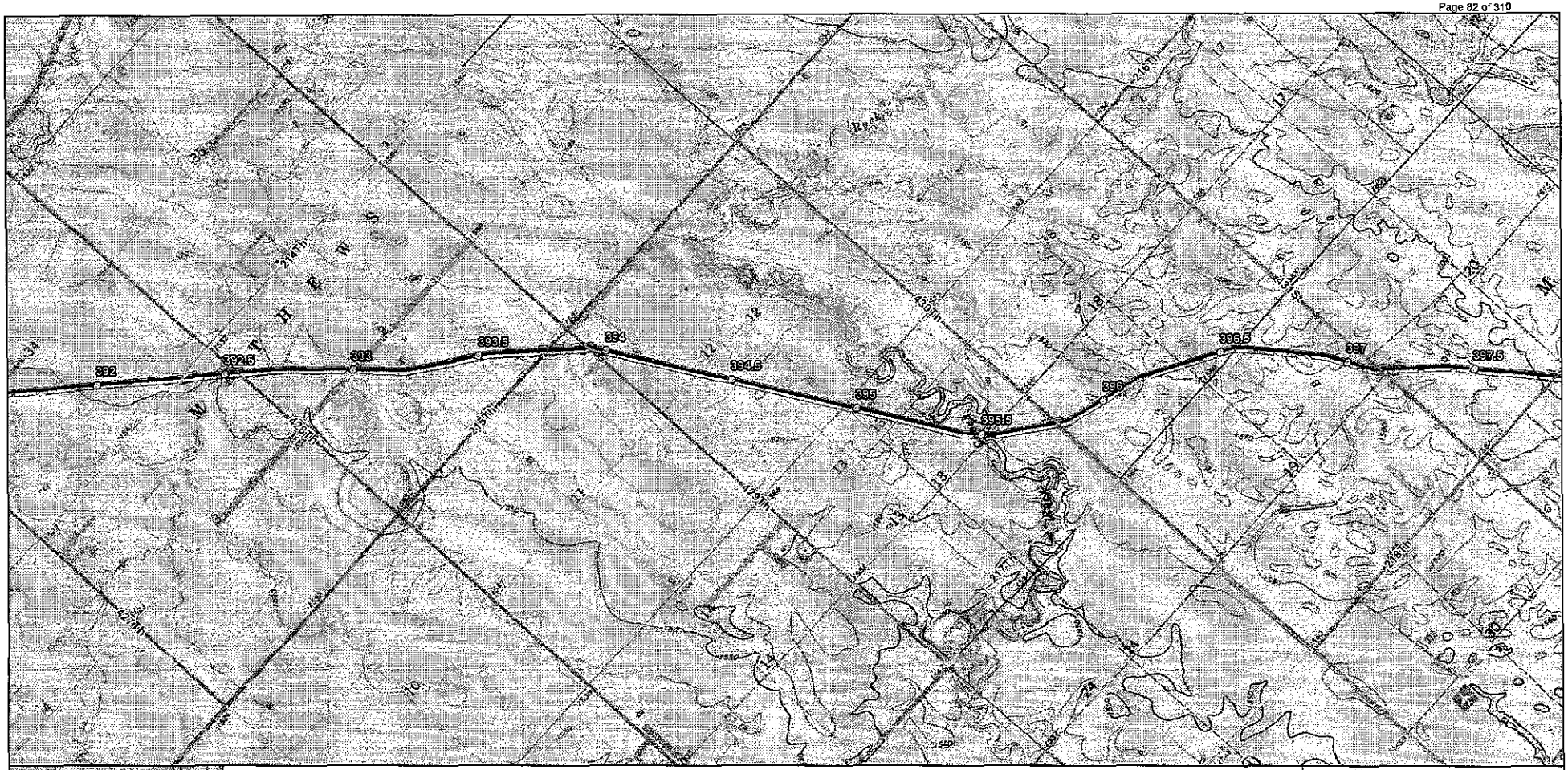
DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 32 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
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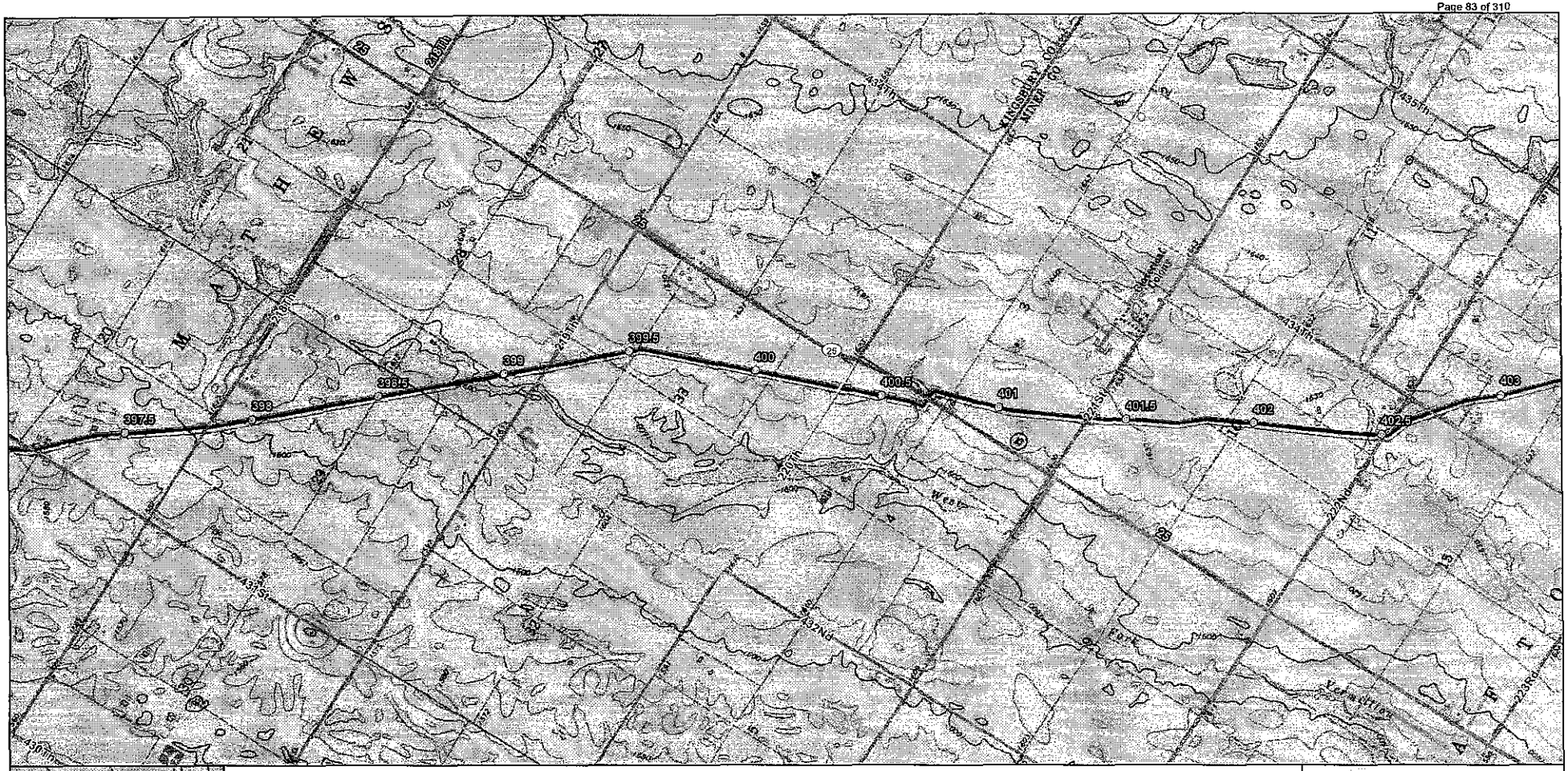

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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NAD 83 South Dakota South Ft	Date: April 2015

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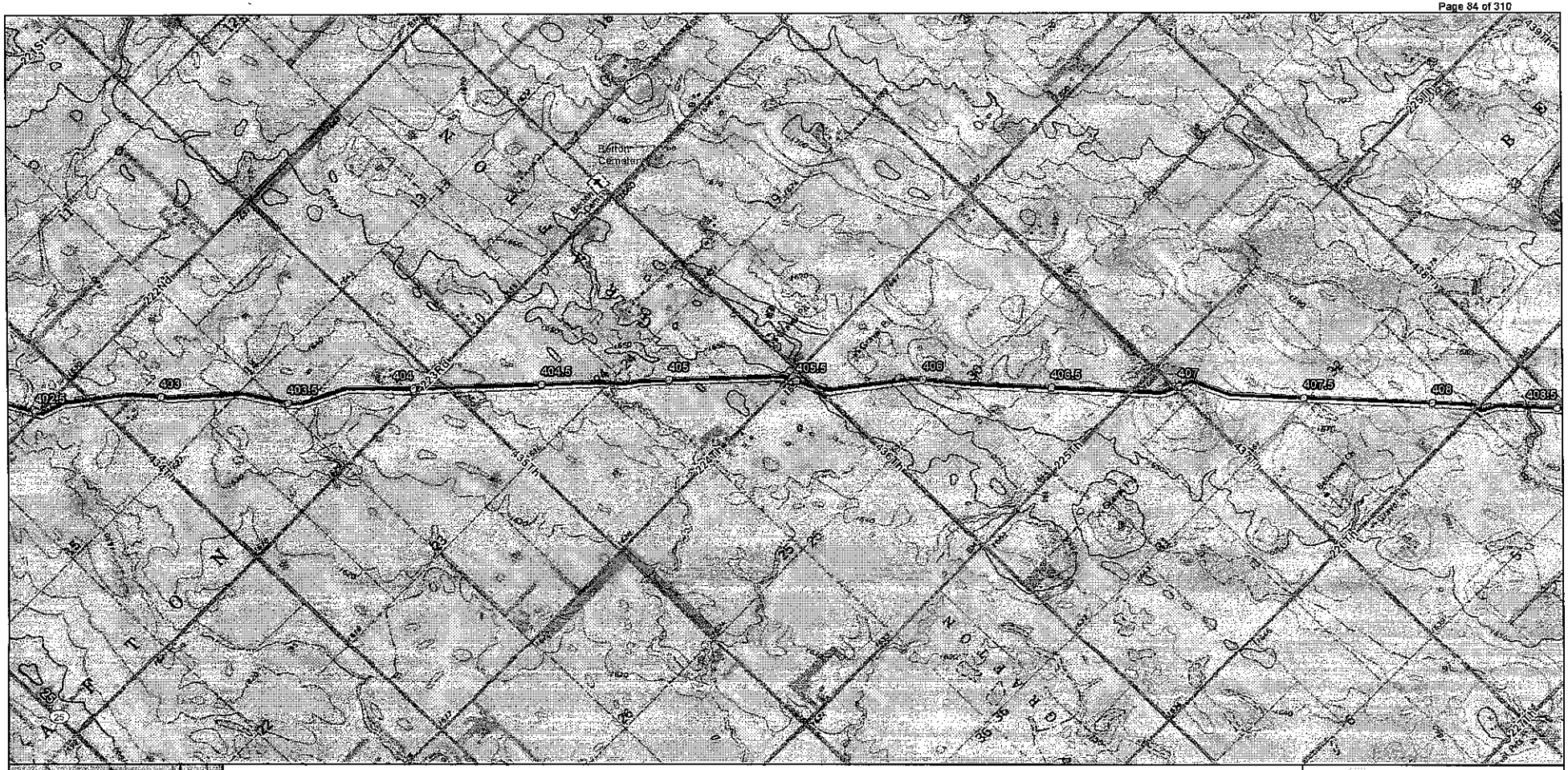

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
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South Dakota

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NAD 83 South Dakota South Ft	Date: April 2015

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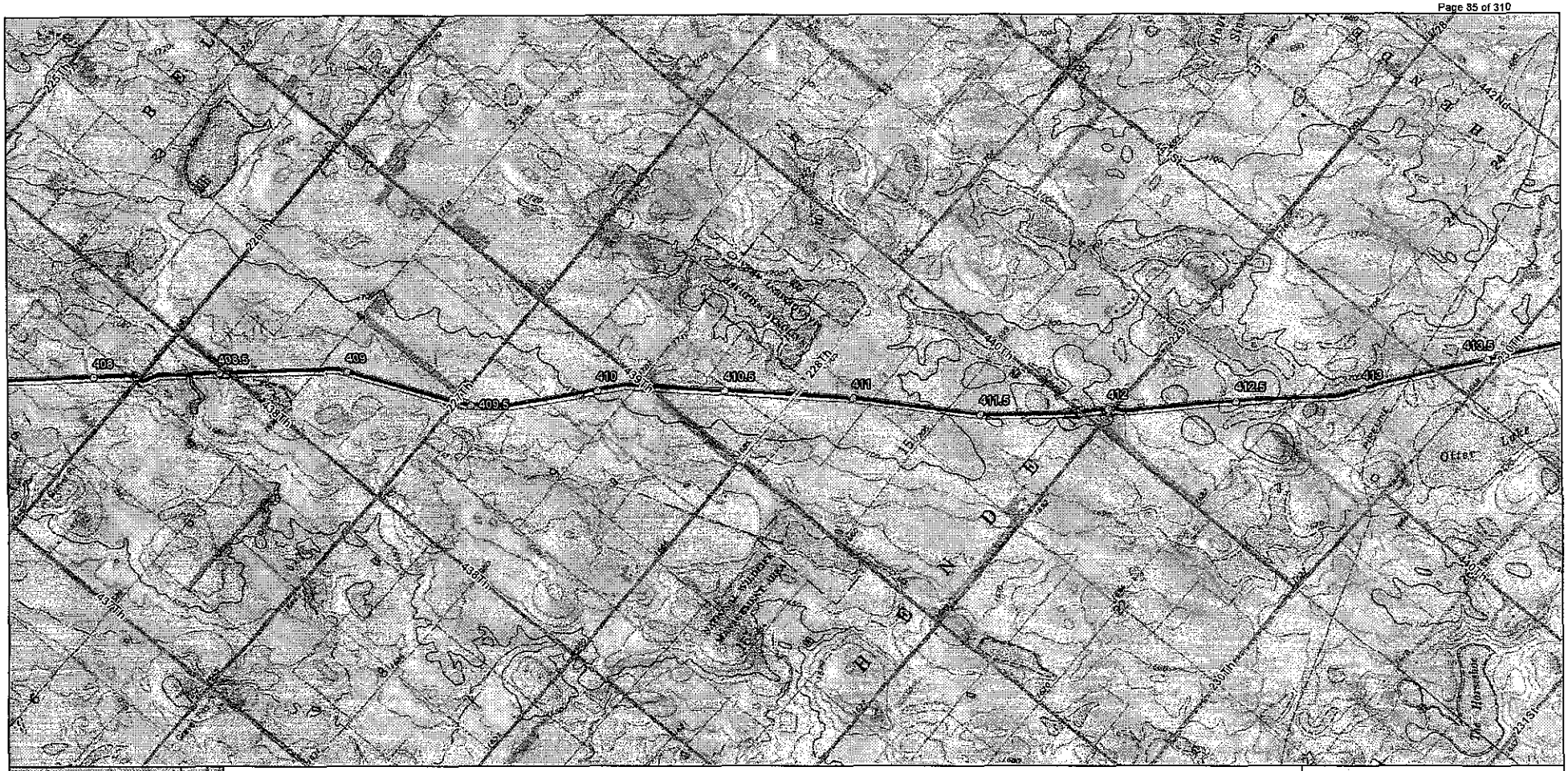

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
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South Dakota

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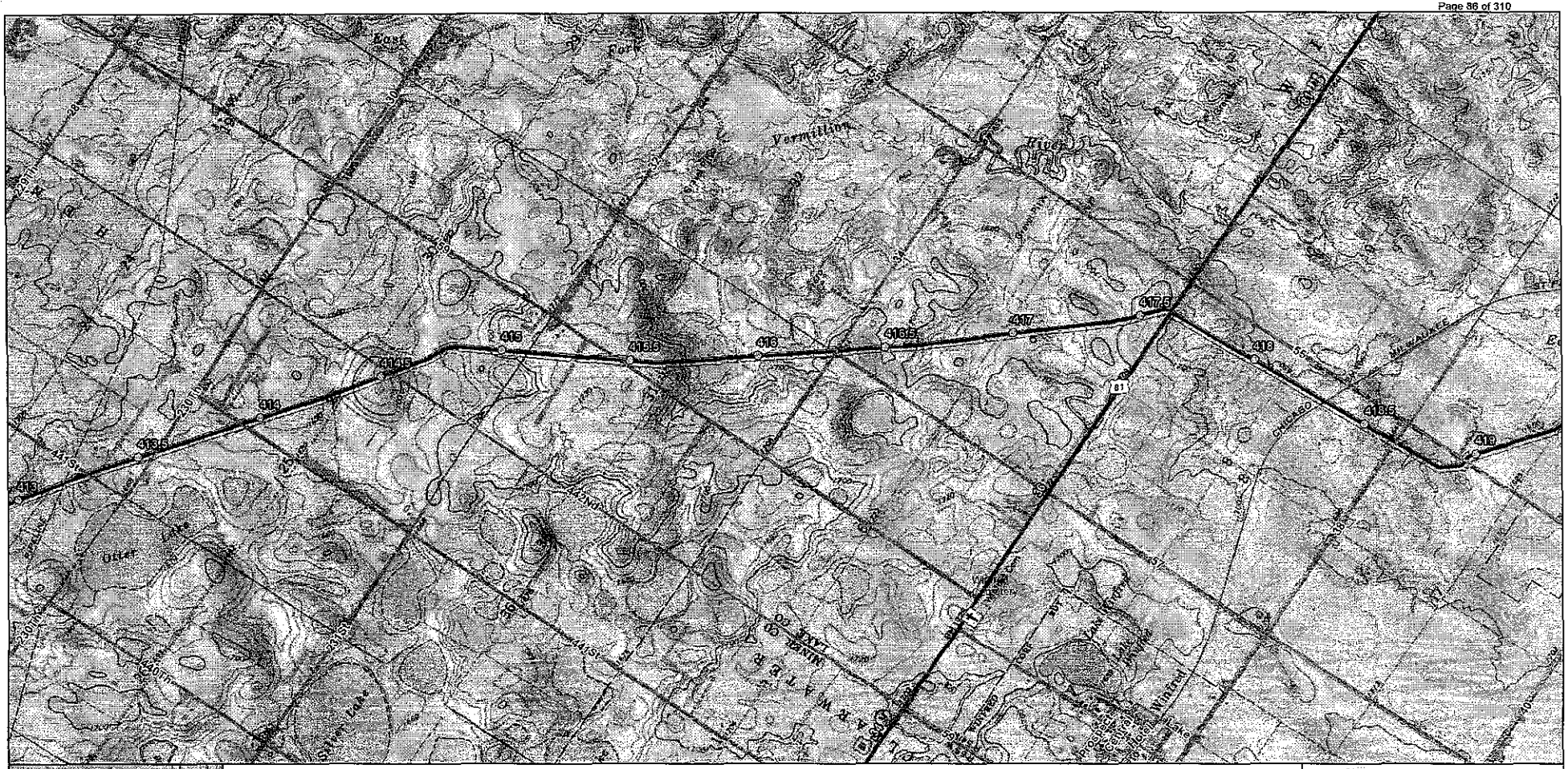

DAKOTA ACCESS, LLC

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Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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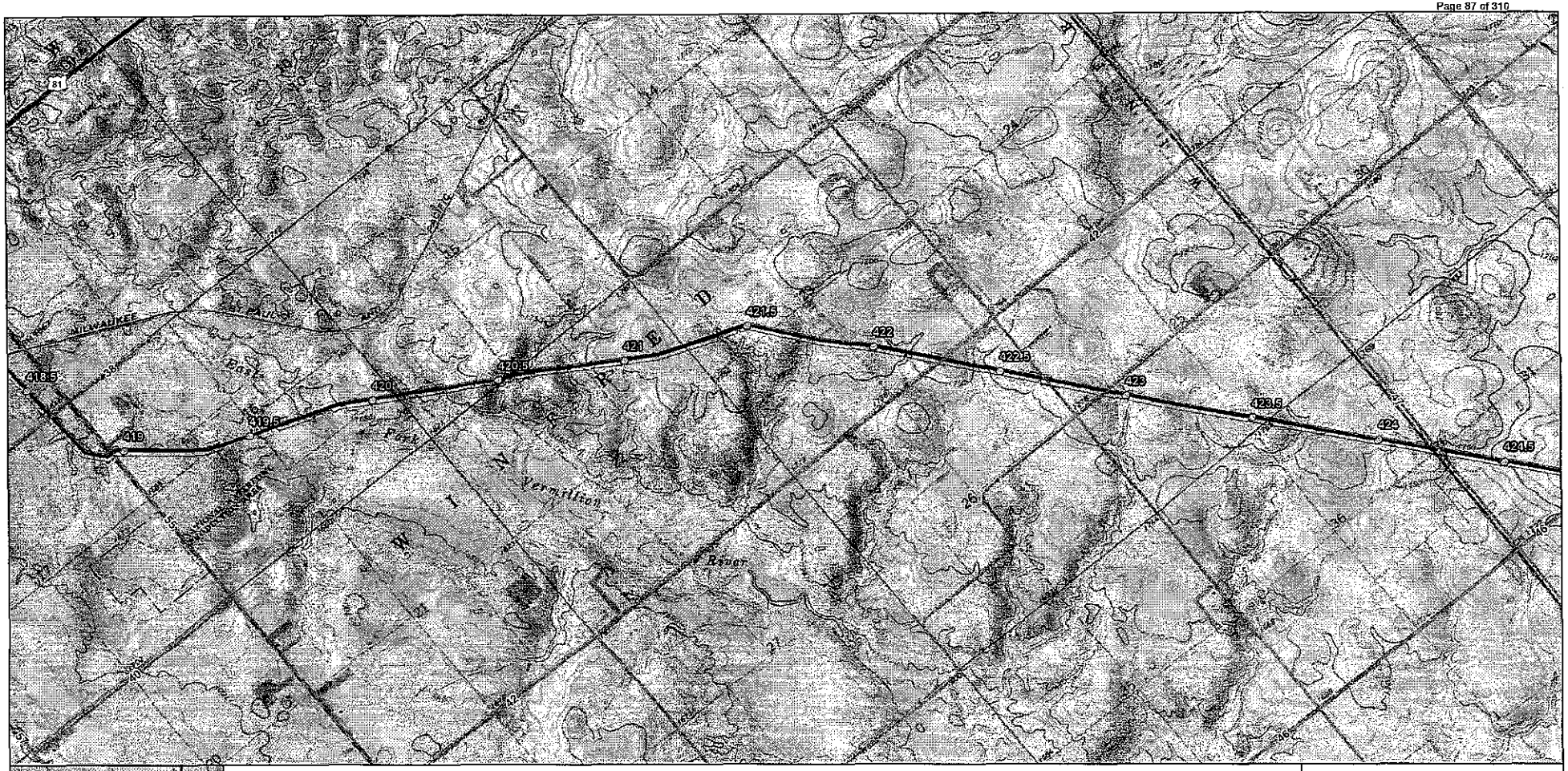

DAKOTA ACCESS, LLC

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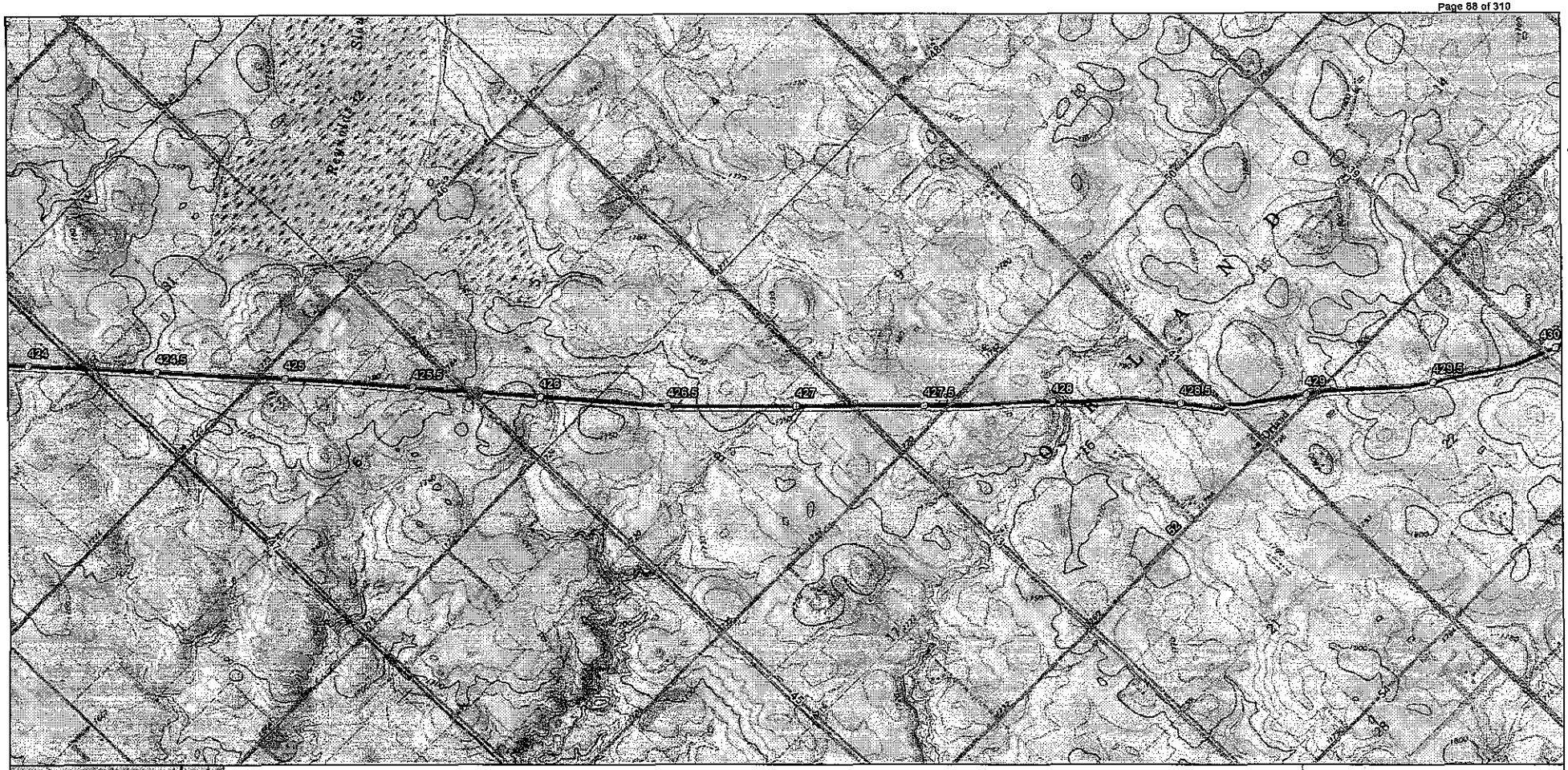

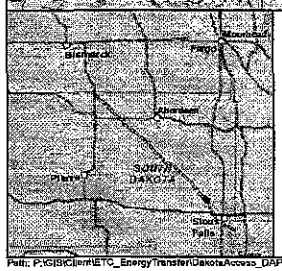

Milepost
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Other Road

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DAKOTA ACCESS, LLC

Dakota Access, LLC
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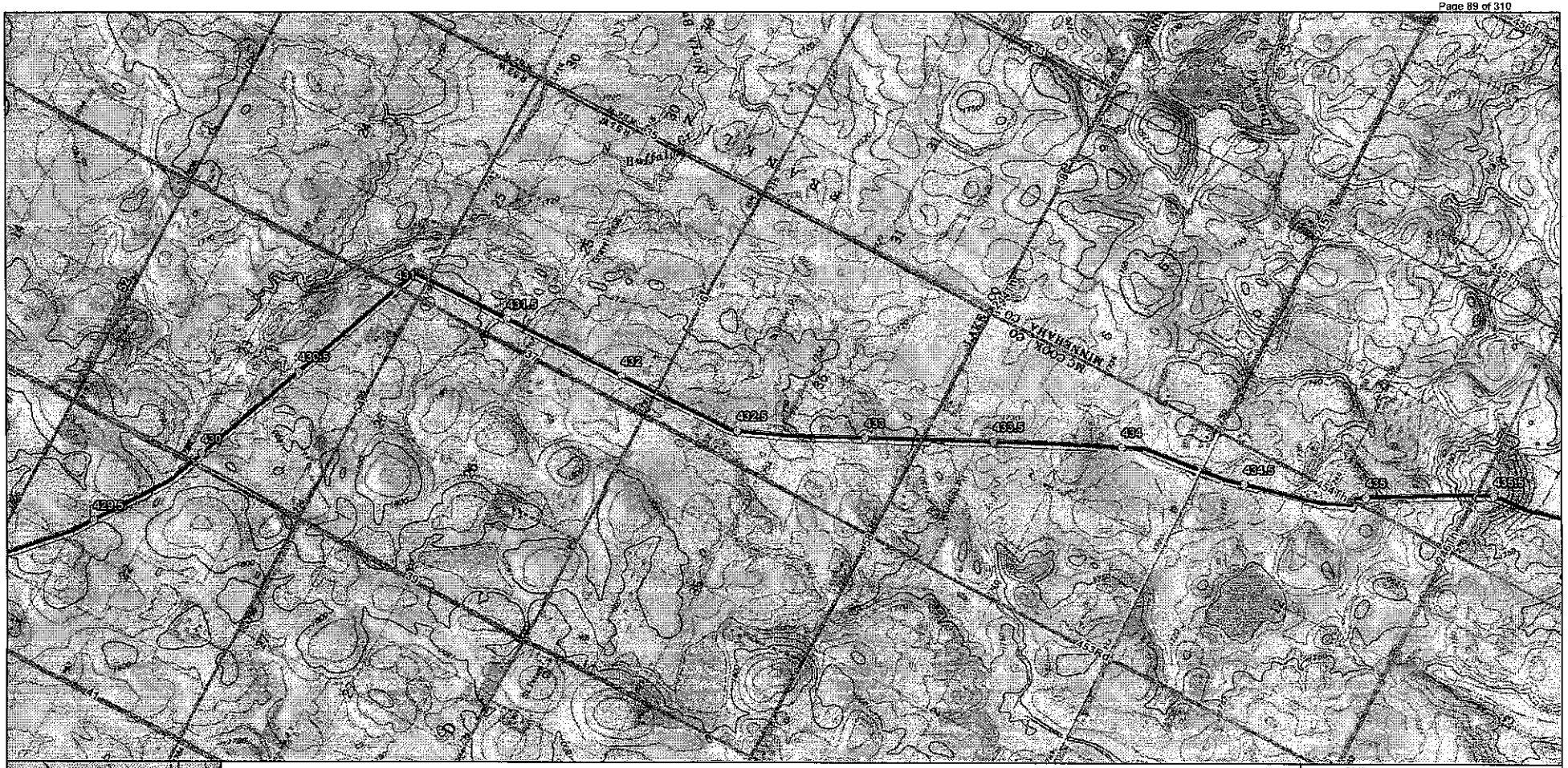

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
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DAKOTA ACCESS, LLC

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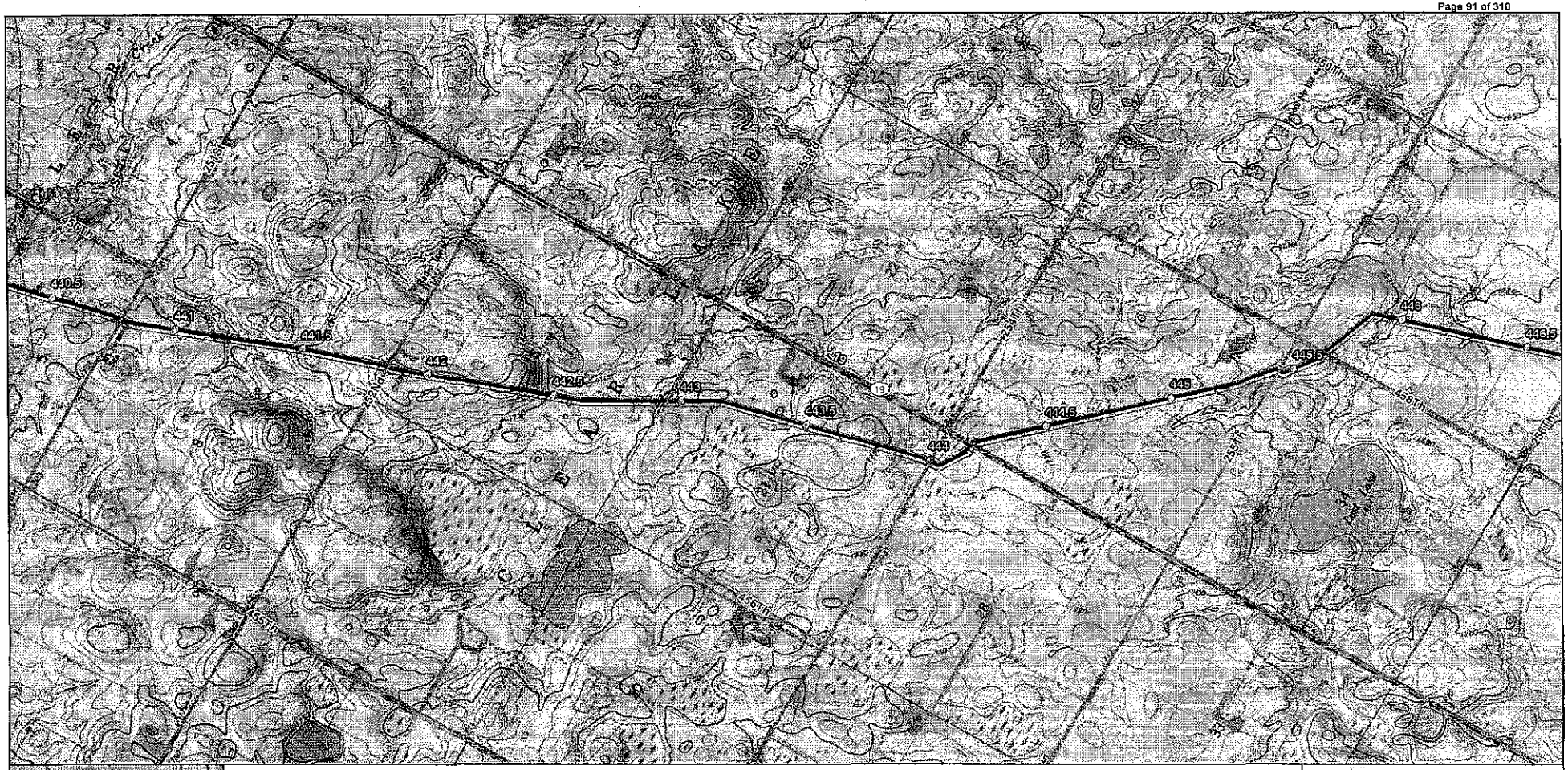

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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Exhibit A
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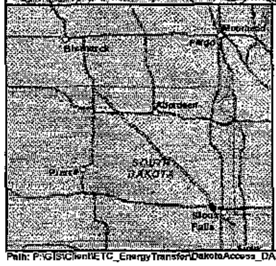

○ Milepost
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◆ Mainline Valve
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☐ Work Space
✝ Cemetery
✈ Airport
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▬ Major Road
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DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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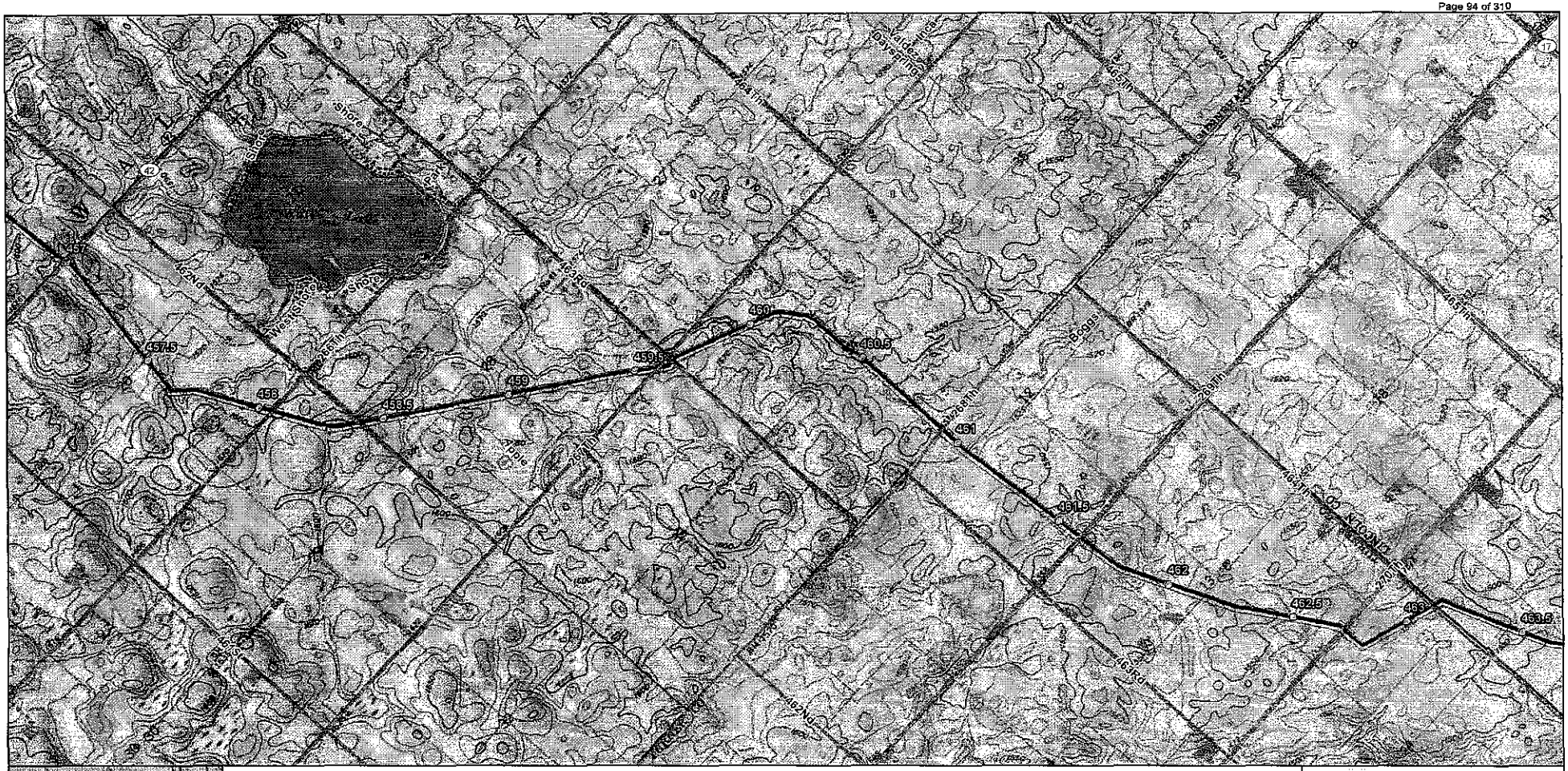
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General Site/Topographic Map
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Page 45 of 49
Scale: 1:24,000
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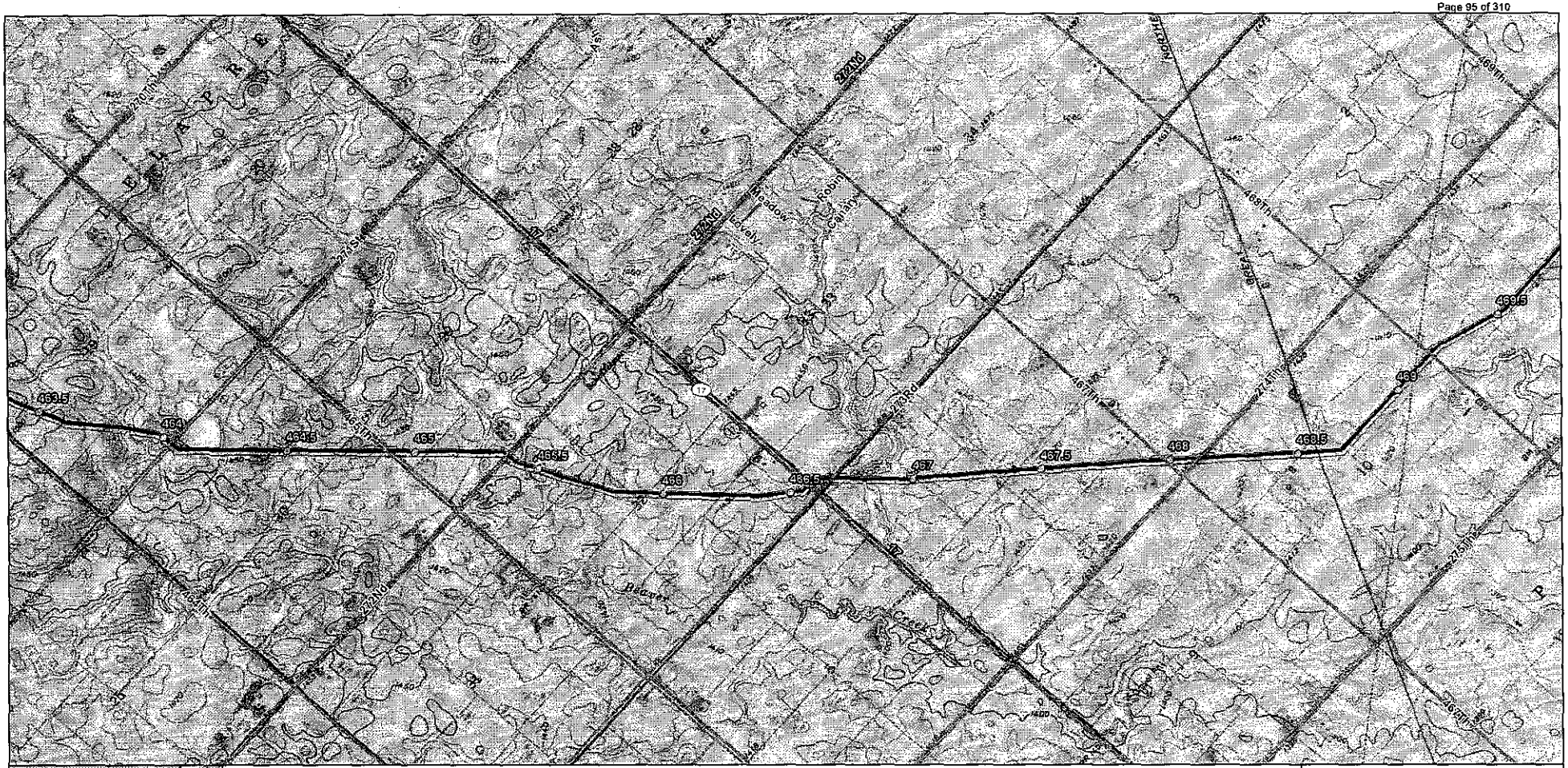

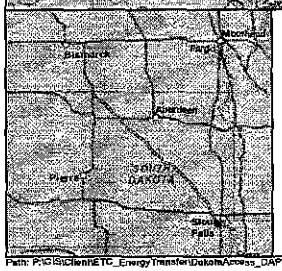

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DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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NAD 83 South Dakota South Ft	Date: April 2015

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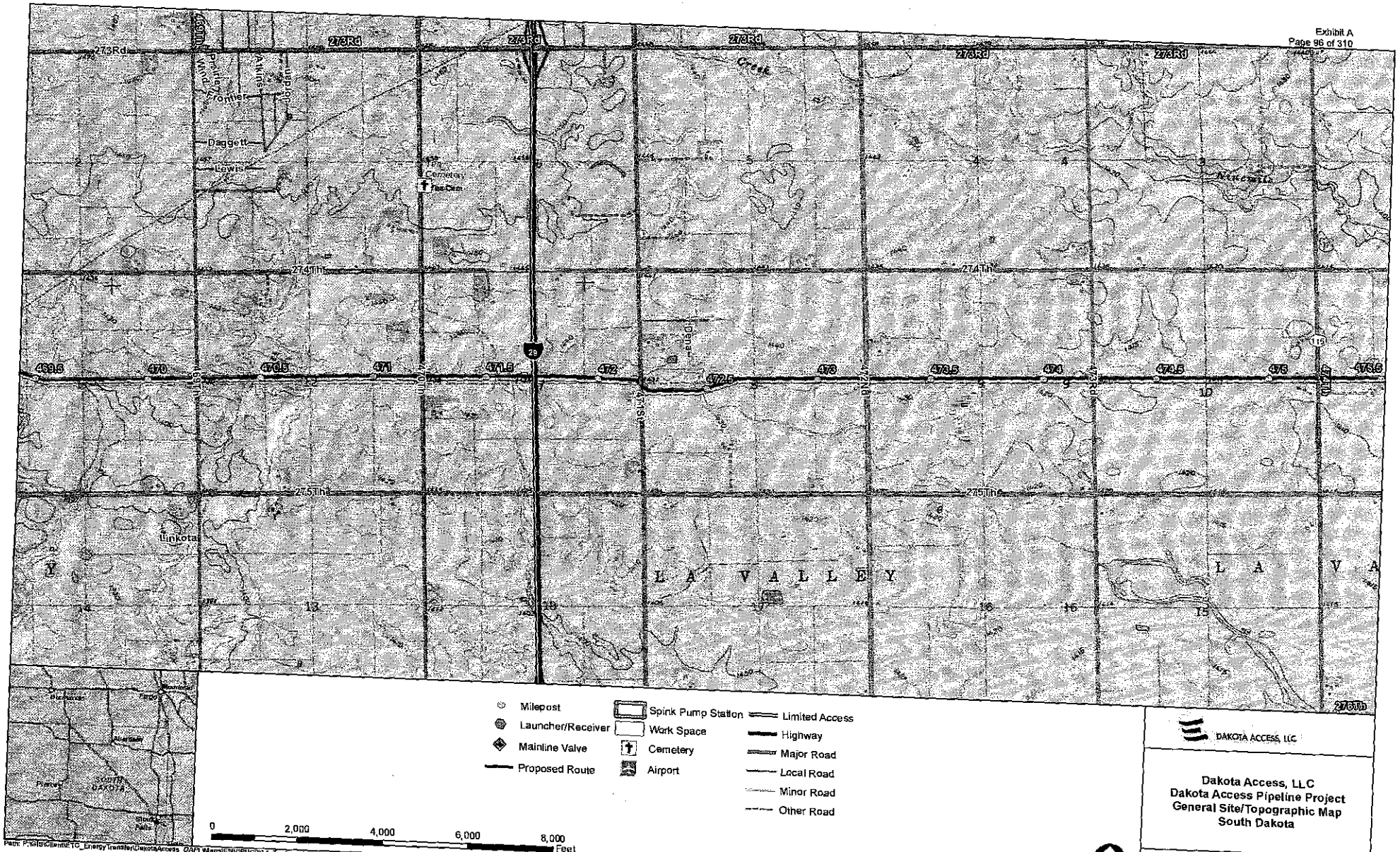
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Prairie Winds Frontier
Atkinson
Daggett
Lewis
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Tee Dem
Nikewild
274Th
Ingram
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Milepost
Launcher/Receiver
Mainline Valve
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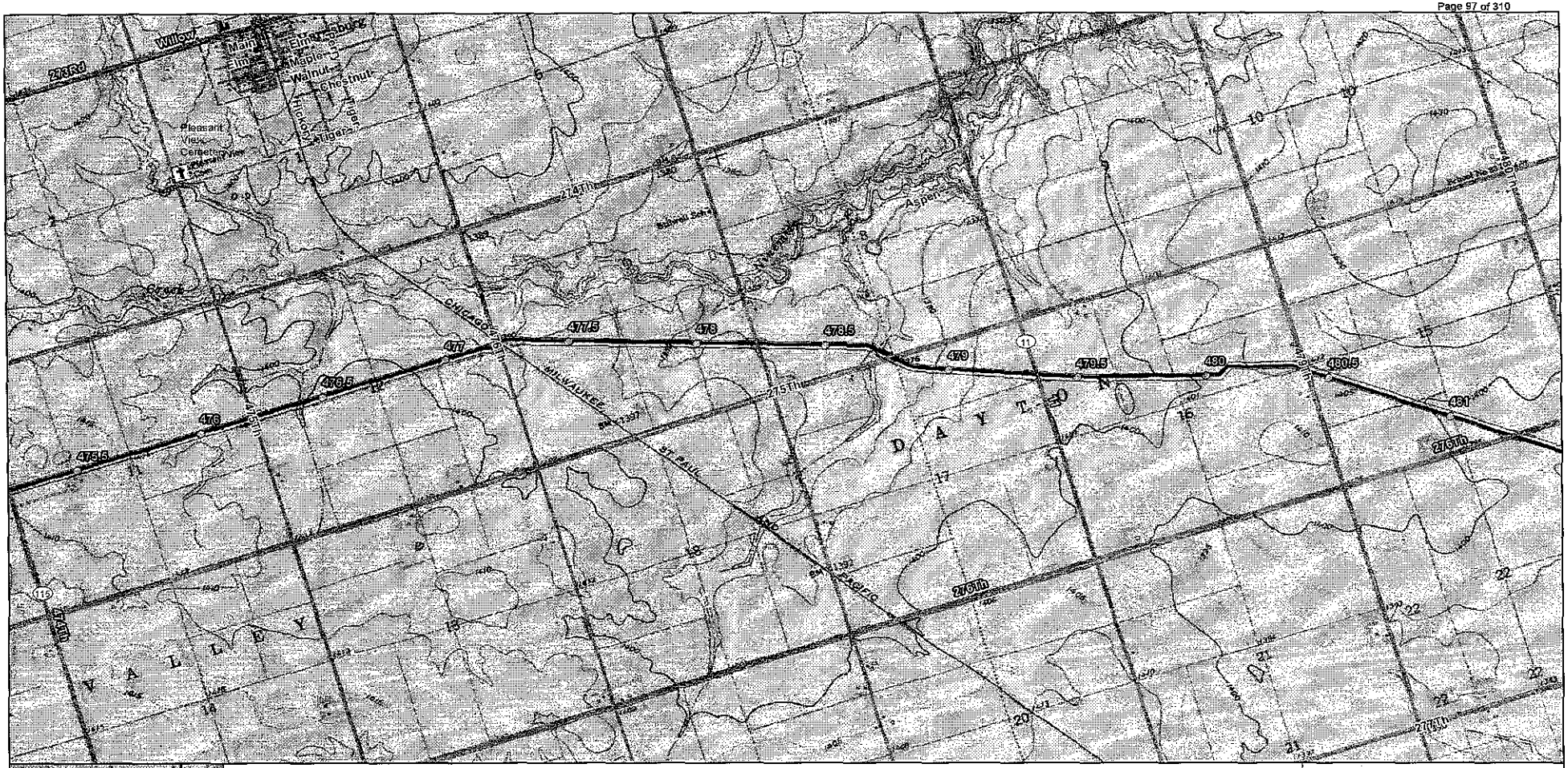
Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota
Page 47 of 49
Scale: 1:24,000
NAD 83 South Dakota South Ft
Date: April 2015


Willow
Main
Elm
Elm Cabin
Maple
Walnut
Chestnut
Cedar
Pleasant View Cemetery
206Rd
147Th
Creek
Aspen
Spring Creek
CHEYENNE RIVER
275Th
SIOUX VALLEY
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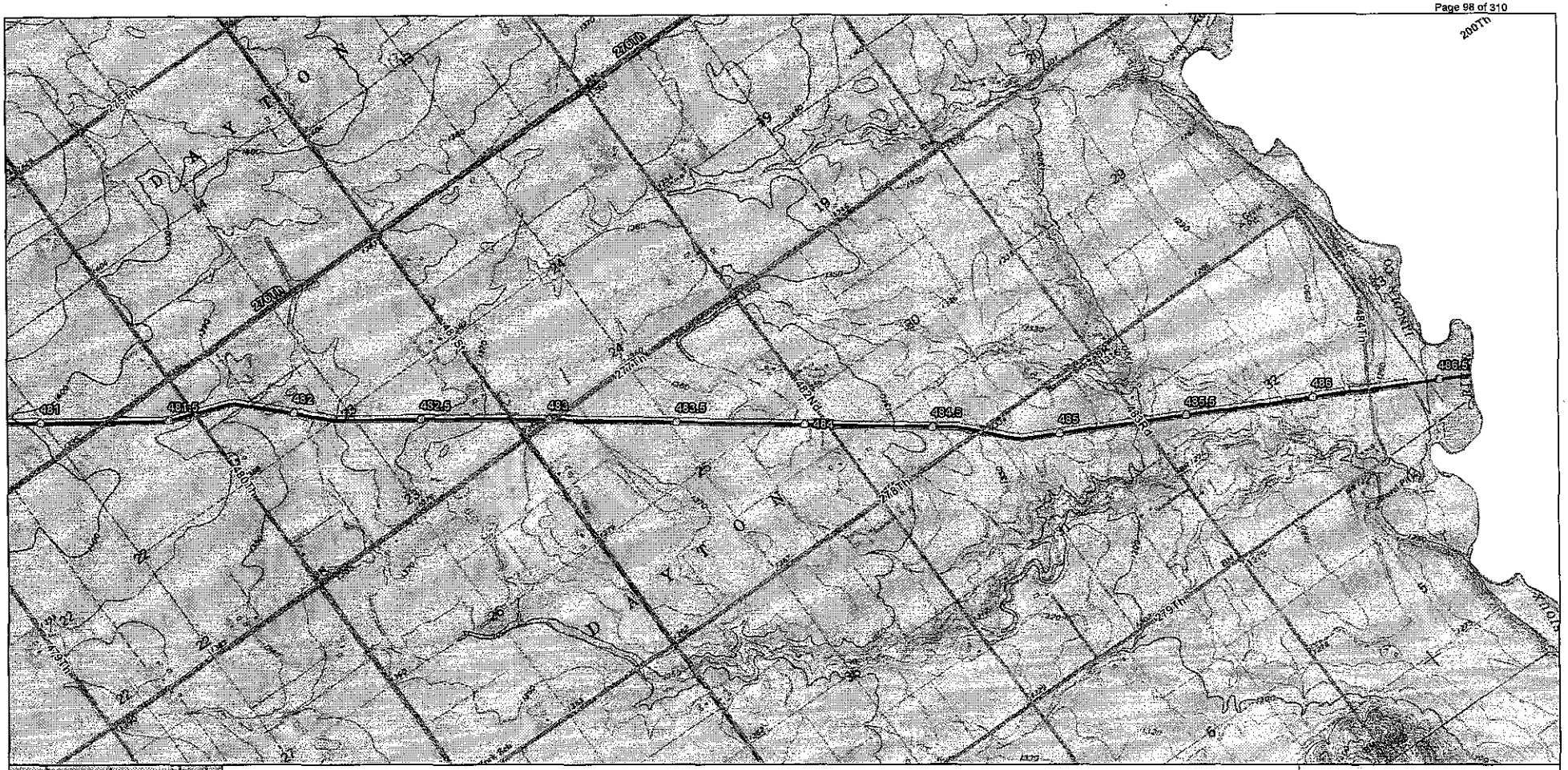
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GeoEngineers

Memorandum

3050 South Delaware, Springfield, Missouri 65804, Telephone: 417.831.9700, Fax: 417.831.9777 www.geoengineers.com

To:	Jack Edwards, Dakota Access, LLC
From:	Mark Miller MM Craig Erdman CE for CE
Date:	April 17, 2015
File:	18782-011-00
Subject:	Response to South Dakota Public Utilities Commission Dakota Access Pipeline Project – Proposed Alignment in South Dakota
Attachments:	Figures 1 through 4. Overburden Thickness

INTRODUCTION

At your request, we have prepared this memorandum to respond to three comments (Data Response No. 11 through 13) provided by the South Dakota Public Utilities Commission (SDPUC). These comments are related to the proposed Dakota Access Pipeline (DAPL) alignment or route through South Dakota and were provided to us via email from Jack Edwards of Dakota Access, LLC on March 30, 2015.

Data Response No. 11:

SDPUC Comment: Please provide cross sections of the bedrock geology and surficial geology to depict the major subsurface variations in accordance with Administrative Rules of South Dakota (ARSD) 20:10:22:14(3).

Reply:

ARSD 20:10:22:14(3) states "A written summary of the geological features of the plant, wind energy, or transmission site using the topographic map as a base showing the bedrock geology and surficial geology with sufficient cross-sections to depict the major subsurface variations in the siting area."

The Geology Mapbook in Appendix A of the preliminary geology and geologic hazards report (GeoEngineers, 2014) presents the geologic units exposed at the surface in the vicinity of the DAPL alignment. Bedrock is typically exposed at the ground surface near the alignment where it crosses from North Dakota into South Dakota (approximate MP 212). As shown within the mapbook, the geologic materials exposed at the surface along most of the alignment within South Dakota consist of Quaternary glacial drift deposits, eolian deposits, lacustrine deposits, and alluvium. Table A-2B of the preliminary geology and geologic hazards report (GeoEngineers, 2014) presents the geologic units exposed at the surface based on publically available data.

To further address the request, we reviewed the geologic map of bedrock prepared by Tomhave and Schulz (2004) and digital (GIS) data of bedrock occurrence and top of bedrock contours. The Quaternary units overlying the bedrock consist of a variety of glacial drift deposits (outwash, glacial till, and other associated deposits), interglacial deposits, and recent, lacustrine, eolian and alluvial deposits. These glacial and non-glacial deposits vary widely laterally and vertically.

Based on our review, it is our opinion that construction of a cross section along the entire alignment would be impractical. However, in response to the data request, we provide below an expanded discussion of the bedrock geology beneath the Quaternary deposits and the thickness of the surficial materials overlying the bedrock.

Based on the map by Tomhave and Schulz (2004), the bedrock underlying the Quaternary deposits within 5 miles of the proposed pipeline alignment consists of the Fox Hills Sandstone, Pierre Shale, Niobrara Limestone, Carlile Shale, Greenhorn Formation, Graneros Shale, Dakota Formation, undifferentiated Cretaceous rocks, and Sioux Quartzite. With the exception of the Sioux Quartzite, all of these rocks are Cretaceous (145 to 65 million years old). Only the Pierre Shale, the Niobrara Limestone, the Carlile Shale, the undifferentiated Cretaceous rocks, and the Sioux Quartzite are mapped beneath the proposed alignment.

The Pierre Shale underlies the Quaternary deposits along a majority of the alignment. The Pierre Shale consists of blue-gray to dark gray shale with occasional beds of bentonite, black shale and light-brown chalky shale. There are also minor beds of sandstone, conglomerate and carbonate or ferruginous concretions. The Pierre Shale is up to 1,000 feet thick. The Pierre Shale is mapped beneath the Quaternary deposits from the North Dakota-South Dakota state line (approximate MP 212) to approximate MP 319.4. Between MP 319.4 and approximate MP 361.7, the Pierre Shale is mapped beneath the alignment intermittently. The Pierre Shale is then mapped beneath the overburden along the alignment from approximate MP 363.5 to approximate MP 417.2 and then approximate MP 419.5 to approximate MP 420.4.

The Niobrara Limestone (also known as the Niobrara Formation) consists of white to dark gray argillaceous chalk, marl and shale, with occasional thin beds of bentonite, chalky carbonaceous shale, sand and small concretions. The Niobrara Limestone is up to 150 feet thick. The Niobrara Limestone, as mapped, appears to be consistent with potential karst areas along the alignment as shown on mapping by Tobin and Weary (2004). The Niobrara Limestone is mapped beneath the Quaternary deposits intermittently between MP 323 and approximate MP 363.5. The Niobrara Limestone is mapped beneath the Quaternary deposits along another segment from approximate MP 417.2 to approximate MP 419.5 and approximate MP 420.4 to approximate MP 432.3. The Niobrara Limestone is mapped beneath the Quaternary deposits along two separate segments near the southeastern end of the alignment in South Dakota. The first of these two segments extends from approximate MP 478.4 to approximate MP 479.8; the second segment extends from approximate MP 482.4 to approximate MP 485.4.

The Carlile Shale consists of dark gray to black silty to sandy shale with zones where concretions are found. There are reported to be up to three sandstone layers in the upper portion of the formation. The basal unit consists of sandy calcareous marl. The Carlile Shale is up to 330 feet thick. The Carlile Shale is mapped along the alignment at the surface or beneath the overburden from approximate MP 473.7 to approximate MP 478.4; from approximate MP 479.8 to approximate MP 482.4; and from approximate MP 485.4 to approximate MP 486.8.

The undifferentiated Cretaceous deposits consist of black opaline spiculite, gray to black shale, yellow-brown to gray chalk, gray silty clay and sandstone. The thickness of the undifferentiated Cretaceous deposits is up to 400 feet. The undifferentiated Cretaceous deposits are mapped beneath the Quaternary deposits or at the ground surface from approximate MP 441.4 to approximate MP 444.0, from approximate MP 454.3 to

approximate MP 462.1, from approximate MP 462.6 to approximate MP 466.2, from approximate MP 468.7 to approximate MP 470.6, and from approximate MP 472.4 to approximate MP 473.7.

The Sioux Quartzite consists of pink and reddish to tan, fine to coarse-grained iron-stained orthoquartzite with minor meta-conglomerate and metamorphosed mudstone. The thickness of the Sioux Quartzite is estimated to be greater than 1,000 feet. The Sioux Quartzite is mapped at the surface or beneath the Quaternary deposits between approximate MP 432.3 to approximate MP 441.4, from approximate MP 444.0 to approximate MP 454.3, from approximate MP 462.1 to approximate MP 462.6, from approximate MP 466.2 and approximate MP 468.7 and from approximate MP 470.6 to approximate MP 472.4.

Utilizing the top of bedrock contour data and a digital elevation model (DEM) of the ground surface from the U.S. Geological Survey, we developed an overburden thickness map. Bedrock is generally present at variable depths below the ground surface along the alignment, but is typically 50 feet or more below the ground surface along the alignment. Bedrock is relatively shallow (less than about 75 feet below the ground surface) along the alignment near the North Dakota-South Dakota state line, in the central portion of the alignment within South Dakota where bedrock highs occur along the Pierre Shale (between approximate MP 322 and 380), and in localized areas near the southeastern portion of the alignment. Although the overburden is relatively shallow along central portion of the alignment in South Dakota, the cover over the Niobrara Limestone is relatively deep (greater than 100 feet). This is because the Niobrara was exposed in old drainage systems that eroded through the Pierre Shale. These valleys were subsequently filled with sediment during glaciation in the Quaternary.

We present maps of portions of the alignment to show thickness of overburden, based on the locations where the Niobrara Limestone is mapped along the alignment (see Figures 1 through 4).

Data Response No. 12:

SDPUC Comment: In sections 14.7 and 14.8 (ARSD 20:10:22:14(7) and (8)), it is identified that the project will cross approximately 47.5 miles of karst terrain. Please expand on the potential for subsidence to occur along the project route and whether or not the pipeline would be damaged as a result of subsidence.

Reply:

It is important to note that the map by Tobin and Weary (2004), (a digital version of the karst terrain mapping by Davies et al., 1984), was compiled at a very small-scale (1:7,500,000) and is intended to show areas that may be susceptible to karst. Because of the scale of the map, we have found it at times to not be very accurate. In addition, bedrock in the area shown in the map may be susceptible to karst development, but the mapping does not necessarily indicate that karst features are present.

To provide the information requested, we developed maps showing the overburden thickness along portions of the alignment where carbonate rocks are present beneath the alignment (see Figures 1 through 4). Based on this analysis, and review of boring logs from the South Dakota Geological Survey (2015), the thickness of Quaternary deposits over the limestone formations with the potential for karst (specifically the Niobrara Limestone) is typically greater than 75 feet. In an area where the cover appears to be near the minimum, in the vicinity of MP 485, the Niobrara Limestone is estimated to be about 70 feet below the ground surface. In addition, the Niobrara Limestone also appears to be relatively thin (perhaps on the order of 15 to 20 feet)

since the underlying Carlile Shale is mapped nearby at a similar depths and based on explorations in the area that encountered Carlile Shale in areas that were mapped as Niobrara Limestone.

Based on the thickness of the Quaternary deposits overlying the Niobrara Limestone and the relatively thin nature of the limestone, we estimate that the risk of substantial karst formation within Niobrara Limestone and the subsequent subsidence of the ground surface to be low. We observed no indications of sinkholes in our review of aerial imagery. Furthermore, there is no mapping of sinkholes, caves, or springs in the vicinity of the alignment based on our research.

Data Response No. 13:

SDPUC Comment: In sections 14.8 (ARSD 20:10:22:14(8)), please expand on the steps Dakota Access will take to protect the pipeline from subsidence. Include a discussion on the known measures Dakota Access could take to protect the pipeline from subsidence.

Reply

ARSD 20:10:22:14(8) states that "An analysis of any constraints that may be imposed by geological characteristics on the design, construction, or operation of the proposed facility and a description of plans to offset such constraints."

Based on the information presented in the reply to Data Response No. 12 above, the risk of subsidence related to karst along the project alignment within South Dakota is estimated to be low, therefore, no additional measures beyond conventional best management practices for pipeline construction are anticipated.

Should voids or other signs of karst development be encountered during construction, further, site-specific evaluations could be completed using geophysical methods. Geotechnical borings could also be completed to confirm the presence of voids. Subsidence could be mitigated by grouting voids encountered. Given that the Niobrara Limestone is relatively thin, we anticipate that the size of voids, if encountered would likely be relatively small. In the unlikely event that larger voids or other substantial features are encountered, site-specific review and assessment by a qualified geologist or geotechnical engineer would be recommended.

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Davies, W.E., Simpson, J.H., Ohlmacher, G.C., Kirk, W.S., and Newton, E.G., 1984, Map showing engineering aspects of karst in the United States: Reston, Va., U.S. Geological Survey National Atlas of the United States of America, scale 1:7,500,000. Dated 1984.

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Tobin, T.D., and Weary, D.J., 2004. "Digital Engineering Aspects of Karst Map: A GIS Version of Davies, W.E., Simpson, J.H., Ohlmacher, G.C. Kirk, W.S., and Newton, E.G., 1984, 'Engineering Aspects of

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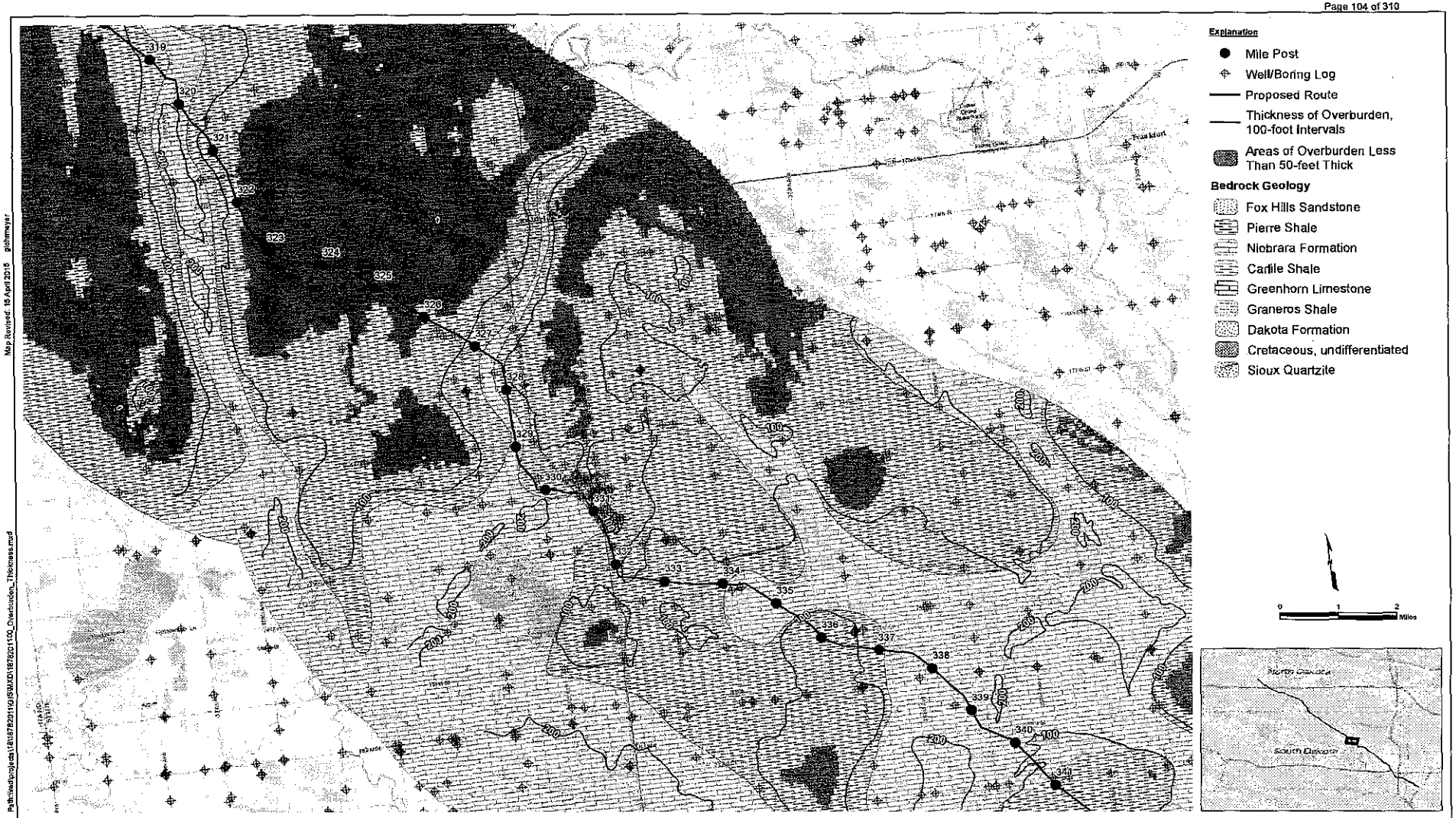
Tomhave, Dennis W. and Schulz, Layne D., 2004. Bedrock Geologic Map Showing Configuration of the Bedrock Surface in South Dakota East of the Missouri River. 1:500,000. South Dakota Department of Environment and Natural Resources, Geological Survey. 1 plate. June 30, 2004.



Map Revised: 15 April 2015 glohmeyer

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Office: Redmond

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Well/Boring logs obtained from the South Dakota Department of Environment and Natural Resources Geological Survey Program (2014).
Bedrock geology of eastern South Dakota is digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014). The overburden thickness were developed from 10-meter digital elevation model (DEM) grid obtained from the U.S. Geological Survey (2014) and top of bedrock contours in digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014).

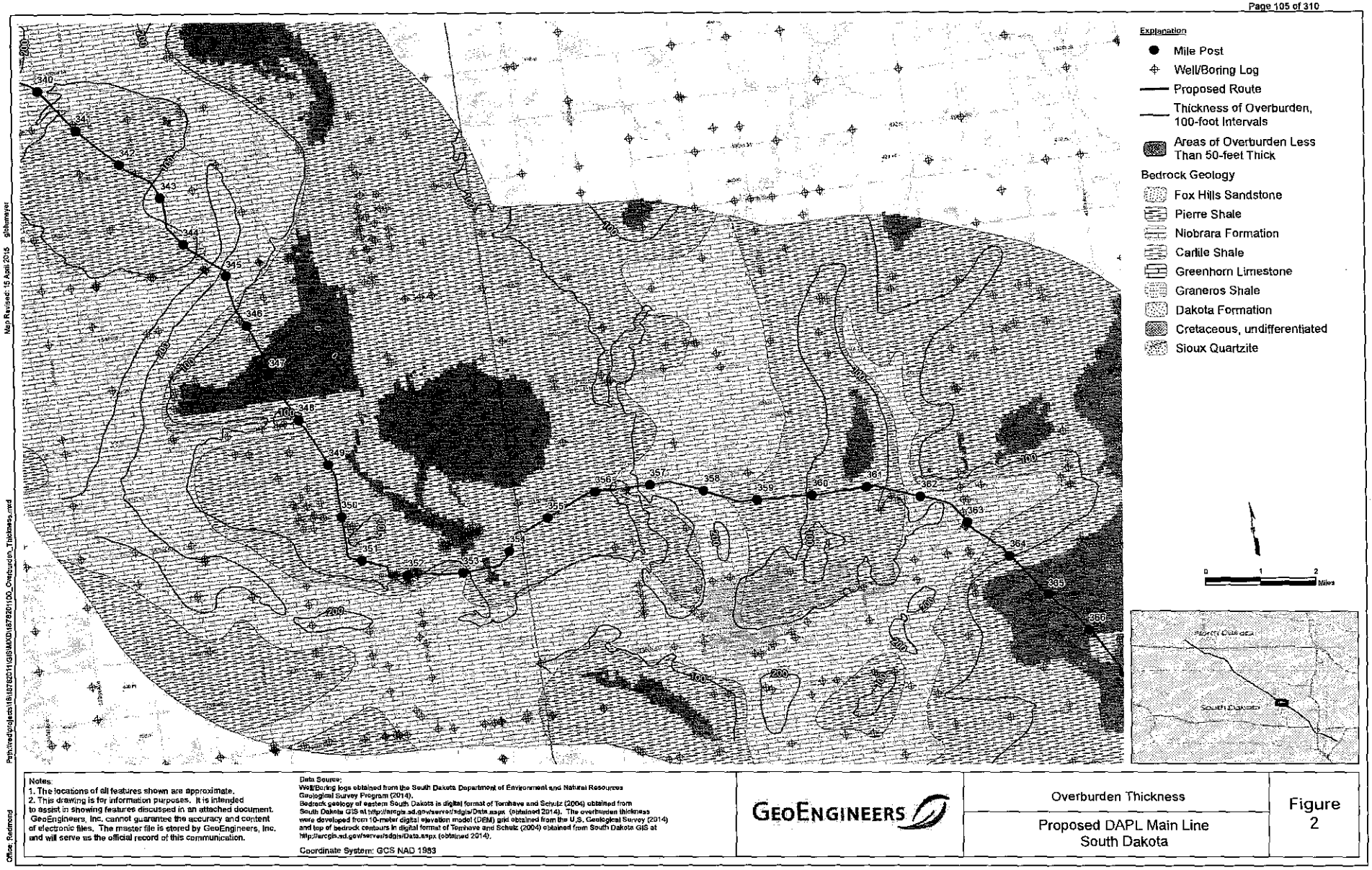
Coordinate System: GCS NAD 1983

GeoEngineers

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 1



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Coordinate System: GCS NAD 1983

GeoEngineers

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 2

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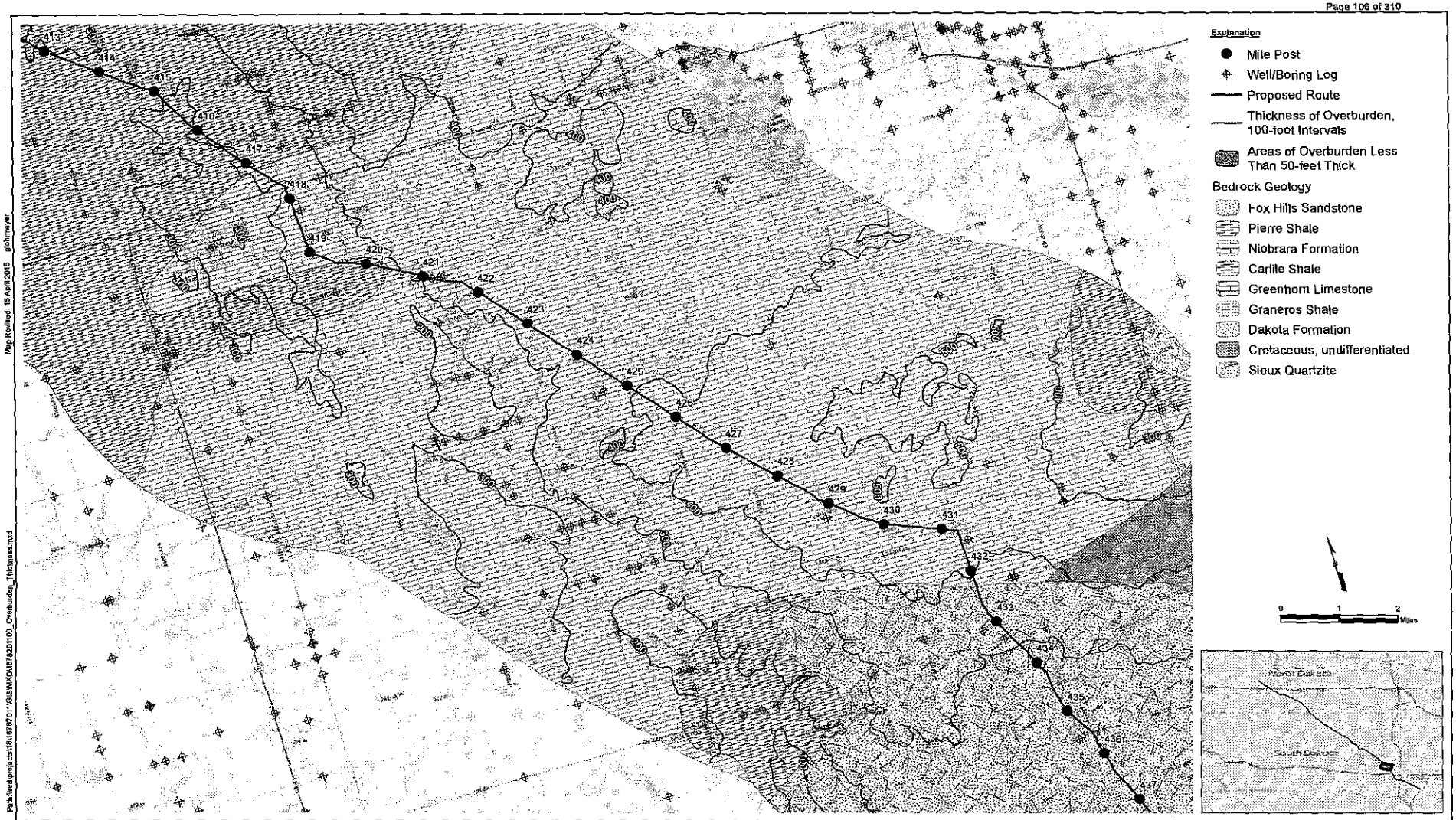

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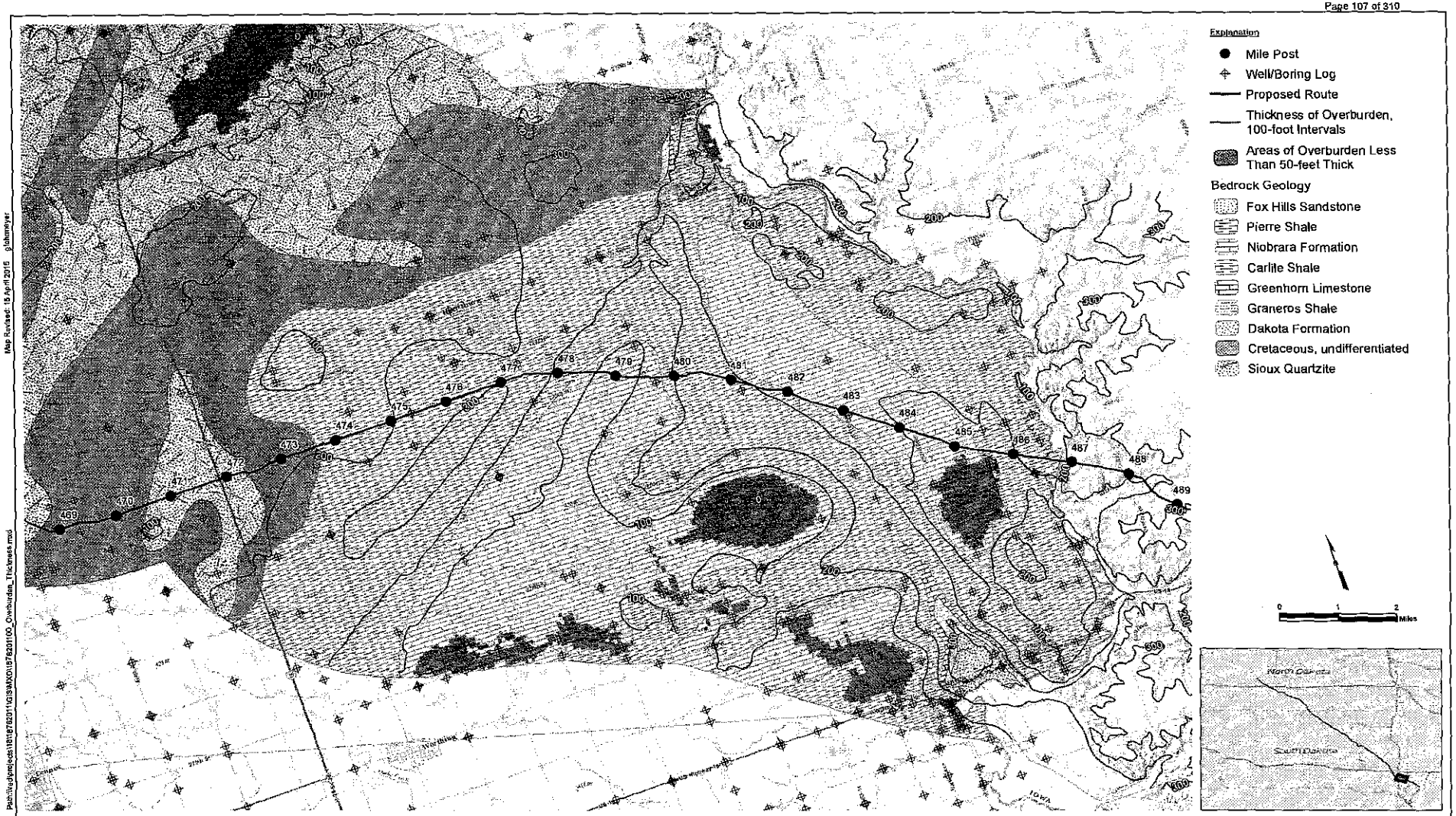
Coordinate System: GCS NAD 1983

GeoEngineers

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 3



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Coordinate System: GCS NAD 1983

GeoEngineers

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure
4

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Office: Redmond

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.

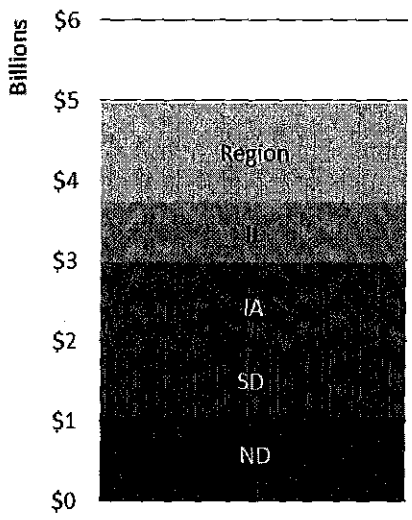
This report endeavors to estimate the economic and fiscal impacts of the pipeline project and to address these issues relating to crude oil transportation in the region.

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



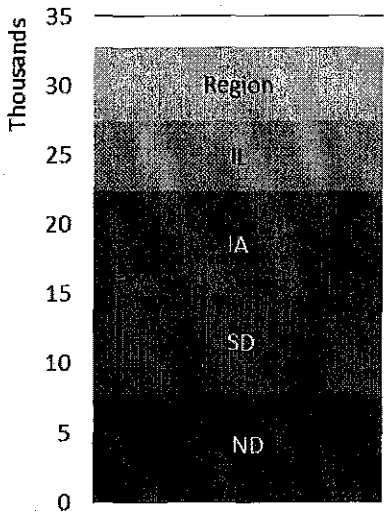
[1] The mileage numbers are approximations based on engineering plans

[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.

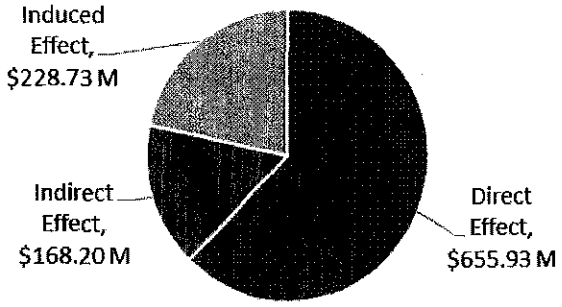
However, the most significant impact will be the felt by the annual taxes that the pipeline will generate for the state and local governments.

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.

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

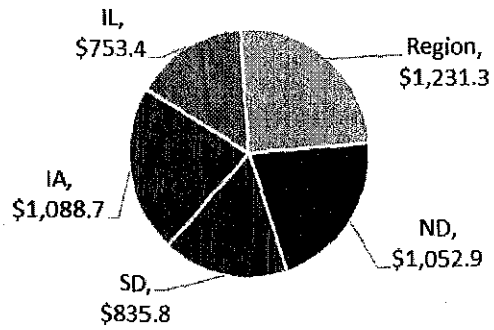
The South Dakota portion of the pipeline will be 267.4 miles long and is expected to cost $*819.6* Million. Of that amount, about 59%, or an estimated $485.6 Million, will result in direct spending in the South Dakota economy.

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.

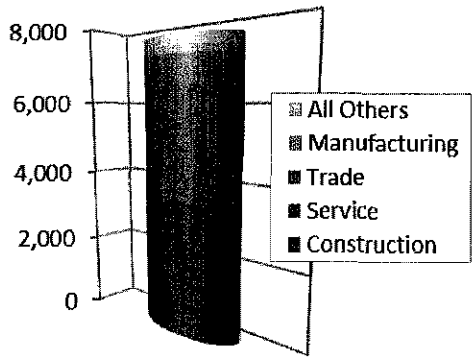
0.4 Impact on Iowa

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.

[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

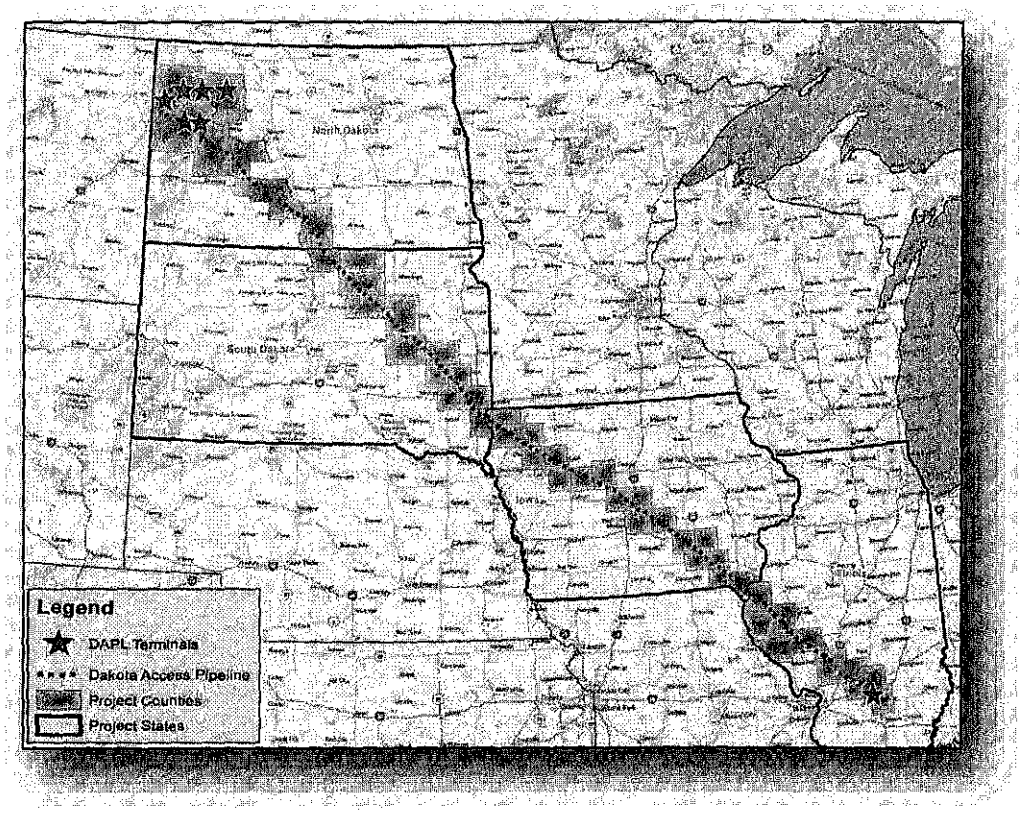
Source: Dakota Access, LLC

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.

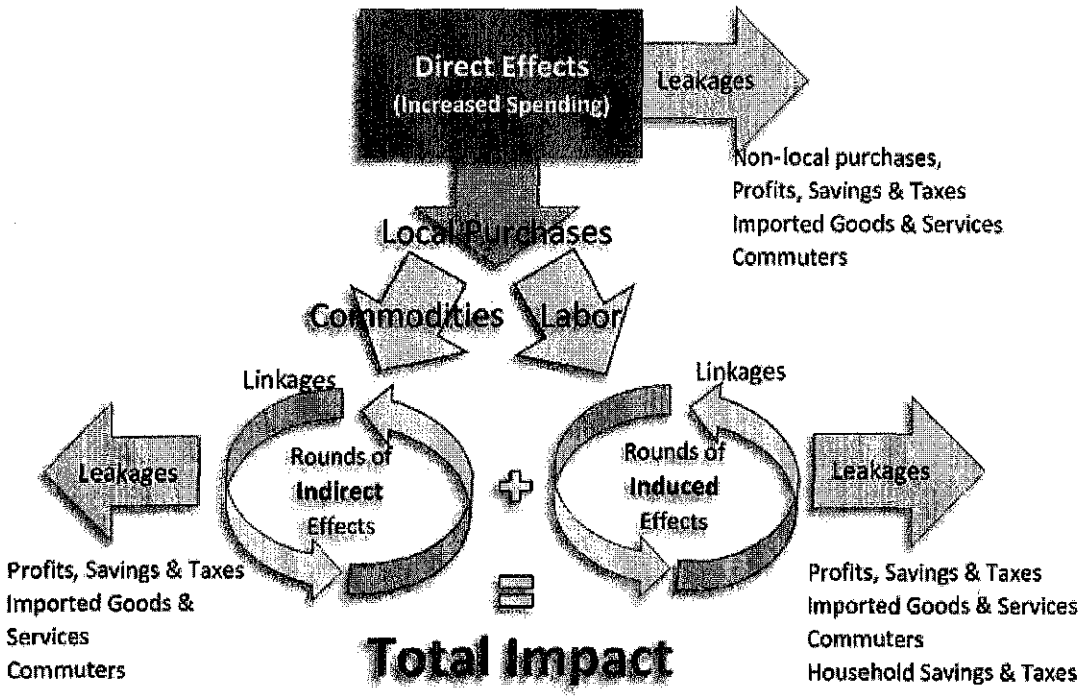
As producers purchase from suppliers that are located outside of the region, some of the spending leaks out of the system (leakages). Profits, savings, and net taxes are also part of the leakage. So, the initial infusion of spending will continue to generate economic activity within the region only until 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.

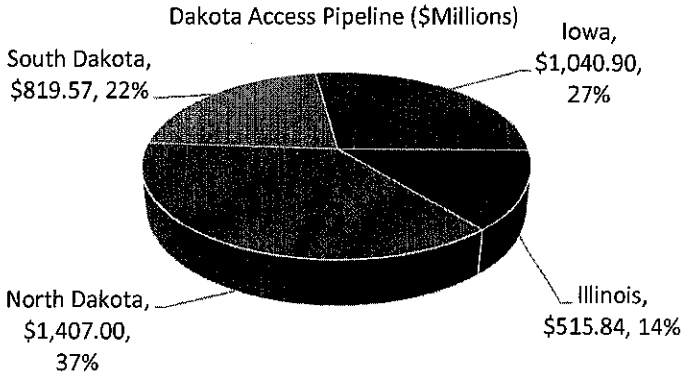
Table 7. IMPLAN Input Spending for the Construction Phase of the Pipeline ($Millions)

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

	Sales and Use Taxes			Gross Receipts/ Lodging Taxes		
State	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:

- **North Dakota** 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.

- **South Dakota** 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.

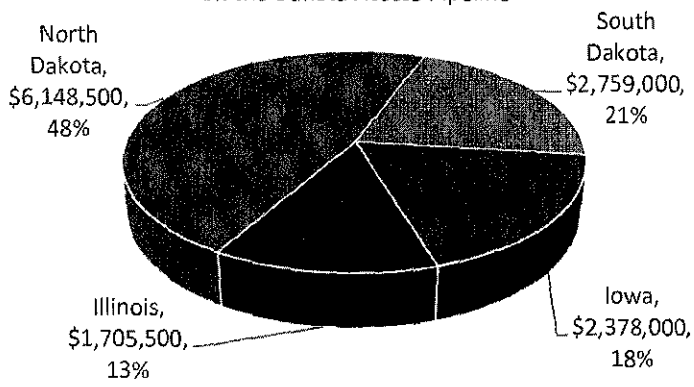
Table 19 shows the values of the spending inputs estimated by Dakota Access, LLC for each state by the appropriate spending categories. Operations and maintenance spending inputs will amount to nearly $13 Million each year for the region with 48% being spent in North Dakota, 21% in South Dakota, 18%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

[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]

[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.

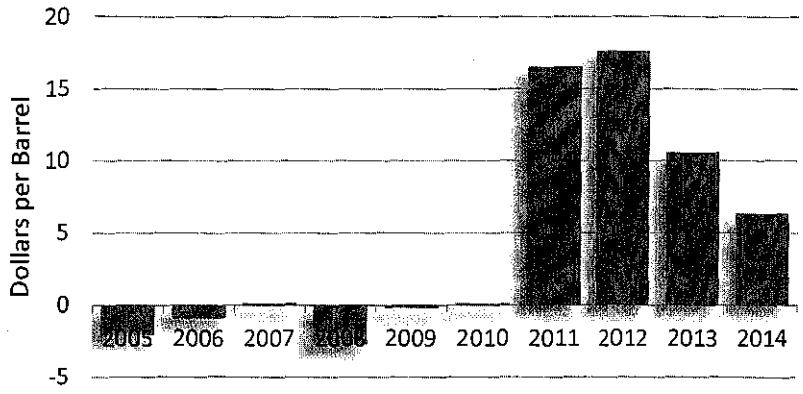
[43] Brent and WTI prices are from the Federal Reserve Bank of St. Louis FRED Economic data internet site accessed November 9, 2014 (http://research.stlouisfed.org/fred2/).; Cushing, OK crude oil inventory data are from the Energy Information Administration Internet site accessed November 9, 2014 (http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPCO_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

[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.

AGRICULTURAL IMPACT MITIGATION PLAN

Dakota Access Pipeline Project (DAPL)

Final Draft

State of South Dakota

Energy Transfer

September 2014

Revised April 2015 in response to PUC Data Request

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Acronyms and Abbreviations

DAPL	Dakota Access Pipeline, LLC (Project Sponsor)
EI/AI	Environmental Inspector/Agricultural Inspector

1 INTRODUCTION

Dakota Access Pipeline, LLC (DAPL) is planning a new 30-inch pipeline to transport crude oil from the Bakken Shale region of North Dakota to Illinois. The eastern terminus of the pipeline will connect with an existing pipeline that will transport the crude oil to the Gulf Coast for processing.

The South Dakota section of the pipeline comprises a 277-mile corridor that will run from north central South Dakota to southeast South Dakota. The proposed pipeline will enter South Dakota in Campbell County and diagonally traverse the state, exiting at the crossing of the Big Sioux River in Lincoln County, South Dakota.

The purpose of this document is to present the proposed measures for minimizing impacts to and restoring agricultural lands during and after pipeline construction.

2 PLAN LIMITATIONS

Mitigation measures identified in this plan apply only to agricultural land and do not apply to urban land, road and railroad right-of-way, interstate natural gas pipelines, mined and disturbed land not used for agriculture. The identified mitigation measures will be implemented as long as they do not conflict with federal, state, and local permits, approvals and regulations.

3 SEQUENCE OF CONSTRUCTION EVENTS AND SCHEDULE

Pipeline construction is anticipated to commence January of 2016 following the receipt of required permits and approvals. Pipeline construction will take approximately 9 months to complete.

The sequence of events for pipeline construction will begin with advance notification of landowners and governmental agencies. Following notification, activities will be undertaken in the following sequence:

- Complete final surveys, stake centerline and workspace;
- Access road installation;
- Grubbing and clearing of the construction corridor;
- Installation of stormwater and erosion control measures;
- Placement of pipe and other supplies along the construction corridor;
- Pipeline welding and bending where necessary
- Excavation of the pipeline trench;
- Temporary repairs to tile lines, if encountered;
- Placement of the pipeline with the trench;
- Permanent repairs to tile lines damaged during construction activities;
- Backfill of the trench and rough grading,
- Hydrostatic testing of the pipeline;
- Final grading and restoration;

- Revegetation and post restoration monitoring; and
- Removal of erosion control measures.

4 POINTS OF CONTACT

Each landowner will be provided the name, telephone number, email address, and mailing address of the DAPL landowner representative two weeks prior to construction. This DAPL representative will be the primary contact person for the landowner throughout construction for easement issues. Landowner representatives will be assigned to that geographic area and be responsible for the liaison activities on behalf of DAPL.

In addition to the landowner representative, a team of experienced Environmental and/or Agricultural Inspectors (EIs/AIs), will be involved in project construction, the initial restoration, and the post-construction monitoring and follow-up restoration. For agriculture construction related issues, the name and telephone number of the EI/AI will also be provided as a secondary contact during construction.

5 DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hayland or pasture and land in government set-aside programs.
Cropland	Land actively managed for growing row crops, small grains or hay.
Drainage Structures or Underground Improvements	Any permanent structure used for draining agricultural lands, including tile systems and buried terrace outlets.
Easements	The agreement(s) and/or interest in privately owned Agricultural Land held by DAPL by virtue of which it has the right to construct, operate and maintain the pipeline together with such other rights and obligations as may be set forth in such agreement.
Environmental Construction Plan (ECP)	Document to present basic environmental construction techniques will be implemented to protect the environment and to minimize potential effects of pipeline and related facilities construction and maintenance.
Pipeline	Any pipe, pipes, or pipelines used for the transportation or transmission of any solid, liquid, or gaseous substance, except water, in

	intrastate or interstate commerce.
Landowner	Person listed on the tax assessment rolls as responsible for the payment of real estate taxes imposed on the property.
Non-Agricultural Land	Any land that is not "Agricultural Land" as defined above.
Pipeline Construction	A substantial disturbance to agricultural land associated with installation, replacement, removal, operation or maintenance of a pipeline.
Soil Conservation Practices	Any land conservation practice recognized by federal or state soil conservation agencies including, but not limited to, grasslands and grassed waterways, hay land planting, pasture, and tree plantings.
Soil Conservation Structures	Any permanent structure recognized by federal or state soil conservation agencies including but not limited to toe walls, drop inlets, grade control works, terraces, levees, and farm ponds.
Right-of-Way (ROW)	Includes the permanent and temporary easements that DAPL acquires for the purpose of constructing and operating the Pipeline.
Tenant	Any person lawfully residing on or in possession of the land, which makes up the "Right-of-Way" (ROW) as defined in this Plan.
Tile	Any artificial subsurface drainage system including clay and concrete, tile, vitrified sewer tile, corrugated plastic tubing and stone drains.
Till	Till is to loosen the soil in preparation for planting or seeding by plowing, chiseling, disking, or similar means. Agricultural land planted using no-till planting practices is also considered tilled.
Topsoil	The upper part of the soil which is the most favorable material for plant growth and which can ordinarily be distinguished from subsoil by its higher organic content and darker color.
Surface Drains	Any surface drainage system such as shallow surface field drains, grassed waterways, open

	ditches, or any other constructed facilities for the conveyance of surface water.

6 AGRICULTURAL MITIGATION MEASURES

The following describes how DAPL proposes to minimize and repair impacts to agricultural lands.

a. CLEARING BRUSH AND TREES ALONG THE EASEMENT

DAPL will be responsible for negotiating compensation related to cutting of any brush and timber for construction of the pipeline with the landowner. Options for removal include: the landowner harvesting any marketable timber/vegetation, the contractor cutting and windrowing along the ROW for Landowner's use, chipped, burned, or hauled off for proper disposal. Unless otherwise restricted by federal, state or local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but are not limited to, burning, chipping, or removal from the property and be approved by the DAPL representative and coordinated with the landowner prior to implementation.

Unless otherwise restricted by federal, state of local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but not limited to burning, chipping or completed removal from the property and be approved by the DAPL Chief Inspector & Lead Environmental Inspector prior to implementation.

b. TOPSOIL SEPARATION AND REPLACEMENT

Topsoil and subsoil excavated for pipeline installation will be separated and segregated in separate stockpiles, and returned to the excavation in reverse order to restore the site to pre-construction condition. The depth of the topsoil to be stripped will be a maximum depth of 12 inches or actual depth of top soil if less than 12 inches or as agreed upon with the landowner. Upon request from the landowner, DAPL will measure topsoil depth at selected locations before and after construction.

The stored topsoil and subsoil will have sufficient separation to prevent mixing during the storage period. Topsoil will not be used to construct field entrances or drives, will not be stored or stockpiled at locations that will be used as a traveled way by construction, or be removed from the property, without the written consent of the landowner. Drainage gaps in the topsoil and subsoil piles will be left to avoid blocking drainage across the right of way.

Topsoil will not be removed where the pipeline is installed by plowing, jacking, boring, or other methods that do not require the opening of a trench.

The topsoil will be replaced so the upper portion of the pipeline excavation and the crowned surface, and the cover layer of the area used for subsoil storage, contains only the topsoil originally removed.

In most areas, ditch-line crowns will be installed to allow for and counter-act ditch settling. In the event the landowner will not allow a ditch-line crown, DAPL may have to regrade the right of way in

subsequent growing season. In this situation, DAPL may regrade the construction right of way and till down to 12 inches to manipulate the soil such that the original contours and elevation are restored. The depth of the replaced topsoil will conform as nearly as possible to the depth removed. Where excavations are made for road, stream, drainage ditch, or other crossings, the original depth of topsoil will be replaced as nearly as possible.

c. Prevention of Erosion

DAPL will follow best management practices and industry standards for erosion and sedimentation control during construction and post-construction. DAPL will develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will detail the project specific stormwater and soil erosion prevention measures. In addition to the SWPPP stipulations, all of the regulations and conditions associated with the required South Dakota DNR NPDES permit will require the Contractor's full compliance. An approved SWPPP and South Dakota DNR NPDES permit will be required before any earth disturbing construction activities can take place.

d. Aboveground Facilities

The location for any aboveground structures will be selected in coordination with respective landowners. If use of agricultural land use is appropriate and/or necessary, aboveground structures will be located in a manner to minimize interference with agricultural operations. Compensation for aboveground structures will be negotiated as part of landowner compensation.

e. Pumping Water from Open Trenches

Trench and/or pit dewatering is necessary due to accumulation of precipitation and/or groundwater in open trenches; the Contractor will locate discharges within the Project ROW whenever feasible to avoid potential impacts to adjacent areas. Should a discharge need to occur outside of the ROW, prior landowner approval will be obtained and the area will be restored to pre-construction conditions. Pumping will occur in a manner that will avoid damaging adjacent agricultural land, crops, and/or pasture. Erosion and sedimentation control measures will be implemented and may include the use of dewatering structures, splash plates, sediment bags, haybales, and silt fence. The removal and disposal of trench water will comply with applicable drainage laws and local ordinances relating to such activities as well as provisions of the federal Clean Water Act.

Prior to initiating dewatering activities, the EI must check the water discharge situation to ensure that the best management practices are applied in such a way to avoid erosion and sedimentation offsite.

At each location where dewatering is to be conducted, the contractor must consider the following conditions in planning the dewatering event.

a. **Water Discharge Setting** – The contractor shall assess each water discharge situation to include:

(1) Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to soak into the ground as compared to clay soils.

(2) Ground Surface - The topography in the area that would influence the surface flow of the discharged water.

(3) Adjustable Discharge Rate - The flow rate of the discharged water (which may need to vary) can be managed based on the site conditions to minimize instances of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may soak into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area)

(4) Discharge Outfall - The amount of hose and number/size of pumps needed to attempt to discharge water at a location, which drains away from waterbodies or wetlands.

b. **Pump Intake** - Use floating suction hose or other similar measures to prevent sediment from being sucked from bottom of trench.

c. **Overwhelming Existing Drainage** - If the discharge (assumed to be clean) does enter a stream, the flow added to the stream cannot exceed 50 percent of the peak storm event flow (to prevent adding high water volumes to a small stream channel that causes erosion due to imposing high flow conditions on the stream.

d. **Filtering Mechanism**

(1) All dewatering discharges will be directed through a filtering device as indicated below.

i) Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area through a geotextile filter bag. Geotextile bags need to be sized appropriately for the discharge flow and suspended sediment particle size.

ii) Straw Bale Dewatering Structure – Where the dewatering discharge point cannot be located in an upland area due to site conditions and/or distance, the discharge should be directed into a straw bale dewatering structure. The size of the straw bale dewatering structure is dependent on the maximum water discharge rate. A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.

iii) Alternative dewatering methods (e.g., use of water cannons) may be approved by DAPL on a site-specific basis.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair

can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

(1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

(2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

(3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

(4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

(1) All damaged, broken, or cracked tile will be removed.

(2) Only unobstructed tile will be used for replacement.

(3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

(4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

(5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

(6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

g. Removal of Rocks and Debris from the Right-of-Way

Excess rocks will be removed from the right-of-way. On completion, the topsoil in the easement area will be free of all rocks larger than three inches in average diameter that are not native to the topsoil prior to excavation, and similar to adjacent soil not disturbed by construction. The top 24 inches of the trench backfill will not contain rocks in any greater concentration or size than exist in the adjacent natural soils. Consolidated rock removed by blasting or mechanical means shall not be placed in the backfill above the natural bedrock profile or above the frost line. In addition, DAPL will examine areas adjacent to the easement and along access roads and will remove any large rocks or debris that may have rolled or blown from the right-of-way or fallen from vehicles.

Rock that cannot remain in or be used as backfill will be disposed of at locations and in a manner mutually satisfactory to the company's environmental inspector and the landowner. All debris attributable to the pipeline construction and related activities will be removed and disposed of properly; such debris includes spilled oil, grease, fuel, or other petroleum or chemical products. Such products and any contaminated soil will be removed for proper disposal or treated by appropriate in situ remediation.

h. Restoration after Soil Compaction and Rutting

Agricultural land compacted by heavy project equipment, including off right-of-way access roads, will be deep tilled to alleviate soil compaction upon completion of construction on the property. In areas where topsoil was removed, tillage will precede replacement of topsoil. At least three passes with the deep tillage equipment shall be made. Tillage shall be at least 18 inches deep in land used for crop production and 12 inches deep on other lands,(except where shallow tile systems are encountered), and shall be performed under soil moisture conditions which permits effective working of the soil. If agreed in advance, this tillage may be performed by the landowners or tenants using their own equipment.

Rutted land will be graded and tilled until restored as near as practical to its preconstruction condition. On lands where topsoil was removed, rutting will be remedied before topsoil is replaced.

i. Restoration of Terraces, Waterways and other Erosion Control Structures

Existing soil conservation practices and structures damaged by pipeline construction, such as surface drains, embankments and terraces, grass waterways will be restored to pre-construction elevation, grade and condition. Any drain lines or flow diversion devices impacted by pipeline construction will be

repaired or modified as needed. Soil used to repair embankments intended to retain water shall be well compacted. Disturbed vegetation will be reestablished, including a cover crop when appropriate. Restoration of terraces will be in accordance with Standard Drawings in Appendix A.

j. Revegetation of Untilled Land

Agricultural land not in row crop or small grain production at the time of construction, such as hay fields and land in conservation or set-aside programs, will be reseeded following completion of deep tillage and replacement of the topsoil. The seed mix used will restore the original or a comparable ground cover unless otherwise requested by the landowner.

Land that is normally used for crops that will not be planted due to pipeline construction will be seeded with an appropriate cover crop following replacement of the topsoil and completion of deep tillage, unless otherwise agreed to with the landowner. Cover crop seeding may be delayed if construction is completed too late in the year for a cover crop to establish and in such instances is not required if the landowner or tenant proposed to till the land the following year.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will consult with the landowner concerning the landowner's plans for these future actions.

l. Restoration of Land Slope and Contour

The slope, contour, grade, and drainage pattern of the disturbed area will be restored as nearly as possible to its preconstruction condition. However, the trench may be crowned to allow for anticipated settlement of the backfill. DAPL will remediate areas of excessive or insufficient settlement in the trench area where it visibly affects land contour or alters surface drainage. Disturbed areas where erosion causes excessive rills or channels or areas of heavy sediment deposition, will be regraded as needed. On steep slopes, methods such as sediment barriers, slope breakers, or mulching will be used as necessary to control erosion until vegetation can be reestablished.

m. Siting and Restoration of Areas Used for Field Entrances and Temporary Roads

The location of temporary roads to be used for construction purposes will be negotiated with the landowner and the Tenant. The temporary roads will be designed to not impede proper drainage and will be built to minimize soil erosion on or near the temporary roads.

Post construction and restoration temporary field entrances or access roads will be removed and the land made suitable for its previous use, in agreement with the landowner. Areas affected will be regraded and deep tilled as required. If by agreement or at landowner request, and approved by local public road authorities, a field entrance or road is left in place, it will be left in a graded and serviceable condition.

n. Construction in Wet Conditions

Construction in wet soil conditions will not commence or continue at times when or locations where the passage of heavy construction equipment may cause rutting to the extent that the topsoil and subsoil are mixed, or underground drainage structures may be damaged. To facilitate construction in soft soils, DAPL may elect to remove and stockpile the topsoil from the traveled way, install mats or padding, or use other methods.

7 Compensation for Damages

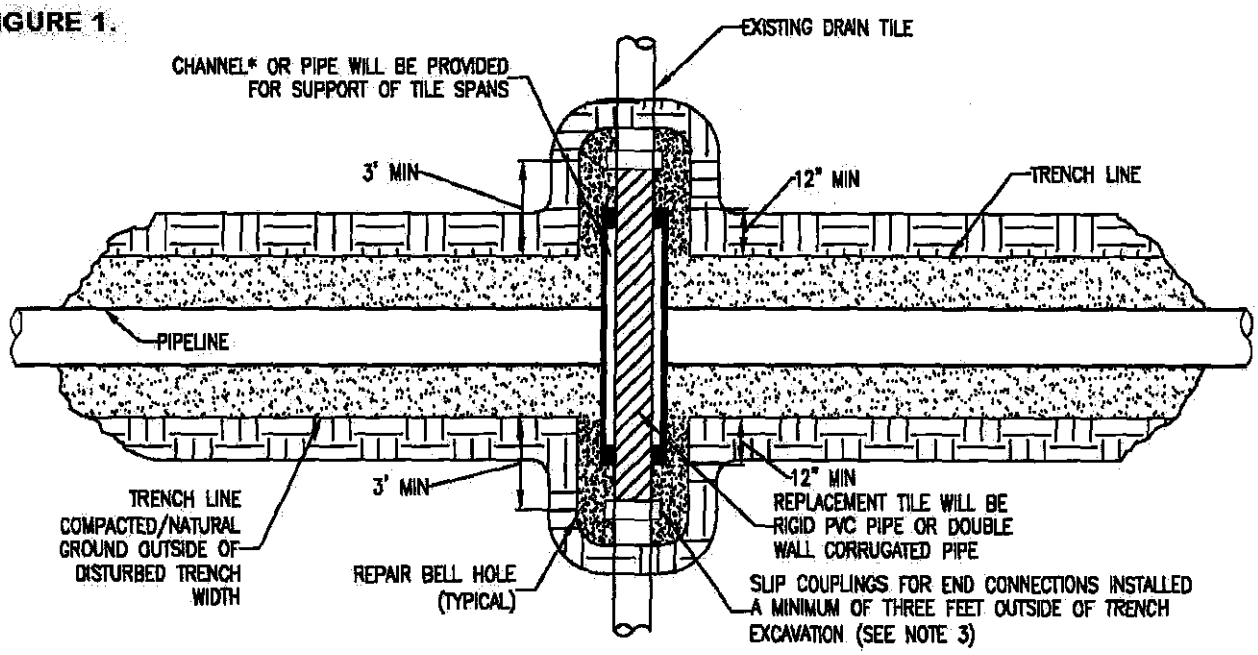
DAPL will be responsible for compensating the landowner for damages during construction. For crops, value of the loss will be established based on current crop values in the area of the impact per South Dakota Department of Agriculture statistics. DAPL will also compensate the landowner for loss of use of agricultural land, if attributable to pipeline construction. Supplemental soil sampling, testing and additional restoration activities to restore agricultural land to its pre-construction conditions will be undertaken by DAPL upon request of the landowner.

DAPL will also be responsible to compensate landowners for other physical property damage attributable to pipeline construction, such as fences, driveways and other structures.

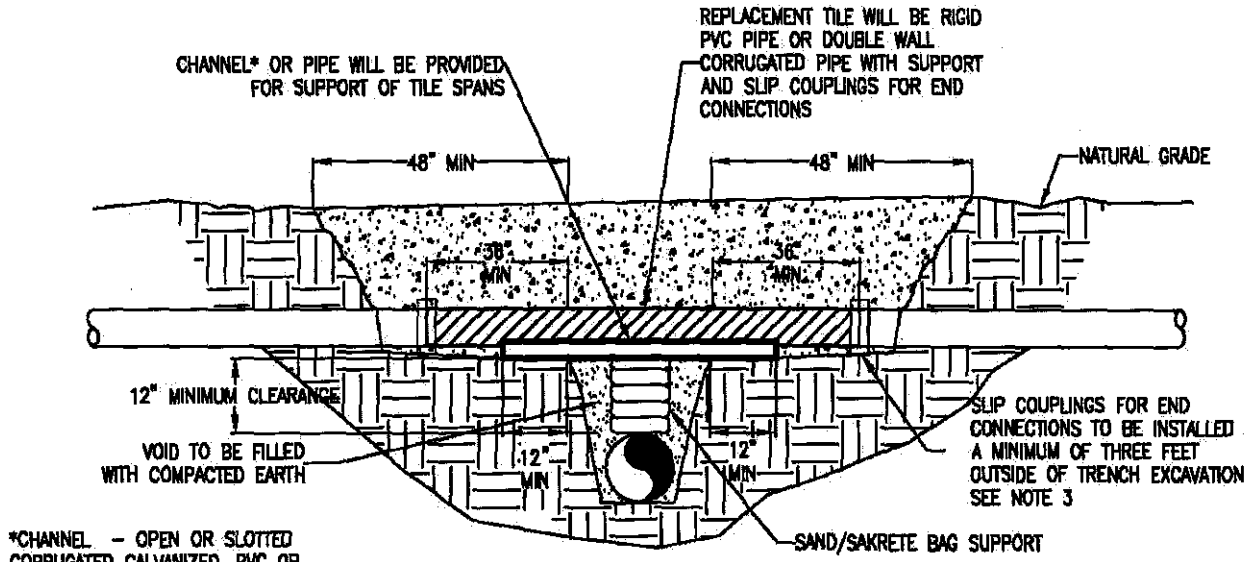
Appendix A

Tile Repair Drawings

FIGURE 1.



PLAN
N.T.S.



*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

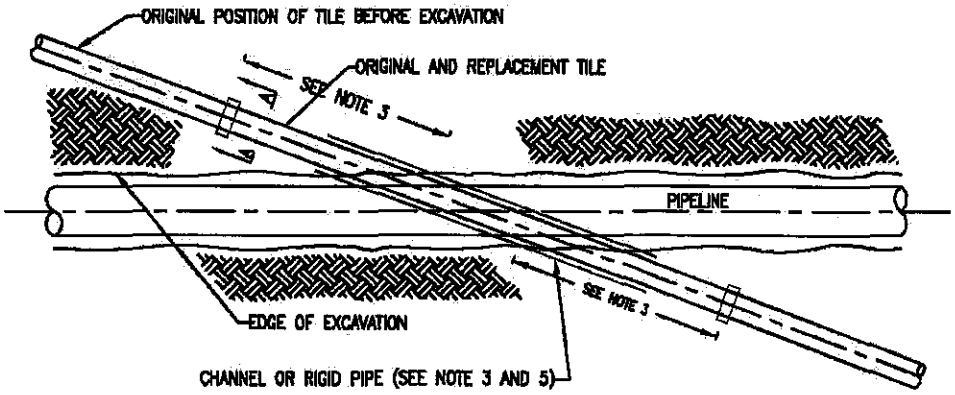
CROSS SECTION
N.T.S.

NOTE:

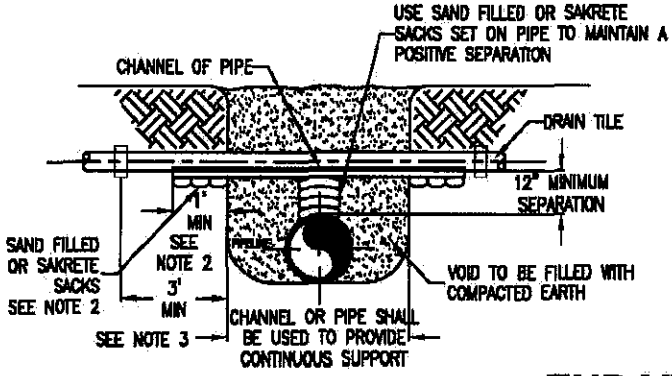
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

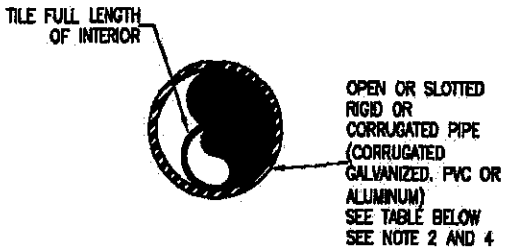
TEMPORARY DRAIN TILE REPAIR

FIGURE 2.



PLAN VIEW





SECTION "A–A"
RIGID OR DOUBLE WALL CORRUGATED PIPE

END VIEWS

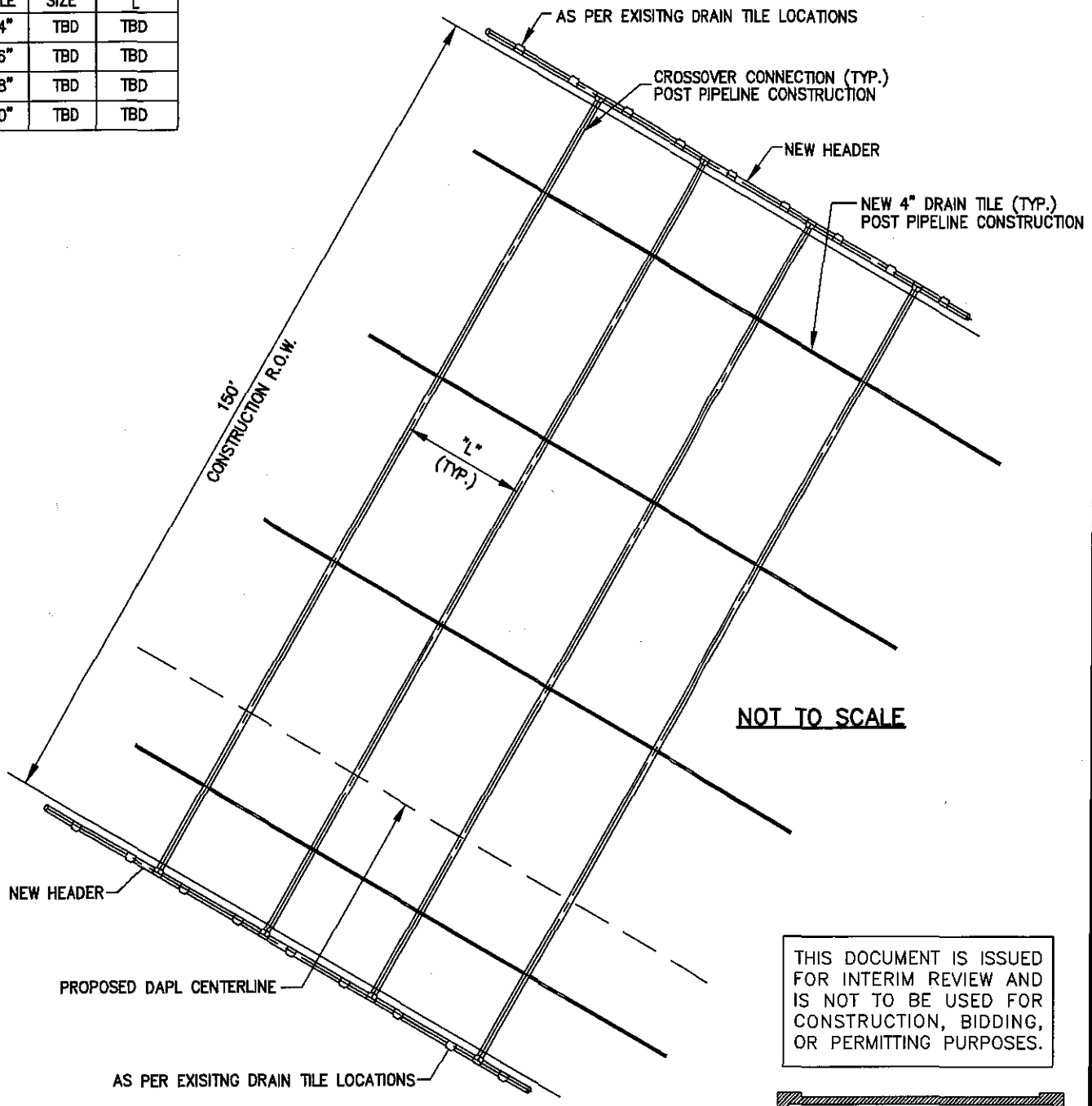
MINIMUM SUPPORT TABLE				
TILE SIZE	CHANNEL SIZE		PIPE SIZE	
3"	4" @ 5.4	#/ft	4"	STD. WT.
4"-5"	5" @ 6.7	#/ft	6"	STD. WT.
8"-9"	7" @ 9.8	#/ft	9"-10"	STD. WT.
10"	10" @ 15.3	#/ft	12"	STD. WT.

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.
2. 1'–0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAKRETE, OR SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).
3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.
4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.
5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.
6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.
7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

PERMANENT DRAIN TILE REPAIR

DRAIN TILE	HEADER SIZE	SPACING "L"
4"	TBD	TBD
6"	TBD	TBD
8"	TBD	TBD
10"	TBD	TBD



THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ISSUED FOR REVIEW
09/02/14

NOTES:
1. HEADERS WILL BE CONNECTED TO EXISTING DRAIN TILE PRE-CONSTRUCTION.
2. CROSSOVER PIPING WILL BE INSTALLED POST PIPELINE INSTALLATION.

REV.	DATE	BY	DESCRIPTION	CHK.
A	9/2/14	DAH	ISSUED FOR REVIEW	

PROJECT NO. 10395700

DAPL/ETCOP

TYPICAL DRAIN TILE HEADER SYSTEM

DRAWN BY: DAH	DATE: 09/02/14	DWG. NO. P12-49	REV. A
CHECKED BY: DAH	DATE: 09/02/14		
SCALE: N.T.S.	APP.:		

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-1

State the name, current address, and telephone number of the person or persons answering these interrogatories.

Response:

See the individual responses for the information requested.

Prepared By: Stephen Veatch
Title: Senior Director - Certificates
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2024

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-2

As mentioned by commenters and intervenors in this case, the 10-K filed by Energy Transfer Partners, L.P. for the 2013 fiscal year states, "we cannot assure you that our current reserves are adequate to cover all future liabilities." Please explain why this should not be a concern to the public.

Response:

The language referred to in the South Dakota PUC question, is taken from one of the risk factors in the 2013 Energy Transfer Partners, L.P.10-K ("10-K"). That particular risk factor states that, given the nature of our business, there could be a potential impact to the company in the future from laws and regulations, particularly those related to environmental remediation. Similar to the other risks related to our business that are discussed in that section of the 10-K, this risk factor addresses the potential negative impacts that could occur in the future, regardless of whether those impacts are probable or remote or whether any associated potential liabilities can be reasonably estimated. It is simply stating that future events could occur, or information could come to light in the future, that could change what we need to reserve for those liabilities. It does not mean that we would not expect to have adequate liquidity to handle such obligations. This language in the 10-K is designed to warn and inform the various investors to make an informed decision when investing and to notify the investing public of the risks of investing into Energy Transfer and that with any investment into a publicly traded company, there is no way to guarantee the potential unknown or future liabilities and therefore there may or may not be adequate funds to cover those unknown or future liabilities, Please be assured that Energy Transfer Partners follows all applicable accounting and disclosure requirements for loss contingencies.

Prepared By: Jim Wright
Title: Deputy General Counsel
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2010

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-3

Does the surge tank that will be located at the pump station require an aboveground storage tank permit from the DENR?

Response:

No.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-4

Please provide the Company's analysis of the project's risk analysis to drinking water in Lincoln County, given the high water table.

Response:

Normal operation of the pipeline carries no risk to drinking water for humans or livestock. Analyses of risks due to leaks are currently being evaluated through spill modeling; appropriate mitigation measures will be implemented into the design and Facility Response Plan (FRP). The FRP will be filed prior to operation as required by state and federal law. The pipeline is being designed and will be operated to meet or exceed federal and industrial standards regardless of the depth to groundwater.

Please note that wellhead protection areas and source water zones were identified in consultation with the South Dakota Department of Environment and Natural Resources (SDDENR) and avoided during routing to further limit potential impacts to drinking water. None of these areas or zones were identified in Lincoln County.

Further, preconstruction activities include locating wells through data base searches, landowner contacts and physical surveys. The location of all wells within the survey corridor will be collected by global positioning system and excluded from the Project workspace.

Lastly, we are in discussions with water distribution companies to review processes for construction techniques where water distribution lines are encountered along the route. We expect those to include lower waterlines and install casing within the pipeline easement, maintaining a separation below pipeline, as required, at crossing locations.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-5

Outside of the single pumping station, does the applicant intend to construct any other buildings along the route? If so, where and for what purpose?

Response:

At each mainline valve where remote controlled communication equipment is proposed, a small data communications shed or building will be installed. These buildings are not intended to house staff or people, but rather to protect the sensitive equipment from the environmental elements. No utilities other than electricity are proposed with the shed or small building.

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-6

Please provide a general description of any pipeline markers and cathodic protection facilities, including their proposed locations.

Response:

According to Part 195.410 buried pipeline markers "must be located at each public road crossing, at each railroad crossing, and in sufficient number along the remainder of each buried line so that its location is accurately known". Test Leads will be installed with some of those pipeline markers. Cathodic protections facilities will be located as required along the pipeline, typical at road crossing and pipeline facilities.

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
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Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-7

Many commenters have expressed concern for a lack of decommissioning bonding or plan. Please explain why this should not be a concern to the public.

Response:

Energy Transfer and their partners are investing more than $3.8 Billion to serve the producers who have signed contracts and who will rely upon this pipeline to transport their product from the Bakken region. This is not a short term investment and there are no foreseeable plans for decommissioning. With proper design and operation, the longevity of a pipeline project can well exceed a century. Essentially all production in the Bakken would have to cease before this pipeline would be obsolete as pipelines are the cheapest and safest way to transport product from the Bakken. Should production in the Bakken region decline or the market tighten, this economical solution of pipeline transportation becomes even more important to producers to monetize their investment. With the value of this asset, and its value to the US economy, it is unreasonable to predict that it will not be utilized for the foreseeable future. When appropriate, decommissioning would take place according to prevailing rules and regulations making a decommissioning plan developed today obsolete.

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Title: Project Manager
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Dakota Access, LLC
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March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-8

If landowners are unaware of existing easements that DAPL easements violate, is the landowner liable for violation of the original easement?

Response:

In no event would a landowner be liable for any of DAPL's actions or if DAPL violated an easement term or a third party easement on private property. DAPL specifically indemnifies that landowner from any and all liability as it relates to actions caused by DAPL. If a landowner violated DAPL's rights under its easements or a third party land right, knowingly or not, they would be liable for any damages to DAPL or the third party for their negligence, just like anyone else in any other land situation where one person has a prescriptive or express right in land via ownership, easement, grant or any other form or legal land rights pursuant to state law.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2710

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-9

Per comments provided by Nancy Stofferahn in the docket, please provide any correspondence with Nortec Seeds regarding routing conflicts as a result of their plans to expand facilities. Does the company believe the proposed route threatens the economic integrity of Nortec Seeds? If so, what has been done or could be done to mitigate any such negative economic impact?

Response:

Dakota Access representatives have called or met with the owners of Nortec Seeds eleven times over a period of several months (November 10, 2014 – March 5, 2015) in an effort to obtain survey permission to determine the impact, if any, of the pipeline route with respect to Nortec's property or potential planned expansions; however, survey permission has been expressly and repeatedly denied. Dakota Access is not in possession of information regarding Nortec Seeds' current economic integrity nor any plans or details relative to a business expansion. The route is currently greater than 700 feet north of the Nortec Seed shed referenced in the letter and the route extends in a north northwesterly direction thus providing additional distance between the remainder of the route and the existing structures on this property. With respect to any planned expansions, the permanent easement would only prohibit permanent structures from being constructed within the fifty foot wide permanent easement, thus providing approximately 650 feet of possible expansion for structures after installation of the pipeline (550 prior to pipeline construction).

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Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
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Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-10

Per comments provided by Matthew Anderson in the docket, please address his concern that the AIMP "leaves many exceptions for Dakota Access not to repair drainage tile back to its original condition."

Response:

A discussion of the temporary and permanent repair of drain tiles is addressed in Sections 6f. and 6k. the Agriculture Impact Mitigation Plan and provided again below. A revised copy of the Plan is attached to this filing.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

(1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

(2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

(3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

(4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

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d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

(1) All damaged, broken, or cracked tile will be removed.

(2) Only unobstructed tile will be used for replacement.

(3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

(4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

(5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

(6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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consult with the landowner concerning the landowner's plans for these future actions.

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Title: Project Manager
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Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-11

Per comments provided by John Peterson in the docket, please address his concern that red bellied dace, sticklebacks, and river otters may be affected by the project.

Response:

Based on review of aerial photography and topographic mapping, there are two waterbodies present on the subject property; an unnamed tributary of the Big Sioux River and a secondary tributary. The Dakota Access route maintains a distance of approximately 500 feet to the unnamed tributary and only crosses the secondary tributary.

Dakota Access conducted environmental surveys within a 400-foot corridor centered on the pipeline across the subject property in April 2015. Based on the field data the secondary tributary that is crossed has no defined channel or ordinary high water mark at the crossing location and was recorded as an emergent wetland; however was documented as channelized and defined elsewhere within the survey corridor and was dry at the time of survey. The proposed crossing location is not suitable habitat for the fish species referenced in the letter. While it is possible for river otters from the Big Sioux River to utilize this area for intermittent foraging, this species is highly mobile, would avoid the area during construction, and adverse impacts cannot be reasonably assumed.

As provided in their initial application, Dakota Access will comply with the U.S. Army Corps of Engineers Nationwide Permit 12 conditions for crossing the wetland on this subject property. Dakota Access will implement best management practices to mitigate for potential construction related impacts associated with stormwater runoff and sedimentation off the right-of-way or into to the tributaries. Additionally, Dakota Access will implement the Spill Prevention Control and Countermeasure Plan to protect sensitive resources from inadvertent releases during construction activities.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-12

In case of erosion, should the pipeline become shallow at any point, will the company be responsible for the costs of adding to the ground cover?

Response:

Yes, DAPL is responsible for the costs of any maintenance to ensure adequate ground cover over it pipeline. If the loss of soil is intentional caused by the action of a third party, DAPL may have the right to seek relief in court to seek fair compensation or remediation of the direct action that caused the soil loss. However for any natural erosion, DAPL would be responsible to provide replacement cover or to lower the line pursuant to Federal standards for cover pursuant to 49 CFR Part 195.

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Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-13

Describe Applicant's plan to restore drainage tile to working condition following construction.

Response:

As answered in response to Interrogatory 1-10 herein, Dakota Access has outlined their proposed procedures for temporary and permanent repair of drain tiles in Sections 6f. and 6k. the Agriculture Impact Mitigation Plan. A revised copy of the Plan is attached to this filing.

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AGRICULTURAL IMPACT MITIGATION PLAN

Dakota Access Pipeline Project (DAPL)

Final Draft

State of South Dakota

Energy Transfer

September 2014

Revised April 2015 in response to PUC Data Request

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Acronyms and Abbreviations

DAPL	Dakota Access Pipeline, LLC (Project Sponsor)
EI/AI	Environmental Inspector/Agricultural Inspector

1 INTRODUCTION

Dakota Access Pipeline, LLC (DAPL) is planning a new 30-inch pipeline to transport crude oil from the Bakken Shale region of North Dakota to Illinois. The eastern terminus of the pipeline will connect with an existing pipeline that will transport the crude oil to the Gulf Coast for processing.

The South Dakota section of the pipeline comprises a 277-mile corridor that will run from north central South Dakota to southeast South Dakota. The proposed pipeline will enter South Dakota in Campbell County and diagonally traverse the state, exiting at the crossing of the Big Sioux River in Lincoln County, South Dakota.

The purpose of this document is to present the proposed measures for minimizing impacts to and restoring agricultural lands during and after pipeline construction.

2 PLAN LIMITATIONS

Mitigation measures identified in this plan apply only to agricultural land and do not apply to urban land, road and railroad right-of-way, interstate natural gas pipelines, mined and disturbed land not used for agriculture. The identified mitigation measures will be implemented as long as they do not conflict with federal, state, and local permits, approvals and regulations.

3 SEQUENCE OF CONSTRUCTION EVENTS AND SCHEDULE

Pipeline construction is anticipated to commence January of 2016 following the receipt of required permits and approvals. Pipeline construction will take approximately 9 months to complete.

The sequence of events for pipeline construction will begin with advance notification of landowners and governmental agencies. Following notification, activities will be undertaken in the following sequence:

- Complete final surveys, stake centerline and workspace;
- Access road installation;
- Grubbing and clearing of the construction corridor;
- Installation of stormwater and erosion control measures;
- Placement of pipe and other supplies along the construction corridor;
- Pipeline welding and bending where necessary
- Excavation of the pipeline trench;
- Temporary repairs to tile lines, if encountered;
- Placement of the pipeline with the trench;
- Permanent repairs to tile lines damaged during construction activities;
- Backfill of the trench and rough grading,
- Hydrostatic testing of the pipeline;
- Final grading and restoration;

- Revegetation and post restoration monitoring; and
- Removal of erosion control measures.

4 POINTS OF CONTACT

Each landowner will be provided the name, telephone number, email address, and mailing address of the DAPL landowner representative two weeks prior to construction. This DAPL representative will be the primary contact person for the landowner throughout construction for easement issues. Landowner representatives will be assigned to that geographic area and be responsible for the liaison activities on behalf of DAPL.

In addition to the landowner representative, a team of experienced Environmental and/or Agricultural Inspectors (EIs/AIs), will be involved in project construction, the initial restoration, and the post-construction monitoring and follow-up restoration. For agriculture construction related issues, the name and telephone number of the EI/AI will also be provided as a secondary contact during construction.

5 DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hayland or pasture and land in government set-aside programs.
Cropland	Land actively managed for growing row crops, small grains or hay.
Drainage Structures or Underground Improvements	Any permanent structure used for draining agricultural lands, including tile systems and buried terrace outlets.
Easements	The agreement(s) and/or interest in privately owned Agricultural Land held by DAPL by virtue of which it has the right to construct, operate and maintain the pipeline together with such other rights and obligations as may be set forth in such agreement.
Environmental Construction Plan (ECP)	Document to present basic environmental construction techniques will be implemented to protect the environment and to minimize potential effects of pipeline and related facilities construction and maintenance.
Pipeline	Any pipe, pipes, or pipelines used for the transportation or transmission of any solid, liquid, or gaseous substance, except water, in

	intrastate or interstate commerce.
Landowner	Person listed on the tax assessment rolls as responsible for the payment of real estate taxes imposed on the property.
Non-Agricultural Land	Any land that is not "Agricultural Land" as defined above.
Pipeline Construction	A substantial disturbance to agricultural land associated with installation, replacement, removal, operation or maintenance of a pipeline.
Soil Conservation Practices	Any land conservation practice recognized by federal or state soil conservation agencies including, but not limited to, grasslands and grassed waterways, hay land planting, pasture, and tree plantings.
Soil Conservation Structures	Any permanent structure recognized by federal or state soil conservation agencies including but not limited to toe walls, drop inlets, grade control works, terraces, levees, and farm ponds.
Right-of-Way (ROW)	Includes the permanent and temporary easements that DAPL acquires for the purpose of constructing and operating the Pipeline.
Tenant	Any person lawfully residing on or in possession of the land, which makes up the "Right-of-Way" (ROW) as defined in this Plan.
Tile	Any artificial subsurface drainage system including clay and concrete, tile, vitrified sewer tile, corrugated plastic tubing and stone drains.
Till	Till is to loosen the soil in preparation for planting or seeding by plowing, chiseling, disking, or similar means. Agricultural land planted using no-till planting practices is also considered tilled.
Topsoil	The upper part of the soil which is the most favorable material for plant growth and which can ordinarily be distinguished from subsoil by its higher organic content and darker color.
Surface Drains	Any surface drainage system such as shallow surface field drains, grassed waterways, open

	ditches, or any other constructed facilities for the conveyance of surface water.

6 AGRICULTURAL MITIGATION MEASURES

The following describes how DAPL proposes to minimize and repair impacts to agricultural lands.

a. CLEARING BRUSH AND TREES ALONG THE EASEMENT

DAPL will be responsible for negotiating compensation related to cutting of any brush and timber for construction of the pipeline with the landowner. Options for removal include: the landowner harvesting any marketable timber/vegetation, the contractor cutting and windrowing along the ROW for Landowner's use, chipped, burned, or hauled off for proper disposal. Unless otherwise restricted by federal, state or local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but are not limited to, burning, chipping, or removal from the property and be approved by the DAPL representative and coordinated with the landowner prior to implementation.

Unless otherwise restricted by federal, state of local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but not limited to burning, chipping or completed removal from the property and be approved by the DAPL Chief Inspector & Lead Environmental Inspector prior to implementation.

b. TOPSOIL SEPARATION AND REPLACEMENT

Topsoil and subsoil excavated for pipeline installation will be separated and segregated in separate stockpiles, and returned to the excavation in reverse order to restore the site to pre-construction condition. The depth of the topsoil to be stripped will be a maximum depth of 12 inches or actual depth of top soil if less than 12 inches or as agreed upon with the landowner. Upon request from the landowner, DAPL will measure topsoil depth at selected locations before and after construction.

The stored topsoil and subsoil will have sufficient separation to prevent mixing during the storage period. Topsoil will not be used to construct field entrances or drives, will not be stored or stockpiled at locations that will be used as a traveled way by construction, or be removed from the property, without the written consent of the landowner. Drainage gaps in the topsoil and subsoil piles will be left to avoid blocking drainage across the right of way.

Topsoil will not be removed where the pipeline is installed by plowing, jacking, boring, or other methods that do not require the opening of a trench.

The topsoil will be replaced so the upper portion of the pipeline excavation and the crowned surface, and the cover layer of the area used for subsoil storage, contains only the topsoil originally removed.

In most areas, ditch-line crowns will be installed to allow for and counter-act ditch settling. In the event the landowner will not allow a ditch-line crown, DAPL may have to regrade the right of way in

subsequent growing season. In this situation, DAPL may regrade the construction right of way and till down to 12 inches to manipulate the soil such that the original contours and elevation are restored. The depth of the replaced topsoil will conform as nearly as possible to the depth removed. Where excavations are made for road, stream, drainage ditch, or other crossings, the original depth of topsoil will be replaced as nearly as possible.

c. Prevention of Erosion

DAPL will follow best management practices and industry standards for erosion and sedimentation control during construction and post-construction. DAPL will develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will detail the project specific stormwater and soil erosion prevention measures. In addition to the SWPPP stipulations, all of the regulations and conditions associated with the required South Dakota DNR NPDES permit will require the Contractor's full compliance. An approved SWPPP and South Dakota DNR NPDES permit will be required before any earth disturbing construction activities can take place.

d. Aboveground Facilities

The location for any aboveground structures will be selected in coordination with respective landowners. If use of agricultural land use is appropriate and/or necessary, aboveground structures will be located in a manner to minimize interference with agricultural operations. Compensation for aboveground structures will be negotiated as part of landowner compensation.

e. Pumping Water from Open Trenches

Trench and/or pit dewatering is necessary due to accumulation of precipitation and/or groundwater in open trenches; the Contractor will locate discharges within the Project ROW whenever feasible to avoid potential impacts to adjacent areas. Should a discharge need to occur outside of the ROW, prior landowner approval will be obtained and the area will be restored to pre-construction conditions. Pumping will occur in a manner that will avoid damaging adjacent agricultural land, crops, and/or pasture. Erosion and sedimentation control measures will be implemented and may include the use of dewatering structures, splash plates, sediment bags, haybales, and silt fence. The removal and disposal of trench water will comply with applicable drainage laws and local ordinances relating to such activities as well as provisions of the federal Clean Water Act.

Prior to initiating dewatering activities, the EI must check the water discharge situation to ensure that the best management practices are applied in such a way to avoid erosion and sedimentation offsite.

At each location where dewatering is to be conducted, the contractor must consider the following conditions in planning the dewatering event.

a. **Water Discharge Setting** – The contractor shall assess each water discharge situation to include:

(1) Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to soak into the ground as compared to clay soils.

(2) Ground Surface - The topography in the area that would influence the surface flow of the discharged water.

(3) Adjustable Discharge Rate - The flow rate of the discharged water (which may need to vary) can be managed based on the site conditions to minimize instances of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may soak into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area)

(4) Discharge Outfall - The amount of hose and number/size of pumps needed to attempt to discharge water at a location, which drains away from waterbodies or wetlands.

b. **Pump Intake -** Use floating suction hose or other similar measures to prevent sediment from being sucked from bottom of trench.

c. **Overwhelming Existing Drainage -** If the discharge (assumed to be clean) does enter a stream, the flow added to the stream cannot exceed 50 percent of the peak storm event flow (to prevent adding high water volumes to a small stream channel that causes erosion due to imposing high flow conditions on the stream.

d. **Filtering Mechanism**

(1) All dewatering discharges will be directed through a filtering device as indicated below.

i) Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area through a geotextile filter bag. Geotextile bags need to be sized appropriately for the discharge flow and suspended sediment particle size.

ii) Straw Bale Dewatering Structure – Where the dewatering discharge point cannot be located in an upland area due to site conditions and/or distance, the discharge should be directed into a straw bale dewatering structure. The size of the straw bale dewatering structure is dependent on the maximum water discharge rate. A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.

iii) Alternative dewatering methods (e.g., use of water cannons) may be approved by DAPL on a site-specific basis.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair

can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

(1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

(2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

(3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

(4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

(1) All damaged, broken, or cracked tile will be removed.

(2) Only unobstructed tile will be used for replacement.

(3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

(4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

(5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

(6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

g. Removal of Rocks and Debris from the Right-of-Way

Excess rocks will be removed from the right-of-way. On completion, the topsoil in the easement area will be free of all rocks larger than three inches in average diameter that are not native to the topsoil prior to excavation, and similar to adjacent soil not disturbed by construction. The top 24 inches of the trench backfill will not contain rocks in any greater concentration or size than exist in the adjacent natural soils. Consolidated rock removed by blasting or mechanical means shall not be placed in the backfill above the natural bedrock profile or above the frost line. In addition, DAPL will examine areas adjacent to the easement and along access roads and will remove any large rocks or debris that may have rolled or blown from the right-of-way or fallen from vehicles.

Rock that cannot remain in or be used as backfill will be disposed of at locations and in a manner mutually satisfactory to the company's environmental inspector and the landowner. All debris attributable to the pipeline construction and related activities will be removed and disposed of properly; such debris includes spilled oil, grease, fuel, or other petroleum or chemical products. Such products and any contaminated soil will be removed for proper disposal or treated by appropriate in situ remediation.

h. Restoration after Soil Compaction and Rutting

Agricultural land compacted by heavy project equipment, including off right-of-way access roads, will be deep tilled to alleviate soil compaction upon completion of construction on the property. In areas where topsoil was removed, tillage will precede replacement of topsoil. At least three passes with the deep tillage equipment shall be made. Tillage shall be at least 18 inches deep in land used for crop production and 12 inches deep on other lands,(except where shallow tile systems are encountered), and shall be performed under soil moisture conditions which permits effective working of the soil. If agreed in advance, this tillage may be performed by the landowners or tenants using their own equipment.

Rutted land will be graded and tilled until restored as near as practical to its preconstruction condition. On lands where topsoil was removed, rutting will be remedied before topsoil is replaced.

i. Restoration of Terraces, Waterways and other Erosion Control Structures

Existing soil conservation practices and structures damaged by pipeline construction, such as surface drains, embankments and terraces, grass waterways will be restored to pre-construction elevation, grade and condition. Any drain lines or flow diversion devices impacted by pipeline construction will be

repaired or modified as needed. Soil used to repair embankments intended to retain water shall be well compacted. Disturbed vegetation will be reestablished, including a cover crop when appropriate. Restoration of terraces will be in accordance with Standard Drawings in Appendix A.

j. Revegetation of Untilled Land

Agricultural land not in row crop or small grain production at the time of construction, such as hay fields and land in conservation or set-aside programs, will be reseeded following completion of deep tillage and replacement of the topsoil. The seed mix used will restore the original or a comparable ground cover unless otherwise requested by the landowner.

Land that is normally used for crops that will not be planted due to pipeline construction will be seeded with an appropriate cover crop following replacement of the topsoil and completion of deep tillage, unless otherwise agreed to with the landowner. Cover crop seeding may be delayed if construction is completed too late in the year for a cover crop to establish and in such instances is not required if the landowner or tenant proposed to till the land the following year.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will consult with the landowner concerning the landowner's plans for these future actions.

l. Restoration of Land Slope and Contour

The slope, contour, grade, and drainage pattern of the disturbed area will be restored as nearly as possible to its preconstruction condition. However, the trench may be crowned to allow for anticipated settlement of the backfill. DAPL will remediate areas of excessive or insufficient settlement in the trench area where it visibly affects land contour or alters surface drainage. Disturbed areas where erosion causes excessive rills or channels or areas of heavy sediment deposition, will be regraded as needed. On steep slopes, methods such as sediment barriers, slope breakers, or mulching will be used as necessary to control erosion until vegetation can be reestablished.

m. Siting and Restoration of Areas Used for Field Entrances and Temporary Roads

The location of temporary roads to be used for construction purposes will be negotiated with the landowner and the Tenant. The temporary roads will be designed to not impede proper drainage and will be built to minimize soil erosion on or near the temporary roads.

Post construction and restoration temporary field entrances or access roads will be removed and the land made suitable for its previous use, in agreement with the landowner. Areas affected will be regraded and deep tilled as required. If by agreement or at landowner request, and approved by local public road authorities, a field entrance or road is left in place, it will be left in a graded and serviceable condition.

n. Construction in Wet Conditions

Construction in wet soil conditions will not commence or continue at times when or locations where the passage of heavy construction equipment may cause rutting to the extent that the topsoil and subsoil are mixed, or underground drainage structures may be damaged. To facilitate construction in soft soils, DAPL may elect to remove and stockpile the topsoil from the traveled way, install mats or padding, or use other methods.

7 Compensation for Damages

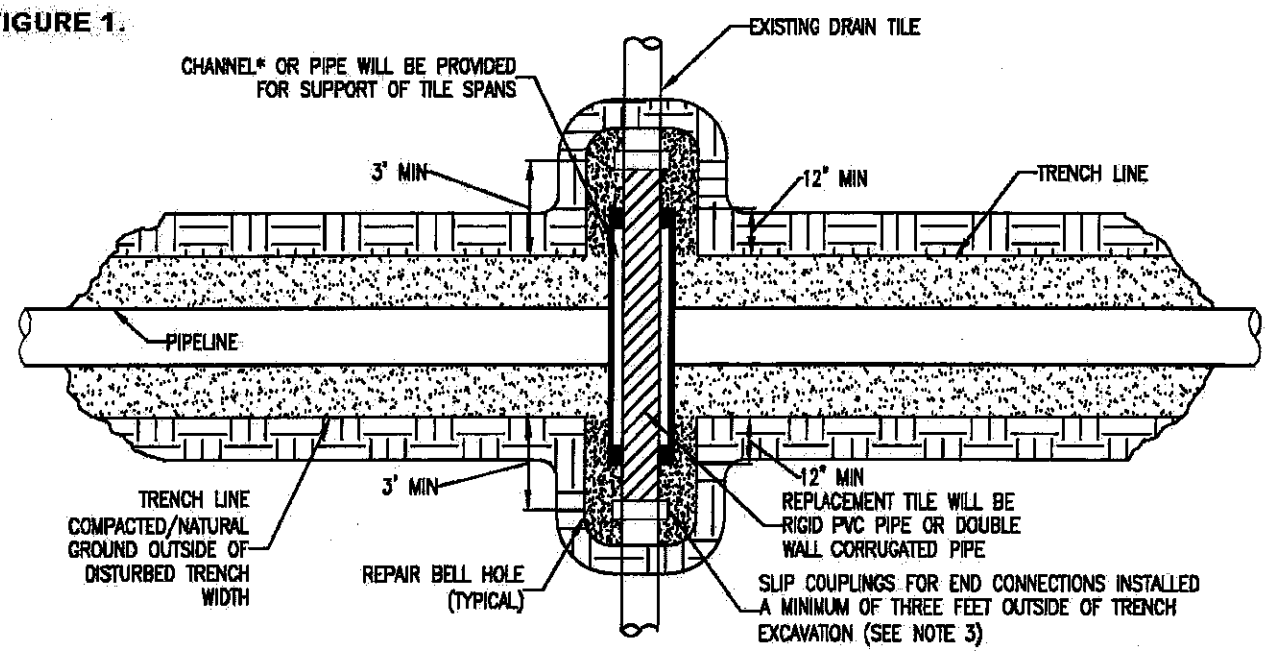
DAPL will be responsible for compensating the landowner for damages during construction. For crops, value of the loss will be established based on current crop values in the area of the impact per South Dakota Department of Agriculture statistics. DAPL will also compensate the landowner for loss of use of agricultural land, if attributable to pipeline construction. Supplemental soil sampling, testing and additional restoration activities to restore agricultural land to its pre-construction conditions will be undertaken by DAPL upon request of the landowner.

DAPL will also be responsible to compensate landowners for other physical property damage attributable to pipeline construction, such as fences, driveways and other structures.

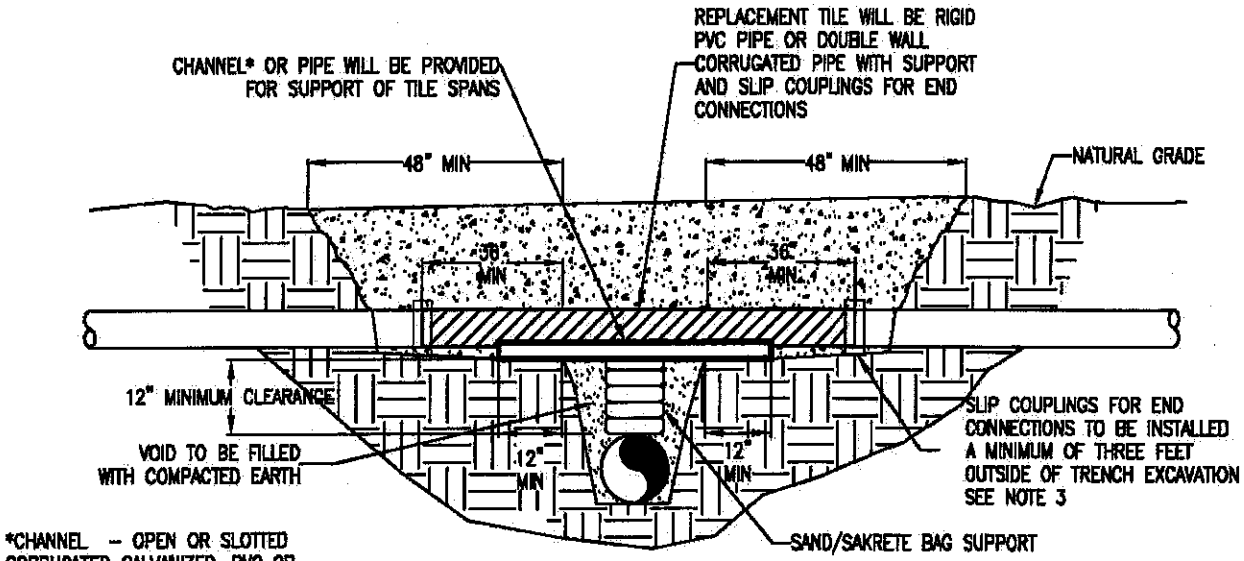
Appendix A

Tile Repair Drawings

FIGURE 1.



PLAN
N.T.S.



*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

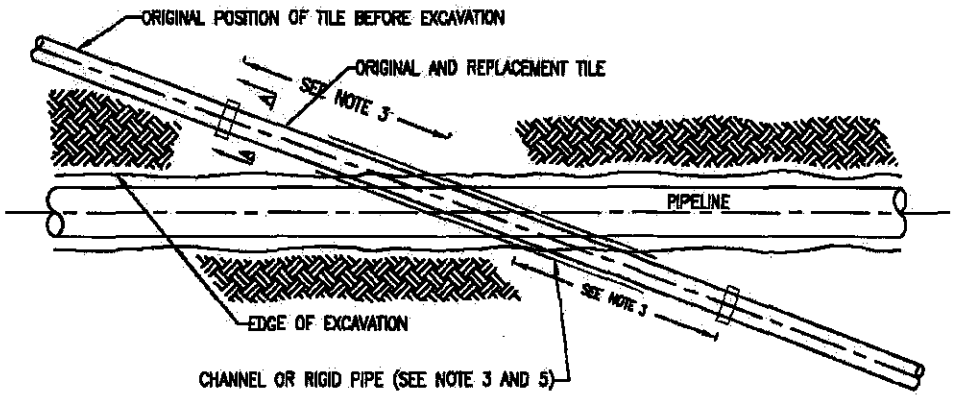
CROSS SECTION
N.T.S.

NOTE:

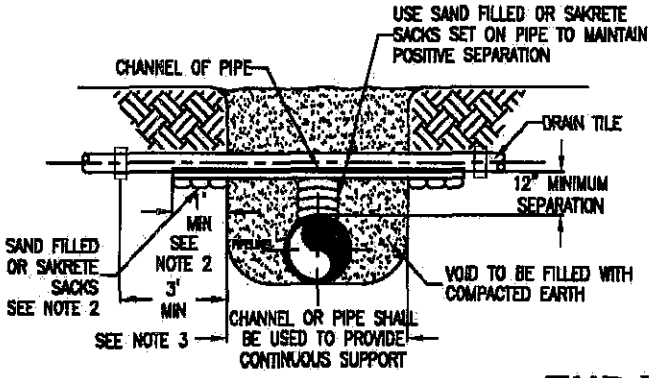
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

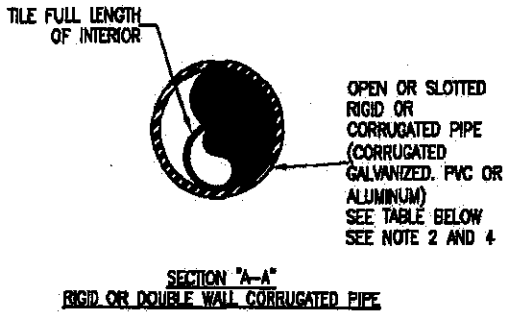
TEMPORARY DRAIN TILE REPAIR

FIGURE 2.



PLAN VIEW





SECTION "A–A"
RIGID OR DOUBLE WALL CORRUGATED PIPE

END VIEWS

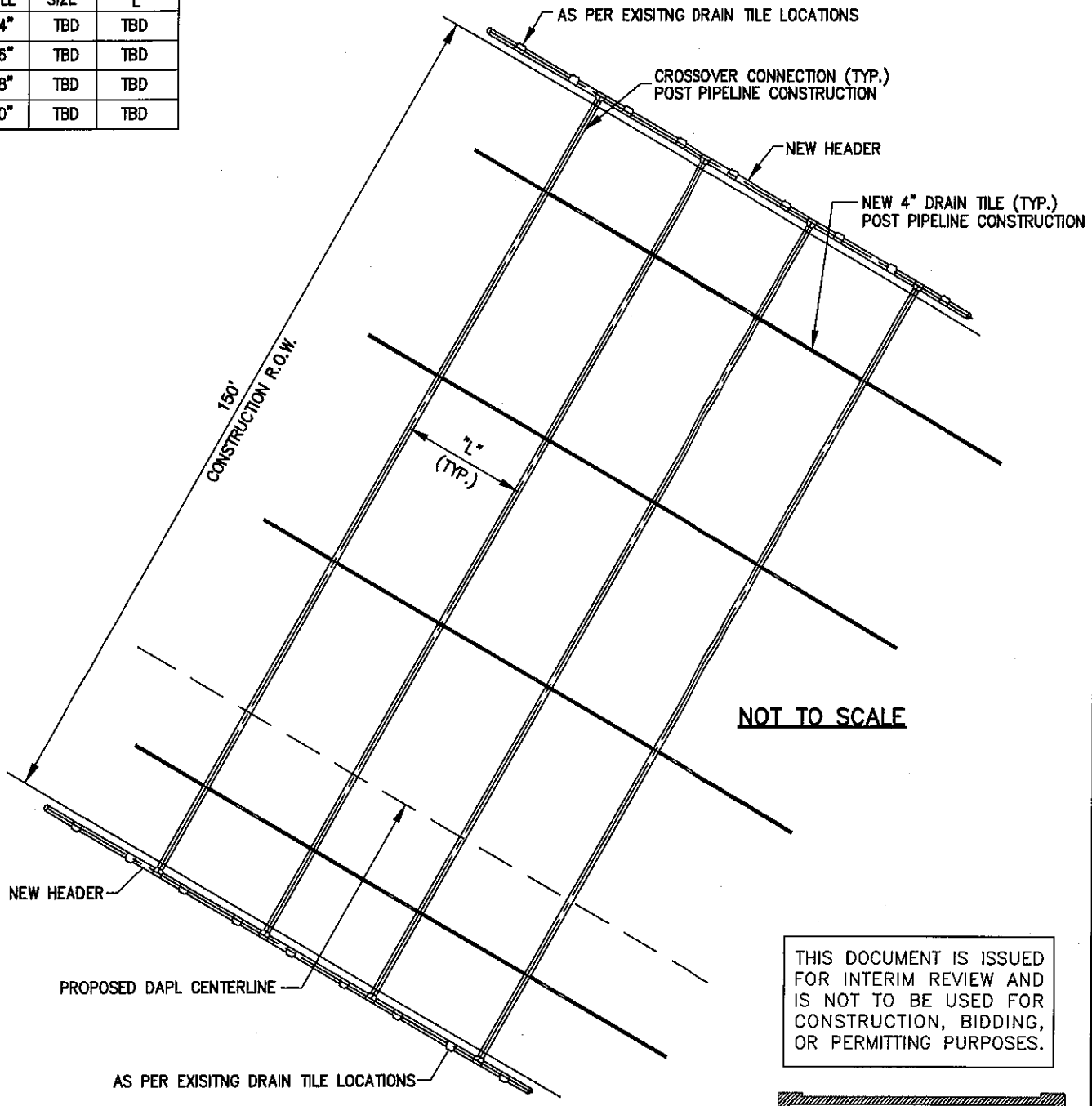
MINIMUM SUPPORT TABLE			
TILE SIZE	CHANNEL SIZE	PIPE SIZE	
3"	4" @ 5.4 #/ft	4"	STD. W.T.
4"-5"	5" @ 6.7 #/ft	6"	STD. W.T.
8"-9"	7" @ 9.8 #/ft	9"-10"	STD. W.T.
10"	10" @ 15.3 #/ft	12"	STD. W.T.

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.
2. 1'–0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAKRETE, OR SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).
3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.
4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.
5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.
6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.
7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

PERMANENT DRAIN TILE REPAIR

DRAIN TILE	HEADER SIZE	SPACING "L"
4"	TBD	TBD
6"	TBD	TBD
8"	TBD	TBD
10"	TBD	TBD



THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ISSUED FOR REVIEW
09/02/14

NOTES:
1. HEADERS WILL BE CONNECTED TO EXISTING DRAIN TILE PRE-CONSTRUCTION.
2. CROSSOVER PIPING WILL BE INSTALLED POST PIPELINE INSTALLATION.

REV.	DATE	BY	DESCRIPTION	CHK.
A	9/2/14	DAH	ISSUED FOR REVIEW	

PROJECT NO. 10395700

DAPL/ETCOP

TYPICAL DRAIN TILE HEADER SYSTEM

DRAWN BY: DAH	DATE: 09/02/14	DWG. NO. P12-49	REV. A
CHECKED BY: DAH	DATE: 09/02/14		
SCALE: N.T.S.	APP.:		

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-1

State the name, current address, and telephone number of the person or persons answering these interrogatories.

Response:

See the individual responses for the information requested.

Prepared by: Stephen Veatch
Title: Senior Director - Certificates
Address: 1300 Main St. Houston, TX 77002
Telephone Number: 713-989-2024

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-2

Briefly explain the status of any civil actions pending in South Dakota Circuit Court(s) regarding the Dakota Access Pipeline. Does Dakota Access anticipate the Circuit Courts(s) will take action prior to the date of the evidentiary hearing in this proceeding?

Response:

Dakota Access was denied survey access by property owners on various tracts of land along the route. As a result, Dakota Access requested the Circuit Court in relevant counties to enter an Order permitting access to property for the purpose of conducting necessary surveys. Dakota Access anticipates the Circuit Court will take action prior to the evidentiary hearing. Please advise if Staff would like additional information including property owner name, Circuit Court file numbers or any additional level of detail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-3

Referring to DAPL's Response to Staff's March 18, 2015, Data Request No. 3: Are shipping contracts take or pay contracts? In addition to oil fields production forecasts, refining capacity, and shipping contracts, are there any other assurances DAPL can provide to the public that the pipeline will be utilized over the near-term and mid-term?

Response:

The term used in the Shipper's contract is a "transportation and deficiency" contract. This term is synonymous with a "take or pay" contract, except the former is typically used in relation to the utilization of capacity and the latter typically relates to the receipt of the commodity. In summary, a "transportation and deficiency" contract is one under which the committed shipper agrees to pay the carrier for the availability of transportation service, even during periods when that transportation service is not actually utilized by the committed shipper. In addition to the applicable fees paid by the committed shipper for volumes actually transported in a month, the committed shipper pays a "deficiency payment" to the carrier for the volume of crude petroleum not transported within the committed shipper's committed volume of pipeline capacity. In terms of utilization in the near-term and mid-term, 100% of the committed shippers of Dakota Access have entered a transportation and deficiency contract with a term of 5 years or greater, and 98.6% of the committed shipper volume is under transportation and deficiency contracts with a term of 7 years or greater. Additionally, North Dakota has very limited refining capacity within the state; accordingly, the crude oil production in North Dakota must be transported to reach markets where it can be sold.

Prepared by: Damon Daniels
Title: Vice President – Commercial Operations
Address: 1300 Main Street Houston, Texas 77002
Telephone Number: 713-989-7920

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-4

Referring to DAPL's Response to Staff's March 18, 2015, Data Request No. 33: Specifically address the claims made by land owners that the notice they received contained either an incorrect name or address and how DAPL performed a Quality Assurance/Quality Control check to verify all landowners properly received notice according to SDCL 49-41B-5.2.

Response: The list of landowners entitled to notice, was generated through tax records kept by each local county government office. Notice letters were sent to landowner addresses on file. Two Hundred Eighty Three (283) letters were returned undeliverable based on the name and address on record with the local government office. The returned letters were all cross-checked against the tax record generated list. None of the letters were returned due to a printing error.

In addition to the letters, DAPL published notice per South Dakota code and provided notice to all county auditor offices.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota AccessAddress: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
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Interrogatory 2-5

Regarding the pump station in Spink County, please provide any known concerns from neighboring residences. Further, please identify any reasonable measures that DAPL plans to implement in order to mitigate concerns such as noise levels and viewshed deterioration that the pump station may cause.

Response: Neighboring residents have voiced noise level concerns. The pumps will be fully enclosed in buildings designed for noise abatement. Noise levels will be reduced to 55 dBA at the pump station property line. Dakota Access will add landscaping and/or paint highly visible components at the pump station to blend in with the landscape as a measure to minimize visual impacts.

Prepared by: Chris Srubar
Title: Engineer
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2879

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-6

Please provide references to any specific sections of the Application, any responses to discovery requests, and any other evidence that DAPL intends to use for demonstrating the Applicant meets the burden of proof to establish that "[t]he proposed facility will comply with all applicable laws and rules." [SDCL 49-41B-22(1)]

Response:

From Federal Pipeline Safety regulations to local county ordinances, Dakota Access is subject to all applicable rules and regulations. Every part of the pipeline's construction and operation is regulated by overlapping levels of government regulation. Table 5.0-1 in the Application lists the various government agencies or bodies which regulate or permit the process during the construction process and beyond. Dakota Access will comply with all rules and regulations of all listed agency or government body. In addition, Dakota Access is subject to all South Dakota Codified laws just as any other business in the State of South Dakota.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-7

In section 14.5 of the Application, page 13, it is identified that DAPL has retained an agricultural consultant to develop specific mitigation measures for work in shallow Natric soils. Please provide the name of the agricultural consultant that DAPL references.

Response:

Aaron DeJoia
DURAROOT ENVIRONMENTAL CONSULTING
4626 WCR 65 • Keenesburg, CO 80643

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-8

In section 16.3 of the Application it is identified that final results of field surveys and input from resource agencies were pending at the time the application was submitted. Please provide an update on the field surveys and agency consultation that has occurred since the application was filed. Moreover, please provide a copy of any finalized filed surveys and mitigation/protection measures to be implemented to protect sensitive, threatened, and endangered species.

Response: Field surveys are complete for all tracts with granted survey access. The only federally listed species potentially encountered along the project in South Dakota is the Topeka shiner at select locations. Dakota Access intends to HDD some of these streams and will comply with the Programmatic Biological Opinion for select Nationwide Permits in South Dakota for the Topeka shiner (October 2014) where the streams would be open cut; this has been communicated with the USACE regarding our submitted Nationwide Permit 12 Preconstruction Notifications that are pending verification.

The Class III cultural resource survey report was submitted to the South Dakota State Historic Preservation office on June 5, 2015.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-9

In section 17.1.1 of the Application it is stated that: "To minimize impacts to aquatic resources, appropriate remedial measures will be implemented to meet federal and state standards designed to ensure protection of aquatic biota." Please provide a discussion on the federal and state standards the project will need to meet and the Applicant's plan to implement the appropriate remedial measures to meet the standards.

Response: With respect to aquatic resources, the project will comply with all applicable sections of the Clean Water Act and South Dakota Codified Law regarding water quality. Dakota Access has submitted a verification request to the USACE for authorization under the Nationwide 12 permit. Dakota Access will comply with all conditions defined in the Nationwide 12 permit and issued verifications, including conditions required by the SD Department of Environment and Natural Resources 401 water quality certification that has been issued for Nationwide permit 12 to minimize impacts to aquatic resources.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-10

In section 17.4 and 17.4.1 of the Application, on page 30, it is identified that "pending final results of field surveys and input from resource agencies, appropriate mitigation and protection measures will be implemented to minimize potential impacts [to the Topeka shiner]." Please provide the status of final surveys and consultation with resource agencies. Also please provide results of any completed surveys and agency coordination that specifies the mitigation and protection measures deemed to be appropriate to protect the Topeka shiner.

Response: This is addressed in the response to interrogatory 2-8. The USACE and USFWS indicated that the Topeka shiner may be present at select locations along the project route in South Dakota. Dakota Access intends to HDD some of these streams and will comply with the Programmatic Biological Opinion for select Nationwide Permits in South Dakota for the Topeka shiner (October 2014) where the streams would be open cut; this has been communicated with the USACE regarding our submitted Nationwide Permit 12 Preconstruction Notifications that are pending verification.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-11

Please identify each parcel of property to be impacted by the pipeline that is owned by the State of South Dakota.

Response: See Interrogatory No. 2-11 Attachement No. 1

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-12

Please explain how any State of South Dakota owned land falls within the predictive model used to identify cultural resources and historic properties.

Response: The Project crosses one parcel of state owned property. The parcel was identified as having a high and moderate probability for cultural resources. The predictive model was based on environmental factors and known cultural resources to predict the likely locations of unidentified cultural resources.

Surveys have been completed at this tract; one archaeological site was encountered and the alignment was shifted to avoid the site. Survey results were included in the cultural resource reporting which in currently under review with the SD SHPO. No impacts to cultural resources are expected to impacted on this tract.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
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Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
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Interrogatory 2-13

Has Dakota Access applied for, or received, a permit from the State Archeologist to conduct filed investigations on State of South Dakota owned land? If answered in the affirmative, please provide a copy of the permit from the State Archeologist. If answered in the negative, will Dakota Access be filing for a permit from the State Archeologist in order to conduct field investigations on State of South Dakota owned land?

Response: A State Permit was obtained for this survey and is attached as SD PUC Interrogatory 2-13 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-14

Please provide any information or reports on Dakota Access's efforts made to identify cultural and historic sites sensitive to Native American Tribes along the project route.

Response: Dakota Access has not conducted any Traditional Cultural Properties (TCP) studies for the Project nor have they been requested. The cultural resource survey protocol was developed by Dakota Access in compliance with the applicable South Dakota and federal standards and was reviewed and approved by the SHPO prior to initiating field surveys. Dakota Access' surveys documented some potentially eligible sites for listing in the National Register of Historic Places. These sites have been largely avoided through route modifications and consultation is ongoing with the SHPO. Lead federal agencies (the USACE and USFWS in this case) are responsible for conducting government to government tribal consultations as they deem necessary in regard to their respective federal actions on the Project.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-15

In response to interrogatory 59 in DRA's first request for discovery, DAPL identifies that there will be three mainline construction spreads. In the revised application, DAPL identifies there will be two large construction spreads. Please clarify the number of construction spreads, and construction jobs associated with those spreads, that will occur during the construction phase in South Dakota.

Response:

Dakota Access plans to have three pipeline construction Spreads in South Dakota. Spread 5 (~124 Miles) will be entirely in South Dakota. Spread 4 (~ 127 Miles) will be in South Dakota and extend into Iowa to the southeast and Spread 6 will be in South Dakota and extend into North Dakota to the northwest.

Each pipeline construction spread will include approximately 700 to 1,000 persons per spread.

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-16

Please provide an update on consultation with the U.S. Fish and Wildlife Service. Has the agency provided Dakota Access with a biological opinion? If so, please provide a copy of the biological opinion and any mitigation measures or recommendations issued by the U.S. Fish and Wildlife Service for the Dakota Access Pipeline. If not, please identify when Dakota Access expects to receive the biological opinion.

Response: Please see responses to 2-8 and 2-10 above.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-17

Describe any measures DAPL will take to ensure that the source water for hydrostatic testing does not exceed water quality standards, such that the discharge of such water could result in a violation of hydrostatic testwater discharge quality limits.

Response: In accordance with required permits, Dakota Access will test source water prior to withdrawal and will take appropriate measures to ensure that discharges comply with applicable permit thresholds.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-18

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," on page 3 it states: "When used from this point forward in this Plan, "EI" will refer to the responsible person, whether it is the EI, CI, Health, Safety and Environmental (HSE) Coordinator, or Project Manager or other responsible person." Please provide a consistent definition of "EI" across the project plans and defined roles and responsibilities between the EI, the contractor, and other members of the construction team.

Response: Dakota Access has revised the Draft Stormwater Pollution Prevention Plan and it addresses this request. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-19

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," please clarify the following apparent discrepancy: On page 3 it is identified that "The Project's EI is responsible for determining the schedule and placement of BMPs." Although DAPL's SWPPP leaves this to the EI's discretion, the South Dakota General Permit states that the plan must comply with Section 3.9 as follows:

> **3.9 Erosion Control and Stabilization**
> The permittee shall stabilize disturbed portions of the site as soon as possible with appropriate BMPs, but in no case more than 14 days after construction activity has temporarily or permanently ceased on any portion of the site. An exception to this effluent limit is allowed if earth-disturbing activities will be resumed within 21 days. All other exceptions shall be approved on an individual basis by the Secretary.

Response: The EI's determination will meet or exceed (less time) than that stated in the South Dakota General Permit. The revised draft Stormwater Pollution Prevention Plan clarifies this. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
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Interrogatory 2-20

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," on page 4 it states: "The following represents a typical sequence of major soil-disturbing events during the Project and the control measures that will be implemented." Please provide a description of front-end grading and topsoil/subsoil storage.

Response: Appropriate descriptions have been incorporated into the attached revised Draft Stormwater Pollution Prevention Plan. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
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Interrogatory 2-21

Referring to the excerpt from the Application provided below, as found on page 14 of the Application, please define "specialized construction techniques." Would this include some kind of poly wrap or coating?

As outlined in Section 14.7– Seismic and Subsidence, desktop studies have identified a potential for karst geology along certain portions of the route. Dakota Access will conduct pre-construction training to educate personnel on the identification of karst features during excavation. If karst features are identified along the route, Dakota Access will take steps to ensure the integrity and safety of the pipeline, which may include realignment or specialized construction techniques.

Response:

See SD PUC Interrogatory No. 2-21 – Attachment No. 1

Prepared by: Mark Miller/Craig Erdman
Title: Group Leader-Principal/Senior Engineering Geologists
Address: 3050 S. Delaware Springfield, MO 65804
Telephone Number: 417-831-9700

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-22

Referring to the excerpt from the Application provided below, as found on page 16 of the application, please confirm that the need for water appropriations permits for the use of surface and groundwater has been addressed in the application.

15.3 SURFACE WATER AND GROUNDWATER

Dakota Access may utilize surface waters as a water source for hydrostatic testing. Exact locations of the hydrostatic testing and discharge sites will be determined by the selected contractor, additional information on testing and discharge areas is provided in Hydrology Section 15.5– Discharge Water. Additional information on surface waters within the Project area is included in Sections 17.0– Effect on Aquatic Ecosystems and 20.0– Water Quality.

15.4 AQUIFERS

Dakota Access anticipates utilizing surface water for hydrostatic testing purposes. Groundwater is not currently proposed for use during construction and operation of the Project.

Response: Groundwater appropriations have not been addressed in the application as no use of groundwater is proposed. Dakota Access will obtain the necessary permits required for utilization of surface waters, as identified in Table 5.0-1 of the application.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-1

Please provide copies interrogatories from other parties served upon Applicant and Applicant's answers as they become available.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-2

Please provide copies of responses of other parties to Applicant's interrogatories and requests for production of documents, as well as any related follow-up contacts or demands when they are received.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-3

Please produce any document requested in, or used in DAPL's response to, any of the interrogatories submitted above.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-4

In section 23.6 of the application, it is identified that an Unanticipated Discovery Plan will be submitted to SHPO for approval. Please produce the Unanticipated Discovery Plan and any communications received from SHPO approving the plan.

Response: Dakota Access has submitted the draft unanticipated discovery plan to the SHPO for review; no response has been received to date. See SD PUC Request 2-4 – Attachment No. 1

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-5

Please provide record of any consultation with SHPO by Dakota Access or any other governmental agency for review and comment on activities regarding jurisdictional cultural resources as identified in Table 5.0-1 of the application.

Response: Copies of email correspondence from Dakota Access to the SHPO is included in SD PUC Request 2-5 – Attachment No. 1. Dakota Access has not been privy to any copies of consultations by other agencies to the SHPO to date.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-6

Referring to DAPL's Response to Staff's March 19, 2015, Interrogatory 1-5: As stated in the revised Application, DAPL identifies all valves will have remote actuators and, thus, a communications shed adjacent to the valves. If any valve locations were changed since filing of the Application please provide the most current design drawings for the pipeline that shows the location of motor operated valves, manually operated valves, check valves, cathodic protection test sites, pig launchers/receivers, and pump station. Please provide this information as a map and GIS shapefile if changes were made since the shapefiles produced in response to Staff's first interrogatories.

Response:

See SD PUC Request 2-6 Attachment No. 1 are maps of requested motor operated valves, pig launcher/receivers, and pump stations. At this time DAPL does not have any check or manual valves. Test leads will be located at road/railroad crossings, along fences, and generally at least one every mile.

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-7

In section 16.3 of the Application it is stated that: "Early coordination and informal consultation with the USFWS, the South Dakota Natural Heritage Program (SDNHP), and South Dakota Game, Fish and Parks (SDGFP) was initiated in 2014." Please provide any official correspondences that document the consultation completed.

Response: There is little record of official correspondence regarding early coordination and informal consultation with the agencies, as it largely consisted of phone calls and emails. All of the agencies identified were contacted in May and June 2014 with respect to data gathering for performing a desktop analysis of the Dakota Access Project. A South Dakota interagency agency meeting was held the last week in June in Pierre, SD where Dakota Access representatives first introduced the project and discussed regulatory requirements, schedules, etc; representative(s) from the SHPO's office and South Dakota Game, Fish and Parks were in attendance.

Correspondence between Dakota Access and the USFWS-SD field office consisted of phone calls and emails to discuss listed species and respective habitats, and permit coordination.

Dakota Access followed-up with the SHPO office in August to get approval on the proposed cultural resource survey protocols (copy of email correspondence is provided in response to 2-5 above), and routinely in 2014 to perform Class 1 literature reviews as were needed on route adjustments.

Early coordination with the SDNHP and SD Game, Fish and Parks Department consisted of phone calls and emails to discuss listed species and occurrence data to utilize during surveys and habitat assessments. The Department confirmed that no formal authorization from SDNHP and the SD Game Fish and Parks Department is required for the project.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-8

In section 23.6 of the Application it is identified that reports detailing the comprehensive cultural resource filed investigations will be prepared that include recommendations for additional investigations to determine NHRP eligibility and/or avoidance measures. Please provide a copy of any report produced in accordance with this section of the application and any correspondence showing the reports were filed with SHPO for review.

Response: A Class III report for all survey activities performed in 2014 and 2015 was submitted to the SHPO on June 5, 2015; no comments have been received to date. A Class III report for all areas under jurisdiction of the USFWS easements in SD was provided to the USFWS Region 6 archeologist (May 7 for all but one tract that remained to be surveyed and an addendum for the outstanding tract on June 2); no comments on the reports have been received to date. This documentation was supplied in response to the Yankton Sioux response previously.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-9

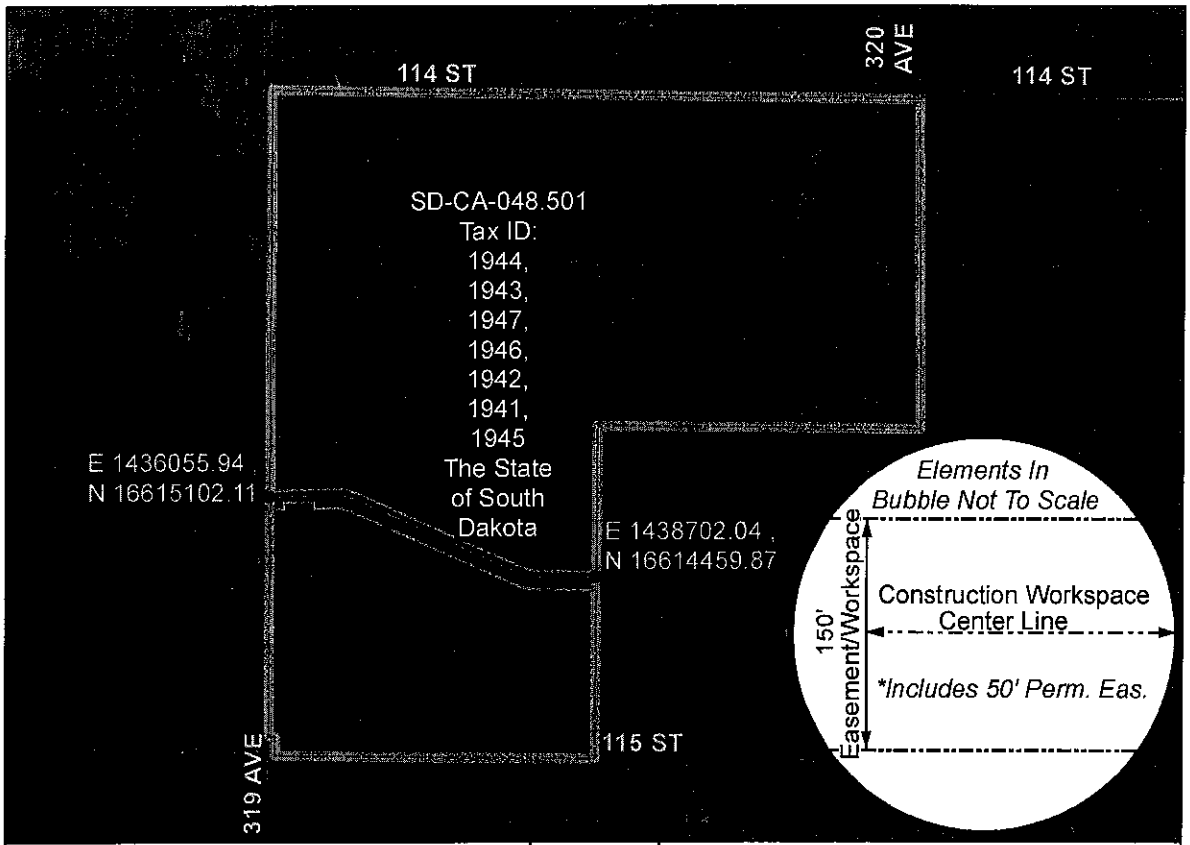
Within the application, DAPL uses language such as "in the unlikely event of spill" (see pages 7, 26, 41, and 47 of application). Please provide a risk assessment, or other similar analysis, that shows the potential volumes, frequencies, and probabilities of spill events along the South Dakota portion of the proposed pipeline that supports the use of language identifying spills are unlikely.

Response: The spill model is currently under development and a draft version is being finalized. The spill model will allow the worst case discharge to be identified for the pipeline, which by definition, is highly improbable.

Prepared by: Todd Stamm
Title: Vice President – Pipeline Operations
Address: One Flour Daniel Drive Sugar Land, TX 77478
Telephone Number: 281-637-6581

Exhibit A

CAMPBELL COUNTY, SD
S16-R74W-T126N



ROW Length: 2778.03 Ft. = 168.37 Rods
Proposed Permanent Easement: 3.19 AC
Temp Easement/ Workspace: 6.1 AC
Add Temp Easement/ Workspace: 0.13 AC

Linear/Areal Calc = NAD 1983 UTM Zone 14N

Feet
0 1,000 2,000

Tract No.: SD-CA-048.501

DAKOTA ACCESS, LLC

Proposed Pipeline Easement Across:
The State of South Dakota

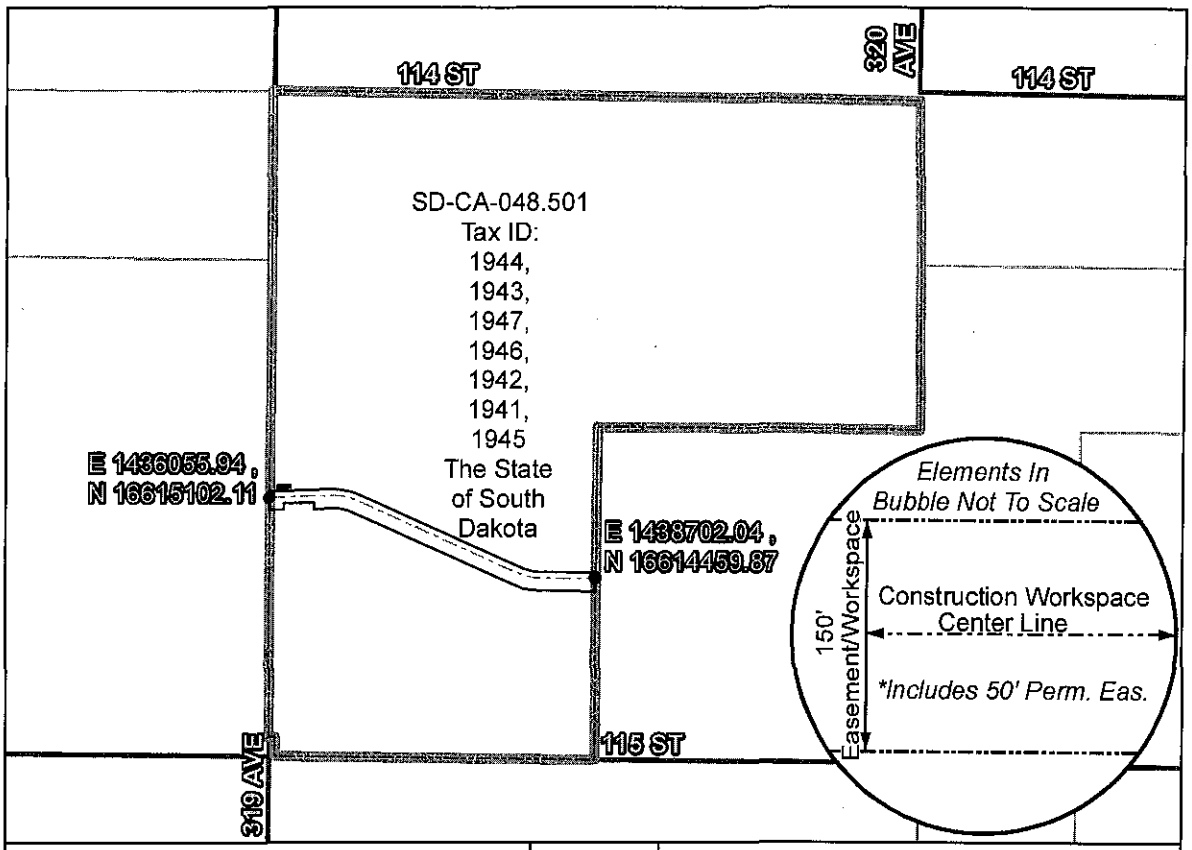
- Entry/Exit
- Centerline
- Easement/Workspace
- Property Boundaries
- Additional Temporary Easement - Workspace
- Adjacent Property Boundaries

Grantor hereby agrees that Grantee shall have the right to and is hereby authorized, with or without the joinder of Grantor, to file Exhibit A-1 by affidavit, to amend this Agreement to include such new Exhibit A-1 or to attach such new Exhibit A-1 to this Agreement, and to record or re-record such affidavit, amendment, or Agreement with the new Exhibit A-1. Grantee shall provide Grantor with a copy of the recorded affidavit, amendment or re-recorded Agreement.

_____
Landowner Initials

Exhibit A

CAMPBELL COUNTY, SD
S16-R74W-T126N



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_____
Landowner Initials

SOUTH DAKOTA
STATE HISTORICAL SOCIETY
DEPARTMENT OF TOURISM

December 10, 2014

Beth McCord
Gray & Pape, Inc.
5807 North Post Road
Indianapolis, IN 46216

RE: Request for State Permit under the Archaeological Exploration Act (SDCL1-20) and the Cemetery and Burial Records Act (SDCL 34-27) for the 2014 Dakota Access Project (DAPL), Campbell County, South Dakota

Dear Beth:

We have received your application for a Permit Under the Archaeological Exploration Act (39SDCL 1-20) and the Cemeteries and Burial Records Act (39SDCL 34-27) for the 2014 Dakota Access Project (DAPL), Campbell County, South Dakota on lands administered by the State of South Dakota. Please consider this you're your notice to proceed under SDCL1-120) and SDCL 34-27). Upon completion, please send a draft copy of the report for review addressed to myself (digital copy is acceptable) and a final hard copy report for our library.

This portion of South Dakota is archaeologically rich, most likely do to the net erosion in the area which reveals sites more abundantly that other locations in the state. Should you have any problems in the field please feel free to call on my personal cell 605-484-8341.

Stipulations:
1. Culturally diagnostic artifacts recovered on state land will be collected, placed in a labeled bag and sent to me personally for curation. Do to the time constraint and my personal interest in this region of the state this will not require a curation agreement.
2. The identification of human remains are to be reported to law enforcement and this office.

Thank you for your continued support in the identification and protection of the cultural resources of South Dakota.

Sincerely,

Michael Fosha
Assistant State Archaeologist

Enclosure: SDCL 1-10 and SDCL 34-27 permit fee.

DAKOTA ACCESS PIPELINE (DAPL) PROJECT

&

ENERGY TRANSFER CRUDE OIL PIPELINE (ETCOP) PROJECT

Stormwater Pollution Prevention Plan

DAKOTA ACCESS, LLC

June 2015

REV	DATE	DESCRIPTION	ORIG	CHK	APPR
A	8-26-2014	Issued for Review	JCD	JW	DJ
B	09-11-2014	Issued for Approval	JCD	JW	DJ
C	06-15-2015	Issued for Approval	JRF	MH	

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1.0 Introduction

Dakota Access, LLC and Energy Transfer Crude Oil Company, LLC (COMPANY) will implement this Stormwater Pollution Prevention Plan (SWPPP) during construction of the Dakota Access Pipeline (DAPL) Project and the Energy Transfer Crude Oil Pipeline (ETCOP) Project (Project). The primary purpose of the SWPPP is to minimize the impacts of stormwater runoff during Project construction activities through the implementation of Best Management Practices (BMP).

1.1 Responsibility for Implementation

The Environmental Inspectors (EI) are responsible for directing, and inspecting efforts regarding implementation of the SWPPP and will fulfill the responsibilities as described herein. As stated in the construction contract or as otherwise agreed, once selected, the Construction Contractor (Contractor) will be responsible for all or part of the implementation of the SWPPP as described herein.

2.0 Site Description

2.1 Project Name, Location, and Purpose

Project Name: Dakota Access Pipeline (DAPL) Project and Energy Transfer Crude Oil Pipeline (ETCOP) Project.

Project Purpose: ETC's primary objective for the proposed Project is to allow for transport of approximately 400,000BPD of crude oil between Stanley, ND and Nederland, TX. The crude oil transported will provide supplemental crude oil supply for markets in the United States. In addition, the proposed project will open railroad transport for other products produced locally that otherwise would not be accessible to other markets.

Project Location: The DAPL and ETCOP projects consist of a Gathering Area, a Mainline Transmission Pipeline, and the Conversion of an existing natural gas transmission line to crude oil. The Gathering System commences at Stanley, North Dakota and ends at Johnson Corner, North Dakota. There are six proposed pump stations along the Gathering System, namely Stanley, Ramberg, Epping, Trenton, Watford City, and Johnson Corner. The Mainline Transmission Pipeline begins at Johnson Corner, North Dakota and ends southeast of the proposed Illinois Patoka Custody Transfer and Metering Station. Approximately 992 miles of mainline make up the DAPL project. The ETCOP project begins at the Patoka Custody Transfer and Metering Station and consists of approximately 24 miles of new Mainline Transmission Pipeline. This will eventually tie into the future expansion of 757 miles of conversion pipeline that extends from Johnsonville, Illinois to Nederland, Texas.

There will be tanks constructed at the six pump stations along the Gathering System. There will be one 50,000 barrel tank at Stanley, one 200,000 barrel tank and one 100,000 barrel tank at Ramberg, one 100,000 barrel tank at Epping, one 100,000 barrel tank at Trenton, two 100,000 barrel tanks at Watford City, and one 200,000 barrel tank at Johnson Corner.

There will be mainline valve sites on both sides of major water body and major highway crossings for isolation in the event of emergency shutdown. In addition to the mainline valves, multiple pump stations and one custody transfer metering station will also be installed along the Mainline Transmission Pipeline. The proposed custody transfer station will be located near Patoka, Illinois.

Launcher and Receiver traps will also be installed along the Mainline Transmission Pipeline at locations less than 100 miles apart.

A proposed rail yard and rail loading facility will also potentially be integrated into the DAPL project. The location of the rail yard will be on the east side of Historical Route 66 and on the west side of Niemanville Trail / Co Rd 225E in Litchfield, Illinois.

2.2 Nature of the Construction Activity

ETC proposes to install the new pipeline within a variable-width construction right-of-way (ROW). Actual workspace width will depend on site engineering and available workspace constraints. In general, the pipeline will be constructed using an approximate 150-foot-wide construction ROW, which includes a new proposed 50-foot-wide permanent easement and 100-foot-wide temporary easement. The temporary easement will be allowed to revert to its original land use following construction. All pump stations and mainline valve sites to be constructed will be located on tracts of sufficient size to accommodate all aboveground appurtenances along the ROW.

2.3 Sequence of Major Soil Disturbing Events

The following represents a typical sequence of major soil-disturbing events during the Project:

- Installation of stabilized construction entrances and surface water (including wetlands) protection BMPs.
- Clearing of the Project ROW area as necessary. This may include clearing of brush and trees to create ROW needed for temporary workspace, soil storage, construction activities, and areas needed for access to particular construction sites within the Project area.
- Topsoil removal and storage.
- Grading of the Project ROW as necessary. Areas of the ROW, including temporary workspace may be graded to allow the safe passage of equipment and meet the bending limitations of the pipe.
- Installation of additional BMPs for erosion and stormwater management, as needed.
- Pipe stringing, bending, welding, and testing.
- Excavation of ditch (trackhoes or similar equipment will be used to excavate the ditch to the required depth).
- Installation of pipe in ditch.
- Tie-ins of the sections of pipeline which will be welded together in the ditch.
- Backfilling the ditch line (excavated soil will be used to cover the pipe).
- Hydrostatic testing of the pipeline as necessary.
- Removal of temporary erosion/sediment controls when other construction activity is completed and final stabilization is achieved.

3.0 Controls

This section describes controls used to prevent or control stormwater pollution. The COMPANY BMPs are based on the current best accepted practices endorsed by the American Gas Association,

Gas Research Institute, Association of Pipeline Contractors, EPA, and USACE. Appendix A contains diagrams showing typical installation of BMPs.

The Project's EI is responsible for determining the schedule and coordinating with the Contractor for placement of BMPs. The Contractor will stabilized disturbed portions of the site as soon as possible with appropriate BMPs, but in no case more than 14 days after construction activity has temporarily or permanently ceased on any portion of the site. An exception to this effluent limit is allowed if earth-disturbing activities will be resumed within 21 days. See Section 3.1.3 for more details regarding the BMPs installation timeframes. This plan will be updated by the Contractor, EI, and/or CI to identify the location and schedule of planned or installed controls as the need for these controls is determined.

The following represents a typical sequence of major soil-disturbing events during the Project and the control measures that will be implemented.

- Clearing of the Project area as necessary. This may include clearing of brush and trees in the ROW, in areas adjacent to the ROW needed for soil storage, and/or in areas needed for access to particular construction sites within the Project area. The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to any soil-disturbing activities, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Topsoil Removal and Storage. To minimize potential impacts on soil productivity, topsoil will be segregated during trench excavation in agricultural land, unsaturated wetlands, and if applicable, other areas where soil productivity is an important consideration. Unless otherwise requested by the landowner, topsoil will be removed to a maximum depth of 12 inches from the trench and spoil storage area and stored separately from the trench spoil in accordance with figures provided in Appendix A. After the trench is backfilled, topsoil will be returned to its approximate original location in the soil horizon.

- Grading of the Project area as necessary. Grading of the ROW may be necessary in areas where a level or tiered workspace is required to facilitate a safe working environment. Areas where grading occurs will be undertaken with the understanding that original contours and drainage patterns shall be re-established to the extent practicable following construction. On steep slopes, or wherever erosion potential is high, temporary erosion control measures such as temporary slope breakers, silt fencing, and hay/straw bales will be implemented by the Contractor. Additional BMPs for erosion and stormwater management will be installed as needed based on existing site conditions.

- Excavation of ditch (trackhoes or similar equipment will be used to excavate the ditch to the required depth). The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to excavation activities, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Backfilling the ditch line (excavated soil will be used to cover the pipe). The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to backfilling, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Performing cleanup and stabilization. This phase will begin after backfilling and will continue throughout the remainder of the Project's construction. This phase will include minor grading to level small areas, and revegetation. Project areas to be stabilized by vegetation will be seeded and mulched.

- The Contractor will remove temporary erosion/sediment controls when other construction activity is completed and final stabilization is achieved.

3.1 Erosion and Sediment Controls

3.1.1 Short and Long Term Goals and Criteria (as applicable)

(a) The construction phase erosion and sediment controls are designed to retain sediment on-site to the greatest extent practicable.

(b) Control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicate that a control has been installed and/or used inappropriately and/or incorrectly, the control shall be replaced and/or modified as needed.

(c) If sediment escapes the Project area, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impact (e.g., fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

(d) Sediment must be removed from sediment traps when capacity has been reduced by 50 percent.

(e) Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

3.1.2 Temporary Erosion Control Measures

The following temporary erosion and sediment controls will be utilized as necessary:

Temporary Slope Breakers: Temporary slope breakers (water bars/terraces) will be installed as necessary (at the EI's discretion) diagonally across the ROW on slopes to control erosion by reducing and shortening the velocity, length and concentration of runoff according to the figures provided in Appendix A. These breakers will divert water to a well-vegetated area. If a vegetated area is not available, erosion control barriers will be installed to filter the runoff at the outlet of the slope breakers and off of the construction ROW. Silt fence, hay/straw bales, or sandbags may be used in place of temporary slope breakers at the discretion of the EI.

Natural vegetation acts as an effective filter medium for silt removal from surface runoff. Its use as a sediment barrier results in less disturbance to the land than other methods. In areas where natural vegetation is not present or does not constitute a suitable barrier, temporary sediment and/or erosion control barriers will be installed. Temporary sediment barriers, typically hay/straw bale filters or silt fences, dissipate the energy of flowing water to allow settlement of sediment from surface water runoff.

Silt Fence/Hay/Straw Bales: Silt fences and hay/straw bales will be installed in accordance with figures provided in Appendix A. The silt fences and/or hay/straw bales will be installed as necessary to prevent erosion and sediment laden runoff from stormwater discharges. These measures will remain in place until permanent revegetation measures have been judged successful.

Silt fence and hay bale structures are also used to control erosion and sedimentation for hydrostatic test water discharges. Bale filters are effective for small rills that can be spanned by one or two bales. Bales are constructed of hay (or straw) that is securely bound to form a berm, which is held in place by two stakes driven through each bale. The first stake is driven at an angle toward the previously positioned bale, and the second stake is driven perpendicular to ground surface. The bindings of the bales will be horizontal. Filter fabric fences (silt fences) perform the same function as hay bale berms, but have the advantage of ease of installation, versatility, and light weight.

A silt fence is a geotextile fabric with fence posts spaced no more than 10 feet apart. Both silt fences and hay/straw bales will be installed according to the manufacturer's instructions where site conditions allow. Otherwise, the silt fence will be imbedded in the ground a minimum of 6 inches. Where two sections are joined, they will be overlapped a minimum of 6 inches. Accumulated sediment will be removed regularly and the silt fencing inspected to ensure the bottom of the silt fence remains imbedded in the ground. A sufficient stockpile of silt fence will be maintained on-site for emergency use.

Hay bales may be left in place. These barriers are required after the initial disturbance of the soil and are typically installed at the following locations:

- At the outlet of a temporary slope breaker when vegetation is not enough to control erosion.
- Along banks of waterbodies between the graded ROW and the waterbody after clearing.
- Downslope of any stockpiled soil in the vicinity of waterbodies and wetlands.
- At the base of slopes adjacent to road crossings where vegetation has been disturbed.
- At sideslope and downslope boundaries of the construction where runoff is not otherwise directed by temporary slope breakers.
- In the ROW at boundaries between wetlands and adjacent disturbed upland areas to prevent flow of sediment into the wetland where runoff is not otherwise directed by a temporary slope breaker.
- At the edge of the ROW to prevent siltation of ponds, wetlands, or other waterbodies adjacent to the downslope of the ROW or as necessary to contain spoil and sediment within the ROW.
- For hydrostatic test water discharges, the water should be released directly into the silt fence/hay bale structures in conjunction with other approved velocity dissipating devices.

Temporary Trench Plugs: Temporary trench plugs prevent water diversion from waterbodies or drainage tiles into upland portions of the pipeline trench during construction and prevent silt-laden stormwater from flowing down the trench into waterbodies. The EI or CI will determine the need for and spacing of trench plugs. Otherwise, the Contractor will install hard trench plugs (undisturbed soil) on either side of waterbody crossings or drain tiles. Topsoil will not be used for trench plugs.

3.1.3 Stabilization Practices

The stabilization measures of the pipeline ROW incorporate permanent erosion and sedimentation measures. However, in the event that final restoration cannot be implemented immediately post-

construction, temporary erosion and sedimentation control measures will be employed as specified by the Contractor until the weather is suitable for final cleanup.

For pipeline construction in areas with sloping terrain, COMPANY will use permanent trench plugs for soil stabilization.

3.1.3.1 Upland Areas

Temporary Stabilization:

- Temporary stabilization measures will be initiated as soon as practicable in portions of the ROW where construction activities have temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day is precluded by weather, stabilization measures will be initiated as soon as machinery is able to access the ROW. If activities resume within 21 days from when the activities ceased, stabilization measures do not have to be initiated by the 14th day following cessation of the activity. These guidelines are based on National Pollutant Discharge Elimination System (NPDES) requirements and may be modified based on state-specific PDES regulations.

- In the event that construction is completed more than 30 days before the seeding season for perennial vegetation, areas adjacent to waterbodies will be mulched with 3 tons/acre of straw, or its equivalent, to a minimum of 100 feet on either side of the waterbody. These guidelines are based on NPDES requirements and may be modified based on state-specific PDES regulations.

- Temporary sediment barriers may be removed from an area when that area is successfully revegetated (i.e., if the ROW surface condition is similar to adjacent undisturbed lands). These guidelines are based on NPDES requirements and may be modified based on state-specific PDES regulations.

Permanent Stabilization:

- Erosion and sedimentation control practices (installation of structures, revegetation, and maintenance practices) will be implemented to minimize the potential for soil erosion or sedimentation of streams and to restore the ROW and any other disturbed areas. Final grading will be completed within 10 days of construction completion (including the installation of permanent erosion control measures in the areas of steep slopes only), weather permitting. Construction debris will be removed from the ROW and the ROW will be graded so that the soil is left in proper condition for planting.

- The ROW on off-road sections will be graded to preconstruction contours, as practical, with a small crown of soil left over the ditch to compensate for settling, as approved by the CM, EI, and/or CI. Openings will be left in the completed crown to restore lateral surface drainage to preconstruction patterns.

- Where topsoil has been segregated, the topsoil will be spread back along the ROW in an even layer.

- Fences that were cut and replaced by gaps during construction will be repaired to at least their equivalent state during preconstruction activities.

- Permanent slope breakers will be constructed after final grading and prior to seeding in accordance with the applicable regulations to replace temporary barriers at pedestrian, trail, road, waterbody, and wetland crossings.

3.1.3.2 Revegetation and Seeding

Seed, fertilizer, and agricultural lime application will be accomplished at the following rates and mixtures unless otherwise instructed by applicable permits or land managing agency requirements:

- Seed Mixture: German Foxtail Millet "hulled" at a rate of 20 pounds per acre, with "hulled" Bermuda grass at a rate of 10 pounds per acre.
- Fertilizer: 5-19-19 at a rate of 300 pounds per acre.
- Agricultural Lime: at a rate of 2,000 pounds per acre.
- Final revegetation standards that will be used by COMPANY for stabilization of the ROW will be determined through discussions with the individual state and local agencies and through the permit process.
- The ROW will be seeded after final grading in accordance with recommended seeding dates, weather and soil conditions permitting.
- Turf, ornamental shrubs, and other landscaping materials will be restored in accordance with landowner agreements. Selection is based on adaptation of plants to the soils and climate, ease of establishment, suitability for specific use, longevity or ability to re-seed, maintenance required, aesthetic values, and landowner agreement. Personnel familiar with local horticultural and turf establishment practices must perform the restoration work.
- Where broadcast or hydro seeding is to be done, the seedbed will be prepared as necessary to ensure sites for seeds to lodge and germinate.
- Where hand broadcast seeding is used, the seed will be applied at one-half the rate in each of two separate passes.
- The seedbed will be prepared to a depth of 3 to 4 inches using appropriate equipment to provide a firm, smooth seedbed that is free of debris.
- The Project area should be seeded as deemed appropriate by the CM and/or EI. If seeding cannot be done soon after final grading, temporary erosion and sediment controls will be used and seeding of permanent cover will be done at the beginning of the next seeding season. Meanwhile, temporary stabilization measures will be implemented as appropriate.
- Slopes steeper than 3:1 will be seeded immediately after final grading in accordance with recommended seeding dates, weather permitting.
- Seed will be purchased in accordance with the Pure Live Seed (PLS) specifications for seed mixes and used within 12 months of testing.
- Legume seed will be treated with an inoculant specific to the species. The manufacturer's recommended inoculant rates will be used.
- The seed will be uniformly applied and covered 0.5 to 1 inch deep, depending on seed size. A seed drill equipped with cultipacker is preferred, but broadcast or hydro seeding can be used at double the recommended seeding rates. Where broadcast seeding is used, the seedbed will be firmed with a cultipacker, roller, or similar method after seeding.

- Other alternative seed mixes specifically requested by the landowner or land-managing agency may be used.
- Areas that are seeded after the recommended seeding date should be mulched if permitted.

3.1.3.3 Wetland Restoration

- COMPANY's approach to wetland mitigation and restoration involves a combination of impact minimization during construction, substrate and hydrology restoration, and vegetation establishment involving successful natural processes as a key component.
- The construction workspace for the Project will be been designed to limit impacts to wetlands.
- During the restoration phase, segregated topsoil will be replaced over the trenchline and wetland contours and drainage patterns will be restored to approximate original condition. Surface rocks and boulders that had been windrowed during the construction phase will be distributed in a natural pre-construction configuration in the temporary work areas. Following restoration of the substrate, wetlands will typically be seeded with annual ryegrass or other seed mixture as directed by regulatory agencies.

3.1.3.4 Riparian Areas

Riparian areas are defined as "on or pertaining to the bank of a natural course of water" (stream, pond, lake, or wetland). The EPA defines "riparian areas" as areas adjacent to streams and lakes where the high water table creates distinct soil and vegetative characteristics from the adjacent uplands.

- Following installation of the pipeline, stream banks and riparian areas will be re-contoured and stabilized. Banks will typically be stabilized with an herbaceous mixture and erosion control fabric such as jute netting. Rock riprap may be used to stabilize particularly erosive or unstable areas at the recommendation/approval of the state agencies and by the USACE.

3.1.4 Other Surface Applications

Other surface applications will be applied as outlined below unless otherwise instructed by applicable permits or land managing agency requirements:

(a) Mulch: After seeding, mulch may be applied by the Contractor as determined necessary by the EI at a rate of approximately 2 tons/acre on the entire ROW except on wetlands, lawns, agricultural crop areas, and areas where hydro-mulch is used. Mulching before seeding may be done if construction or restoration activity is interrupted for an extended period, such as when seeding cannot be completed due to seeding period restrictions. Except for site-specific locations that may be identified during construction, mulch before seeding if final cleanup (including final grading and installation of permanent erosion controls in the areas of steep slopes) is not completed in an area within approximately 10 days after construction completion.

If mulching occurs before seeding, the Contractor shall increase mulch application on slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre. Up to 1 ton/acre of wood chips may be added to mulch if areas are top-dressed with 11 pounds/acre available nitrogen (at least 50 percent of which is slow release).

If a mulch blower is used, the strands will not be shredded to less than 8 inches in length to allow anchoring. The mulch will be anchored immediately after placement to minimize loss by wind and water. When anchoring by mechanical means, the Contractor shall use a mulch-anchoring tool to properly crimp the mulch to a depth of 2 to 3 inches. When anchoring with liquid mulch binders, the Contractor shall use the rates recommended by the manufacturer. The Contractor shall not use liquid mulch binders within 100 feet of wetlands or waterbodies.

(b)Matting/Netting: Matting or netting consists of jute, wood excelsior, or similar materials, and will be installed by the Contractor to anchor mulch and stabilize the surface of the soil during the critical period of vegetative establishment, where directed by the EI.

Matting or netting will be applied to critical, sensitive areas (e.g., steep slopes, banks of waterbodies, bar ditches) as specified by the EI. On waterbody banks, the matting or netting will be installed at the time of the final bank re-contouring. In the event that erosion control fabric is not readily available, the Contractor will temporarily use mulch anchored via crimping (or some other means) or hydromulch until the erosion control fabric material becomes available. Matting or netting will be anchored with pegs or staples as recommended by the manufacturer.

3.2 Stormwater Management

Stormwater management will be conducted through stormwater flow attenuation, velocity dissipation devices, and water filtration. COMPANY's construction procedures describe the criteria for placement and use of stormwater control methods/devices. The EI will have the authority to determine the location of these controls.

If herbicides or pesticides are to be used for vegetation maintenance, the applications of those substances will be in accordance with applicable landowner and land management or state agency specifications. COMPANY will not use herbicides or pesticides in or within 100 feet of any waterbody except as specified by the appropriate land management or state agency.

3.3 Other Controls

3.3.1 Waste Materials

(a) Trash, litter, and debris will be collected for off-site disposal; it will not be discarded along the ROW. Refuse will be disposed of according to state and local regulations.

(b) Solid waste that contains (or at any time contained) oil, grease, solvents, or other petroleum products, falls within the scope of the oil and hazardous substances control, cleanup, and disposal procedures of COMPANY's Spill Prevention Control and Countermeasures (SPCC) plan. This material shall be segregated for handling and disposal as hazardous waste under the provisions of the plan.

3.3.2 Offsite Vehicle Tracking

(a) A stabilized construction entrance will be used, if appropriate, to reduce vehicle tracking of soil and sediments. Access to the ROW will normally be from existing public roads. Attempts will be made to locate roadway crossings/access points to ensure that safe and accessible conditions exist throughout the construction phase. Use of 50-foot-long crushed stone access pads, sweeping, culvert installation, matting, and other forms of rutting protection may be used subject to local permit conditions. Periodic sweeping and scraping will remove sediment tracked onto

public roads. If crushed stone access pads are used in active agricultural areas, the stone will be placed on a synthetic fabric to facilitate later removal.

(b) The stabilized construction entrances will be installed before clearing and grading. Once other construction activities permanently cease in an area, that area will be stabilized by reseeding and/or mulching as needed. Once revegetation has been judged successful, temporary erosion/sediment control structures will be removed.

4.0 Maintenance

Erosion and sediment control measures and other protective measures identified in this SWPPP must be maintained in effective operating condition. If site inspections required by Section 5 of this SWPPP identify erosion control devices that are not operating properly, maintenance shall be performed before the next anticipated storm event, or as necessary to maintain the continued effectiveness of erosion controls. If maintenance prior to the next anticipated storm event is impractical, maintenance must be scheduled and accomplished as soon as practicable. Temporary sediment barriers will remain in place until permanent revegetation measures have been judged successful.

5.0 Inspections

The EI will inspect disturbed areas of the Project area that have not been finally stabilized (including areas used for storage of materials that are exposed to precipitation, staging areas, temporary contractor yards, access roads, structural control measures, and locations where vehicles enter or exit the site). The Project area should be considered stabilized when construction activity ceases and a uniform vegetative cover (see below) has been established.

Areas that are not revegetated should be considered to have achieved final stabilization when they have a permanent cover that will prevent erosion of soil by wind or water. At that time, activity under this plan, including inspections, will cease. Inspections shall be conducted as follows and/or in accordance with the applicable National or State-Specific Pollution Discharge Elimination System guidelines:

- Conduct **daily inspections and following any storm event of 0.5 inch of precipitation or greater**, except those portions of the site that have been finally or temporarily stabilized, for which inspections will be conducted at least weekly. Inspections should continue until disturbed areas are completely stabilized (for areas to be revegetated, this means that perennial vegetation cover has reached a uniform cover of at least 70 percent of the preconstruction cover).

- **Inspect control measures** daily in areas of active construction or equipment operation and on a weekly basis in areas with no construction. Inspect within 24 hours of the end of a storm event that is 0.5 inch of rainfall or greater. Control measures will be maintained in good working order; if repair is necessary, it should be initiated within 24 hours of report.

- **Inspect disturbed** areas for evidence of or potential for pollutants entering the drainage system. Sediment from silt fences should be removed regularly and the fence inspected to ensure that the bottom of the fence remains imbedded in ground. Damaged hay/straw bales will be replaced with new bales as necessary.

- **Inspect material storage areas** where materials are exposed to precipitation for evidence of potential for pollutants entering the drainage system.

- **Inspect vehicle entrances** for evidence of off-site sediment tracking.
- **Inspect discharge points**, if accessible, to determine if erosion control measures are effective in preventing significant impacts to receiving waters. If these points are inaccessible, inspectors should inspect nearby downstream locations.
- **Inspect vegetation** after the first and second growing season after seeding to determine the success of revegetation. Wetland revegetation is considered successful if at least 80 percent of the total cover is native species and the level of diversity of the native species present after construction is at least 50 percent of the level originally found in the wetland. Restoration shall be considered successful if the ROW surface condition is similar to adjacent undisturbed lands.
- **Complete an inspection report** of each inspection. Inspection forms and form instructions provided in Appendix C provide additional guidance.

See Section 7 for additional detail on requirements for construction activity and inspection documentation and record keeping.

6.0 Plan Modification

This plan may need to be modified and/or updated based on information and experience gathered during actual construction activities (e.g., include or modify BMPs designed to correct problems, etc.). If changes to the design, construction, or maintenance that can have significant effect on the potential for discharging pollutants in stormwater at the site occur, this plan should be modified accordingly by the Contractor, EI, and/or CI. In addition, if the plan proves to be ineffective in controlling pollutants, any necessary modifications to the application of the practices presented in this plan should be made by the Contractor, EI, and/or CI in order to prevent the discharge of pollutants into stormwater.

7.0 Required Reports, Documentation, and Record Keeping

7.1 Records Retention

All permit-related documents will be retained as part of the SWPPP for at least three years from the date that the site is finally stabilized as required by COMPANY's document retention policies. The following documentation will be kept on file at the construction site:

- A copy of this SWPPP and referenced attachment(s)
- Inspection reports
- Log of construction and BMP installation/maintenance activities and/or construction alignment sheets/construction plans showing the placement of BMPs.
- Notice of Intent and Notice of Termination (if applicable)

7.2 Inspection Reports

A separate report will be developed for each inspection. Inspection reports will identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report will contain a certification that the facility is in compliance with this SWPPP. In addition, inspection reports should:

- Summarize the scope of the inspection.

- Provide the name(s), title(s), and qualifications of personnel making the inspection.
- Indicate the date(s) of the inspection.
- Provide weather information and a description of any discharges occurring at the time of the inspection.
- Provide weather information for the period since the last inspection (or since commencement of construction activity if first inspection), including:
    - A best-estimate of the beginning of each storm event
    - Duration of each storm event
    - Approximate amount of rainfall for each storm event (in inches)
    - If any discharges occurred
- Indicate the location(s) of discharges of sediment or other pollutants from the site.
- Indicate the location(s) of BMPs that need to be maintained.
- Indicate the location(s) of BMPs that failed to operate as designed or proved inadequate for that particular location and plans for correction of the problem (including implementation dates of corrective action).
- Indicate location(s) where additional BMPs are needed that did not exist at the time of inspection.

7.3 Log of Construction and BMP Installation and Maintenance Activities

In addition to inspection and maintenance reports, keep a record of construction activity on the site with this SWPPP. In particular, keep record of the following:

- The dates when major grading activities occur in a particular area.
- The date when construction activities cease in an area, temporarily or permanently.
- The date when an area is stabilized, temporarily or permanently.
- Erosion control maintenance activities.

8.0 SWPPP Certification

8.1 Company's Certification

I certify under penalty of law that this document and its appendices were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____ Date: _____

Print Name: _____

Title: _____

Company: _____

8.2 Contractor's/Subcontractor's Certification

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: _____ Date: _____

Print Name: _____

Title: _____

Company: _____

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: _____ Date: _____

Print Name: _____

Title: _____

Company: _____

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: _____ Date: _____

Print Name: _____

Title: _____

Company: _____

APPENDIX A

BEST MANAGEMENT PRACTICES FIGURES

APPENDIX B

SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN

APPENDIX C

INSPECTION FORMS AND INSTRUCTIONS

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Signature of Inspector: _____

Printed Name of Inspector: _____

Title of Inspector: _____

Qualifications of Inspector: _____

Date: _____

Current Weather Information: _____

Weather Information Since Last Inspection: _____

Beginning Date/Time of Last Storm Event: _____

Duration of Last Storm Event: _____

Amount of Rainfall: _____ Inches

Discharges Since Last Inspection/Storm Event: _____

NOTE: Inspection documents are to be maintained for a minimum of 3 years.

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Earth Dikes/Berms

Is the dike stabilized? _____

_____

Is there evidence of washout or over-topping? _____

_____

If water is present in the drainage ports, does it:

- Have a sheen on it? _____
- Have an acceptable TDS? _____
- Show excessive turbidity? _____

Maintenance required for Earthen Dike: _____

_____

_____

To be performed by: _____ On or before: _____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Roads and Locations Where Vehicles Enter or Exit the Construction Site

Are sediment traps or barriers along road construction zones preventing runoff into adjacent wetlands, lakes, etc.?_____

_____

_____

_____

At locations where construction equipment exits onto paved roads, are the existing best management practices successfully minimizing off site tracking of sediments? _____

_____

_____

_____

Maintenance Required: _____

_____

_____

To be performed by: _____ On or before: _____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

_____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Straw Bale and Filter Fence Barriers

Do the barriers have tears or holes in them? _____

Are there any missing barriers? _____

Are the barriers properly aligned? _____

Where sediment has reached one-third the height of the barrier, has it been removed? _____

_____

Have straw bales with excessive sediment saturation been replaced? _____

_____

Maintenance required for barriers: _____

_____

_____

To be performed by: _____ On or before: _____

SWPPP Upgrades:

If any deficiencies in pollution control structures or procedures were identified above, have those deficiencies been corrected and the Storm Water Management Plan modified, if appropriate?

Explain: _____

_____

_____

_____

_____

_____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

_____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

General

Have there been any uncontrolled releases of mud or muddy water or measurable quantities of sediment found off site? _____Yes _____No

If **Yes**, describe measures taken to clean up fugitive sediment: _____

If **Yes**, describe measures taken to prevent a future occurrence: _____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Location	Diversion Structure	Sediment Trap	Date Excavated	Date Filled	Date Dressed	Signs of Erosion	Stabilized ?	Ground Covered?	Date of Inspection

NOTE: If signs of erosion become apparent, stabilize by backfilling and leveling and use of mulch, sod, seeding, or other means of preventing further erosion.

Date: _____ Inspector's Name (Print and Initial) _____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Maintenance required for: _____

_____

_____

_____

To be performed by: _____ On or before: _____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

NOTE: Inspection documents are to be retained for a minimum of 3 years.

NOTE: Check flowline trenches for the following:

- Settlement below natural grade
- Washouts of spoil along excavated trenches
- Muddy/contaminated rainwater
- Placement of spoil upslope of trench

_____

GeoEngineers

Memorandum

3050 South Delaware, Springfield, Missouri 65804, Telephone: 417.831.9700, Fax: 417.831.9777 www.geoengineers.com

To:	Tom Siguaw, Dakota Access, LLC
From:	Craig Erdman, Mark Miller and Jon Robison
Date:	June 12, 2015
File:	18782-011-00
Subject:	Dakota Access Pipeline Project – Response to Interrogatory 2-12 from the South Dakota Public Utilities Commission Regarding Special Construction Techniques in Karst Terrain

We understand that Dakota Access, LLC (DAPL) has received the following interrogatory from the South Dakota Public Utilities Commission (SDPUC) regarding special construction techniques that might be used in areas of karst terrain:

Interrogatory 2-21

Referring to the excerpt from the Application provided below, as found on page 14 of the Application, please define "specialized construction techniques." Would this include some kind of poly wrap or coating?

"As outlined in Section 14.7 – Seismic and Subsidence, desktop studies have identified a potential for karst geology along certain portions of the route. Dakota Access will conduct pre-construction training to educate personnel on the identification of karst features during excavation. If karst features are identified along the route, Dakota Access will take steps to ensure the integrity of the pipeline, which may include realignment or specialized construction techniques."

Response:

In general, although the proposed DAPL alignment does pass through some regions where karst is possible based on the underlying bedrock geology, we believe the risk of encountering karst-related voids or other features during the construction process to be low. See GeoEngineers memorandum titled "Response to South Dakota Public Utilities Commission, Dakota Access Pipeline Project - Proposed Pipeline in South Dakota," dated April 17, 2015. Should karst related voids be encountered, however, a geotechnical professional or geologist should be consulted to provide input and site-specific mitigation measures. These measures might include minor alignment adjustments (if possible) to avoid the feature, or specialized construction techniques such as the following:

1. Over-excavating the trench and then placing biaxial geosynthetic grid (geogrid) across shorter intervals of openings in the rock, placing crushed rock over the geogrid and compacting, then placing pipeline bedding material over the crushed rock,
2. Filling small to modest sized voids (up to perhaps 30 cubic yards in volume) with a flowable fill (lean mix concrete).

We recommend addressing caves, or other significant karst features, if encountered, on a case-specific basis with a geo-professional as described above.

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.

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 be 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

2. If the EI believes that the discovery is a cultural 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. Dakota Access or its representative will arrange for the discovery to be evaluated by a qualified archaeologist in accordance with applicable regulations. The archaeologist will evaluate the remains and provide recommendations for how to manage the resource under the appropriate State's Historic Preservation Plan.

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 activity.

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 the Interior's Standards and Guidelines for Archaeological Documentation (48 CFR 44734--44737); the Advisory Council on Historic Preservation (ACHP) publication "Treatment of Archaeological Properties" (ACHP 1980); and follow the guidelines set forth by the applicable State(s) Historic Preservation Office.

C. PROCEDURES FOR THE DISCOVERY OF HUMAN REMAINS

In the event that human remains are encountered during either construction or maintenance activities, the following plan outlines the specific procedures to be followed. These procedures meet or exceed the Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects set forth by the National Historic Preservation Act (Public Law [PL] 89-665), its implementing regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800); the Native American Grave and Repatriation Act (43 CFR Part 10); Procedures for the Protection of Historic Properties (33 CFR 325 Appendix C); the Archaeological and Historic Preservation Act; and Consultation and Coordination with Indian Tribal Governments (EO 13175): South Dakota's state burial law (South Dakota Codified Law [SDCL] 34-27) and its accompanying Administrative Rules (ARSD 24:52).

All activity that might disturb the remains shall cease and may not resume until authorized by appropriate law enforcement officials or the State Archaeologist. Any human remains, burial sites, or burial related materials that are discovered during construction will at all times be treated with dignity and respect. If any member of the construction work force believes that human remains are encountered the following plan will be implemented:

1. Any activity that may disturb the unmarked burial site, human skeletal remains, or burial artifacts associated with the site will immediately cease on discovery. The site will be carefully covered and secured for protection from degradation by weather or unauthorized individuals.

2. The EI will be notified and responsible for taking appropriate steps to protect the discovery. This will include fencing off the immediate area of discovery and flagging the area as an exclusion zone.

No activity may resume until authorized by the agency authority governing the disposition of the human remains.

3. The EI will notify the Project Environmental Manager, who will contact the Project archeologist, specific county law enforcement agency and the coroner of the jurisdiction where the site or remains are located. The State Archaeologist will also be contacted to assist with identifying the remains.

4. If the unmarked burial site, human skeletal remains, or funerary objects can be shown to have ethnic affinity with a living Native American tribe, a the Environmental Project Manager will notify the appropriate federal agency with jurisdiction and/or SDSHPO to assist in determining the tribe(s), if any, who may have historic ties to the region and represent descendants of any Native American remains. If direct relations to a Native American tribe are verified, the tribe will have control of the disposition of the human skeletal remains.

5. If the District Coroner finds that the unmarked burial site is over 50 years old and that there is no need for a legal inquiry by their office or for a criminal investigation, and if no direct relations to any Native American tribe are found, then the SHPO will have jurisdiction of the site, human skeletal remains, and the burial artifacts.

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: Jack Edwards
Telephone (o) 515-777-7723 (c) 832-421-5691
Email: Jack.Edwards@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 Historic Preservation Program

Contact: Jay D. Vogt/SHPO
Telephone: (605) 773-3458
E-mail: Jay.Vogt@state.sd.us
Address: South Dakota State Historical Society
900 Governors Dr. 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

Abby Peyton

From: Olson, Paige <Paige.Olson@state.sd.us>
Sent: Monday, August 18, 2014 10:43 AM
To: 'Beth McCord'
Cc: Abby Peyton
Subject: RE: DAPL proposed SOW

Good morning,

Thank you for the opportunity to review the proposed scope of work. I do have several comments that I hope can be taken into consideration.

1. My first comment concerns the use of at least one shovel test to provide information on a site's integrity. If the goal is to determine a site's integrity (vs. presence / absence) I would recommend using a 1x1 in an area with the best potential for intact subsurface deposits.
2. Is it possible to be informed when your survey methods are refined based on what you're seeing in the field?
3. I recommend gathering GPS coordinates for all shovel tests, not just positive shovel tests.
4. On the second page, 8th paragraph, last sentence, "Should an eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." Can you please explain why testing will be conducted if the sites determined eligible?

Finally, the Archaeological Research Center's database should reflect the most up to date information from the mortuary surveys. If you find that this is not the case please let me know.

Thanks,
Paige

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Friday, August 15, 2014 1:40 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: DAPL proposed SOW

Paige,

Thanks for meeting with us. We certainly benefitted from the conversation. I wanted to present our proposed scope of work for your comment based on our meeting. I have attached it for your review. Our approach is to run this as a

Section 106-like project. Please let me know if you have any comments or require clarification on these procedures. We are hopeful that this approach will satisfy the SHPO.

I also wanted to inquire on how we might receive copies of the recent mound surveys you mentioned. We will be crossing Beadle, Campbell, Edmunds, Faulk, Kingsbury, Lake, Lincoln, McCook, Minnehaha, Miner, McPherson, and Spink counties. Any information from these counties would be great.

We look forward to working with you.

Thank you,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

Abby Peyton

From: Beth McCord <bmccord@graypape.com>
Sent: Wednesday, June 03, 2015 2:23 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: RE: Areas with buried site potential
Attachments: SD DAPL Geoarchaeological Methods.pdf

Paige,

Attached is the plan for your review. Please let me know if you need any additional information or have questions.

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

From: Olson, Paige [mailto:Paige.Olson@state.sd.us]
Sent: Wednesday, June 03, 2015 9:37 AM
To: Beth McCord
Subject: RE: Areas with buried site potential

Hi Beth,

It really depends on when you submit the methods. I will be out of the office next Tuesday – Friday. But in general the review would probably take a day or two.

Thanks,
Paige

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Tuesday, June 02, 2015 3:28 PM
To: Olson, Paige
Subject: Areas with buried site potential

Paige,

As we mentioned in the management summary for the DAPL project we have a couple of stream crossings that have low energy deposition and have the potential for buried cultural deposits. Currently, the streams will not be avoided by HDD. In the scope of work for the Level III survey we submitted to you in August, we had noted that we would submit a work plan to conduct the geoarchaeological assessment for your review. We believe the best method to identify cultural deposits will be a few backhoe trenches at each location. I was wondering when we submit our methods how long it would take you to review the plan. Could you let me know?

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

Abby Peyton

From: Olson, Paige <Paige.Olson@state.sd.us>
Sent: Friday, June 05, 2015 2:14 PM
To: 'Beth McCord'
Cc: Abby Peyton; Haug, Jim; Fosha, Mike
Subject: RE: Areas with buried site potential

Thank you for the opportunity to review the proposed methods for identifying deeply buried deposits. I have no concerns with the proposed methods provided that the trenching matches or exceeds the depth of the pipeline.

Thank you,

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Wednesday, June 03, 2015 2:23 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: RE: Areas with buried site potential

Paige,

Attached is the plan for your review. Please let me know if you need any additional information or have questions.

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

From: Olson, Paige [mailto:Paige.Olson@state.sd.us]
Sent: Wednesday, June 03, 2015 9:37 AM
To: Beth McCord
Subject: RE: Areas with buried site potential

Hi Beth,

It really depends on when you submit the methods. I will be out of the office next Tuesday – Friday. But in general the review would probably take a day or two.

Thanks,
Paige

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Tuesday, June 02, 2015 3:28 PM
To: Olson, Paige
Subject: Areas with buried site potential

Paige,

As we mentioned in the management summary for the DAPL project we have a couple of stream crossings that have low energy deposition and have the potential for buried cultural deposits. Currently, the streams will not be avoided by HDD. In the scope of work for the Level III survey we submitted to you in August, we had noted that we would submit a work plan to conduct the geoarchaeological assessment for your review. We believe the best method to identify cultural deposits will be a few backhoe trenches at each location. I was wondering when we submit our methods how long it would take you to review the plan. Could you let me know?

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

June 11, 2015

Jim Haug
Archaeological Research Center
South Dakota State Historical Society
217 Kansas City Street
Rapid City, SD 57701

RE: Level III Intensive Cultural Resources Survey of Dakota Access Pipeline Project for Campbell, McPherson, Edmunds, Faulk, Spink, Beadle, Kingsbury, Miner, Lake, McCook, Minnehaha, Turner, and Lincoln Counties, South Dakota

Dear Mr. Haug,

On behalf of Dakota Access, LLC, we are submitting the draft report referenced above. The survey was conducted in coordination with the state Public Utilities Commission requirements in compliance with SD 1-19A-11.1. Dakota Access, LLC is independently coordinating with federal agencies for Section 106 requirements for those portions of the Project that traverse federally-managed easements or jurisdictional areas.

A copy of the report has also been submitted to the Paige Olson at the SHPO office. If you have any questions feel free to contact me at 317-541-8200. Should you wish to defer your review at this time, please notify me.

Sincerely,

Beth McCord
Indiana Branch Manager

cc: Monica Howard, Energy Transfer, Monica.Howard@energytransfer.com
Abby Peyton, Perennial Environmental, APeyton@Pernnialenv.com

June 11, 2015

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501

RE: Level III Intensive Cultural Resources Survey of Dakota Access Pipeline Project for Campbell, McPherson, Edmunds, Faulk, Spink, Beadle, Kingsbury, Miner, Lake, McCook, Minnehaha, Turner, and Lincoln Counties, South Dakota

Dear Ms. Olson,

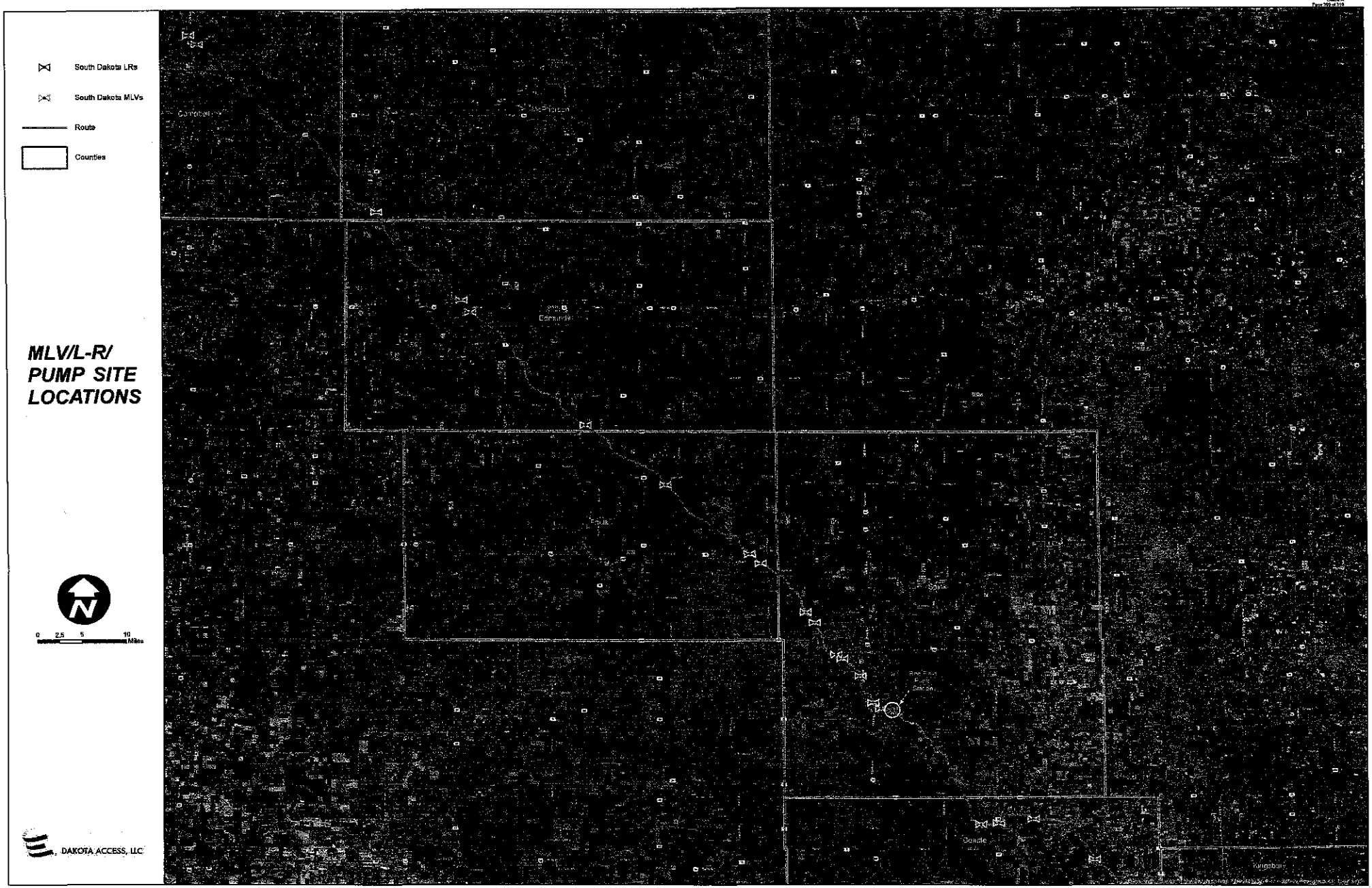
On behalf of Dakota Access, LLC, we are submitting the draft report referenced above. The survey was conducted in coordination with the state Public Utilities Commission requirements in compliance with SD 1-19A-11.1. Dakota Access, LLC is independently coordinating with federal agencies for Section 106 requirements for those portions of the Project that traverse federally-managed easements or jurisdictional areas.

A copy of the report has also been submitted to the Jim Haug at the Archaeological Research Center. If you have any questions feel free to contact me at 317-541-8200. Should you wish to defer your review at this time, please notify me.

Sincerely,

Beth McCord
Indiana Branch Manager

cc: Monica Howard, Energy Transfer, Monica.Howard@energytransfer.com
Abby Peyton, Perennial Environmental, APeyton@Pernnialenv.com


South Dakota LRs
South Dakota MLVs
Route
Counties
MLV/L-R/
PUMP SITE
LOCATIONS
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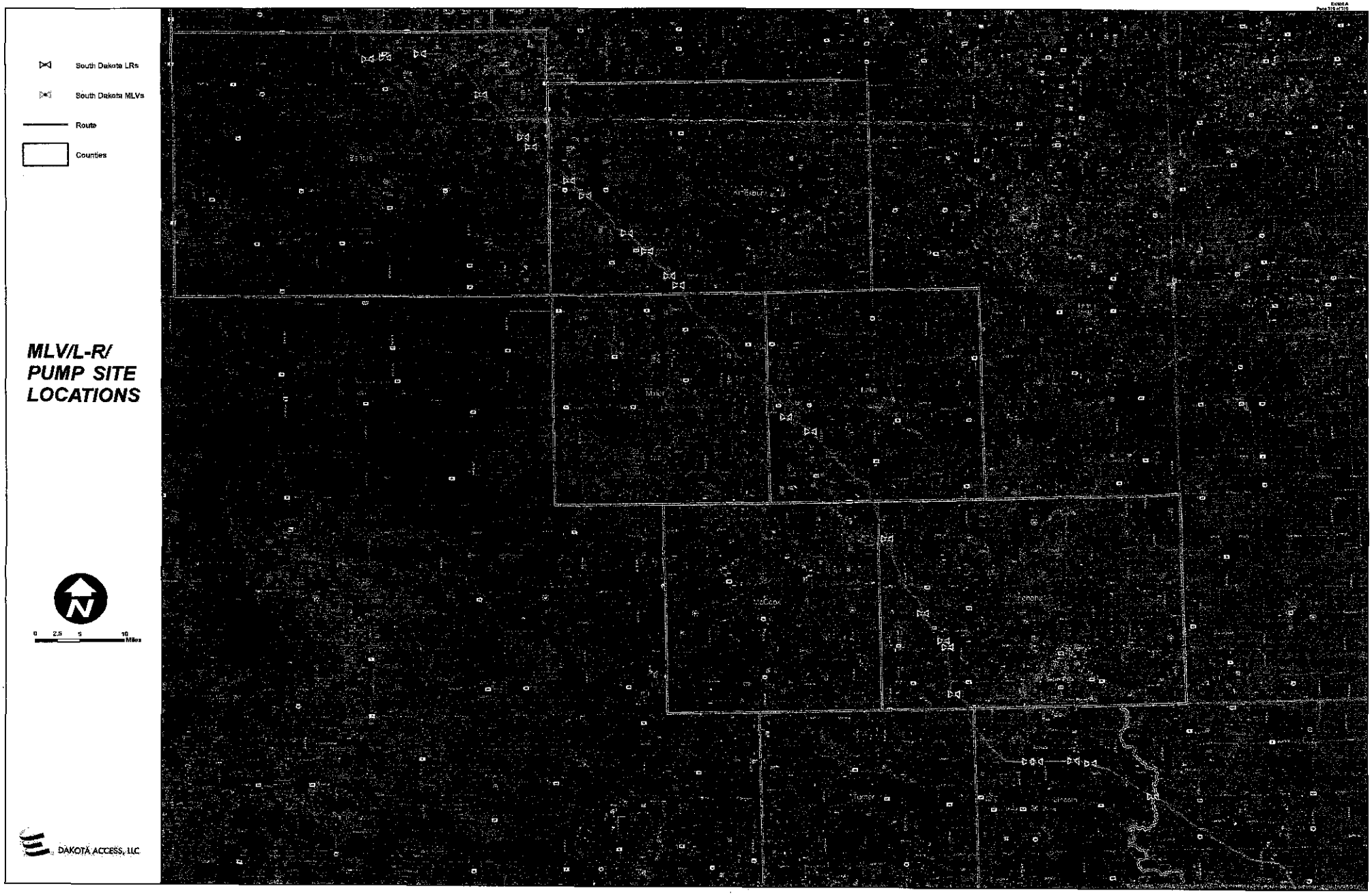
Miles
DAKOTA ACCESS, LLC
Campbell
Edmunds
Faulk
Spink
Day
Clark
Codington
Grant
Deuel
Hamlin


South Dakota LRs
South Dakota MLVs
Route
Counties
MLV/L-R/
PUMP SITE
LOCATIONS
N
0 2.5 5 10
Miles
DAKOTA ACCESS, LLC

DARREN D. KEARNEY

500 E Capitol Ave · Pierre, SD 57501· 605-773-3201
Darren.Kearney@state.sd.us

EDUCATION:

UNIVERSITY OF SOUTH DAKOTA, Vermillion, South Dakota
Beacom School of Business
Master's in Business Administration (GPA 4.0) *June 2013 – May 2015*

UNIVERSITY OF ST. THOMAS, Minneapolis, Minnesota
Opus College of Business
Pursued Master's in Business Administration (GPA 3.95) *November 2011 – December 2012*

UNIVERSITY OF MINNESOTA, Minneapolis, Minnesota
College of Biological Sciences
Bachelor of Science, Biology (GPA 3.347) *December 2003*

EXPERIENCE:

SOUTH DAKOTA PUBLIC UTILITIES COMMISSION, Pierre SD
Utility Analyst *February 2013 - Present*

- Ensured public utility company filings are in compliance with South Dakota statutes and regulations.
- Analyzed transmission facility siting dockets and helped draft settlement agreements when appropriate.
- Analyzed energy efficiency, telecom tariff, telecom certificate of authority, and electric service territory dockets.
- Reviewed proposed EPA rules and authored comments in response to the proposed rules.
- Participated in regional transmission planning discussions.
- Attended a number of trainings on electric grid operation, regional transmission planning, public utility policy issues, and ratemaking.

XCEL ENERGY, Minneapolis MN
Plant Environmental Analyst III *October 2009 – February 2013*

- Reviewed power plant processes and made modifications as necessary to ensure the plant was in continued compliance with environmental permits and regulations.
- Coordinated environmental related testing (e.g. annual stack tests required by Air Permit/CAA).
- Worked on Title V Air Permit and NPDES Permit renewals/amendments.
- Reviewed plant air and water emissions data and generated compliance reports for Air and NPDES/SDS Permits.
- Performed plant compliance inspections/audits to ensure permits, policies, and procedures were properly executed.
- Provided environmental training to plant staff.
- Conducted root cause investigations on spills and permit non-compliance incidents, developed corrective actions to prevent incident reoccurrence, and then implemented the corrective actions as directed by plant management.
- Acted as point of contact during regulatory agency inspections and internal audits.
- Managed the facility's hazardous waste program for compliance with county waste rules and RCRA.

Environmental Analyst II *August 2006 – October 2009*

- Subject matter expert for AST/UST compliance, the Oil Pollution Act of 1990 (SPCC) and Industrial Stormwater.
- Managed an Environmental Incident Response Program that involved training individuals on reporting and/or cleanup requirements for oil/chemical spills and power plant permit non-compliance incidents.
- Mobilized company and contractor resources to spills and directed spill cleanups.
- Negotiated with regulators (e.g. Minnesota Pollution Control Agency) to secure aboveground storage tank permits.

ADECCO TECHNICAL, Edina MN
Contract Biologist - Xcel Energy Environmental Analyst *June 2004 – August 2006*

- Developed monitoring plans, conducted field monitoring/sampling, performed statistical analysis on data collected, and authored reports for biological studies at Xcel Energy power plants as required by State and Federal Rules.
- Established knowledge of environmental permits and Federal, State, and Local environmental regulations.

ACHIEVEMENTS

- Academic: Beta Gamma Sigma International Honor Society (Business School)

BEFORE THE
PUBLIC UTILITIES COMMISSION
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

SD PUC DOCKET HP14-002

PREFILED TESTIMONY OF DARREN KEARNEY
ON BEHALF OF THE COMMISSION STAFF
July 6, 2015

Q. State your name.

A. Darren Kearney.

Q. State your employer and business address.

A. South Dakota Public Utilities Commission, 500 E Capitol Ave, Pierre, SD, 57501.

Q. State your position with the South Dakota Public Utilities Commission.

A. I am a Staff Analyst, which is also often referred to as a Utility Analyst.

Q. What is your educational background?

A. I hold a Bachelor's of Science degree, majoring in Biology, from the University of Minnesota. I also hold a Masters of Business Administration degree from the University of South Dakota.

Q. Please provide a brief explanation of your work experience.

A. I began my career in the utility industry working as contract biologist for Xcel Energy, where I conducted biological studies around various power plants, performed statistical analysis on the data collected, and authored reports in order to meet National Pollutant Discharge Elimination System (NPDES) permit requirements.

After two years of performing biological studies, I then transitioned into an environmental compliance function at Xcel Energy as a full time employee of the company and became responsible for ensuring Xcel's facilities maintained compliance with the Oil Pollution Act of 1990. This involved writing Spill Prevention Control and Countermeasure (SPCC) plans and also ensuring Xcel facilities maintained compliance with those plans. During this time I was also responsible for the company's Environmental Incident Response Program, which involved training Xcel employees on spill reporting and response, managing spill cleanups, and mobilizing in-house and

contract spill response resources. I was also responsible for aboveground storage tank permitting during this time.

I was in that role for approximately three years and then I transitioned to a coal-fired power plant at Xcel and became responsible for environmental permitting and compliance for the plant. Briefly, my responsibilities involved ensuring that the facility complied with all environmental permits at the plant, which included a Clean Air Act Title V Air Permit, a Clean Water Act NPDES permit, and a hazardous waste permit. I also submitted reports on the plant's operations to various agencies as required by permit or law. After three years at the power plant, I left Xcel Energy to work for the South Dakota Public Utilities Commission (SD PUC).

I have been at the SD PUC for over two years now. During this time I worked on a variety of matters in the telecom, natural gas, and electric industries. The major dockets that I worked on were transmission siting dockets, pipeline siting dockets, and energy efficiency dockets. I also attended a number of trainings on public utility policy issues, electric grid operations, regional transmission planning, electric wholesale markets, and utility ratemaking.

Q. On whose behalf was this testimony prepared?

A. This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission.

Q. When did Dakota Access, LLC file its Application for a permit to construct the Dakota Access Pipeline?

A: The original application was filed on December 15, 2014.

Q: Did you review Dakota Access, LLC's Application for a permit to construct the Dakota Access Pipeline?

A. Yes. I also reviewed the exhibits, revised application, revised exhibits, and discovery responses produced by all parties.

Q. Were other Staff involved in the review of this petition?

A. Yes. Staff Analyst Brian Rounds also assisted in reviewing the application.

Q. Explain, in your words, the main role of the SDPUC Staff in the Application proceedings.

A. After receiving the application filing, Staff completed a review of the contents of the Application as it relates to the Energy Facility Siting statutes, SDCL 49-41B, and Energy Facility Siting Rules, ARSD 20:10:22. Staff then identified information required by statute or rule that was either missing from the Application or unclear within the application. Staff then requested Dakota Access to provide the information that Staff believed to be missing or unclear.

Staff also subpoenaed experts from various State Agencies including the Department of Environment and Natural Resources, Game Fish and Parks, Historic Preservation Office, and Department of Revenue in order to have individuals knowledgeable in their associated fields assist with Staff's review. Staff facilitated the preparation of testimony from these experts by providing questions that Staff believed were relevant to the review of the Application. These experts then completed their review and authored their testimony as filed in this docket.

Further, Staff hired two consultants to assist with reviewing the Application. The first consultant, Natural Resources Group, has expertise with environmental permitting,

environmental impact analyses and mitigation, and socioeconomic impact analyses. The second consultant, REM Pipeline Consultants, LLC, has expertise with the Pipeline and Hazardous Materials Safety Administration regulations the pipeline will be subject to. Staff facilitated the preparation of testimony from these consultants by providing questions that Staff believed were relevant to the review of the Application. These experts then completed their review and authored their testimony as filed in this docket.

The State experts and consultants completed a review of the application, exhibits, and relevant discovery responses. Staff then relied on these individuals to identify any outstanding issues they found with the applications that falls under their areas of expertise. These issues will be addressed in their testimony and Staff will then work with the company to address the issues or provide mitigation measures for Commission consideration.

Finally, Staff assisted a number of intervenors and affected landowners by providing responses to numerous questions on the pipeline, the siting process at the PUC, and the opportunities available for these individuals to be heard by the Commission. If the landowners had specific concerns with the pipeline, Staff often recommended that those individuals file comments in the docket for the Commission's consideration. Where appropriate, Staff also included some of the landowners' questions or concerns in Staff's interrogatories sent to Dakota Access.

Q. Was Dakota Access, LLC's application considered complete at the time of filing?

A. At the time of the filing, the application was generally complete. However, as identified above, Staff requested further information, or clarification, from Dakota

Access, LLC which Staff believed were necessary in order to satisfy the requirements of SDCL 49-41B and ARSD 20:10:22. Dakota Access's responses to Staff's information requests are attached as Exhibit A. Staff's experts also sought information from Dakota Access and any outstanding information needs would be addressed in their prefiled testimony. Finally, I would also note that an Applicant supplementing its original application with additional information as requested by Staff is not unusual for siting dockets.

Q. How many parties were granted party status?

A. There were 49 individuals that were granted party status.

Q. Does Staff have any recommendations regarding an appropriate indemnity bond for road and bridge damages according to SDCL 49-41B-38?

A. Yes. In response to Staff's completeness review data request number 32, Dakota Access proposed an indemnity bond totaling $15 million. For both the first Keystone pipeline and Keystone XL pipeline, the Commission adopted an indemnity bond amount based on ten percent of the estimated value of construction in South Dakota for each year of construction. Within its Application, Dakota Access estimates that construction of the pipeline and facilities in South Dakota will cost $820 million. However, according to a report prepared on November 12, 2014, by Strategic Economics Group titled "An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, and Iowa," it is identified that of the $820 million approximately $485.6 million will result in direct spending in South Dakota. Therefore, Staff proposes that the bond amount be based on $485.6 million. Applying the same formula used for the Keystone and Keystone XL pipelines, this

results in a total bond amount of $48 million. Spreading the bond amount over two years of estimated construction (i.e. 2015 and 2016 as stated in the Application) would equate to a $24 million bond per year. As such, Staff recommends the Commission require an indemnity bond of $24 million for the year in which construction is to commence and a second bond in the amount of $24 million for the ensuing year, including any additional period until construction and repair has been completed. Finally, it should be noted that Staff would be willing to reconsider the recommended bond amount should Dakota Access identify that the expected value of construction in South Dakota will be less than the estimated direct spending in South Dakota as provided by Strategic Economics Group. In any event, it is Staff's opinion that the formula used to calculate the bond amount in this docket should be consistent with the formula used in past pipeline siting dockets.

Q. Does this conclude your testimony?

A. Yes.

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 1:

Per ARSD 20:10:22:05, please provide a list of each notification that is required to be made to any other governmental entity. If no notifications are required beyond those provided in Table 5.0-1 in the Revised Application, please provide such a statement.

Response:

Table 5.0-1 is inclusive of all required permits and notifications to governmental entities for the Project.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 2:

Per ARSD 20:10:22:07, please provide a complete description of the ownership structure of Dakota Access, LLC and DAPL-ETCO Operations Management, LLC.

Response:

Dakota Access, LLC is a Delaware limited liability company with its principal offices at 3738 Oak Lawn Avenue, Dallas, Texas 75219. The membership interest of Dakota Access, LLC is owned 75 percent by Dakota Access Holdings, LLC and 25 percent by Phillips 66 DAPL Holdings LLC.

(a) Dakota Access Holdings, LLC is owned 100 percent by Energy Transfer Partners, L.P. ("ETP"), a master limited partnership publicly traded on the New York Stock Exchange ("NYSE"). Energy Transfer Equity, L.P. ("ETE"), also a master limited partnership publicly traded on the NYSE, indirectly owns the general partner of ETP and certain of that partnership's limited partner units, and also owns the general partner of Regency Energy Partners, L.P. ("Regency") and certain of its limited partner units. (ETE and ETP are together referred to herein as "Energy Transfer"). Energy Transfer maintains its corporate headquarters at 3738 Oak Lawn Avenue, Dallas, Texas 75219.

(b) Phillips 66 DAPL Holdings LLC is owned 20 percent each by Phillips 66 DE Holdings 20A LLC, Phillips 66 DE Holdings 20B LLC, Phillips 66 DE Holdings 20C LLC, Phillips 66 DE Holdings 20D LLC, and Phillips 66 DE Holdings Primary LLC. The five Phillips 66 entities are owned 100 percent by Phillips 66 Project Development Inc. Phillips 66 Project Development Inc. is 100 percent owned by Phillips 66 Company. Phillips 66 Company is 100 percent owned by Phillips 66, a Delaware corporation. Phillips 66 maintains its corporate headquarters at 3010 Briarpark Drive, Houston, Texas 77042.

Operational services for the Dakota Access Pipeline will be provided by DAPL-ETCO Operations Management, LLC, a Delaware limited liability company, pursuant to an Operating Agreement. DAPL-ETCO Operations Management, LLC is 100 percent owned by La Grange Acquisition, L.P. La Grange Acquisition, L.P. is an indirect subsidiary of ETP.

Prepared By: Stephen Veatch
Title: Sr. Director Certificates

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 3:

Please provide the results of the "expansion open season" mentioned in Section 10.0 of the Revised Application. Further, do the long-term binding contracts that resulted from the open season include any clauses that would allow shippers to break the contract should demand for oil from the Bakken and Three Forks formations decrease?

Response:

Following the expansion open season, Dakota Access, LLC's entered into long-term binding contracts with customers that underpin a system capacity of not less than 467,500 bpd, with 90% of the system capacity allocated to committed shippers under the long-term binding contracts and 10% of the system capacity reserved for walk-up shippers.

The long-term binding contracts that Dakota Access, LLC has entered with customers do not include any clauses that would allow shippers to break the contract should demand for oil from the Bakken and Three Forks formations decrease.

Prepared By: Damon Rahbar Daniels
Title: Vice President – Commercial Operations

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 4:

Per ARSD 20:10:22:10, please provide a description of present and estimated crude oil demand of those customers to be directly served by the pipeline. Included with the description, please provide

a. all "data, data sources, assumptions, forecast methods or models, or other reasoning upon which the description is based";
b. information on the relative contribution to Bakken oil exports and U.S. refinery imports; and
c. a "statement on the consequences of delay or termination of the construction" of the pipeline.

Response:

Crude oil transported by Dakota Access, LLC will be capable of directly accessing a significant percentage of total U.S. refining capacity through the crude oil logistics infrastructure at the key crude oil terminalling hubs to which Dakota Access, LLC will provide service, whether solely or in conjunction with Energy Transfer Crude Oil Company LLC.

Accounting solely for pipeline connectivity,[¥] with respect to Dakota Access, LLC's deliveries to the "Patoka Hub" near Patoka, Illinois, the following refineries will have direct pipeline access to the Bakken and Three Forks production transported by Dakota Access, LLC to the Patoka Hub:

Refinery	Location	Capacity (barrels per day)
CITGO Lemont Refinery	Lemont, IL	172,045
Exxon Joliet Refinery	Joliet, IL	238,600
BP Whiting Refinery	Whiting, IN	413,500
Marathon Detroit Refinery	Detroit, MI	123,000
Husky Lima Refinery	Lima, OH	155,000
BP/Husky Toledo Refinery	Toledo, OH	135,000
PBF Toledo Refinery	Toledo, OH	160,000
Marathon Petroleum Canton Refinery	Canton, OH	80,000
Marathon Petroleum Robinson Refinery	Robinson, IL	212,000
Marathon Petroleum Catlettsburg Refinery	Catlettsburg, KY	242,000
WRB Wood River Refinery	Wood River, IL	336,000

With respect to Dakota Access, LLC's deliveries to the terminalling hub in the vicinity of Nederland, Texas, in conjunction with Energy Transfer Crude Oil Company LLC, the following refineries will have direct pipeline access to Bakken and Three Forks production transported by Dakota Access, LLC, again accounting solely for pipeline connectivity[¥]:

Refinery	Location	Capacity (barrels per day)
Exxon Beaumont Refinery	Beaumont, TX	330,000
Motiva Port Arthur Refinery	Port Arthur, TX	600,250
Total Port Arthur Refinery	Port Arthur, TX	225,000
Valero Port Arthur Refinery	Port Arthur, TX	330,000
Phillips 66 Lake Charles Refinery	Westlake, LA	239,400
CITGO Lake Charles Refinery	Lake Charles, LA	427,800

Dakota Access, LLC
Docket No. HP14-002

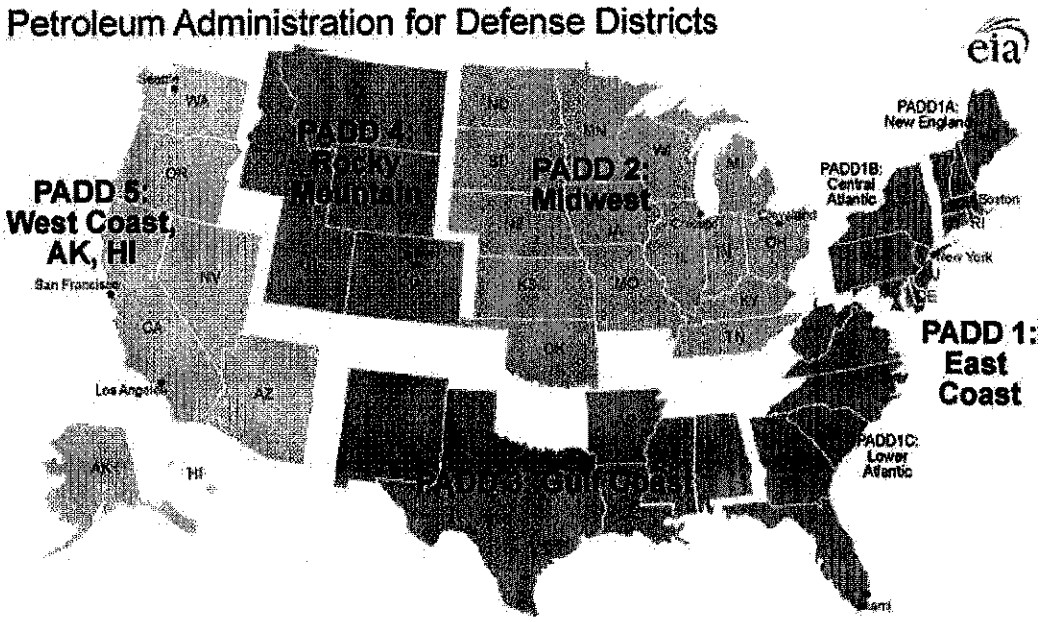
Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Calcasieu Refinery	Lake Charles, LA	78,000
Exxon-Mobil Baton Rouge Refinery	Baton Rouge, LA	502,500
Placid Refinery	Port Allen, LA	59,000
Motiva Convent Refinery	Convent, LA	235,000
Marathon Garyville Refinery	Garyville, LA	522,000
Motiva Norco Refinery	Norco, LA	238,000
Valero St. Charles Refinery	Destrehan, LA	205,000
Shell St. Rose Refinery	St. Rose, LA	45,000
Exxon-Mobil Chalmette Refinery	Chalmette, LA	192,500
Valero Meraux Refinery	Meraux, LA	125,000
Phillips 66 Alliance Refinery	Belle Chasse, LA	247,000

Crude oil can be moved by modes of transportation other than pipeline, such as truck, vessel, or rail. Thus, the market for Bakken and Three Forks production to be transported by Dakota Access, LLC is effectively even broader than what is represented by focusing on pipelines alone.

Companies regard as proprietary the details of the crude oil slates for their refineries, but all of these refineries have the capability to refine crude oil produced from the Bakken and Three Forks production region within their crude oil slates. Indeed, the significant demand for capacity on the Dakota Access Pipeline highlights that Dakota Access, LLC will enable Bakken and Three Forks production to reach markets where that production is desired.

The crude oil market in the U.S. is typically divided among five Petroleum Administration for Defense Districts (each, a "PADD"), which are defined by geographic areas within the U.S. as reflected by the following:



Source: U.S. Energy Information Administration

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

The Patoka Hub is located in PADD II, while the crude oil terminalling hub in the vicinity of Nederland, Texas, is located in PADD III. Below is the most recent data available from the EIA on imports into each PADD:

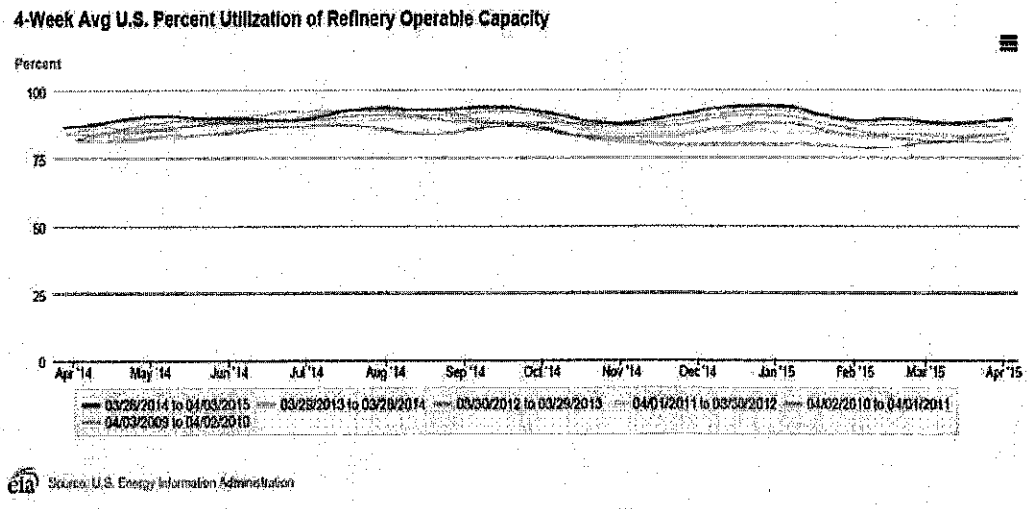
Table: PADD Imports (1,000 barrels per day)

	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15
PADD I	563	709	735	641	644	611
PADD II	2,005	2,142	2,058	1,859	2,224	2,006
PADD III	3,526	3,192	2,993	3,432	3,018	3,154
PADD IV	259	282	245	317	297	279
PADD V	1,118	1,183	1,099	1,025	1,027	1,099

Source: U.S. Energy Information Administration

This import data highlight that Dakota Access, LLC will establish a direct pipeline path for the delivery of Bakken and Three Forks crude oil production – domestically produced production – to reach the two PADDs that import the greatest volume of foreign crude oil.

Moreover, as reflected by the following chart, refineries in the U.S. are running at historically high utilization rates.



This high level of refinery demand is expected to continue in light of the strong margins in refining sector, driving continued demand for domestically produced crude oil like that from the Bakken and Three Forks production region.

Delay or termination of constructing the Dakota Access Pipeline would negatively impact the access that producers in the Bakken and Three Forks production region have to key U.S. refining markets. Likewise, it would restrict the availability of abundant supplies of domestically produced crude oil to the U.S. refineries that produce the petroleum products upon which the U.S. economy depends. These inefficiencies will negatively impact U.S. jobs in oil and gas production, as well as in domestic refining; result in greater dependence on foreign sources of crude oil; and impede greater efficiency in the domestic energy supply chain, which those in the U.S. depend upon to

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Request Numbers: 1-33

generate the wide array of petroleum products (*e.g.*, gasoline, diesel, and a wide array of chemicals) that are necessary to drive growth in U.S. jobs and the overall U.S. economy. Indeed, as reflected by the willingness of numerous shippers to make substantial contractual commitments to transport on the Dakota Access Pipeline, market participants believe that it is critical for the Dakota Access Pipeline to connect the Bakken and Three Forks production area to refineries in PADD II and PADD III refining markets in as timely a manner as possible..

Prepared By: Damon Rahbar Daniels
Title: Vice President – Commercial Operations

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 5:

Please identify all high consequence areas (HCAs) located along the route.

Response:

There are no HCAs, as defined by PHMSA, located along the route within South Dakota.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 6:

Please provide GIS shapefiles of the route and associated facilities.

Response:

GIS shapefiles provided are the latest route of the proposed pipeline. The provided route has minor changes from the filed route.
These minor changes were made;
Landowner Request
- Paralleling farm tiles
- Avoiding trees
- Avoiding water well
- Avoiding septic system

Culture Survey
- Cultural Site identified

Biological Survey
- Wetland avoidance

Constructability Issues

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 7:

Per ARSD 20:10:22:11, please provide a map showing cemeteries, places of historical significance, transportation facilities and other public facilities adjacent to or abutting the pipeline.

Response:

Revised maps with the requested information are included within Appendix A. Publicly available datasets were added to the topographic map set including cemeteries, transportation facilities (roads and airports), hospitals, and schools. Based on publically available datasets and field reconnaissance along the route, no hospitals, schools, or recorded places of historical significance are within or adjacent to the Project footprint, therefore these datasets are not included within the map legend.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 8:

Regarding Section 12.1 (ARSD 20:10:22:12), please provide further explanation on the criteria used (and how such criteria were measured and weighted) in the route selection process to demonstrate the following:

a) The route will not pose a threat of serious injury to the environment;
b) The route will not pose a threat of serious injury to the social and economic conditions of inhabitants or expected inhabitants in the siting area;
c) The route will not substantially impair the health, safety or welfare of the inhabitants; and
d) The route will not unduly interfere with the orderly development of the region.

Response:

The GIS route selection/optimization program was described in Section 12.0 of the December 22, 2014 submittal. The tables below outline all of the datasets and the weighting utilized for each dataset in the GIS routing program. Based upon the 4 factor siting criteria, Dakota Access has either routed the pipeline to avoid sensitive areas to remove any conflicts with the 4 factors or has incorporated mitigation measures into the project to minimize and avoid any impacts. For example, mitigation measures such as depth of cover and Dakota Access's commitment to bury the pipeline a minimum of 48-inches to allow unobstructed and continued land use on top of the pipe has been incorporated in the project across all agricultural lands. Avoidance of sensitive habitats such as wetlands, state or Federal threatened or endangered species or cultural resources and populated areas have been taken into account as part of the project route. In instances where total avoidance is not feasible, mitigation and minimization measures have been or will be employed to not pose serious injury to the environment. Any such unavoidable impacts will be permitted by the various state and Federal resource agencies that have primary jurisdiction over the resources. Overall the pipeline is being designed, routed and will be constructed and operated in a manner to meet or exceed all state and Federal requirements which further minimizes and avoids impacts to the health, safety and the welfare of inhabitants located near the vicinity of the pipeline. Last and based upon consultation and communications with the multiple community leaders and planning groups located along the pipeline route, the pipe will not interfere with the development of the region. Dakota Access believes that factors a. – d. above have been addressed through this routing process and through subsequent feedback throughout the design and routing process.

In addition to these routing measures, Dakota Access has outlined a series of safety and design measures in Section 23.7 of their application, that will be implemented on the Project to help ensure that the environment, inhabitants in the siting area, and the development of the region will not be impacted by the proposed Project.

Prepared By: Monica Howard
Title: Director - Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

GIS Criteria Assessed

Weighting
Preferred Routing (Low Risk)
Avoided Routing (Moderate Risk)
Excluded Routing (High Risk)

Engineering Datasets	Weighting
Existing Pipelines	Preferred- Collocation
Karst Topography	Avoid
Peak Ground Acceleration	Avoid Areas of Moderate to High PGA
Railroads	Avoid
Roads	Avoid
Side Hill Slope- Gradient	0-15% = Preferred ; 15-20% = Low Avoid ; 20-30% = Low Avoid ; 30-40% = Moderate Avoid ; >40% = Exclude
Utilities	Power Plants = Avoid ; Substations = Avoid ; Powerline Corridors = Preferred Collocation
Environmental Datasets	**Weighting**
Aquifers	Avoid Surficial / Critical Aquifers Where Applicable
Bird & Wildlife Trail Site	Avoid
Brownfield Agreement Site	Exclude at 2,640'
Commercially Navigable Waterways	Avoid
Conservation Easement/Tax Credit Property	Avoid
Critical Habitat	Exclude
EPA 303 (c & d) Impaired Waters	Avoid
EPA Sites of Interests	Avoid
Fault Area	Avoid
FEMA Floodplain- 100 Year Floodplain	Avoid
Fish Hatchery	Exclude at 2,640'
Fishing Water Quality	Avoid
Forest Stewardship Land	Exclude
Game Land	Avoid
Geologic Unit	Crossing Tables Only - Further Analysis After Crossings To Be Provided
Hazardous Waste Site	Exclude
High Quality Water Zone	Avoid
Landslide Risk	Avoid
Local Forest	Avoid
Mining - Abandoned Mine	Avoid
Active Mining - Operation	Exclude
Mining - Permit	Avoid
Mining - Refuse	Exclude
National Trail	Exclude
National Registry of Historic Places (SHPO)	Exclude
Nature Preserve	Exclude at 500'
NHD Flowlines- Streams & Rivers	Perennial- Avoid ; Intermittent- Avoid ; Ephemeral- Low Avoid
NHD Waterbodies	Perennial- Avoid ; Intermittent- Avoid ; Ephemeral- Low Avoid
National Pollutant Discharge Elimination	Exclude
NWI Wetlands	LUB = Avoid; LUS = Avoid; PFO = Avoid; PSS = Avoid; PEM = Low Avoid; PUB = Low Avoid; PUS = Avoid; RUB = Low Avoid
Oil & Gas Wells	Avoid
Private Conservation Land	Avoid
Protective Management Area	Exclude
Recreation Area	Exclude at 1,000'
Research Education Land	Avoid
Registered Heritage Area	Avoid
USACE Reservoir	Avoid
Sewer Pump	Exclude at 1,000'
Sewer Treatment Plant	Exclude at 1,000'
Stocked Trout Lake	Exclude at 1,000'

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Response to South Dakota Public Utilities Commission
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SSURGO	Crossing Tables Only - Further Analysis After Crossings To Be Provided
STATSGO (Depth to Bedrock)	Crossing Tables Only - Further Analysis After Crossings To Be Provided
State Forest Ownership Boundaries	Avoid
PHMSA- Drinking Water	Avoid
PHMSA- Ecologically Sensitive Areas	Avoid
State Historic Site	Exclude
State Parks and Natural Area Preserve	Avoid
Surface Water Intake	Exclude at 500'
Swine Lagoon Site	Exclude at 1000'
Underground Storage Tank	Exclude at 500'
USFS National Forest Boundaries	Exclude
Water Distribution Intake	Exclude at 500'
Water Distribution Meter	Exclude at 500'
Water Distribution Pump	Exclude at 500'
Water Distribution Tank	Exclude at 1,000'
Water Distribution Treatment Plant	Exclude at 1,000'
Water Wells	Avoid at 200'
Wild & Scenic River	Exclude
Wilderness Area	Exclude
Wildlife Management Areas	Avoid
Land Datasets	**Weighting**
Address Point	Avoid at 400'
Airports	Exclude at 2,640'
Animal Operations	Avoid at 1,000'
Antenna/Cellular Structure	Exclude at 250'
Boat Access	Exclude at 1,000'
Bridge	Exclude at 500'
Cemetery	Exclude at 1,000'
Church	Exclude at 1,000'
Dam	Exclude at 1,000'
Emergency Operation Center	Exclude at 1,000'
Fire Department/Law Enforcement	Exclude at 1,000'
Gas Plant	Exclude at 1,000'
Gas Station	Exclude at 1,000'
Golf Course	Exclude at 1,000'
Government Building	Exclude at 1,000'
Hospitals	Exclude at 1,000'
Industrial/Office Building	Exclude at 1,000'
Industrial Park/Industrial Site Boundary	Exclude at 1,000'
Institution/Nursing Home	Exclude at 1,000'
Land Ownership (Typical)	Federal = Exclude ; State = Avoid ; Local = Avoid ; Nondesignated = Low Avoid ; Other Protected Land = Avoid
Landfill	Exclude at 2,640'
Landmark	Exclude
Local Structure	Avoid at 250'
Military Installation	Exclude
PHMSA - Highly Populated Area	Exclude
PHMSA - Other Populated Area	Avoid
Pipeline Meter	Avoid at 50'
Race Track	Exclude at 1,000'
Retail Center	Exclude at 1,000'
School	Exclude at 1,000'
Transportation Terminal	Avoid at 500'

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 9:

In section 12.2 (ARSD 10:10:22:12), please provide a description of any alternative route corridors considered and justification for choosing the proposed route over the alternatives.

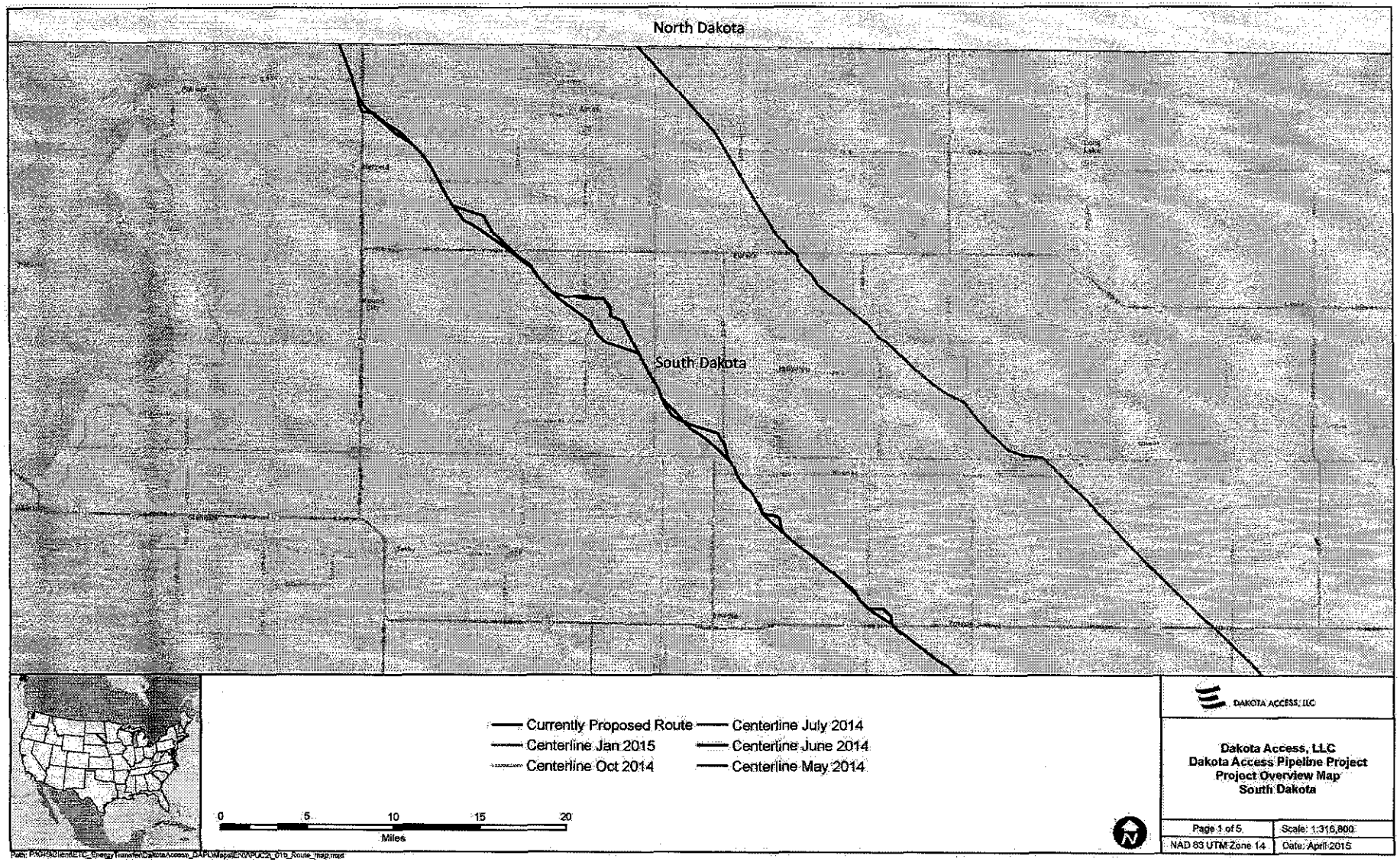
Response:

See Data Response No. 9 Map below to view the original proposed routes and the final proposed route. The original routes were developed largely via desktop routing by a team of pipeline professionals. These routes were then optimized through field investigations and the GIS routing program as discussed within Section 12.0 of the December 22, 2014 submittal, and within Data Response No. 8. The output of the GIS routing program, combined with field survey results and micro routing considerations for non-desktop information gathered by the project team (e.g. environmental resources, landowner feedback, government feed-back [planned developments], have led to the basis of the current proposed route.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33



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Response to South Dakota Public Utilities Commission
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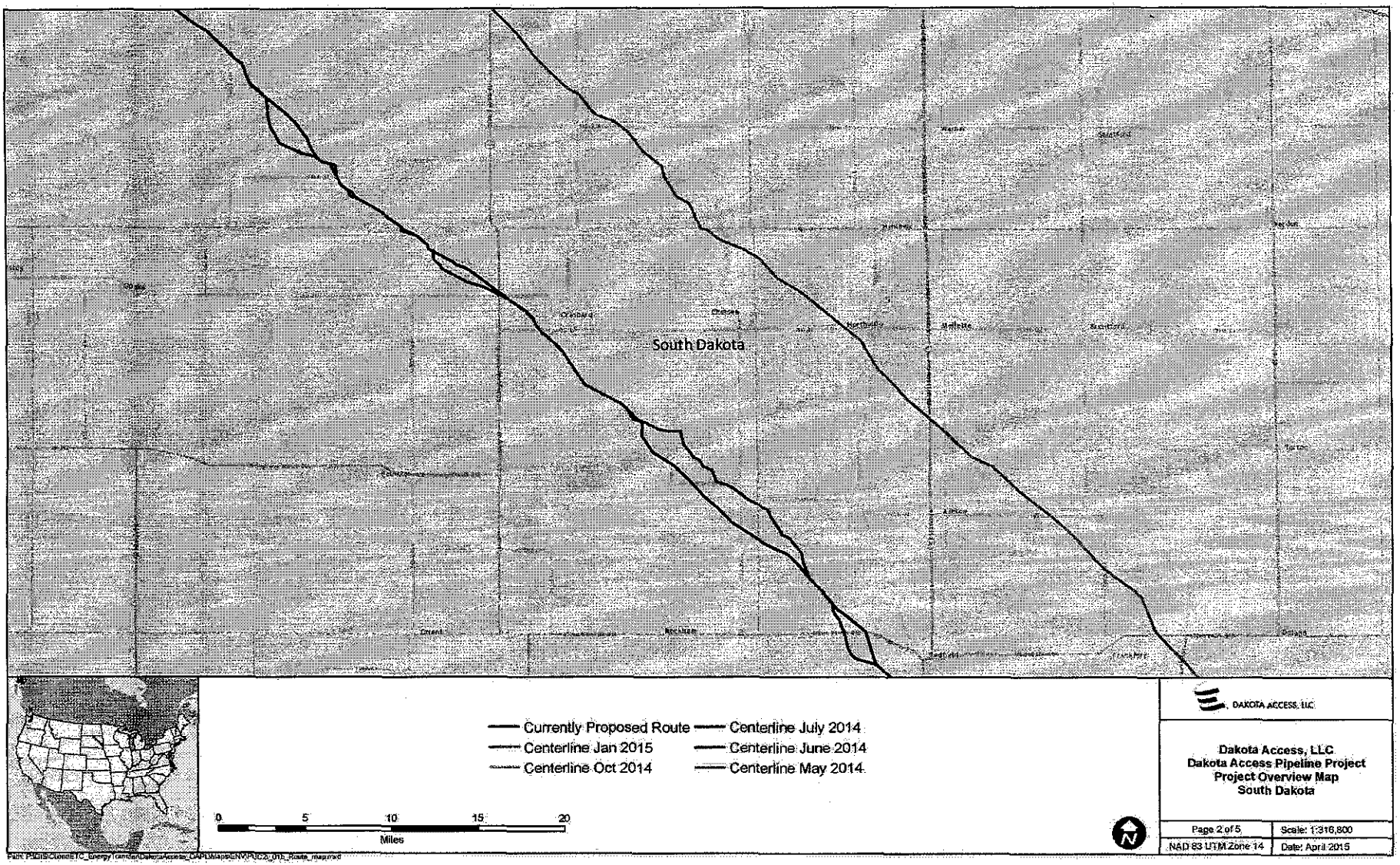

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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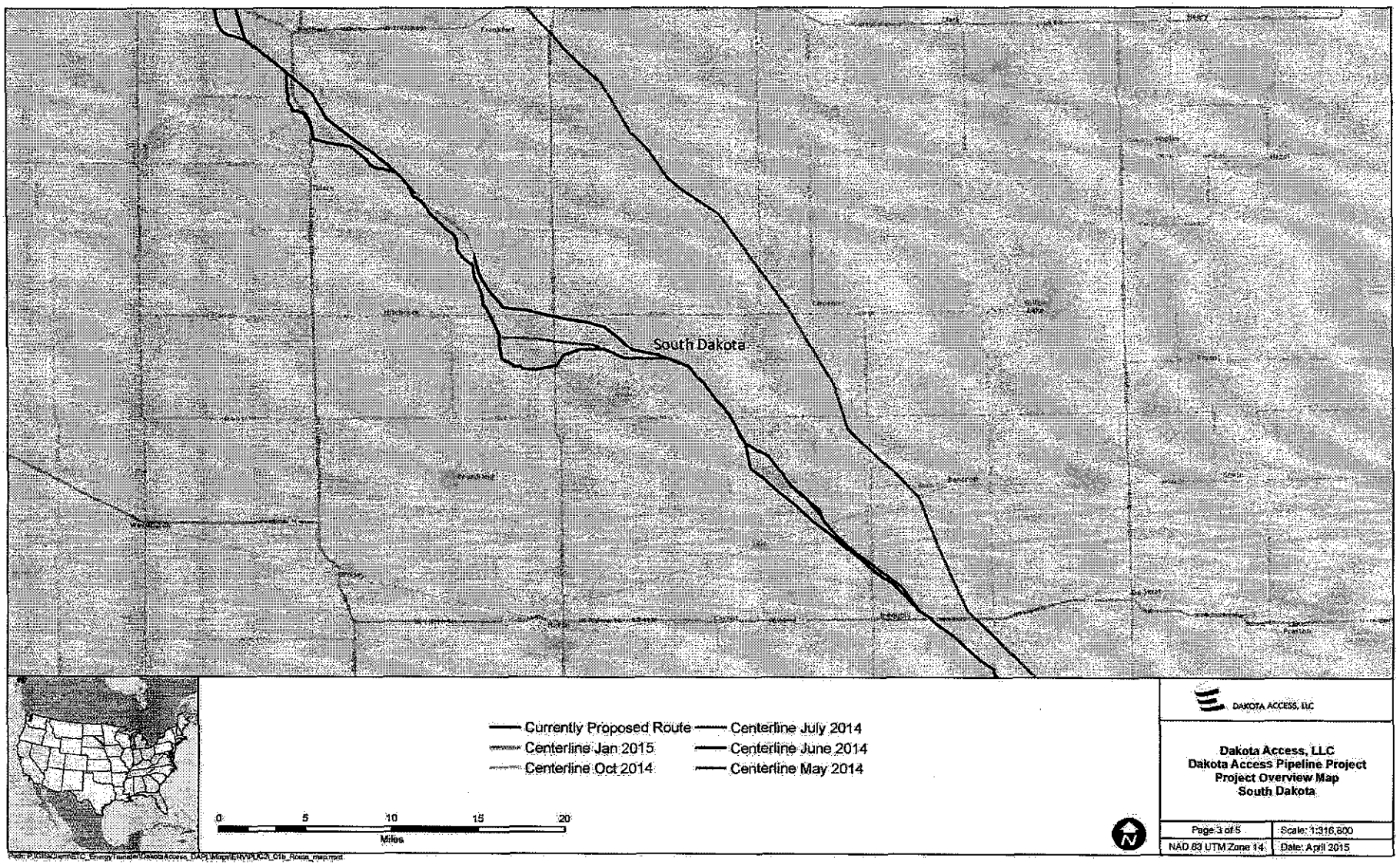
Request Numbers: 1-33



Dakota Access, LLC
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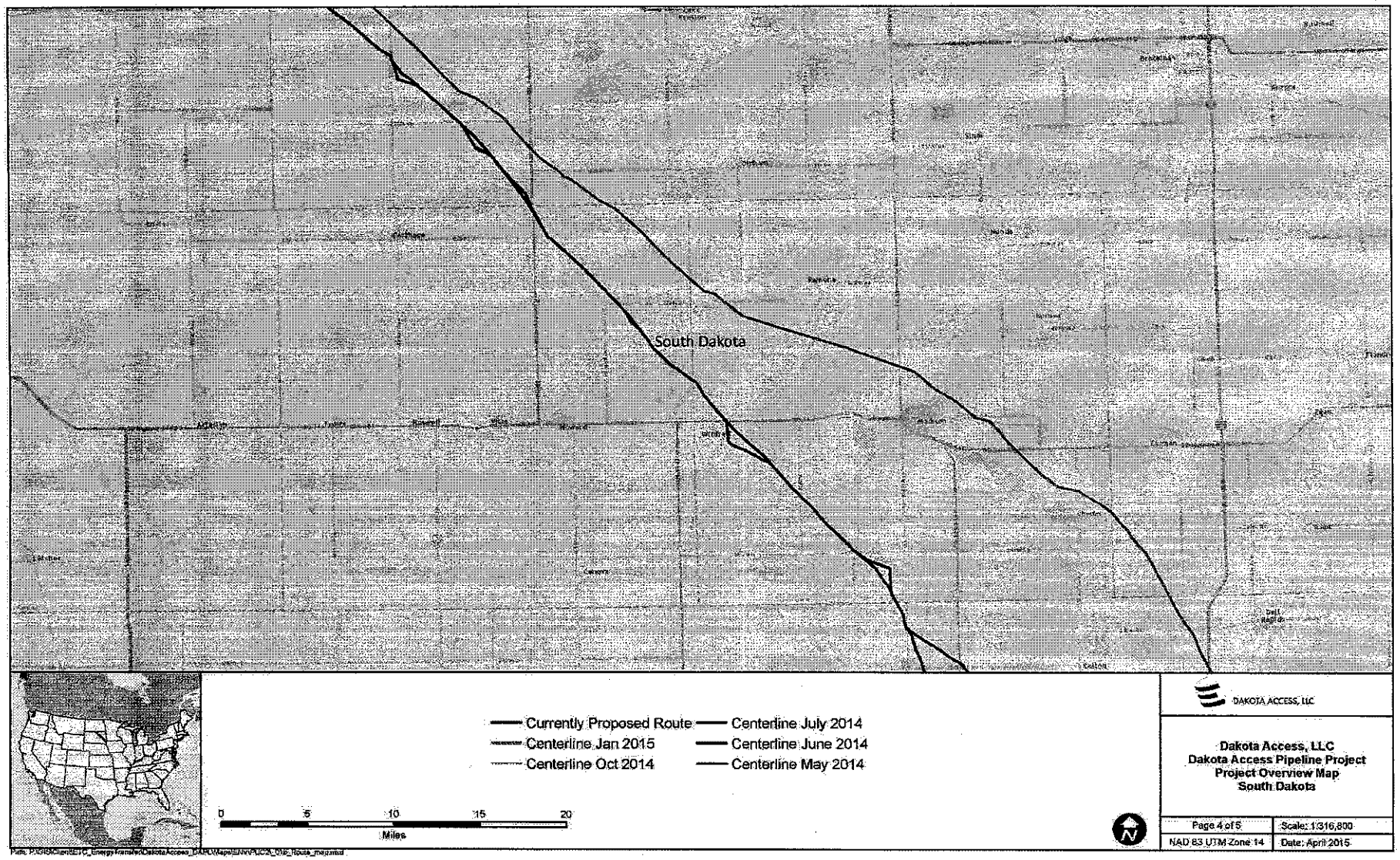

Dakota Access, LLC
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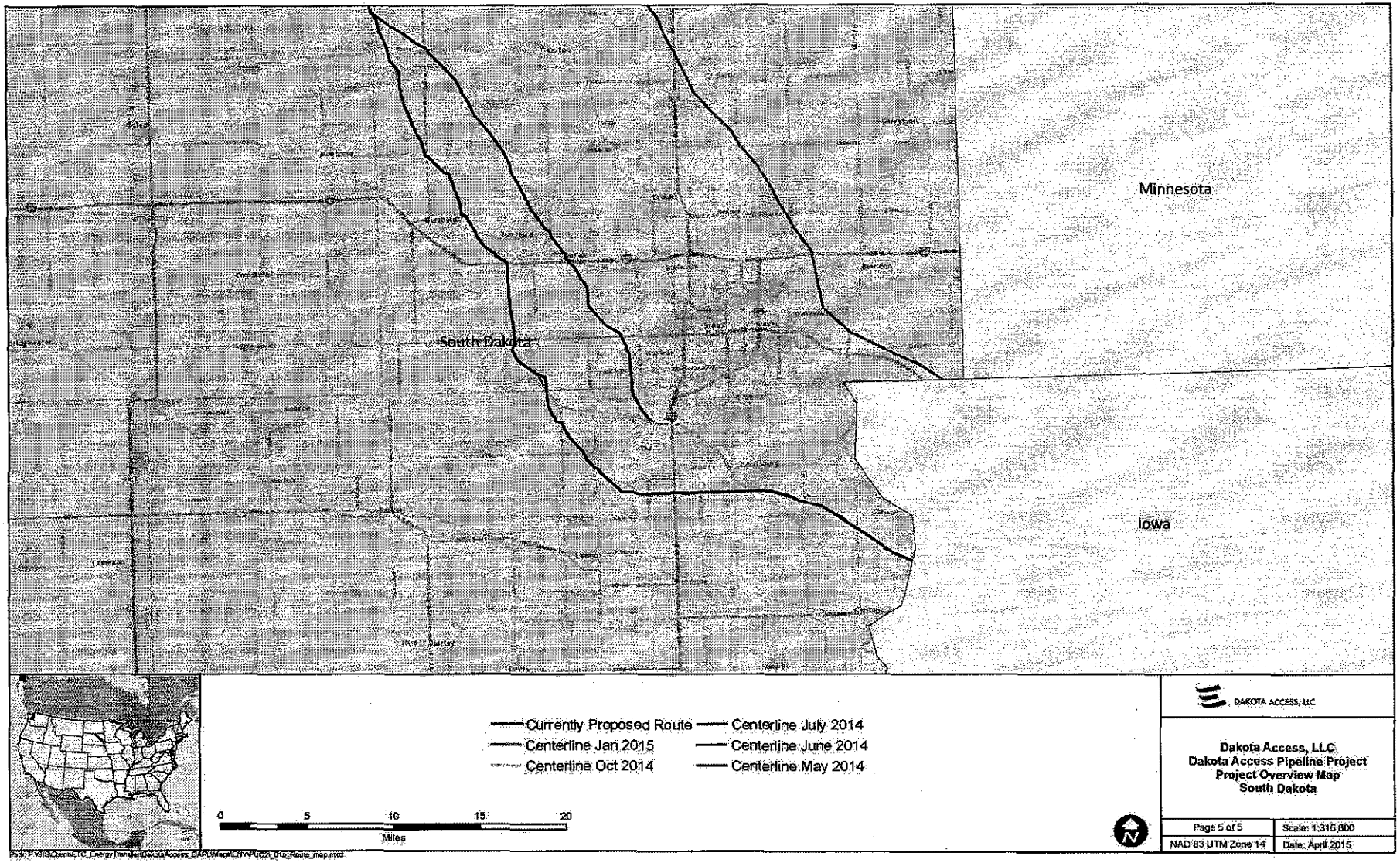


Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 10:

In accordance with ARSD 20:10:22:12(3), please include a detailed discussion of the extent to which reliance upon eminent domain powers could be reduced by use of an alternative site. Include a discussion specifically addressing whether or not alternative routes in Minnehaha, Turner, and Lincoln counties could reduce the reliance upon eminent domain powers.

Response:

The use of eminent domain is dependent upon a host of factors. The pipeline is a linear facility extending for hundreds of miles and by definition must be contiguous. The parcels of property required for the construction and operation of the pipeline are numerous, but none-the-less interdependent and interrelated as part of this request and one factor, constraint, or landowner hold out cannot interfere with the contiguous routing in which a gap can occur. The pipeline crosses literally hundreds of separate discrete parcels of real estate, numerous environmental and contractibility constraints that when all combined result or define a route that is feasible, but may not avoid or mitigate the need to rely upon eminent domain to ensure the route is ultimately contiguous. The goal is to avoid, minimize and then mitigate as much as possible all foreseeable constraints but not arbitrarily or unduly route the pipeline based upon landowner personal preference such that one landowner is more affected than another and no more unreasonably than another based upon demographic criteria such as economic capability to influence the route, political standing or affiliation, race or social standing (environmental justice considerations). Therefore the routing is strictly based upon minimization of impacts to environmental resources, regulated areas as defined or managed by regulatory considerations, the South Dakota four-factor criteria, constructibility considerations and by Dakota Access's ability to procure the right-of-way through reasonable negotiated communications and easements. Only after all considerations and reasonable compromises have been made, alternate routes considered and failed negotiations occurred to resolve any disputes where the pipeline cannot be reasonable rerouted would Dakota Access rely upon Eminent Domain. Based upon the studies, surveys and all the criteria considered to date, Dakota Access does not believe that there are any other routes or actions that could be taken other than a "no-action" alternative that would reduce the potential for eminent domain across Minnehaha, Turner and Lincoln Counties. Lastly, Dakota Access is currently negotiating with the affected landowners along the entire route and in particular Minnehaha, Turner and Lincoln Counties and is making good progress on purchasing voluntary easements across the state and those counties and Dakota Access feels confident that there will not be any higher percentage or reliance of eminent domain in those counties than anywhere else along the pipeline in South Dakota. Currently, Dakota Access has secured approximately 60% voluntary easements across the state of South Dakota and 42% across Minnehaha, Turner and Lincoln Counties.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 11:

Please provide cross sections of the bedrock geology and surficial geology to depict the major subsurface variations in accordance with ARSD 20:10:22:14(3).

Response:

See the attached response.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 12:

In sections 14.7 and 14.8 (ARSD 20:10:22:14(7) and (8)), it is identified that the project will cross approximately 47.5 miles of karst terrain. Please expand on the potential for subsidence to occur along the project route and whether or not the pipeline would be damaged as a result of subsidence.

Response:

See the response attached to Data Request No. 11.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 13:

In sections 14.8 (ARSD 20:10:22:14(8)), please expand on the steps Dakota Access will take to protect the pipeline from subsidence. Include a discussion on the known measures Dakota Access could take to protect the pipeline from subsidence.

Response:

See the response attached to Data Request No. 11.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 14:

How close is the pipeline to the Minnehaha County Wellhead Protection Area? Is this a sufficient distance in the event of a leak?

Response:

The closest point to the Minnehaha County Wellhead Protection Area is 0.43 mile. Spill models continue to be run and appropriate mitigation measures will be implemented to protect the water source.

Prepared By: Chuck Frey
Title: Vice President - Engineering

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 15:

Please provide a map of all Wellhead Protection Areas along the route.

Response:

The only Zone A Source Water and Wellhead Protection Area identified by the South Dakota Department of Environment and Natural Resources (SDDENR) located near the pipeline is the Minnehaha Wellhead Protection Area as provided in the December 22, 2015 application submittal, and as Exhibit A-1 to the March 2015 submittal. Included below is an email from the SDDENR confirming this information and a map to illustrate the entire route through South Dakota and the respective location of this feature.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Archived: Monday, April 06, 2015 10:29:20 AM
From: Walsh, Brian
Sent: Thursday, June 12, 2014 2:04:13 PM
To: Ashley Thompson
Cc: Walsh, Brian; Brandner, Tom
Subject: RE: Proposed Pipeline
Importance: Normal
Attachments:
Minnehaha_County_WHPA.dbf; Minnehaha_County_WHPA.prj; Minnehaha_County_WHPA.sbn; Minnehaha_County_WHPA.sbx; Minnehaha_County_WHPA.shp; Minnehaha_County_WHPA.shx; MinnehahaCo_ZoneA_SWPA.dbf; MinnehahaCo_ZoneA_SWPA.prj; MinnehahaCo_ZoneA_SWPA.sbn; MinnehahaCo_ZoneA_SWPA.sbx; MinnehahaCo_ZoneA_SWPA.shp; MinnehahaCo_ZoneA_SWPA.shp.xml; MinnehahaCo_ZoneA_SWPA.shx;

Hi Ashley,

We have reviewed the proposed route and, based on the information we have, it does not cross any Zone A (the most critical protection zones) Source Water or Well Head Protection areas except in Minnehaha County where it crosses the Minnehaha County Well Head Protection Area. Attached are shapefiles for the Zone A Well Head and the Source Water Protection areas in Minnehaha County.

It is DENR's recommendation that the pipeline be routed to avoid crossing any Zone A Well Head or Source Water Protection areas. Also, since the counties and communities are responsible for any management activities in these protection areas, DENR recommends you contact the affected counties to get the most up-to-date information about the protection areas and any ordinances or restrictions that may apply in those areas.

It is likely the proposed route will cross shallow aquifers not directly associated with Source Water or Well Head areas. If this occurs, DENR recommends the pipeline be designed, constructed and operated in a manner that protects these resources.

If you have any questions about this email or need additional information please let me know. Also, if the route changes let us know and we will be happy to re-evaluate it. For your information, below are several links to DENR's website and online databases that may be useful as you plan this project.

http://www.sdgs.usd.edu/	(South Dakota Geological Survey)
http://denr.sd.gov/des/wr/dbwrsearch.aspx	(Water Rights / Wells)
http://denr.sd.gov/des/wr/dblogsearch.aspx	(Well Driller's Logs)
http://denr.sd.gov/boards/pipelinetf.aspx	(SD Underground Pipeline Task Force Report)

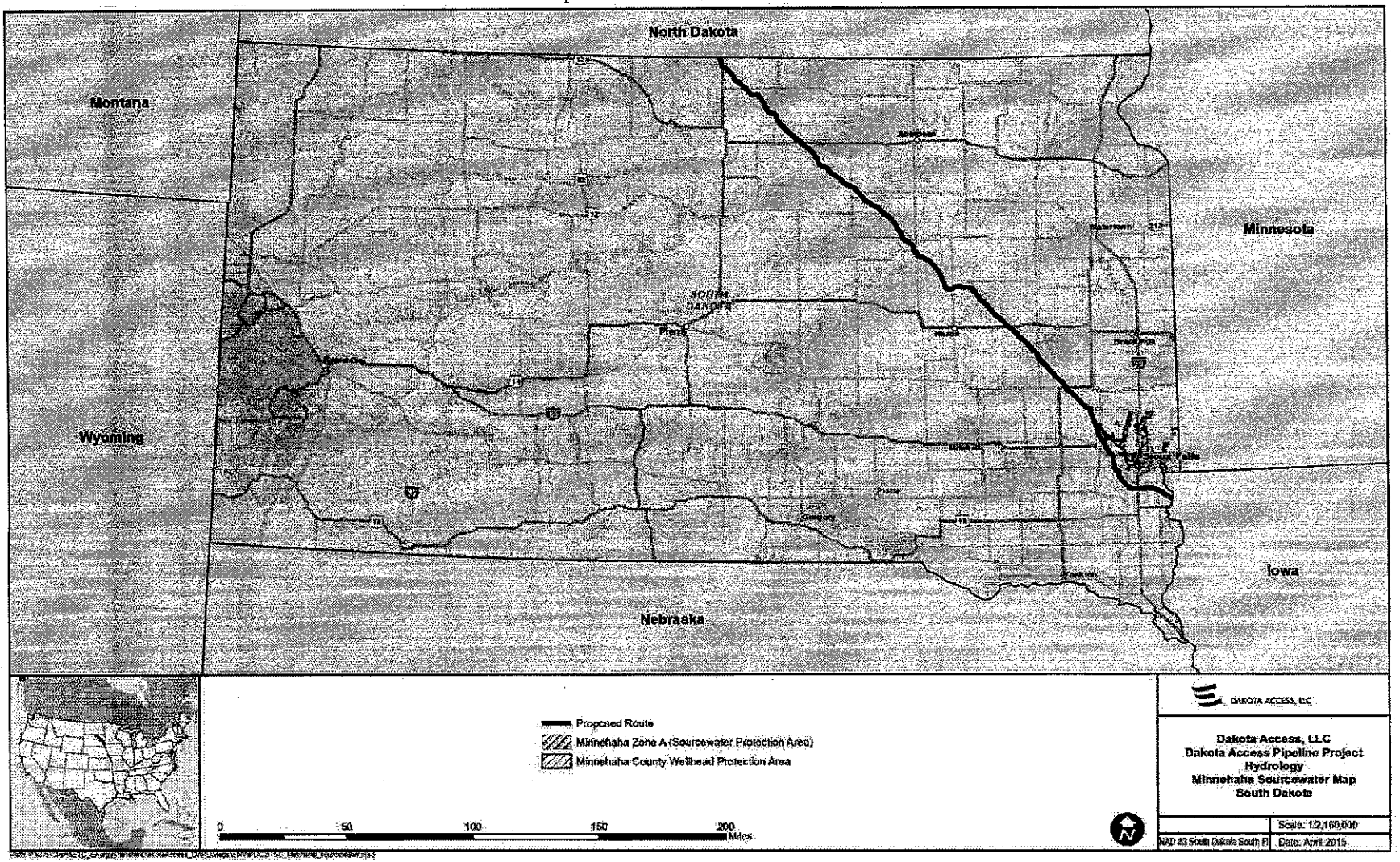
Finally, some of this information is sensitive so please keep that in mind and restrict its use to those who need the data to develop the pipeline project.

Sincerely,

Brian J. Walsh
Environmental Scientist III
SD DENR
523 E. Capitol Ave.
Pierre SD 57501
605.773.3296
Fax: 605.773.6035
brian.walsh@state.sd.us

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33



Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 16:

On the maps provided in Revised Exhibit A4, waterbodies and streams are shown; however, drainage patterns are not shown. Please provide updated maps that show the surface water drainage patterns before and anticipated after construction as required by ARSD 20:10:22:15(1).

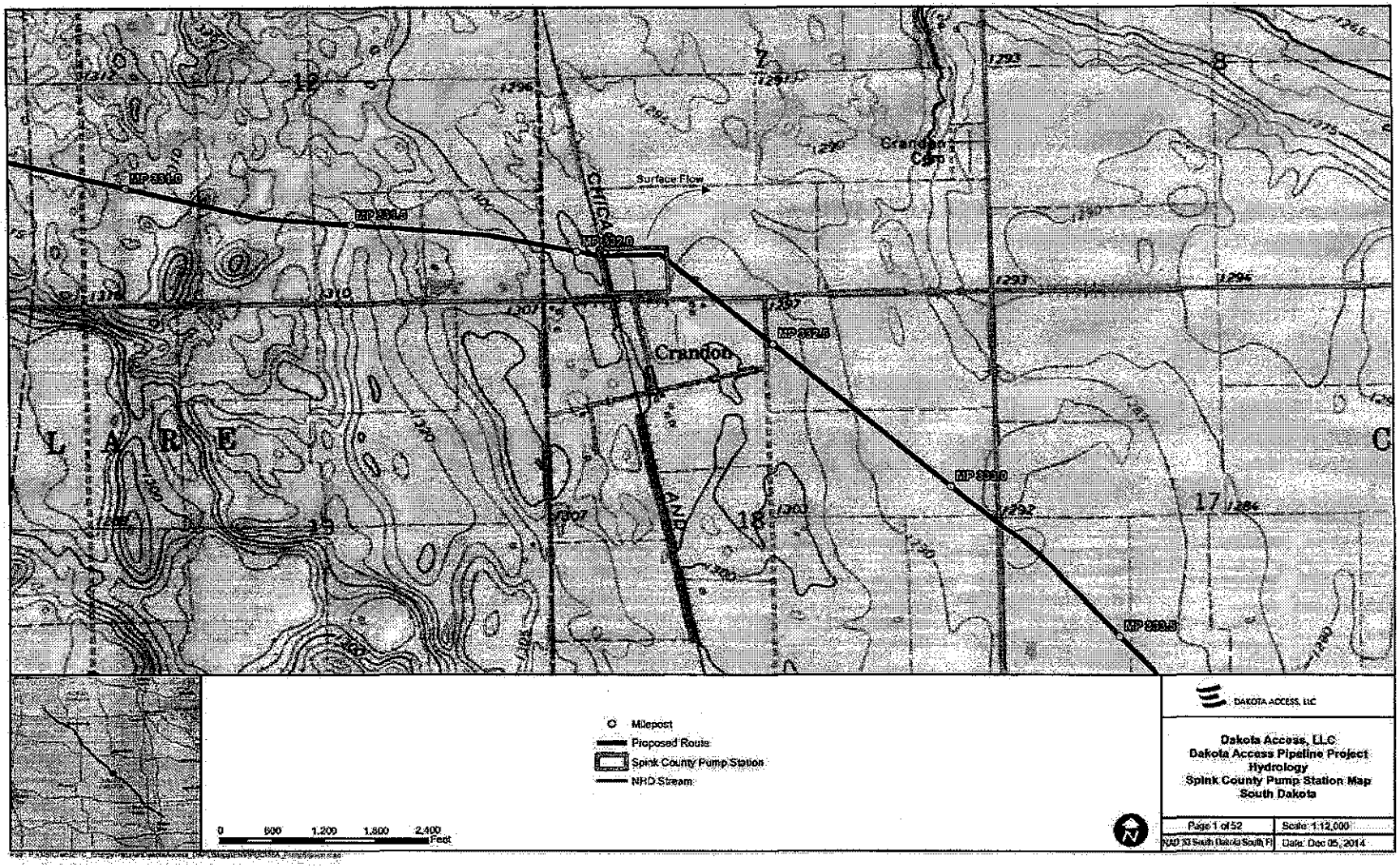
Response:

As stated in Section 15.1 of the December 22, 2014 application submittal, the pipeline is a below ground facility where after construction the right-of-way will be restored to pre-construction contours and elevations and no change to the drainage patterns are expected as a result of pipeline construction. The pump station in Spink County is the only aboveground facility of any significance with the potential to interfere with drainage patterns. While construction plans have not been finalized for this facility, Dakota Access is committed to maintaining current drainage patterns at this site. Below is the map of the current surface flow at the Spink County pump station that was provided with the December 22, 2014 application submittal.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33



Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 17:

Regarding section 15.5 (ARSD 20:10:22:15(5)), does Dakota Access expect the discharge of heated water to occur as a result of the project?

Response:

No discharge of heated water will occur.

Prepared By: Chris Srubar
Title: Associate Engineer

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 18:

Per ARSD 20:10:22:16, please provide an analysis of the impacts of the pipeline's construction and operation on the breeding times and places and pathways of migration of terrestrial fauna, if any. Include in the analysis a discussion on Dakota Access's plans for stripping vegetation along the entire pipeline route before the start of breading season in mid-April in order to ensure ground nesting birds avoid the project area (as inferred from section 16.2.1).

Response:

In theory, construction of the pipeline could result in very localized and temporary displacement impacts to terrestrial fauna along the Project route through South Dakota. A majority of the species are mobile in nature, and the proposed ROW is roughly 150 feet wide, therefore along very minor compared to the entire landscape and available adjacent similar habitat it is theoretical that localized displacement of species will occur throughout the construction period at any given location and will reestablish following construction activities and restoration of the ROW. That said, given the large percentage of agricultural development along the Project ROW, existing species that may utilize the Project area are likely very accustomed to seasonal vegetation impacts on a far greater scale than this Project will cause. As such, Dakota Access does not believe there will be any measurable impacts to terrestrial fauna.

To ensure mobility and mitigate any impacts to the migration of terrestrial fauna across areas of active work, trench plugs will be installed at visible wildlife game trails, as identified by an EI or wildlife agency, and at livestock watering trails, as identified by the landowner, that intersect the trench line. Gaps will be left in spoil and topsoil stockpiles at all trench plugs to permit unimpeded movement of wildlife and livestock. Suitable ramps will be installed from the bottom of trench to the top with a minimum of 5-foot wide open path across the trench plug. A corresponding gap in the welded pipe string will be left at each trench plug.

Dakota Access has not made a commitment to strip vegetation along the entire pipeline route before mid-April but anticipates that large portions of the ROW will have ground disturbance by that point in time. As indicated in Section 16.2.1, we expect that construction activities will begin well in advance of the breeding season and accordingly ground nesting birds would choose other areas when locating their nests for the season. Even if the vegetation has not been stripped, there will be pre-construction activities associated with surveys which will cause an increased human presence thus likely making other areas more desirable as a nesting place.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 19:

Please provide all professional opinions and recommendations received from USFWS, SDG&P, SDDENR, and SHPO for the project.

Response:

Ongoing coordination has been occurring on a regular basis with federal and state agencies in South Dakota (including the aforementioned agencies); however, formal professional opinions or recommendations have been limited to date as the permitting/consultation process is on-going.

Dakota Access is working with the USFWS in relation to the crossing of easements under the USFWS's control. Additional coordination is ongoing with the USFWS as part of the USACE permitting process. Through such process, Dakota Access has consulted the USFWS regarding routing and assessment protocols for listed species that may be affected by the Dakota Access. The only protected species of potential concern in South Dakota is the Topeka shiner at 4 waterbody crossing locations. As surveys are still ongoing, an official opinion or recommendation has not been provided, but it is expected that a not likely to adversely affect determination will be concurred or issued by the USFWS.

Dakota Access has been in contact with the SDFG&P regarding Project impacts under their jurisdiction. It has been confirmed that no formal permit or approval from the agency, outside of their participation in the PUC process. The response provided in Data Response 18 above further addresses the determination Dakota Access has made regarding minor or negligible impacts to wildlife and the environment as a result of the Project.

Dakota Access has also been in contact with the SDDENR at times throughout development of the Project. It has been confirmed that, based on the communicated scope of the project, there is no formal permit or approval required from the agency and that the project Facility Response Plan will be submitted in accordance with regulation prior to operation.

Provided below is the South Dakota SHPO's formal comments on Dakota Access' cultural resource survey protocol, which were incorporated into the scope of work. Like the USFWS, the SHPO will also be formally consulted through the USACE permitting process for the Project.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Monday, August 18, 2014 6:56 PM
To: Olson, Paige
Cc: Abby Peyton; Patrick Trader
Subject: RE: DAPL proposed SOW

Paige,

Thanks for your review. I think we can incorporate each of your suggestions. We will use a 1 x 1m unit at sites to provide better information on integrity. We will keep you informed of changes to the survey methods if/or when we would like to refine them. We will GPS all shovel tests (and units). For the last comment the sentence should read "Should *a potentially* eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." We would use this for sites that need an evaluation of significance.

Please let me know if you have any additional concerns.

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

From: Olson, Paige [mailto:Paige.Olson@state.sd.us]
Sent: Monday, August 18, 2014 11:43 AM
To: Beth McCord
Cc: Abby Peyton
Subject: RE: DAPL proposed SOW

Good morning,

Thank you for the opportunity to review the proposed scope of work. I do have several comments that I hope can be taken into consideration.

1. My first comment concerns the use of at least one shovel test to provide information on a site's integrity. If the goal is to determine a site's integrity (vs. presence / absence) I would recommend using a 1x1 in an area with the best potential for intact subsurface deposits.
2. Is it possible to be informed when your survey methods are refined based on what you're seeing in the field?
3. I recommend gathering GPS coordinates for all shovel tests, not just positive shovel tests.
4. On the second page, 8th paragraph, last sentence, "Should an eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." Can you please explain why testing will be conducted if the sites determined eligible?

Finally, the Archaeological Research Center's database should reflect the most up to date information from the mortuary surveys. If you find that this is not the case please let me know.

Thanks,
Paige

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Friday, August 15, 2014 1:40 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: DAPL proposed SOW

Paige,

Thanks for meeting with us. We certainly benefitted from the conversation. I wanted to present our proposed scope of work for your comment based on our meeting. I have attached it for your review. Our approach is to run this as a Section 106-like project. Please let me know if you have any comments or require clarification on these procedures. We are hopeful that this approach will satisfy the SHPO.

I also wanted to inquire on how we might receive copies of the recent mound surveys you mentioned. We will be crossing Beadle, Campbell, Edmunds, Faulk, Kingsbury, Lake, Lincoln, McCook, Minnehaha, Miner, McPherson, and Spink counties. Any information from these counties would be great.

We look forward to working with you.

Thank you,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 20:

Per the applicant's statement on page 32 of the Revised Application, please explain why four land use types "were not documented". If these land use types do not exist along the route, please provide a statement as such. If these land use types do exist, please provide a map showing their locations.

Response:

Baseline surveys and desktop analysis for land use occurred during 2014 to classify land uses along the proposed pipeline route using classifications listed in Section 22:20:10:18 of the South Dakota Administrative Rules. Four land use types (i.e. existing and potential extractive nonrenewable resources; other major industries; municipal water supply and water sources for organized rural water systems; and noise sensitive land uses) were not identified along the proposed route, and therefore were not documented in the summary tables and Project mapping provided in the December 22, 2014 submittal.

Prepared By: Monica Howard
Title: Director – Environmental Science

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 21:

Referring to section 19.0 (ARSD 20:10:22:19), are there any local land use controls that Dakota Access took into consideration for the proposed route in Minnehaha, Turner, and Lincoln counties? In addition, please explain how the project will affect the Lincoln County Comprehensive Growth Plan.

Response:

The project considered the growth plan maps of the cities of Sioux Falls, Tea and Harrisburg. The list of data sets accounted for during the initial routing optimization process is provided in Data Request 8 above. Local land use considerations were taken into consideration once they were made available to Dakota Access. With respect to Minnehaha, Turner, and Lincoln counties, the details and results were provided in the March 19, 2015 submittal to the PUC. Additionally, we have reviewed the Lincoln County, South Dakota Comprehensive Growth Plan as amended and do not find any inconsistencies or incompatibilities therein.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 22:

Please provide documentation to support the economic benefits cited in Section 23.1 of the Revised Application.

Response:

The documentation to support the economic benefits cited in Section 23.1 of the Revised Application can be found in the report on the impacts of the Dakota Access Pipeline prepared by the Strategic Economics Group of West Des Moines, Iowa entitled (*"An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois"*) dated November 12, 2014. The full report is available at the following link:

http://www.economicsgroup.com/reports/DAPL%20Report.pdf.

A copy of the full report is also attached to the response.

Prepared By: Stephen Veatch
Title: Sr. Director Certificates

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 23:

In section 23.1, please provide support for the claim that "property values are not usually affected by the installation or presence of a pipeline in rural areas."

Response:

A brief review of the literature supports this conclusion. See for example:

"Pipelines and Property Values: A Review of the Academic Literature" Somerville, and Wetzel, 2014.
"Natural Gas Pipeline Impact Study" INGAA Foundation, Inc., 2001.

"Pipelines and Property Values: An Eclectic Review of the Literature" Wilde, Loos and Williamson, 2012.

"Pipeline and Power Easements: How will they Impact Ranch Land Cost, Usage?"Stalcup *The Cattleman* March 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 24:

Per ARSD 20:10:22:23(1), please provide a forecast of the impact on land values where residential or commercial development is likely.

Response:

Literature on the topic shows that the existence of a pipeline has no impact on land values that can be discerned. Additionally, it would be impossible to forecast an impact on land values where residential or commercial development is likely without knowing the likelihood of the development, the timeline and other information.

A brief review of the literature supports this conclusion. See for example:

"Pipelines and Property Values: A Review of the Academic Literature" Somerville, and Wetzel, 2014.
"Natural Gas Pipeline Impact Study" INGAA Foundation, Inc., 2001.

"Pipelines and Property Values: An Eclectic Review of the Literature" Wilde, Loos and Williamson, 2012.

"Pipeline and Power Easements: How will they Impact Ranch Land Cost, Usage?"Stalcup *The Cattleman* March 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota

Dakota Access, LLC
Docket No. HP14-002

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Data Request No. 25:

Per ARSD 20:10:22:23(1), please explain any long-term electric energy required to operate the pipeline pump station and other pipeline equipment. Further, please describe any new electric facilities that may be required for the pump station.

Response:

The South Dakota pump station will require approximately 15 Megawatts of electrical power to operate the pump motors and ancillary equipment. This power will be served by high voltage electrical lines and purchased from local electric supplier.

The pump station will require electrical transformers, located within an on-site substation, to transform the incoming high voltage to the appropriate voltage level needed to operate the pump motors. The substation will also contain circuit breakers, insulators, disconnect switches, communications and protective equipment needed to safely and remotely operate the facility.

The local electric supplier will be responsible for engineering and design of the substation, tapping the adjacent high voltage electrical line, constructing approximately 300-feet of power line and the on-site substation in its entirety, as well as operating and maintaining the substation facility once the pump station is in-service.

Prepared By: Chris Srubar
Title: Associate Engineer

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 26:

Per ARSD 20:10:22:23(1), please provide a forecast of the impact on schools and other community and government facilities or services.

Response:

Overall the pipeline will be constructed in a relatively short period of time, potentially extending for a duration of 8 to 12 months across the entire state of South Dakota and more likely 2 to 4 months on any particular parcel of land. With that said, Dakota Access's construction will include a traveling set of construction staff that will move up and down the right-of-way where the majority of the construction staff will be transient or and will be in a given location for only the construction period. As such, the impact to any community services or facilities and schools will be temporary in nature. When evaluating the potential for the location of the construction staff within the region during construction, they will most likely group within the larger communities where existing governmental services or infrastructure exists. Furthermore, this level of influx is estimated to be a max of approximately 4,000 people, which 1/2 of those are expected to already live within the local communities or surrounding region. Therefore, there is a potential for around 2,000 additional people to be located across the state of South Dakota for approximately 8 to 12 months.

When considering the approximate 2,000 additional people within the region who will most likely choose to temporarily live within the larger communities located along the pipeline right-of-way, Dakota Access does not foresee any negative impacts to the local resources that cannot be accommodated by existing governmental services or facilities. In the event and in situations where there are no communities that have governmental or public type services, Dakota Access will require the contractor to provide those services or needs for the construction workforce (e.g. ambulatory services, access to doctors or nursing services, law enforcement - temporary security or traffic control, etc..).

Negative impacts to schools are not anticipated due to the short term nature of the construction. Most of the construction workforce will not relocate their families for the short duration and those that do will likely be very few and could be accommodated by the local school system. Until and such time the contractor workforce mobilizes to the project, it is unknown the number of children that would temporarily relocate to the project area, However any relocations would be temporary. For the construction workers who live in the communities, no changes are expected to result as these workers and their families already live within the communities.

Although the impact from a person count will largely be minor (less than 2,000 additional people), the economic impact to South Dakota and local communities from a tax perspective and purchasing of secondary goods and services will be tremendous both short and long term. In accordance with the economic analysis conducted by Strategic Economic Group (attached as part of the response to Request No. 22) and the spending projections by Dakota Access, the project value or cost in South Dakota is expected to be $820 million in project direct spending on materials that will be utilized and taxed in South Dakota, an additional $168.2 million in indirect spending from the construction work force and local purchasing of materials that will be utilized on the pipeline and lastly, approximately $186.2 million in induced spending or what is often referred to as spending or respending resulting from the direct spending. The result of this additional revenue that will be realized in South Dakota is an influx of revenue to the state and local governments from taxes. Based upon current tax laws and Dakota Access's initial projections during construction, approximately $35.6 million will be generated in state sales taxes ($29 million on materials alone for the pipeline and pump station)

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throughout construction and approximately $2.9 million will be generated and paid to the local governments where the proposed pipeline or its facilities traverse local taxing authorities.

In addition to sales tax benefits, the pipeline will generate long term property taxes that will benefit the state and in theory the local governments once the tax revenue is distributed to the local communities. Dakota Access year 1 property tax estimate is $12.34 million. This value may be less or more in subsequent tax years depending upon the prevailing tax laws and the methodology utilized to determine the applicable property tax accessed against the pipeline.

Lastly, after construction and into operations, Dakota Access is projecting to add up to 12 new direct permanent employees that will live and pay taxes within South Dakota and who will contribute to the tax base that will have a long term positive impact on the schools and other government services and facilities within the state.

For the one permanent above ground facility or pump station located in Spink County associated with Dakota Access, it is anticipated that a maximum of 8 to 10 permanent employees and their families will be located within the county, contributing to the tax base as well as to the local purchasing of goods and services associated with normal and expected living expenses. The addition of these permanent employees is not anticipated to negatively impact the communities and if anything will provide additional tax revenue to add to and support the existing governmental services, facilities and schools.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
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Data Request No. 27:

Per ARSD 20:10:22:23(2), please provide a detailed forecast of the "long-range impact of property…taxes of the affected taxing jurisdictions".

Response:

Based upon South Dakota current tax laws as promulgated by Chapter 10-37 of the South Dakota Codified Laws, the proposed pipeline's taxes will be assessed centrally at the state level by the South Dakota Department of Revenue and Regulation utilizing what is referred to as real property ad valorem taxation of the real value of the property rather than on the quantity or some other form of measure.

At this time, the only measure Dakota Access has to determine an approximate ad valorem tax value is to estimate the actual cost of the pipeline for the first year tax value as there is no operational or company data available to generate the "value" of the pipeline, company or revenues or losses to determine the value of the company. After year 1, the operational data coupled with the depreciated value of the facilities and further coupled with the value of Dakota Access as a company compared to the portion of the company within South Dakota will be accessed to determine the ad valorem taxes that will be paid is subsequent years. Since there is not adequate data to provide a true estimate or basis of the long term tax benefits, Dakota Access is estimating it will pay approximately $12.34 million in ad valorem taxes for year 1 based strictly upon the cost of the pipeline and asset in South Dakota. Since any other data in subsequent years would be purely speculative at this time, estimates beyond year 1 are not reasonable or provided herein.

Prepared By: Megan McKavanagh
Title: Manager – Property Tax

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 28:

Please provide more specific employment estimates, as specified in ARSD 20:10:22:24.

Response:

During construction, Dakota Access anticipates that there will be three mainline construction spreads. These spreads will include approximately 700 to 1,000 persons per spread for a total for 2,100 to 3,000 persons for the pipeline portion of the project. There will be one additional contractor for the pump station who will have approximately 400 to 600 persons. Total Approximate labor will be no less than 2,500 to a maximum of 3,600 persons. Of these persons and based upon commitments from the various trade unions as part of the Pipe Line Contractors Association, roughly 50 percent of the labor will come from South Dakota or from the labor halls that service South Dakota
Based upon these labor estimates, Dakota Access anticipates paying approximately $155 million in labor payments.

During operations of the pipeline, Dakota Access estimates it will hire and permanently staff 10 to 12 employees in South Dakota, with the majority located within Spink County. This includes:

Employees would work at the pipeline facility in Spink County, SD

1 - Supervisor, Pipeline Operations
1 - Administrative Assistant
6 - Pipeliners
2 - Electrical Technicians
2 - Mechanical Technicians

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
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Data Request No. 29:

Please revise section 4 of the Agriculture Impact Mitigation Plan to include that landowner representative's and EI's email addresses will be provided to landowners.

Response:

The Agriculture Impact Mitigation Plan has been revised to state that email addresses will also be provided. The modified document is included as Appendix B.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 30:

In section 5 of the Agriculture Impact Mitigation Plan, what is the company's definition of "substantial disturbance" when used in the definition of pipeline construction?

Response:

In the context of defining pipeline construction impacts to agricultural areas, "substantial disturbance" would be defined as normal construction activities to include topsoil stripping, trenching, heavy equipment traffic, and other related ground disturbing activities associated with installing the pipeline.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
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Data Request No. 31:

Regarding Section 6.e of the Agriculture Impact Mitigation Plan, will all trench and pit dewatering activities occur within the right of way? If not, how will Dakota Access ensure landowners approve of the discharge on their property and repair any damage that may result from the discharge?

Response:

Dakota Access intends to locate dewatering discharge points within the Project right-of-way. While the discharged water would not necessarily be contained within the right-of-way, discharge activities would be monitored and adjusted as necessary to avoid property damage (e.g. excessive flooding of a field that would impact crops, scouring or erosion, offsite deposition of sediment, etc). In some cases, site specific conditions may prohibit the discharge point from being within the right-of-way and alternative discharge locations would be required. In any location where discharge points would be required outside of the Project right-of-way, landowner approval will be obtained prior to the activity and the area would be restored to pre-construction conditions.

The Agriculture Impact Mitigation Plan has been modified to clarify this and is attached as Appendix B.

Prepared By: Jack Edwards
Title: Project Manager

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 18, 2015 Data Request
Request Numbers: 1-33

Data Request No. 32:

Please propose an indemnity bond amount, as will be required per SDCL 49-41B-38.

Response:

Dakota Access proposes an indemnity road bond totaling $15 million.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
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Data Request No. 33:

Per SDCL 49-41B-5.2, please describe how the applicant carried out the required notice, specifically addressing concerns brought up at public hearings and in comments filed within the docket.

Response:

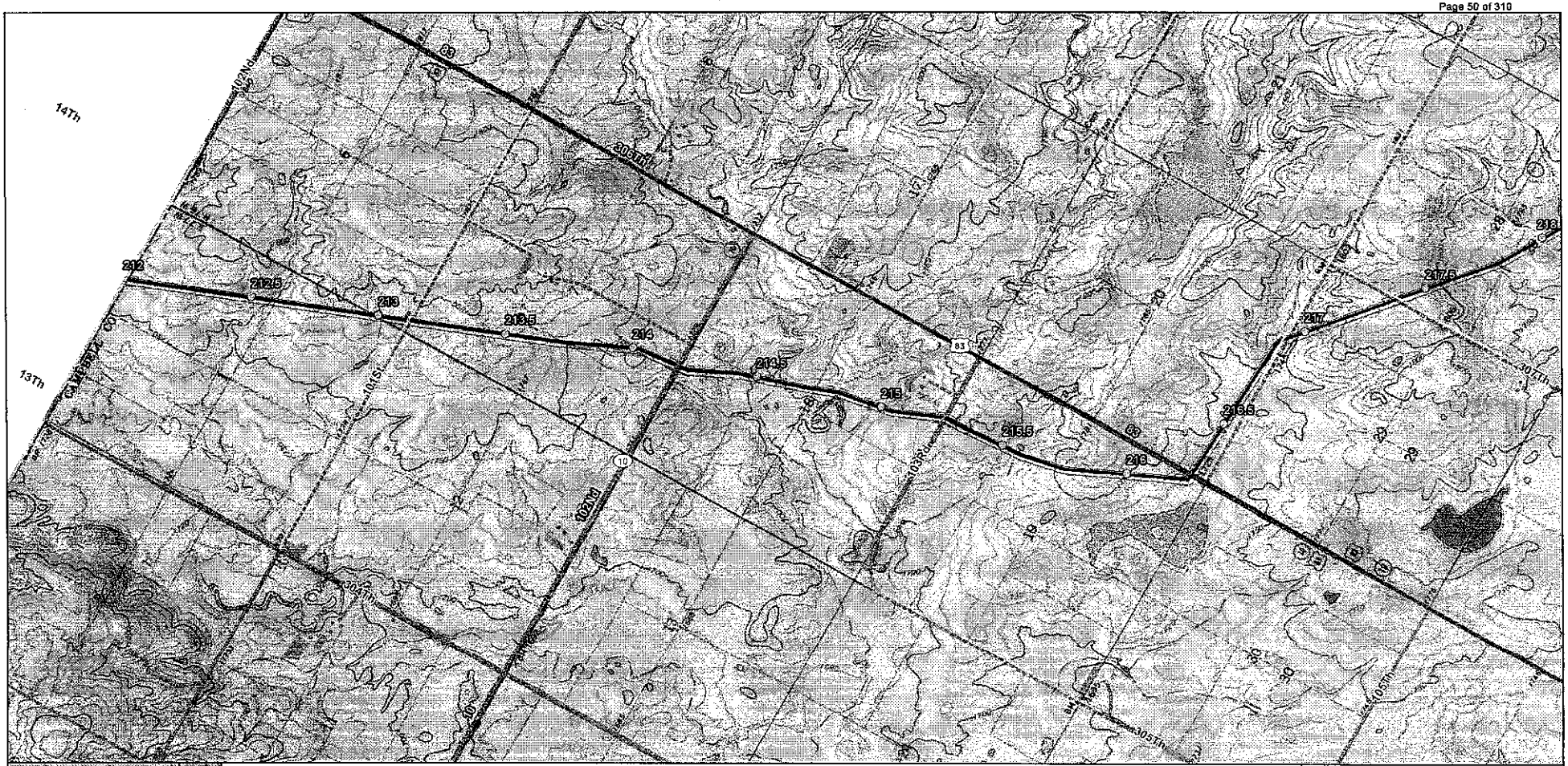
Applicant developed a list of all traversed and abutting landowners located within one half mile of the proposed pipeline centerline by obtaining the ownership lists from the county tax records for property ownership. This ownership data was cross-referenced against the county property delineation maps and also verified as much as possible by civil survey, public property data bases and landowner records and property title records that could be reasonable accomplished/reviewed ahead of the notice period. Therefore the data and notices were based upon public data as maintained by each respective county tax office for counties traversed by the pipeline.

Once the data was obtained from the tax office, the Applicant created a spreadsheet of parcels crossed by the proposed pipeline. The spreadsheet contained names and addresses of owners of record of the parcels. Applicant's attorneys, once application was made and public meetings schedule obtained from the Commission, sent notice by registered mail to those owners of record as delineated by the tax offices. Applicants also caused notice to be published in legal newspapers in each county in which the pipeline route was located.

Notice was sent by registered mail during the week of December 15, 2014. Publishing in the newspapers was conducted that week and in subsequent weeks starting on December 17, 2014 and concluding on December 26, 2014.

Applicant filed an amended application with a different route on December 23, 2014. Notice of the public meetings was mailed to landowners on that route as delineated by the tax office records during the week of January 7, 2015. Applicant's attorneys filed proof of notice on January 14, 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota



DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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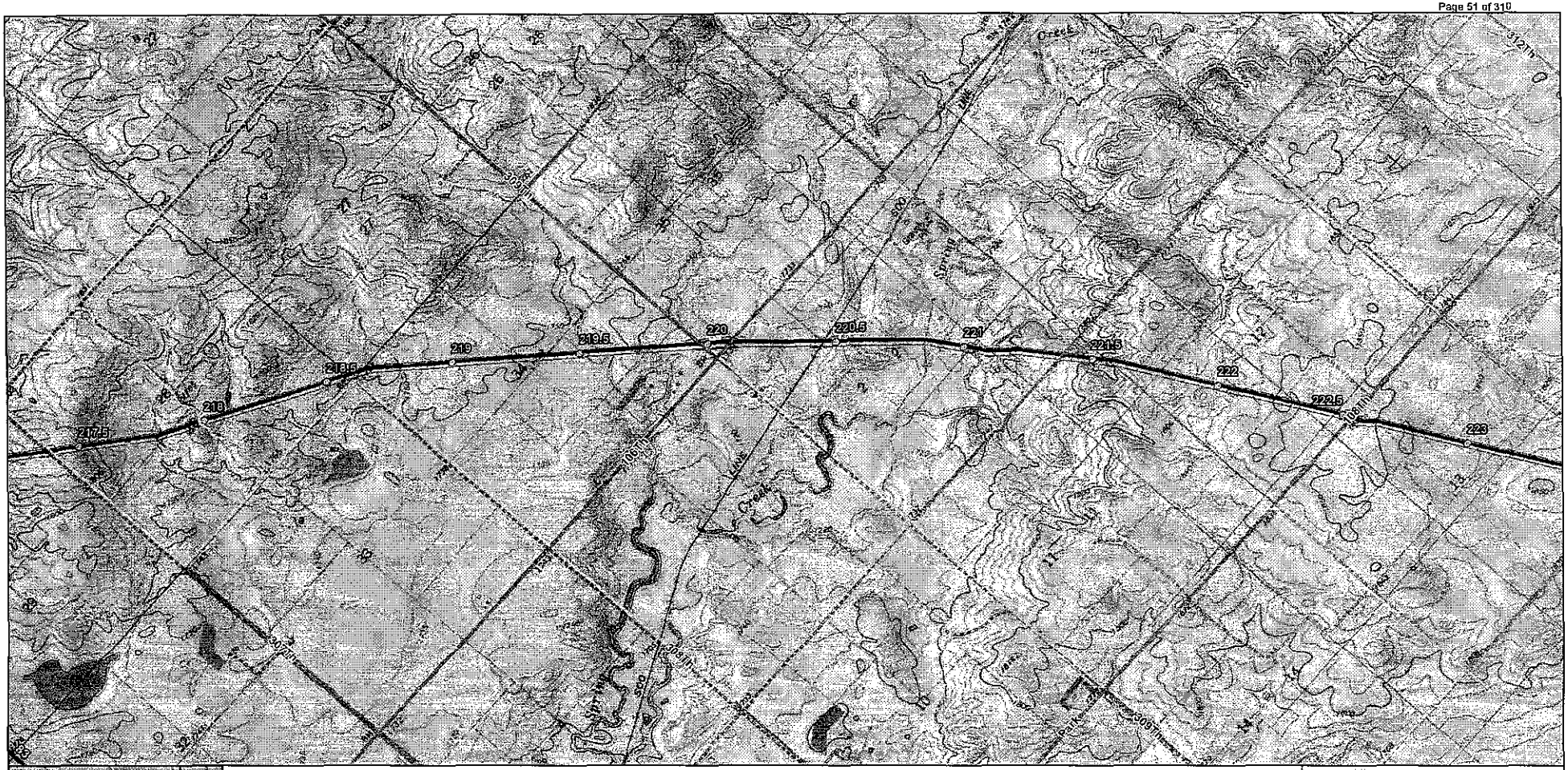

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
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South Dakota

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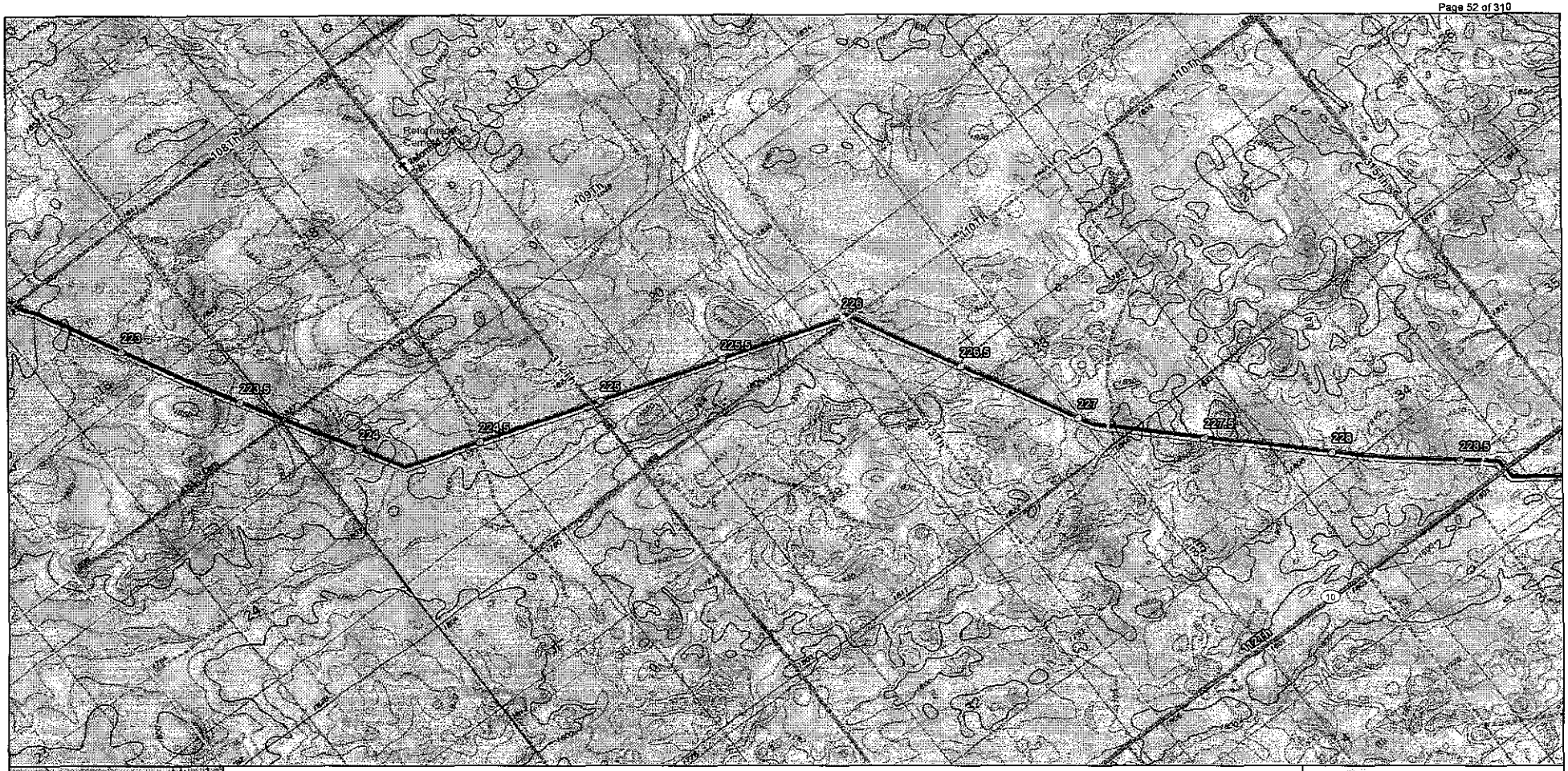

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
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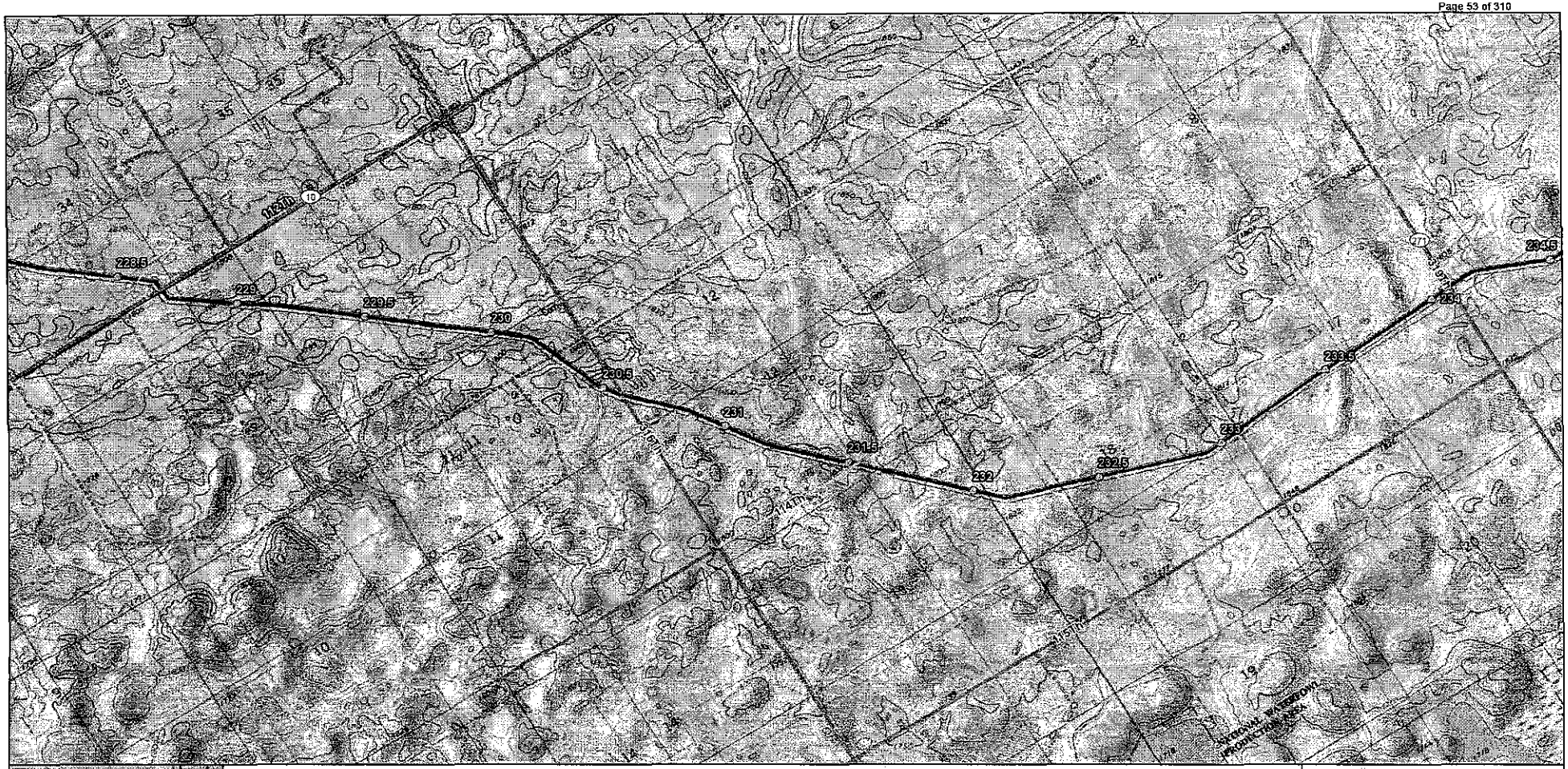

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DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
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South Dakota

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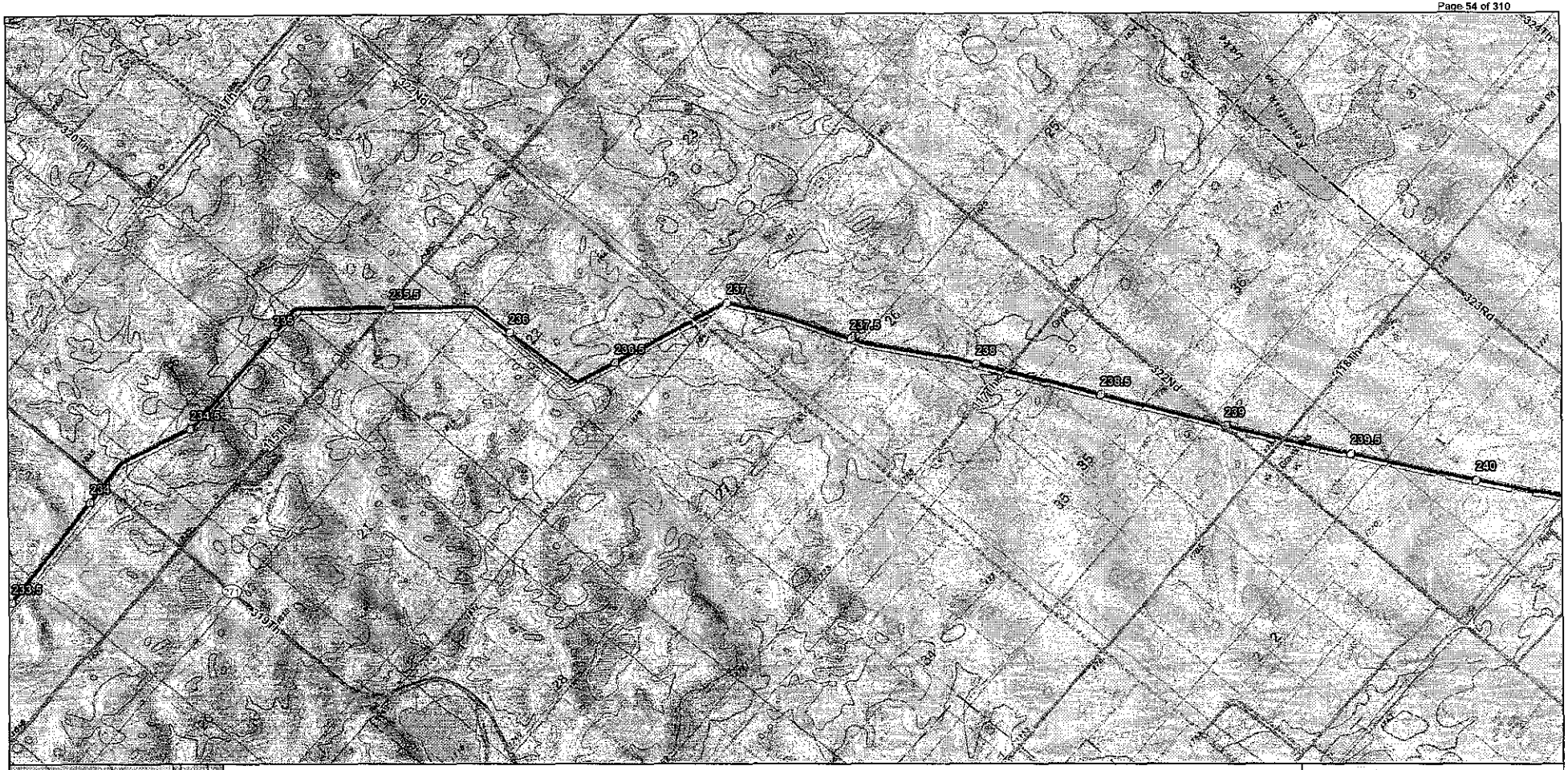
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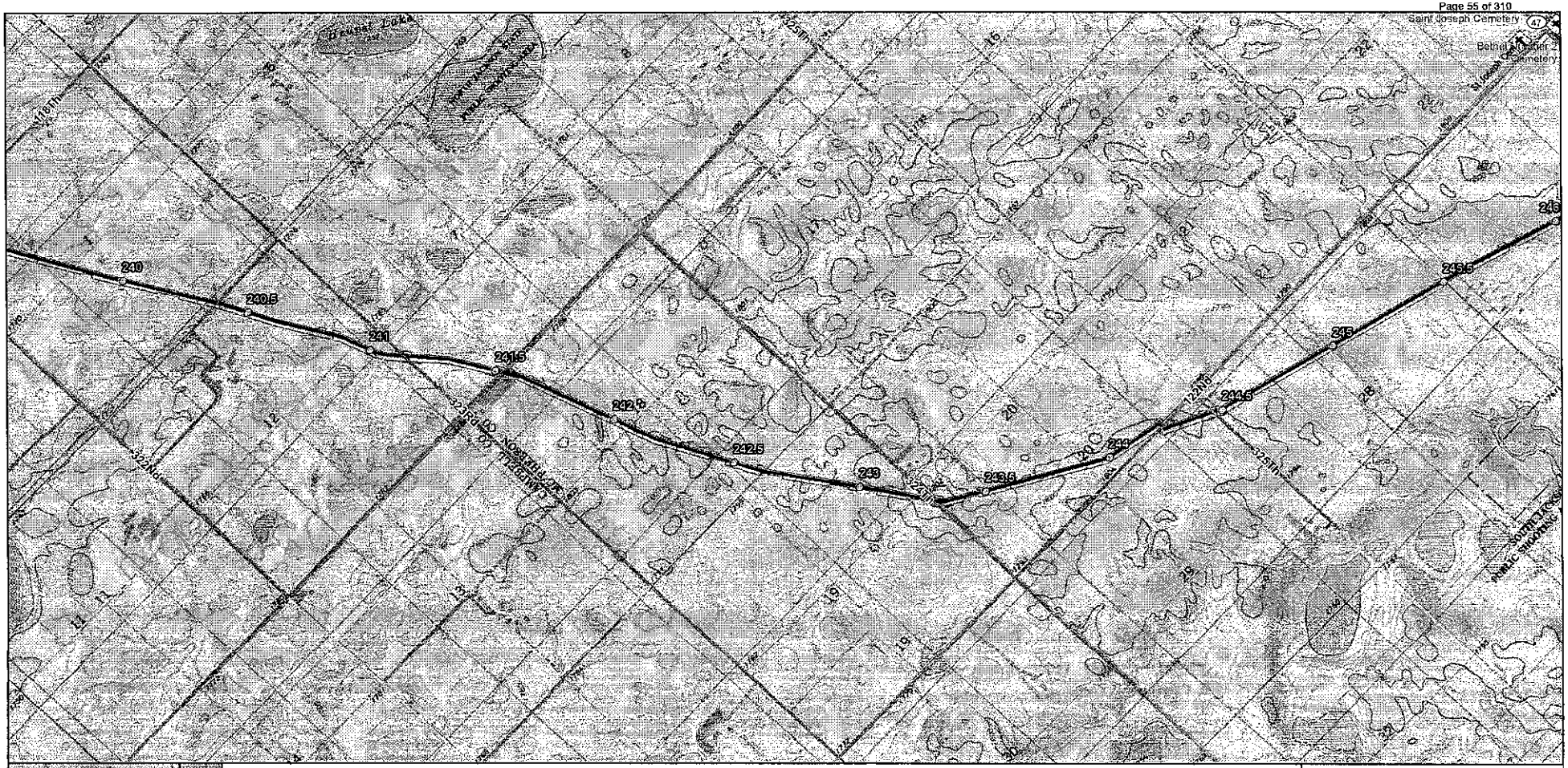

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Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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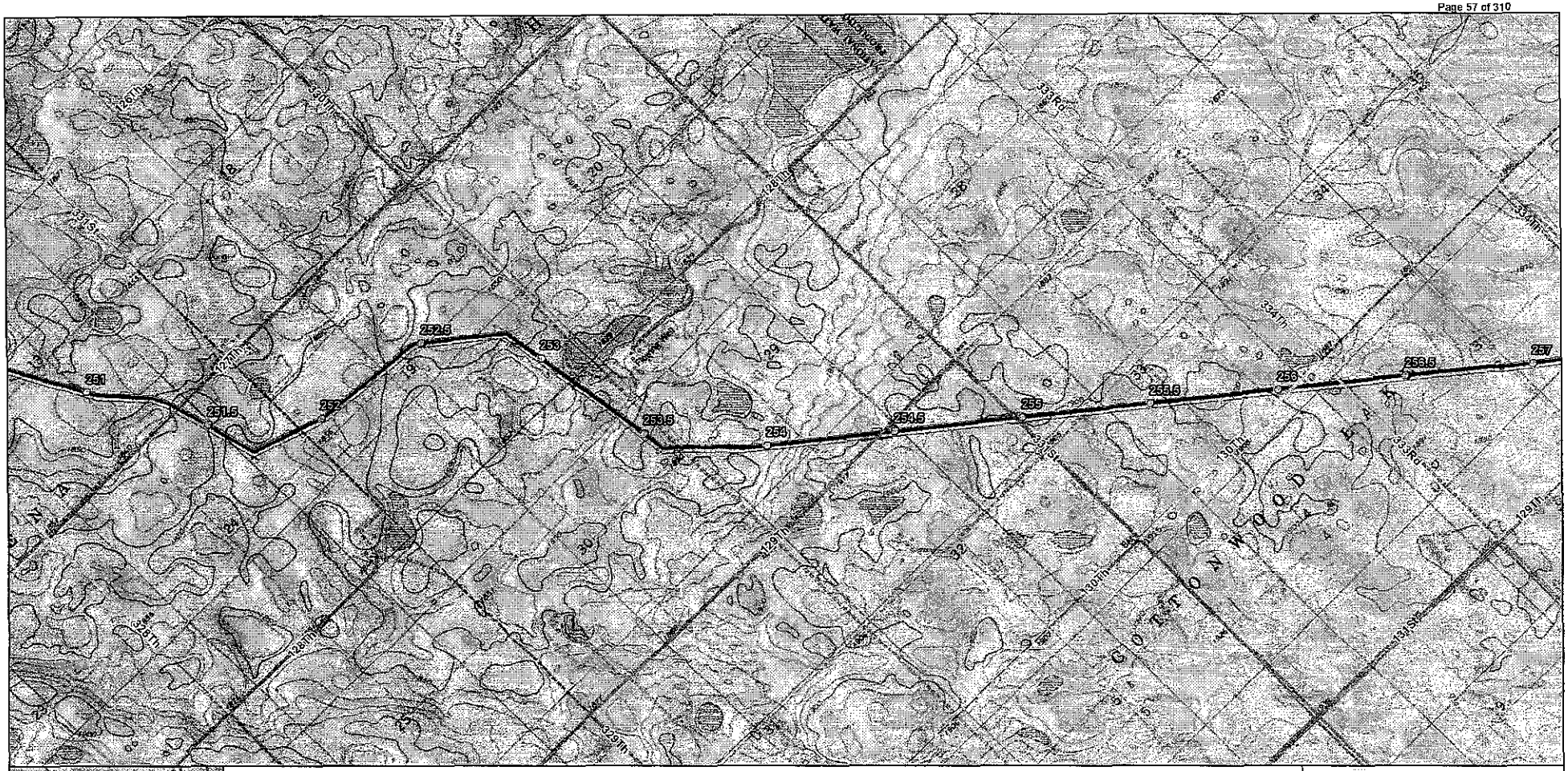

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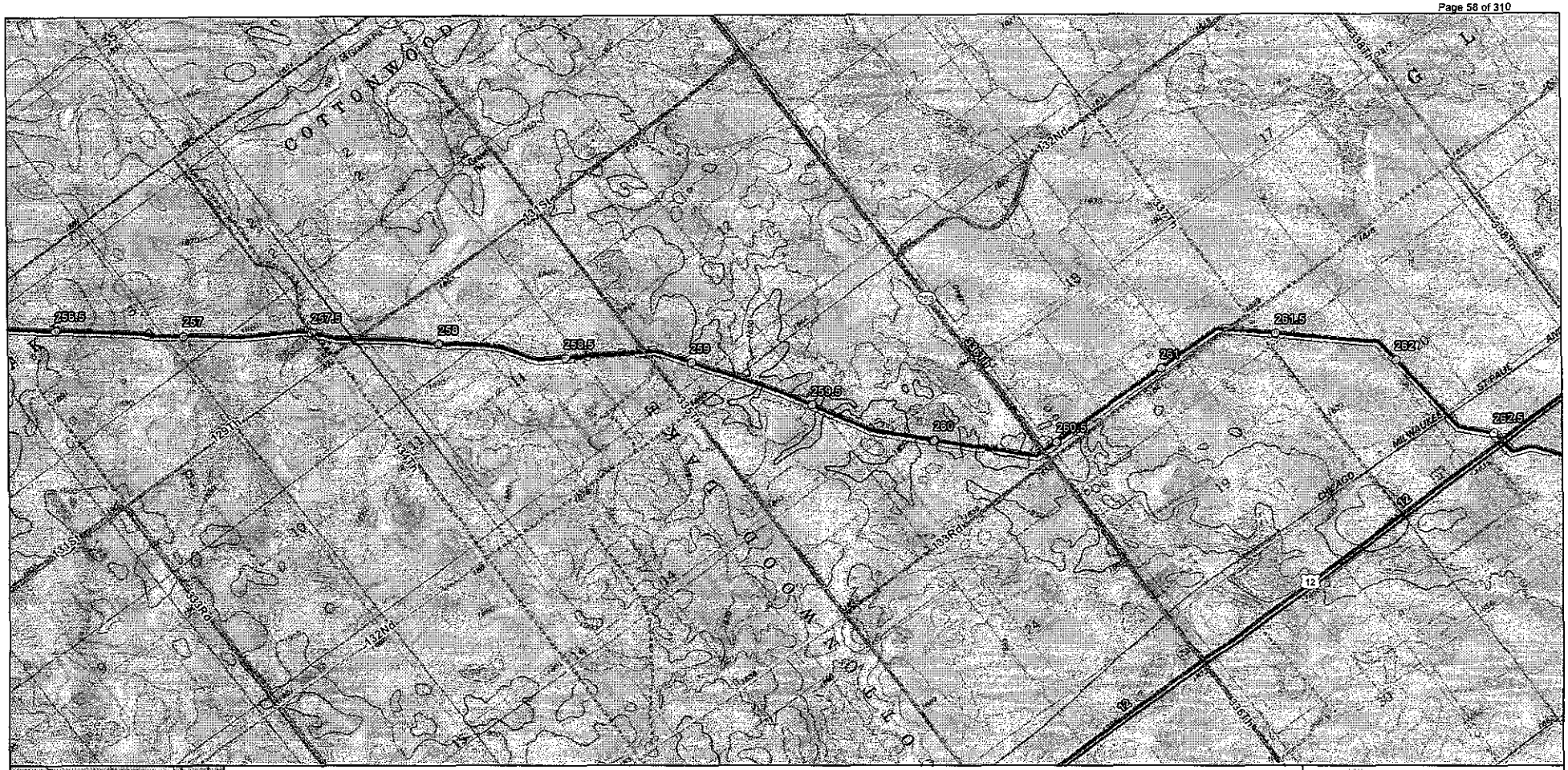
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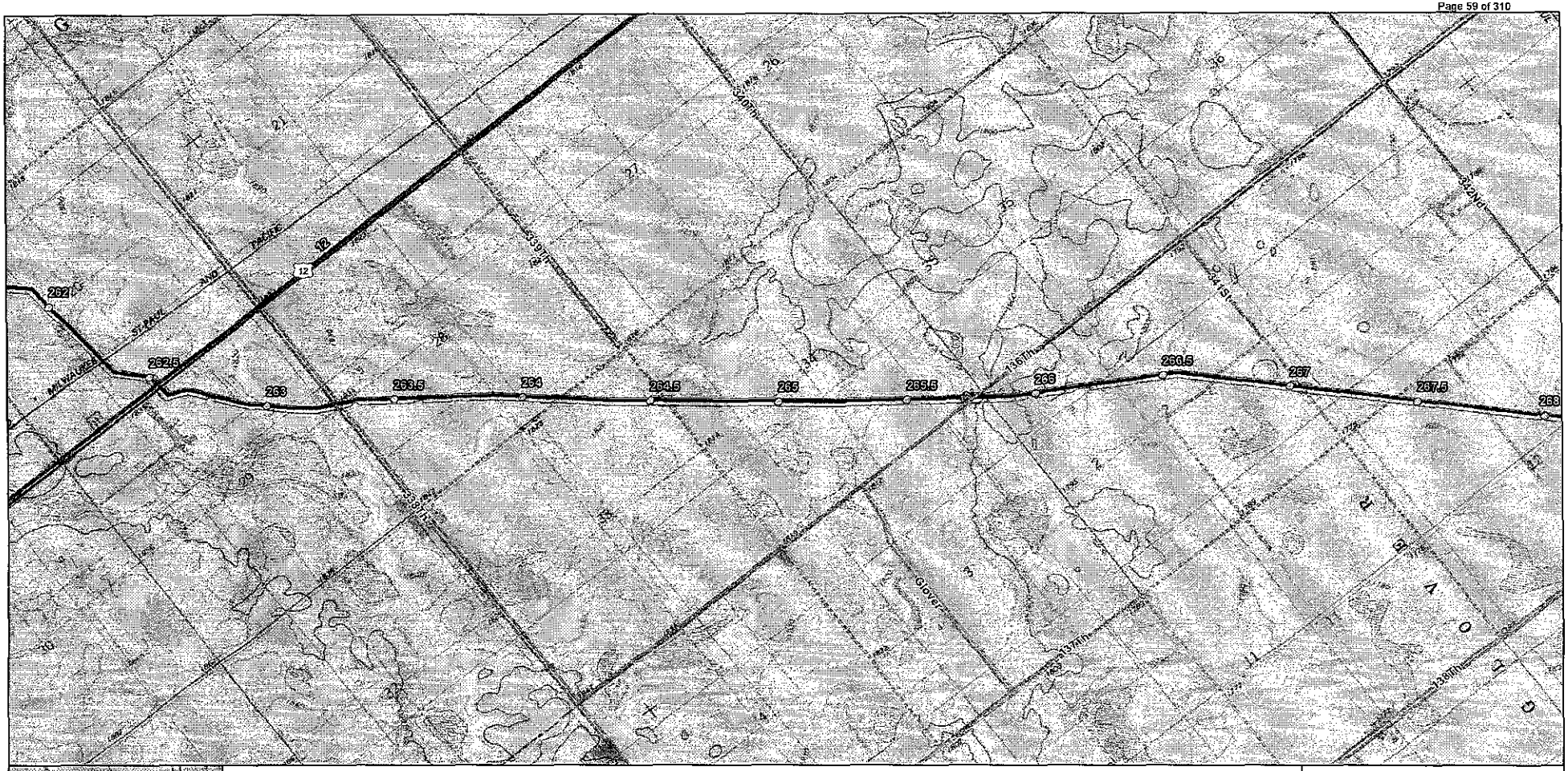

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 10 of 49	Scale: 1:24,000
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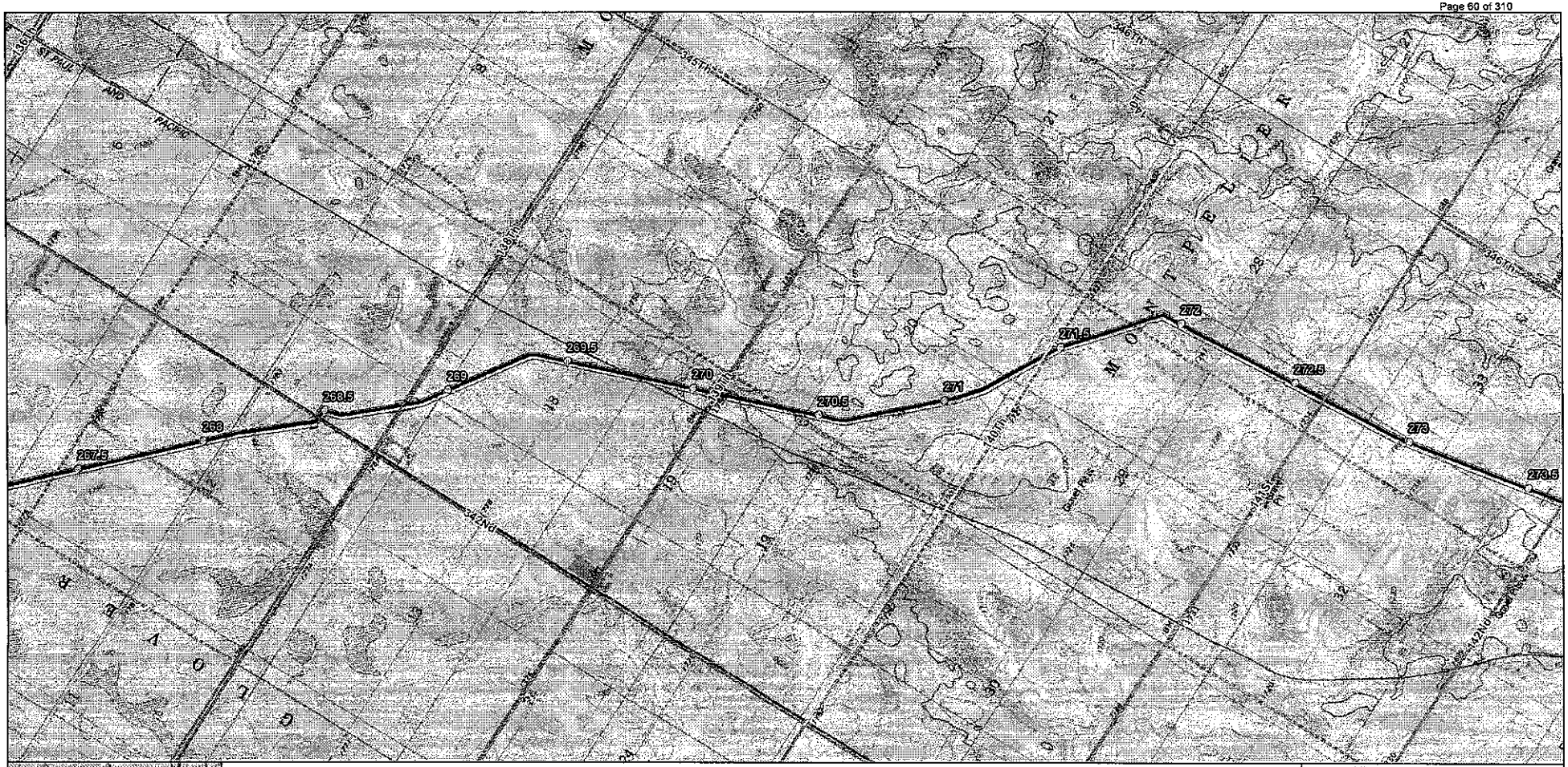

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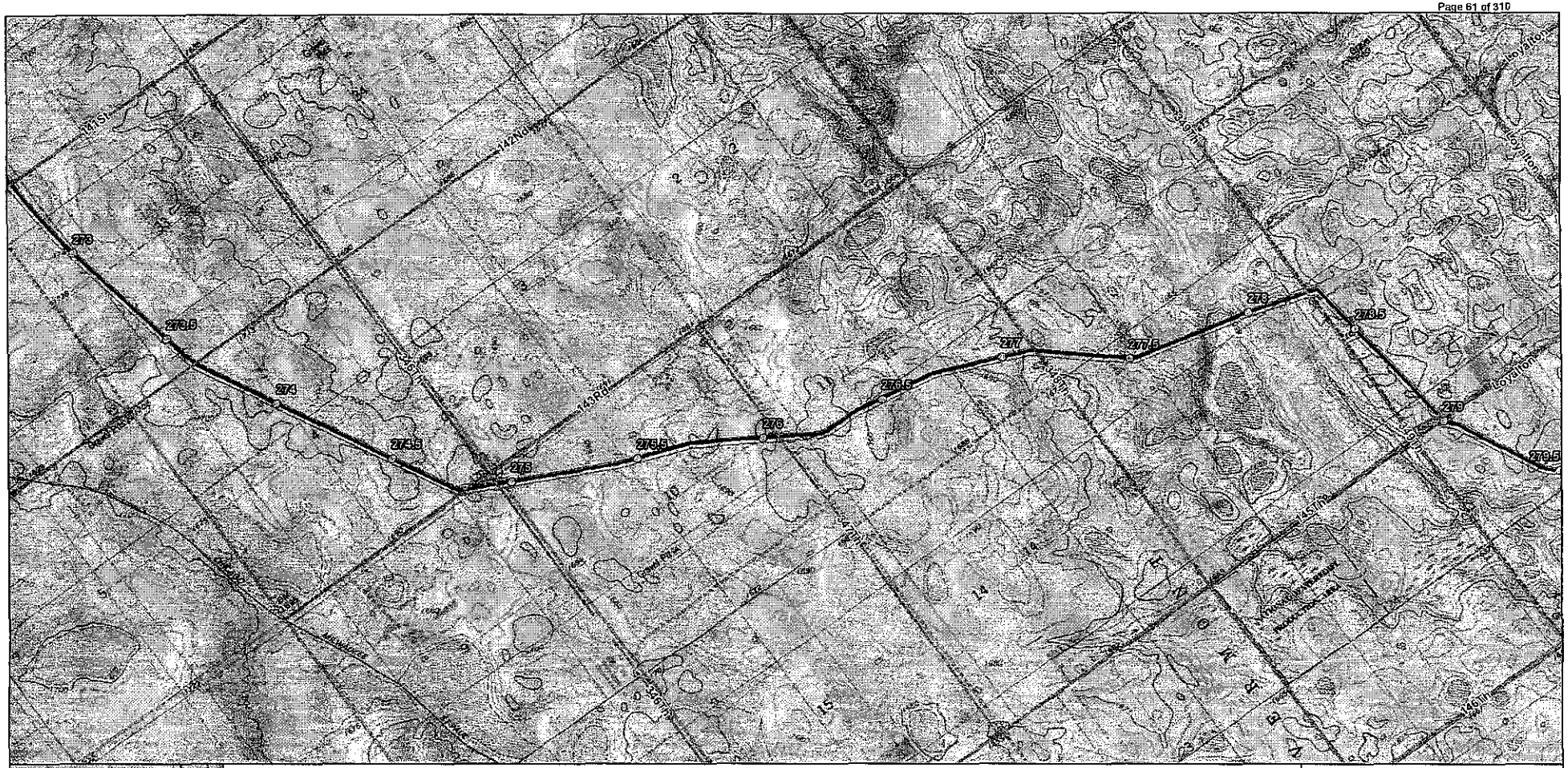

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Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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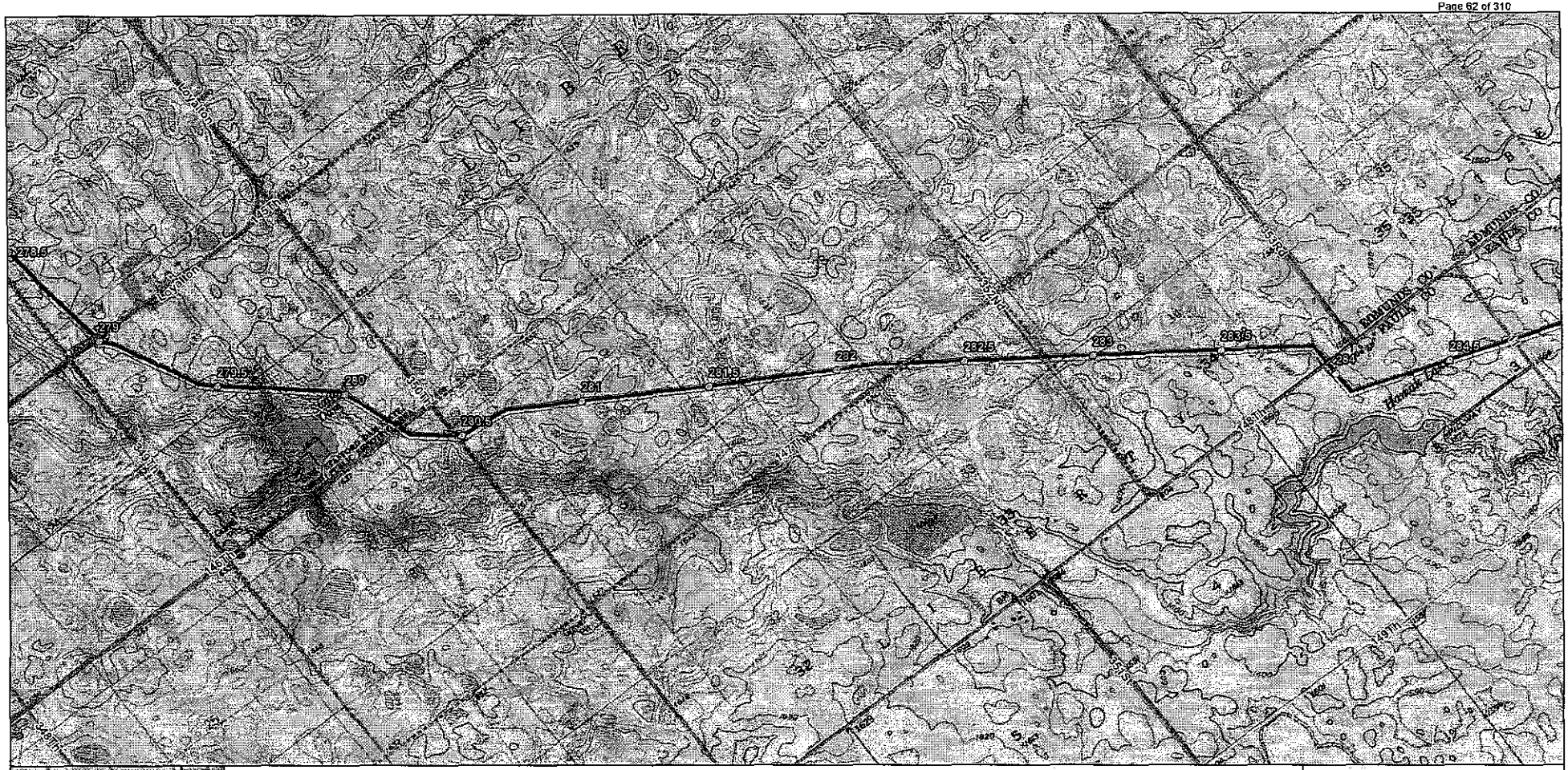

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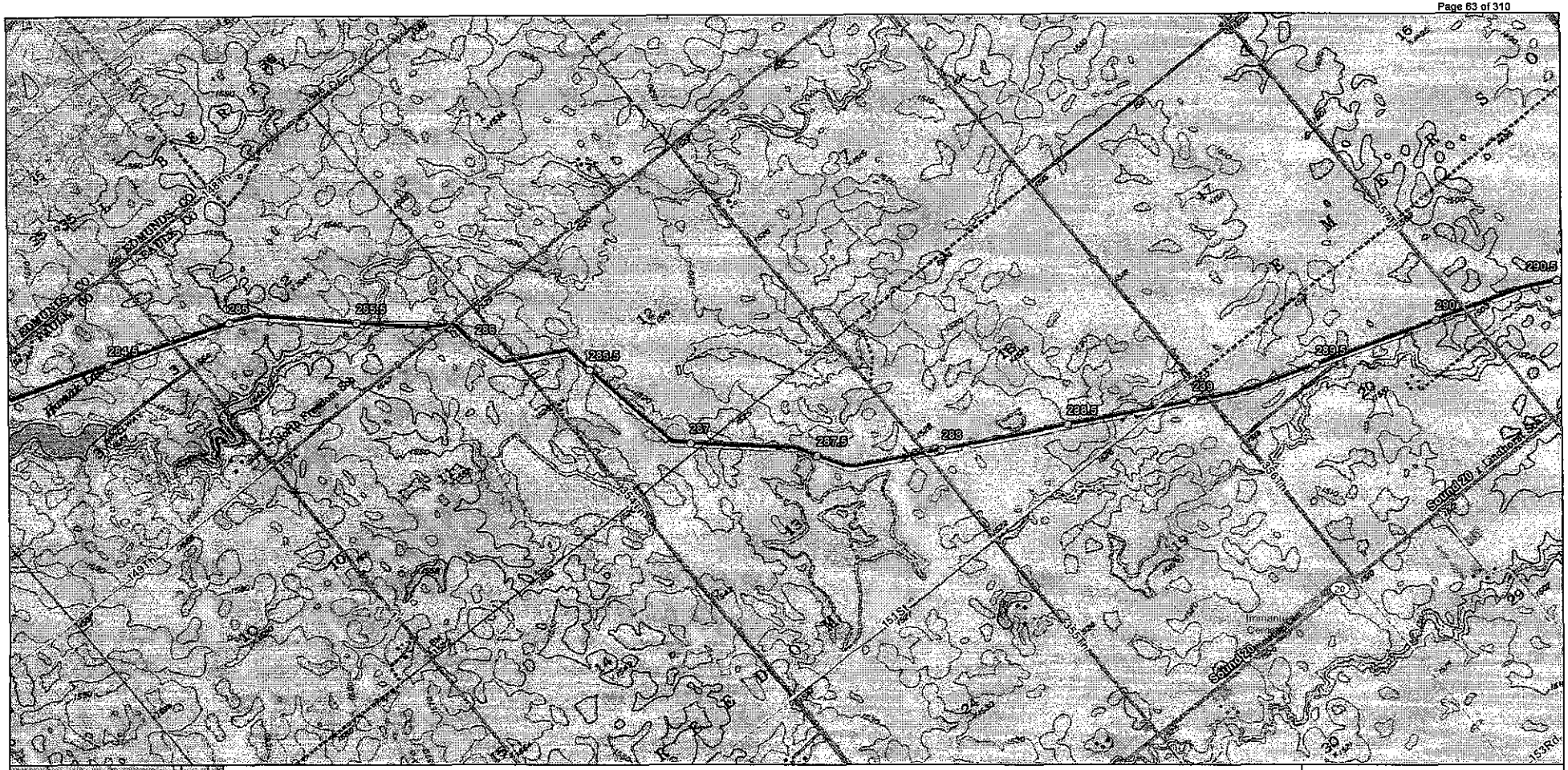

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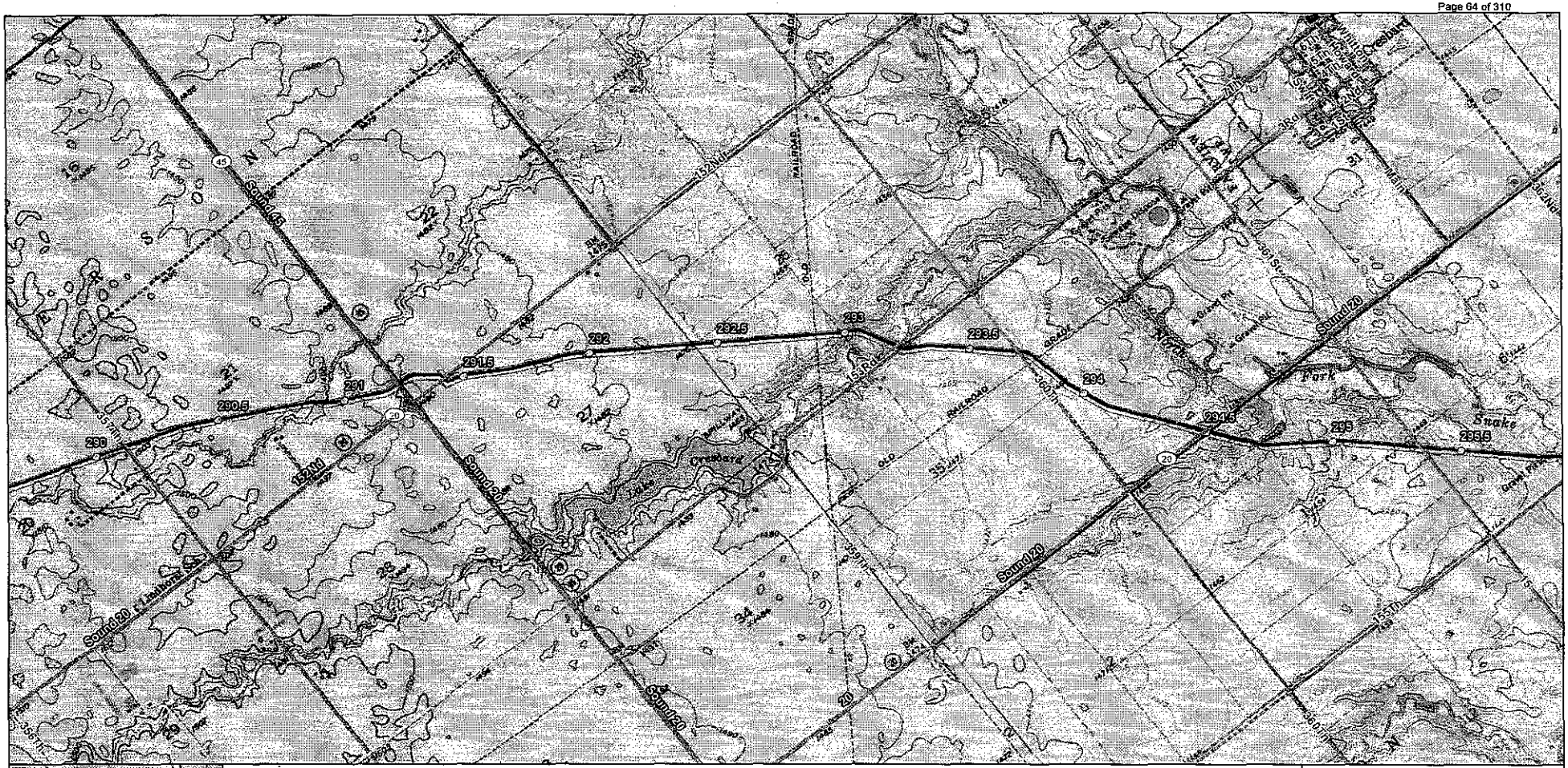
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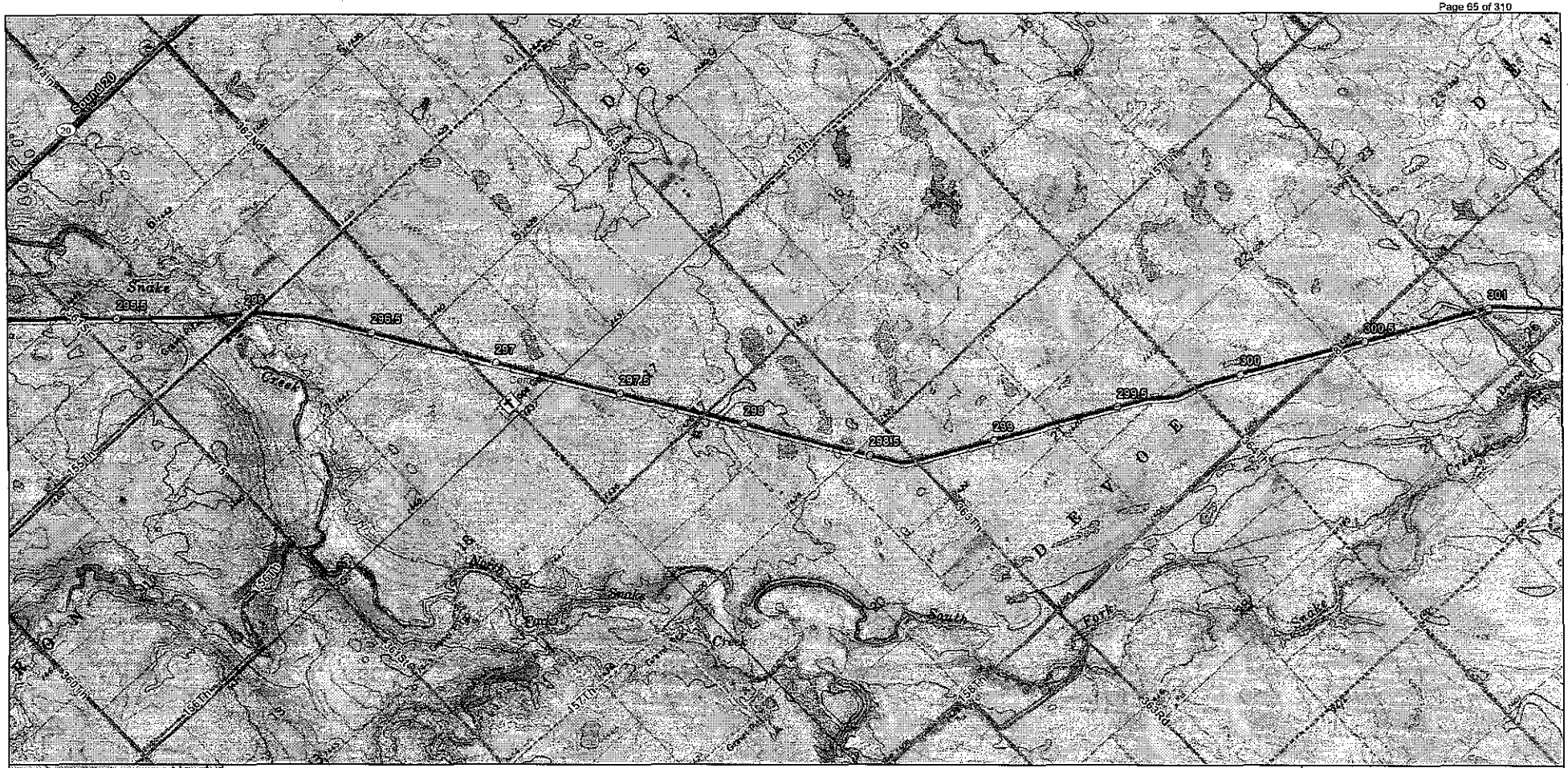

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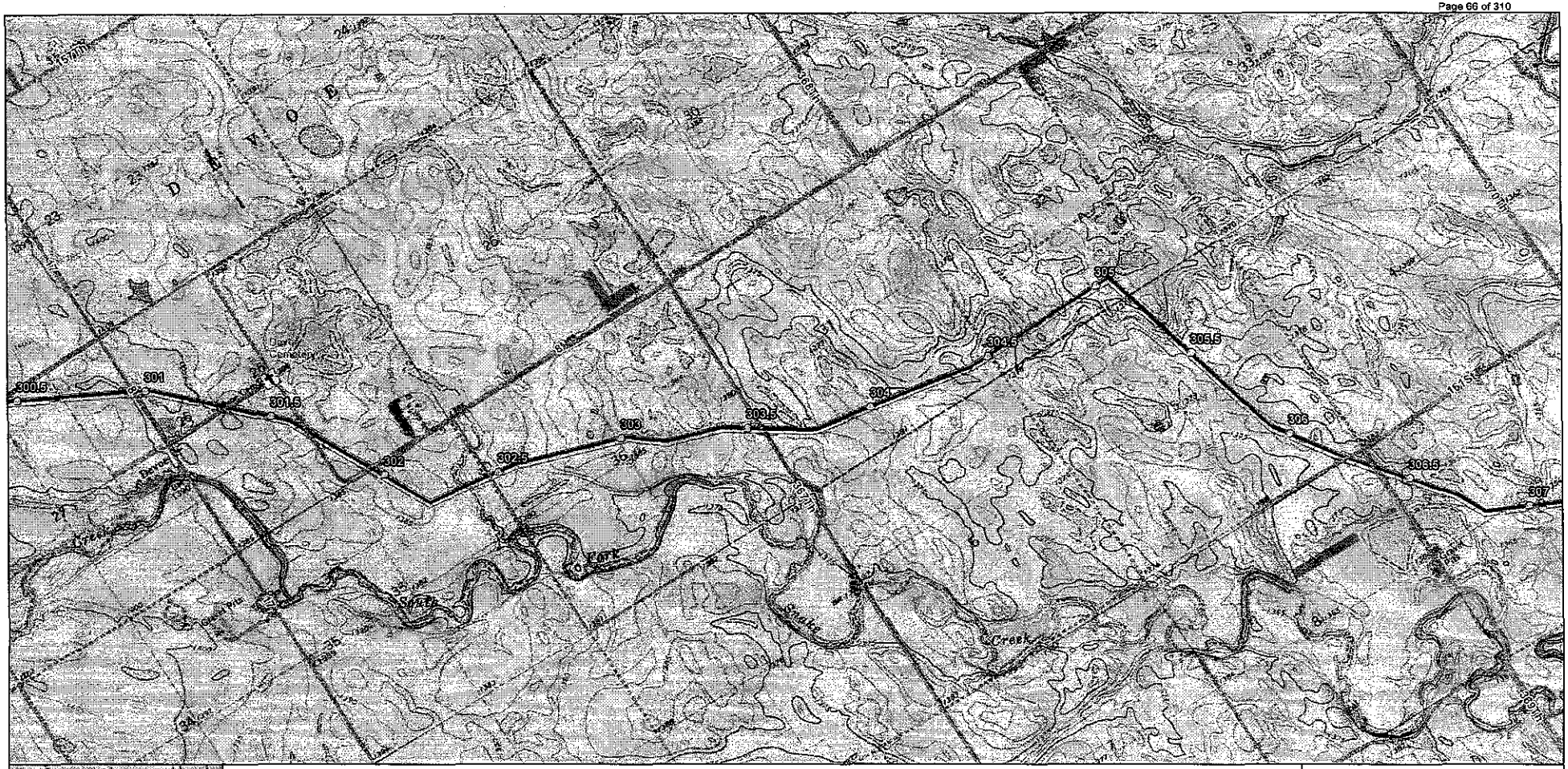
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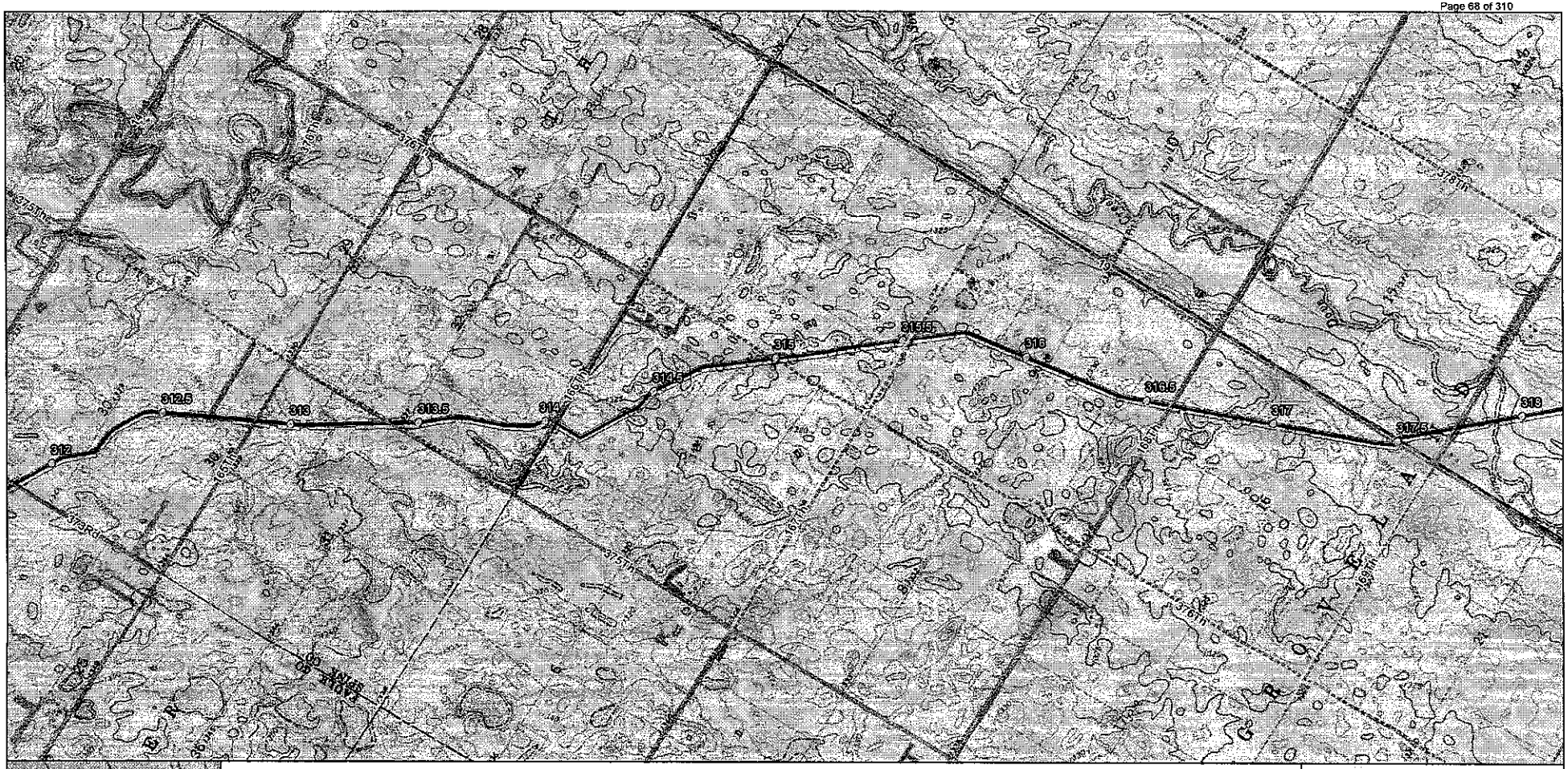

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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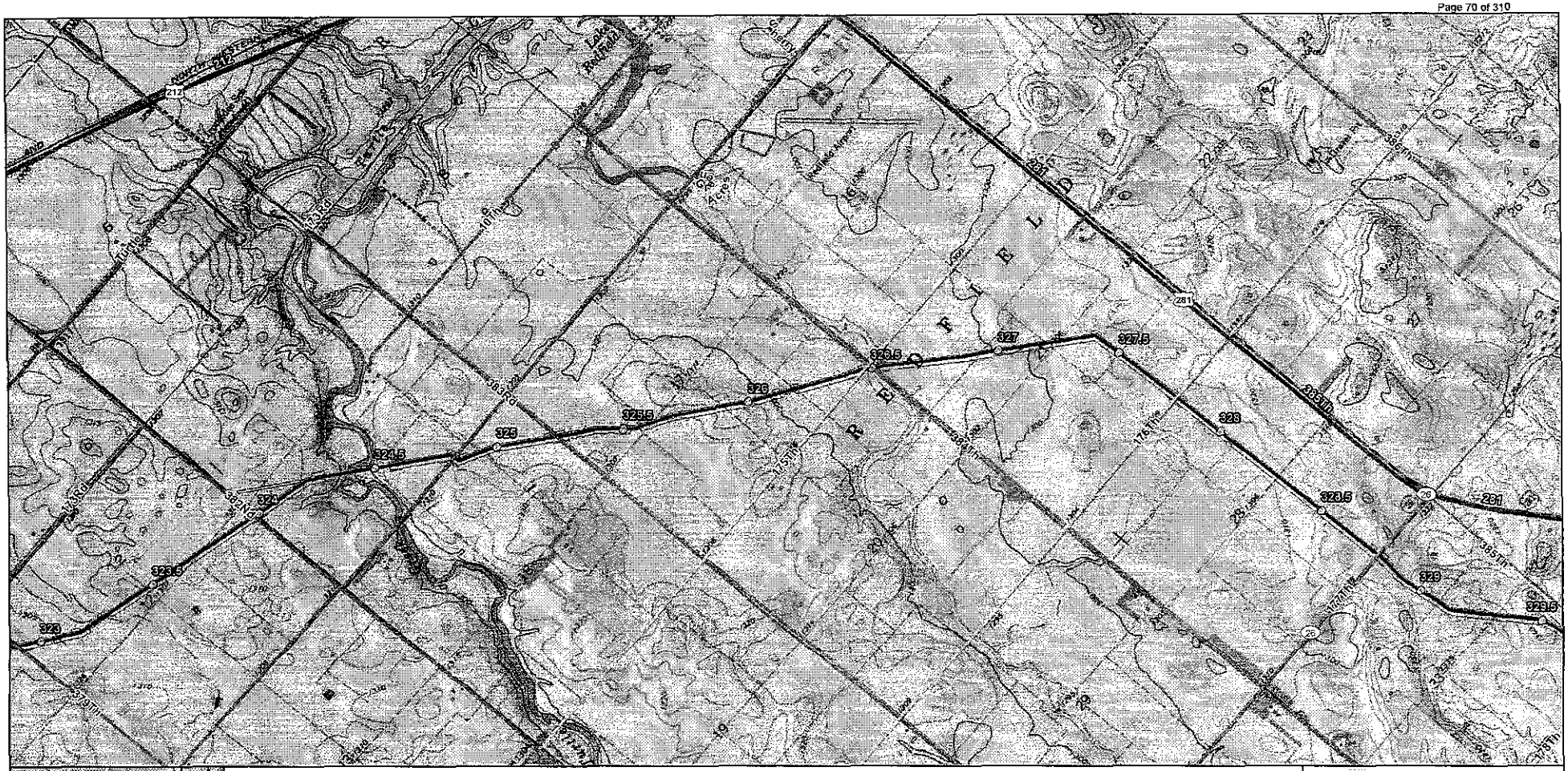

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Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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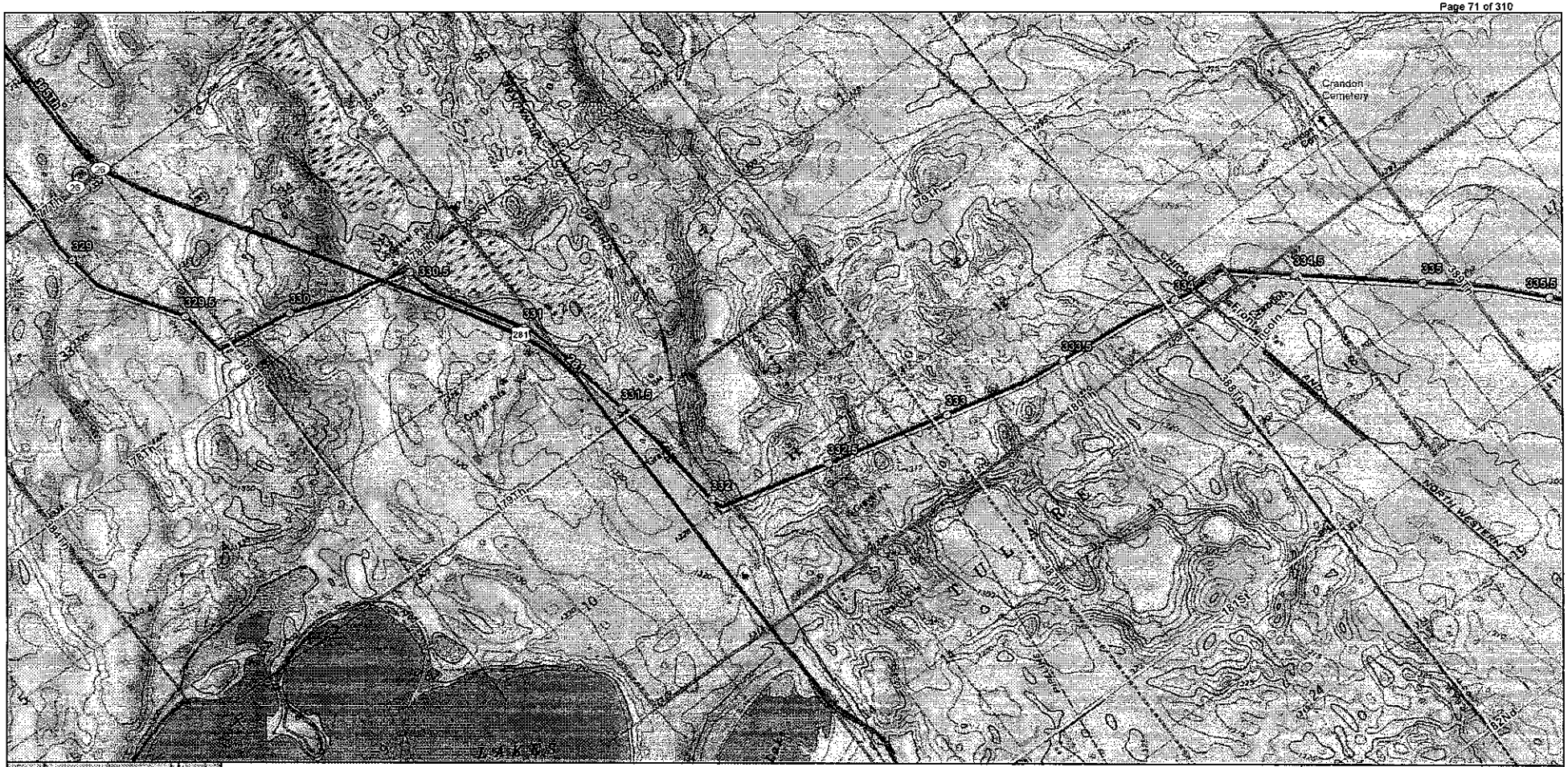

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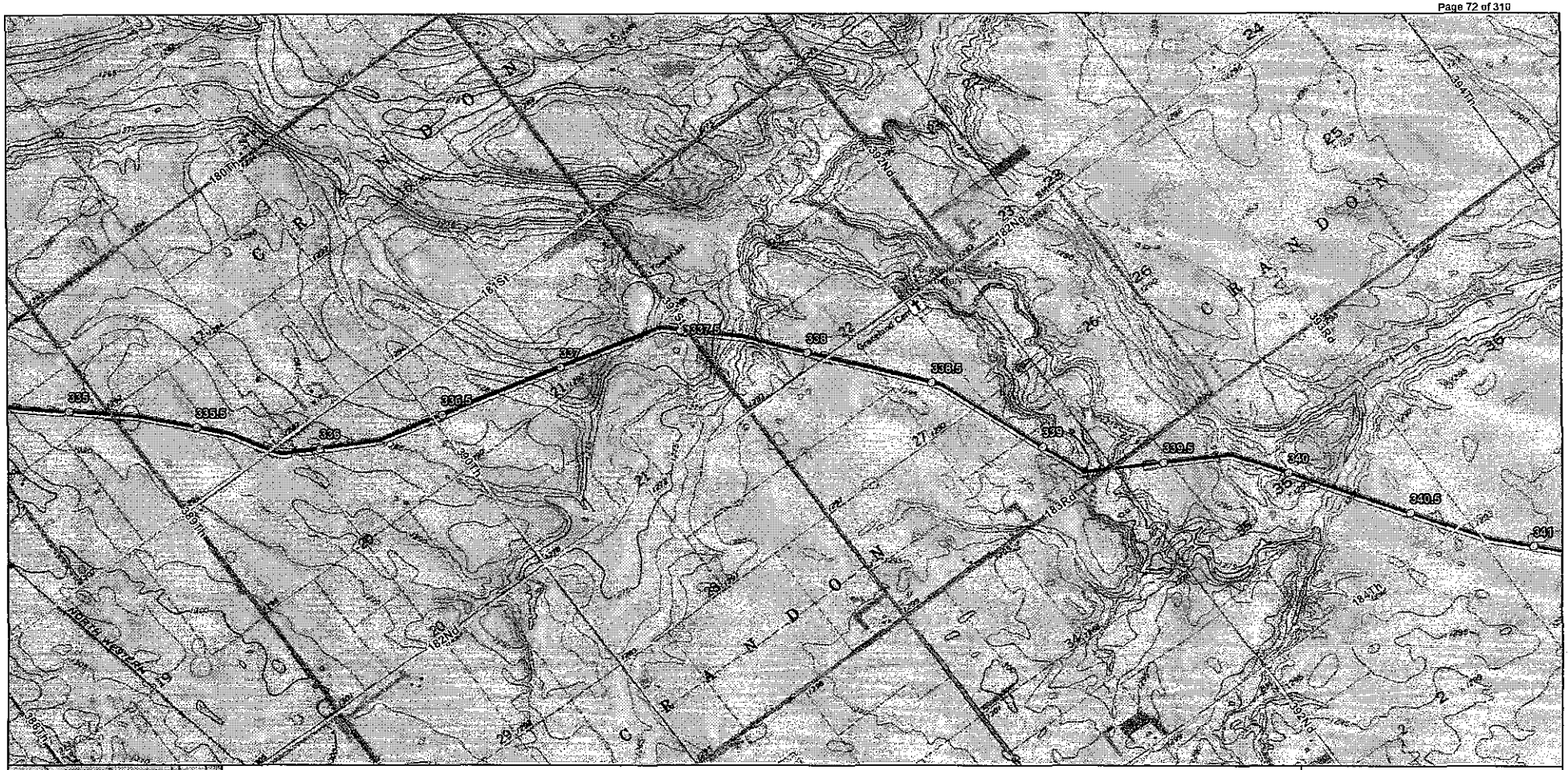

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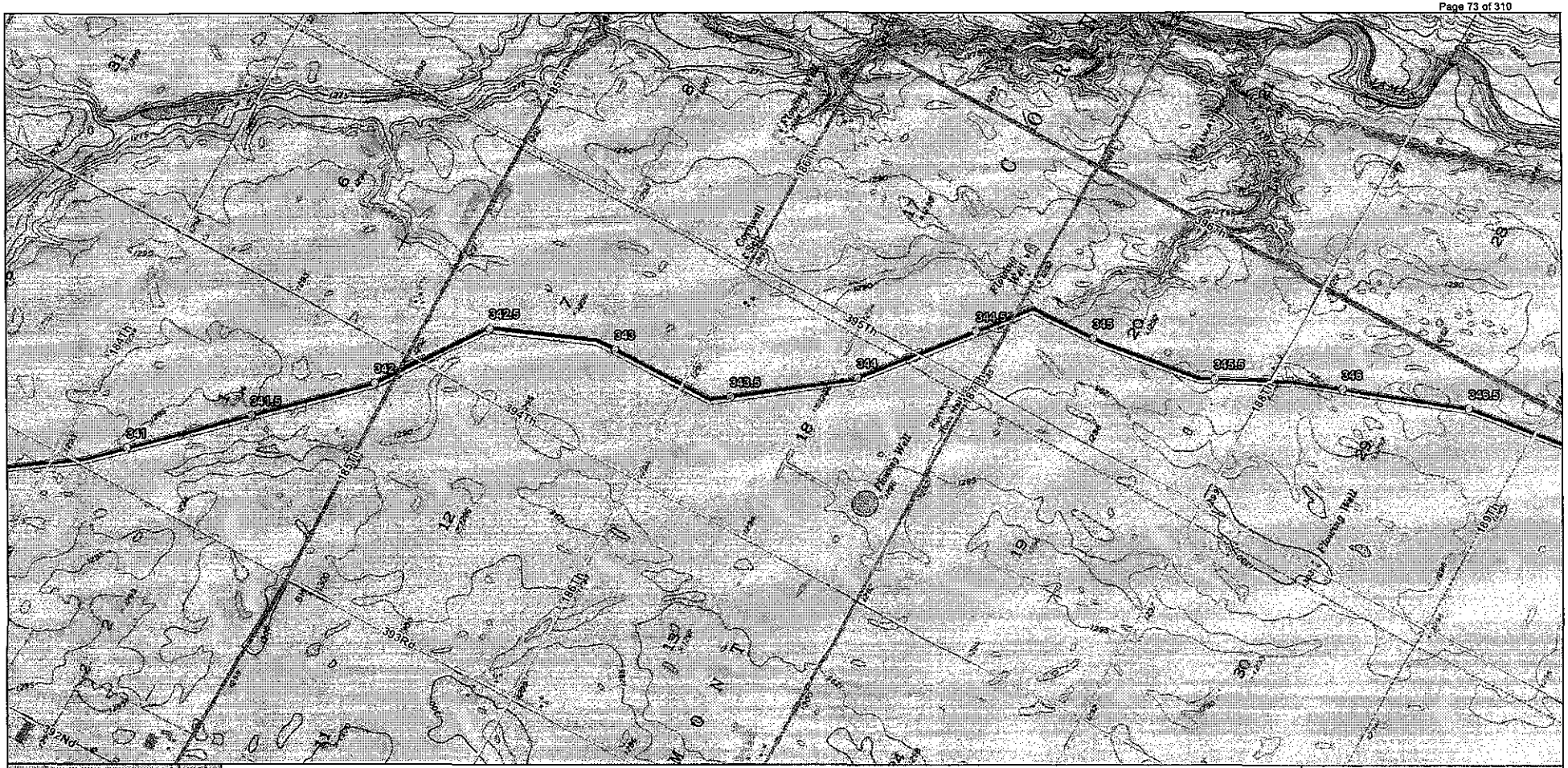

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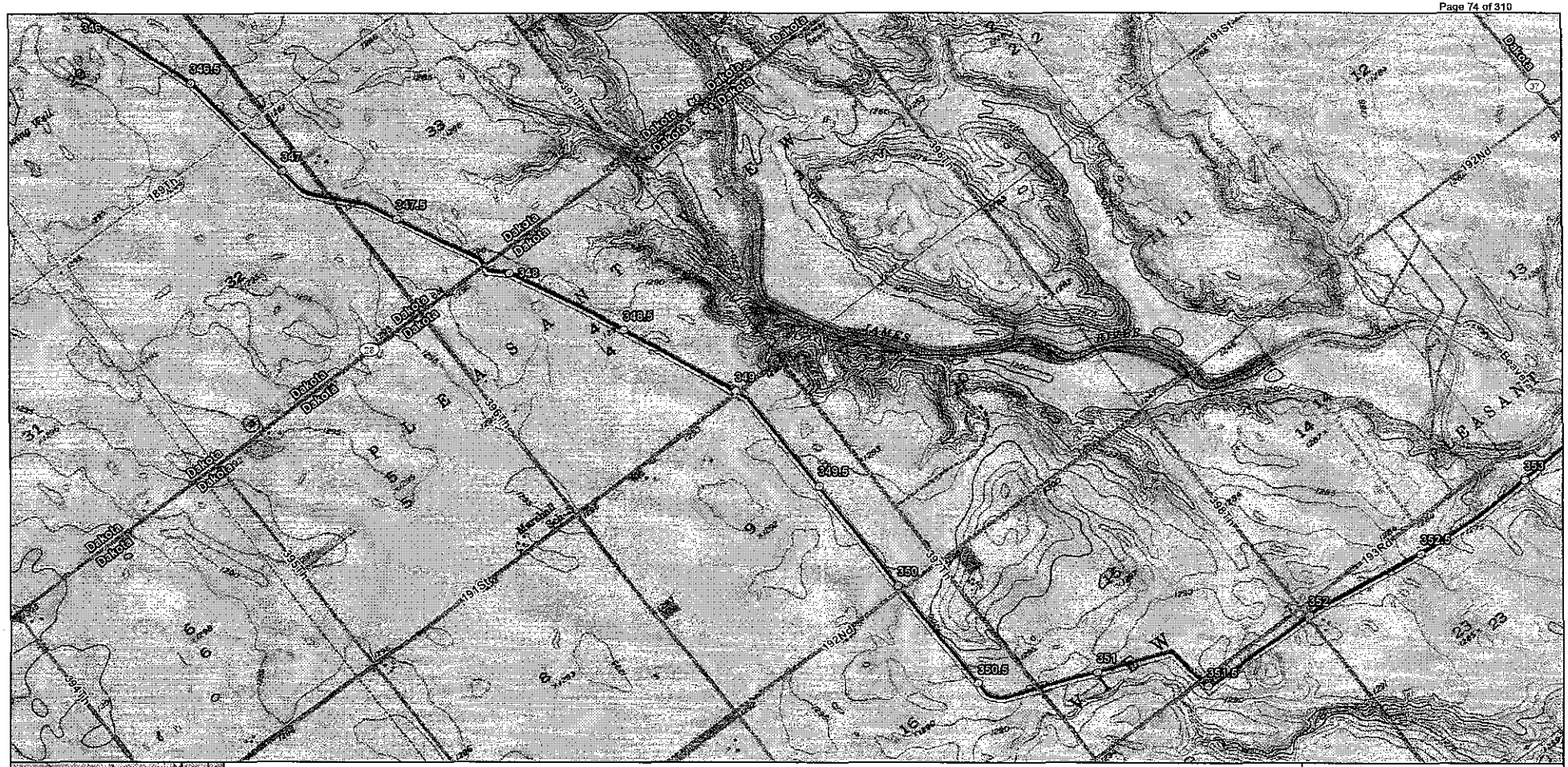

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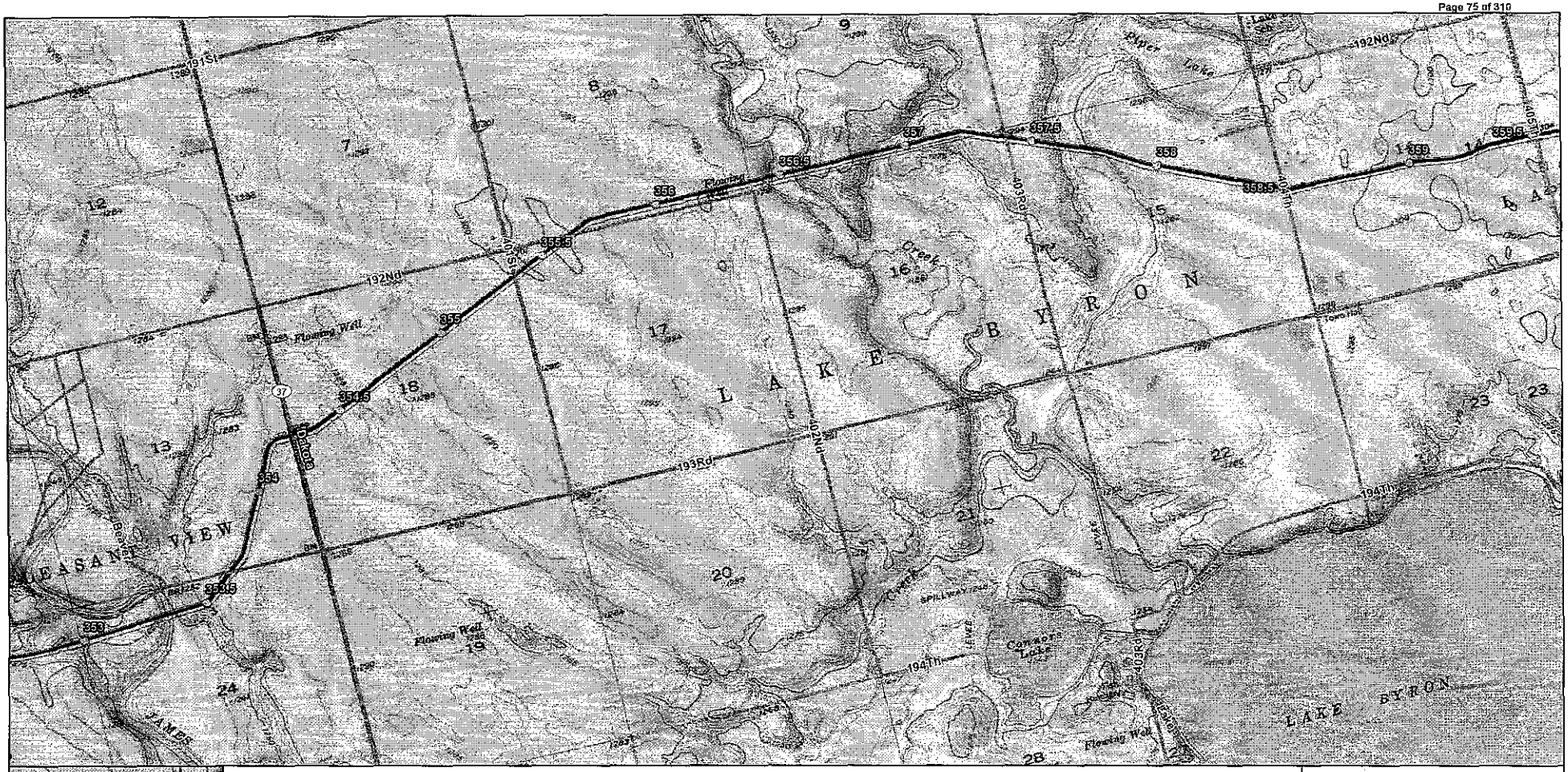

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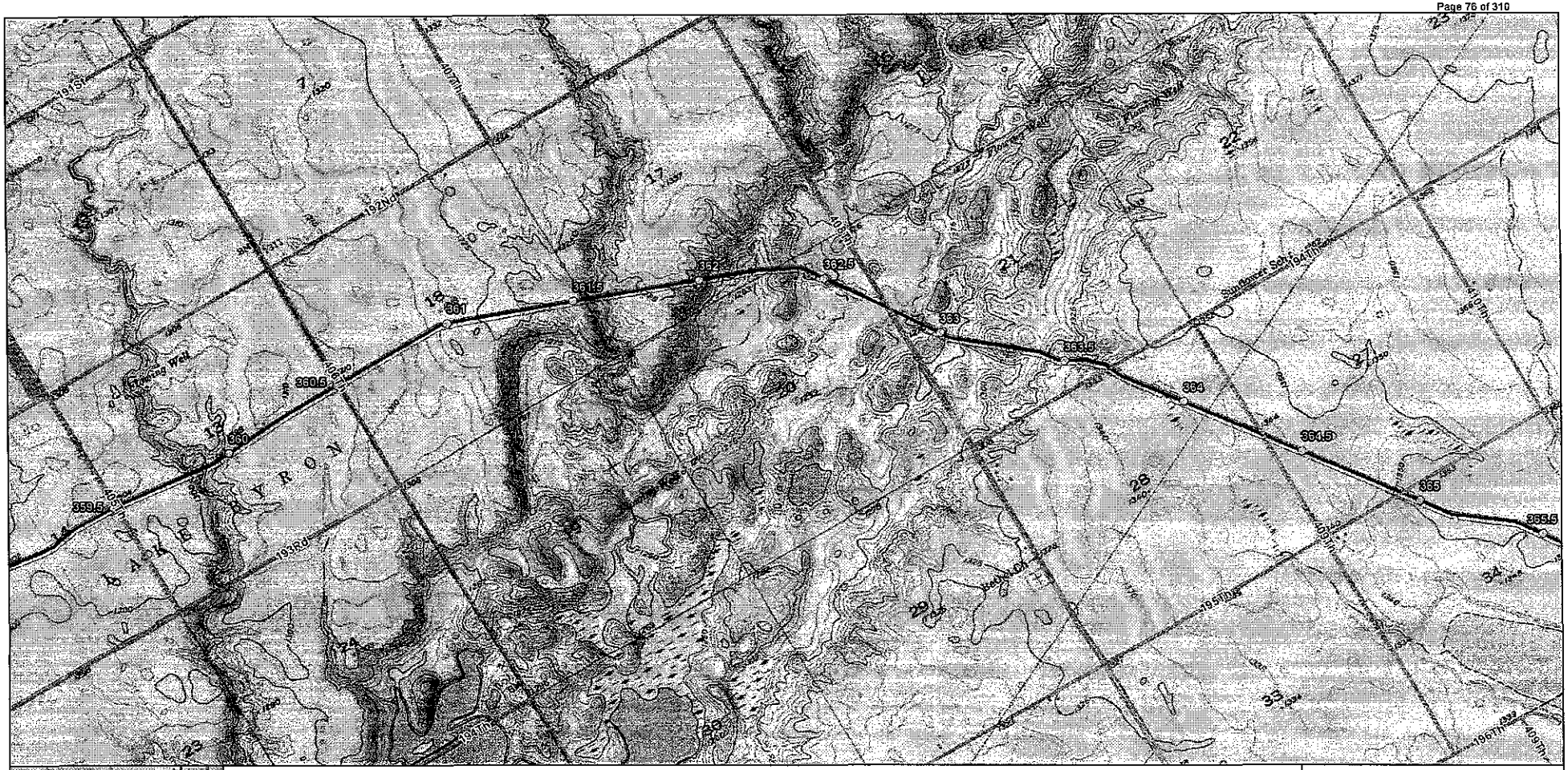

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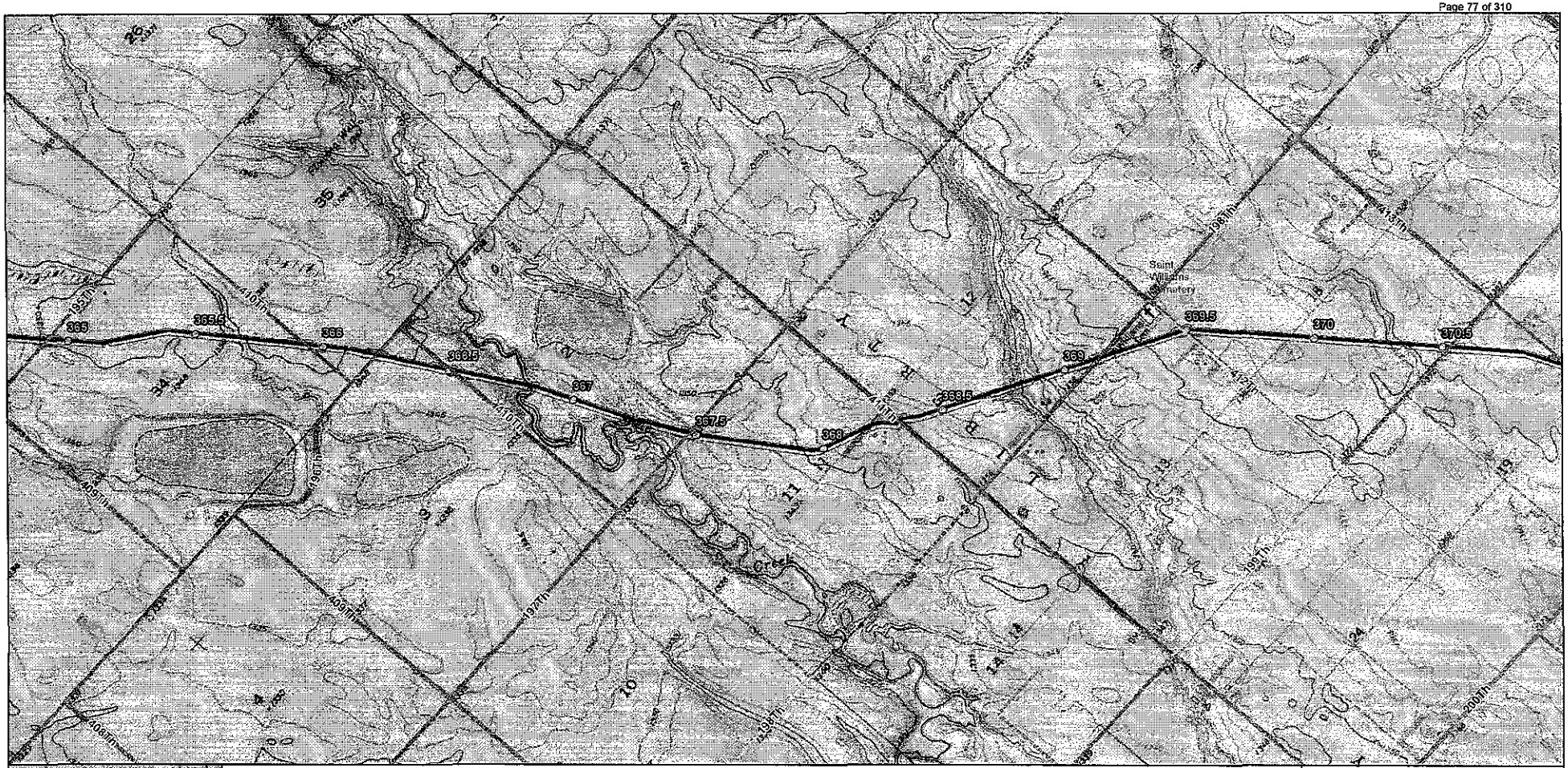

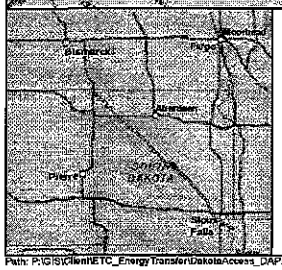

Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

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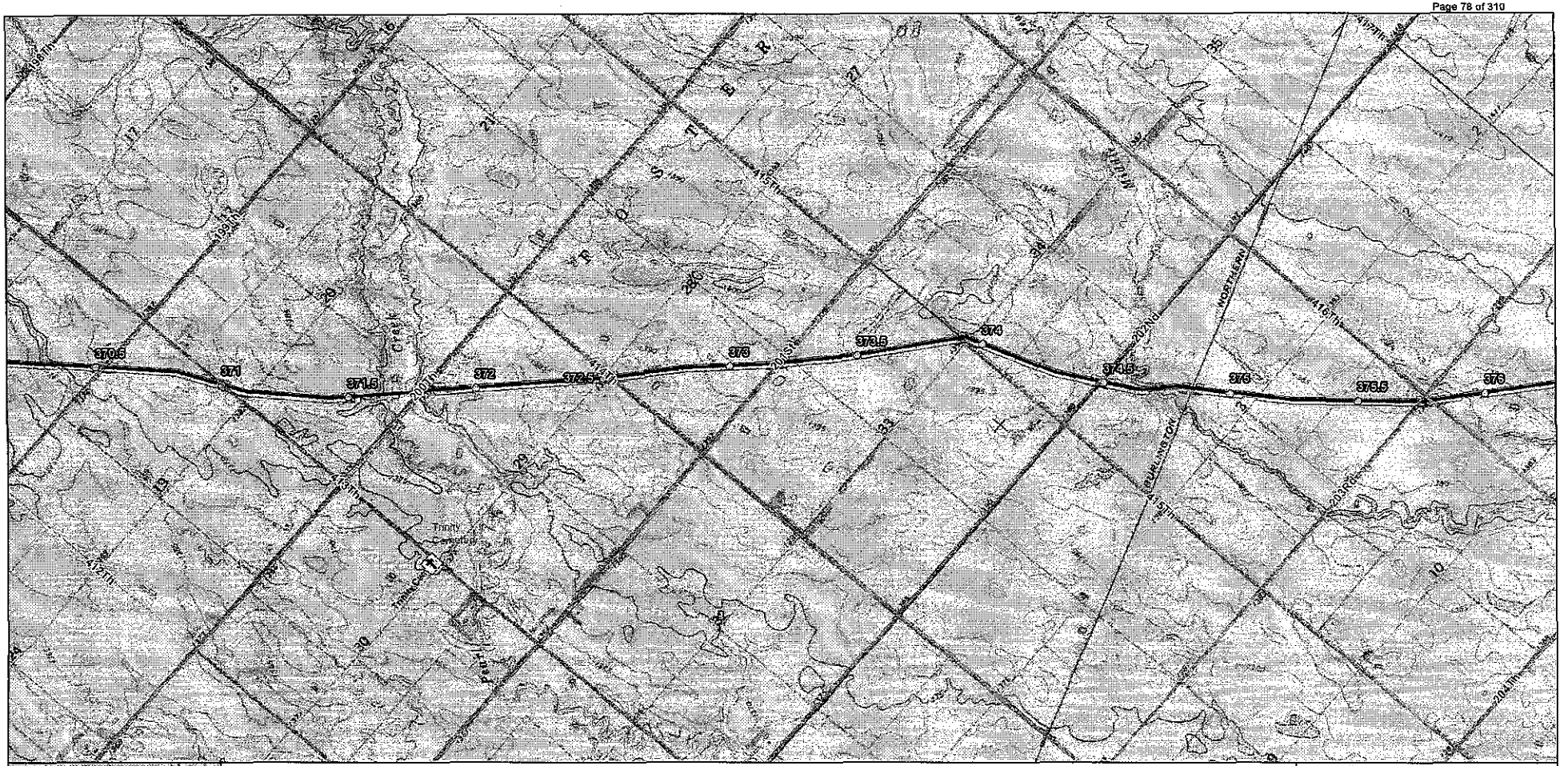

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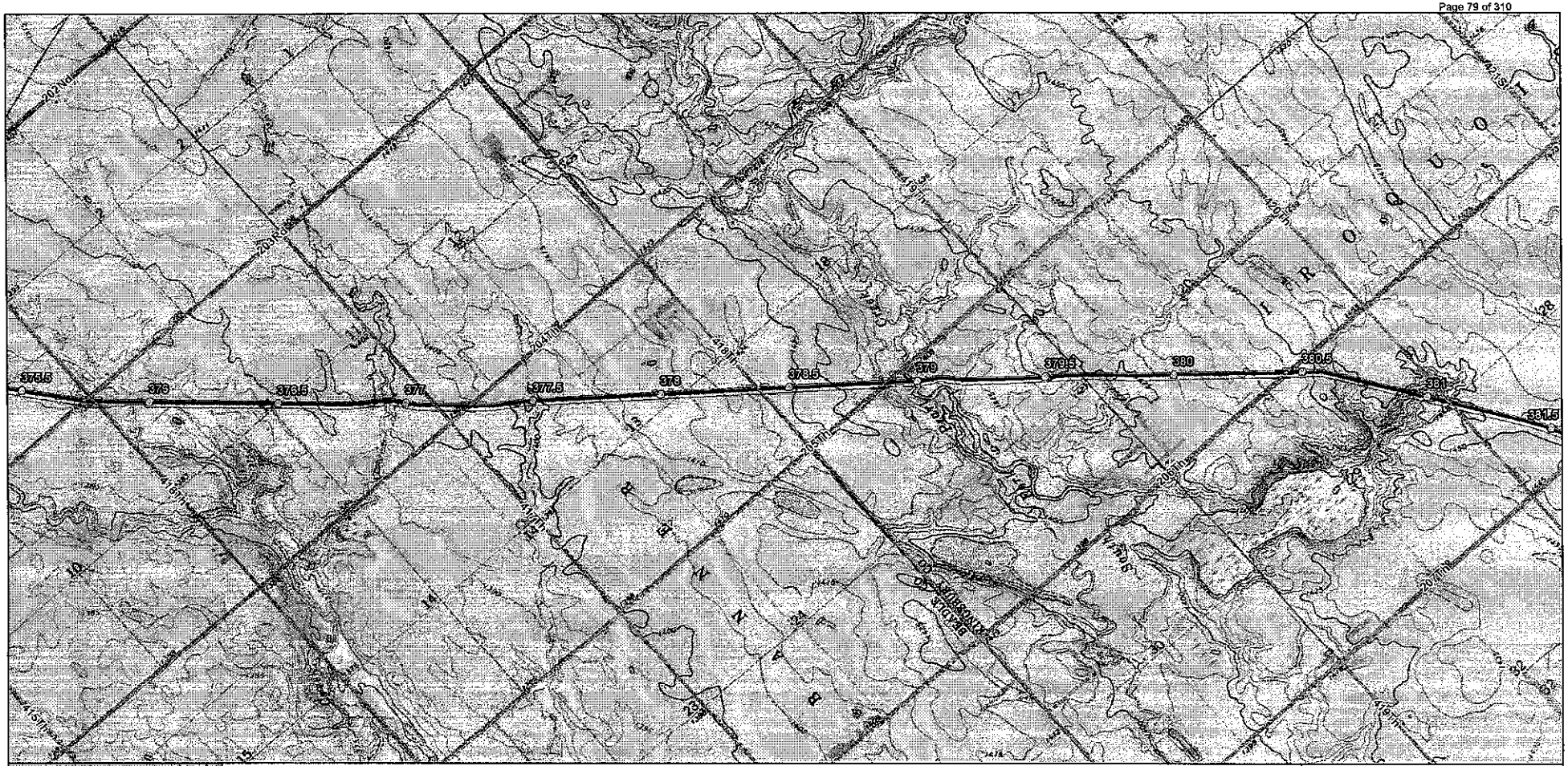
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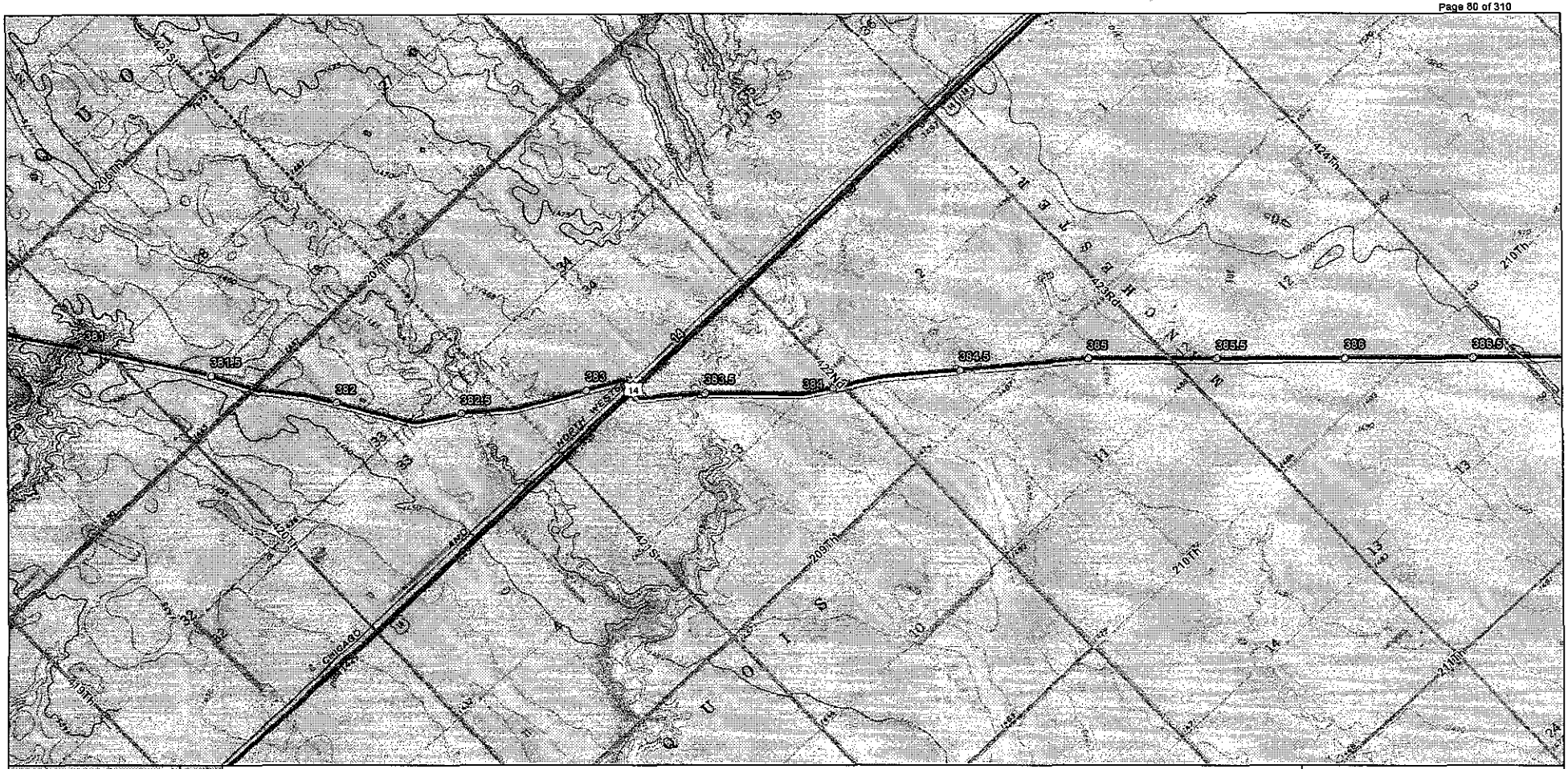

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

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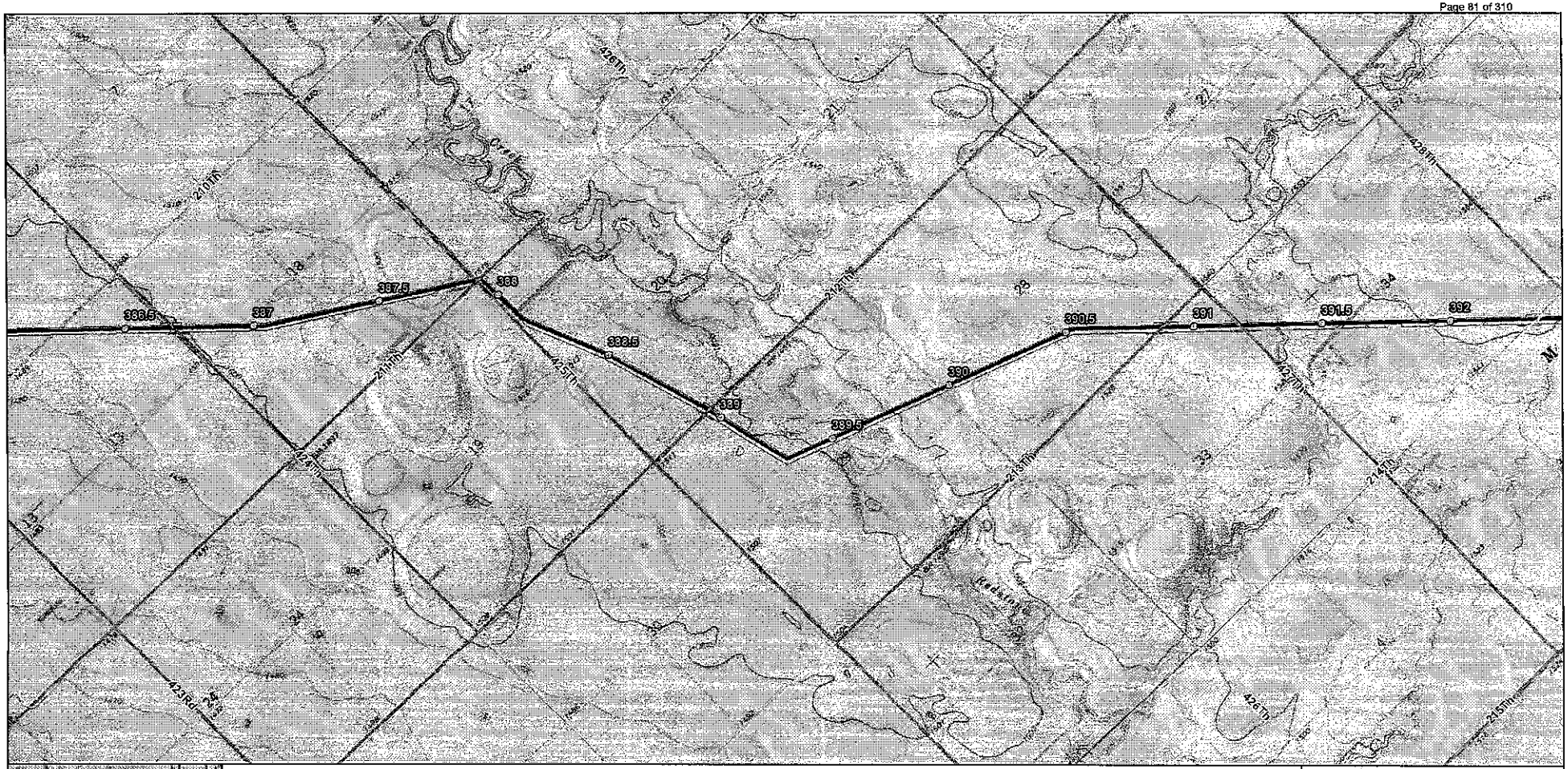

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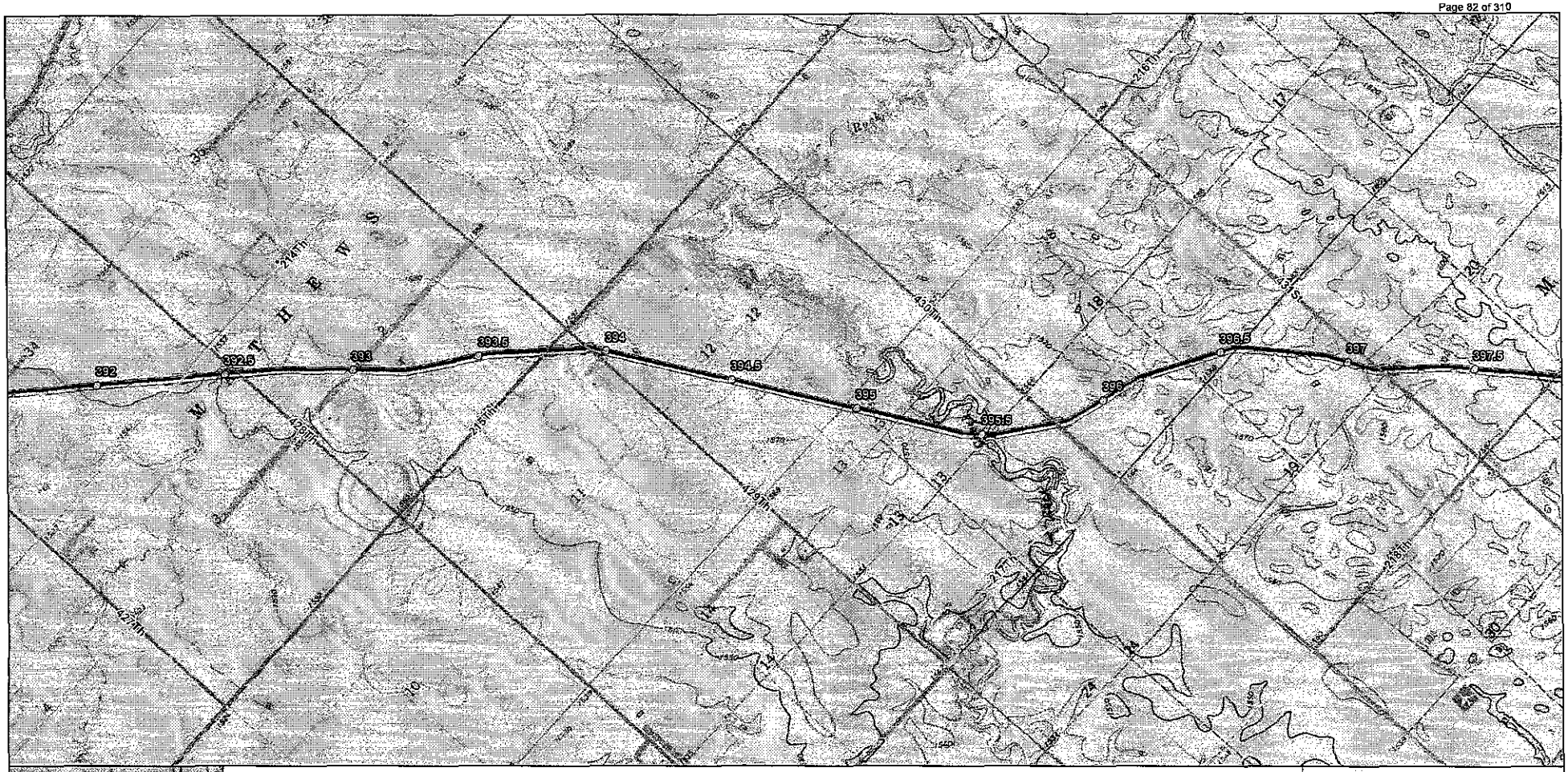

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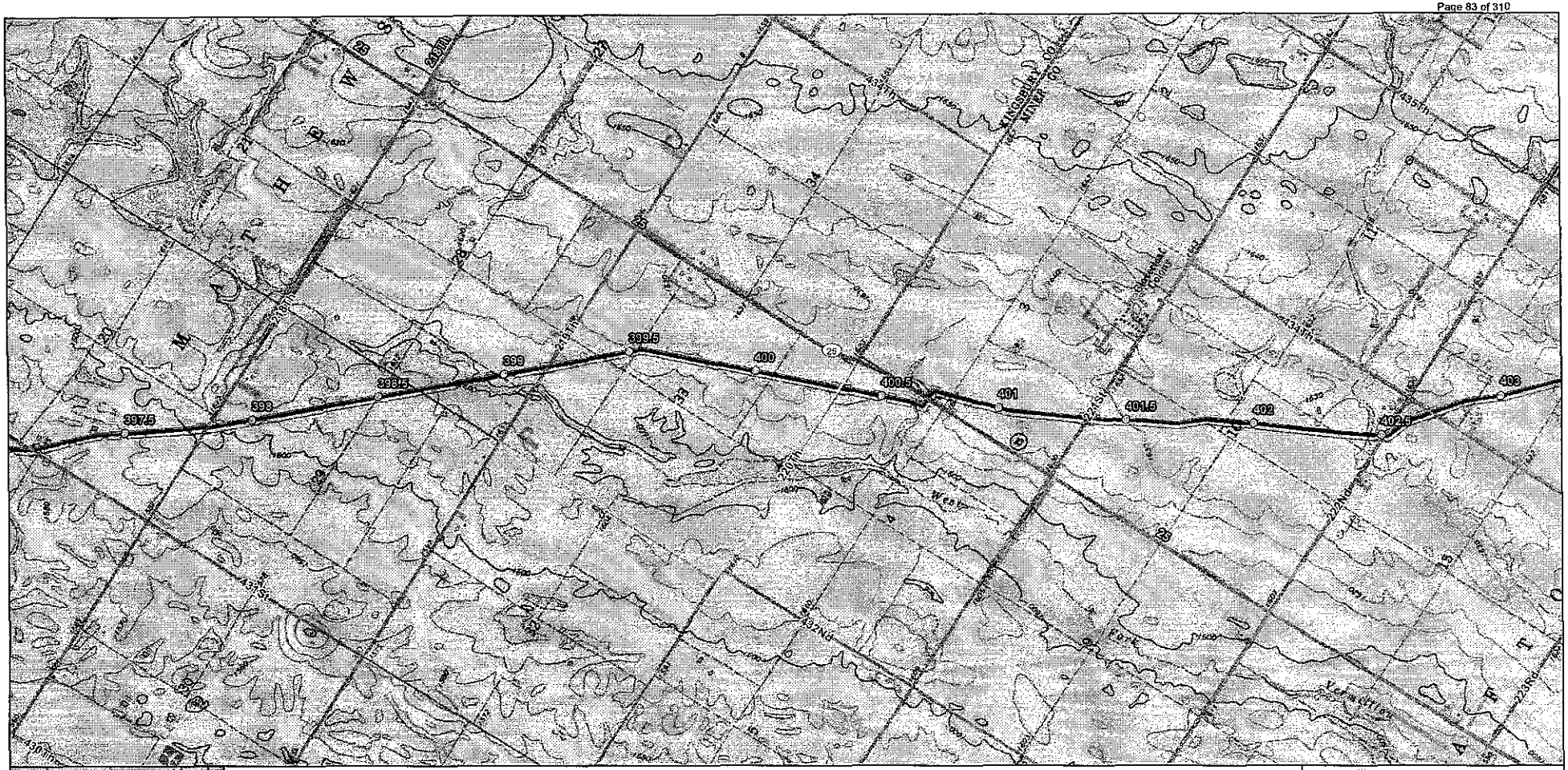

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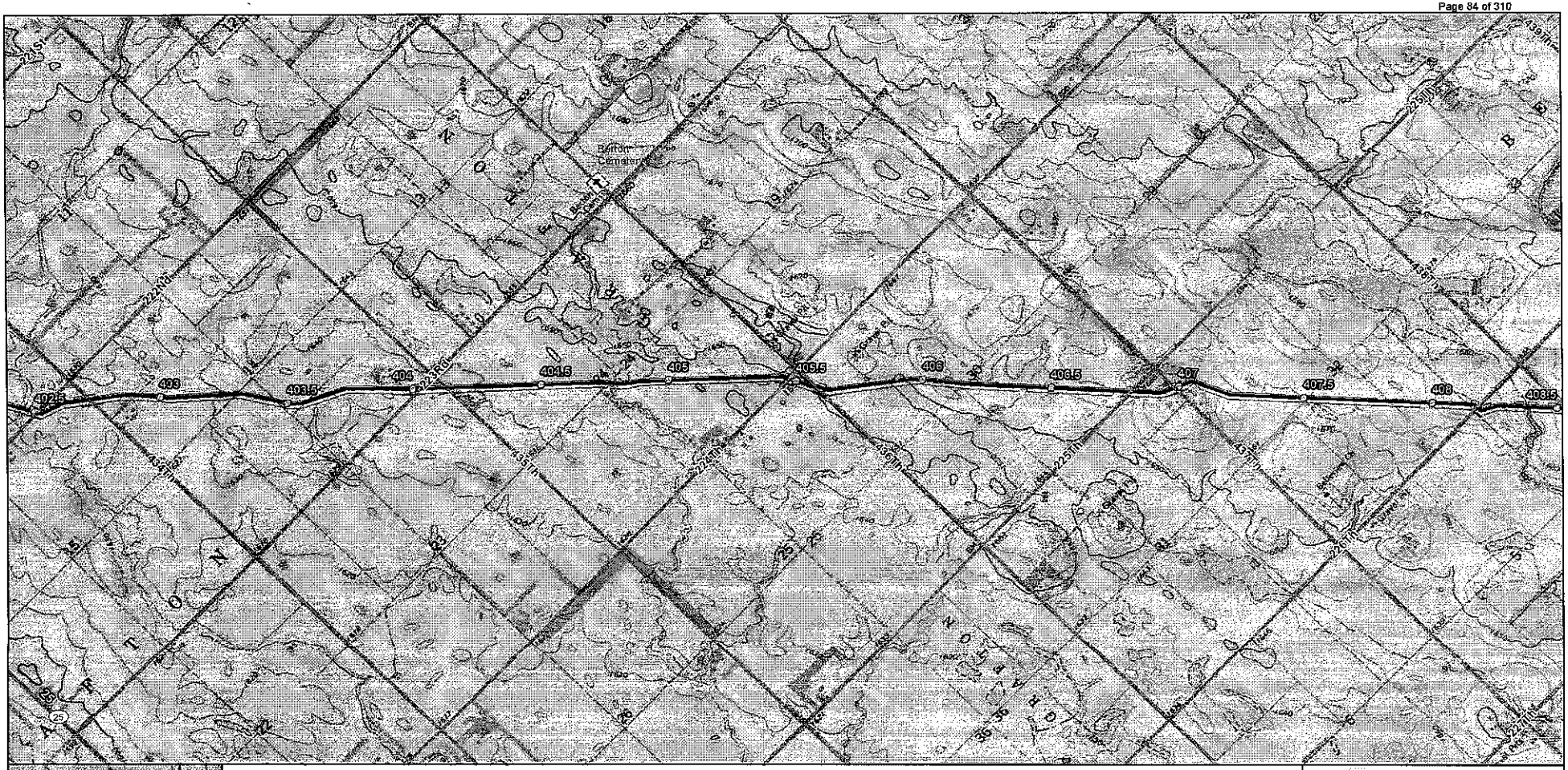
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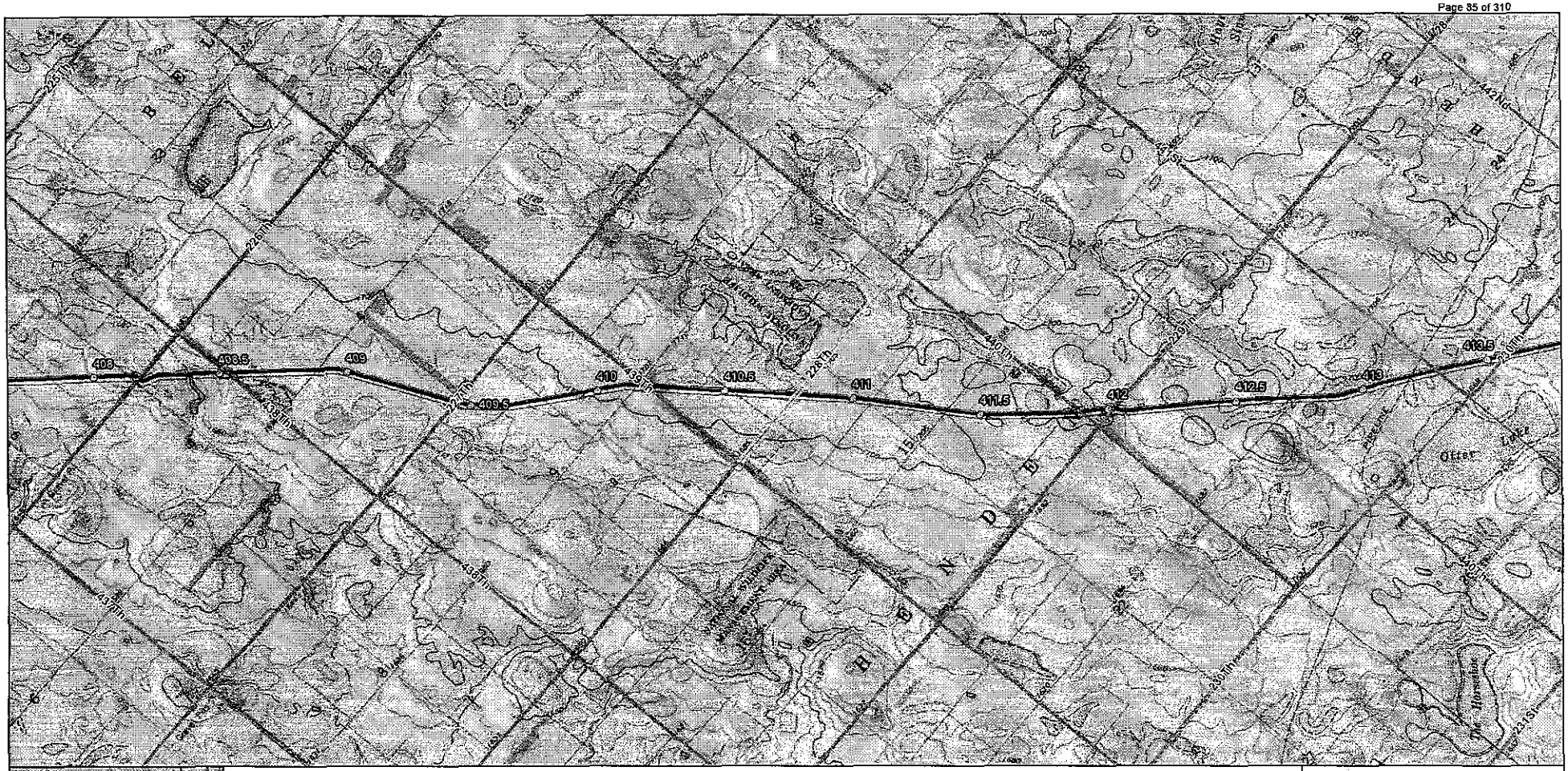
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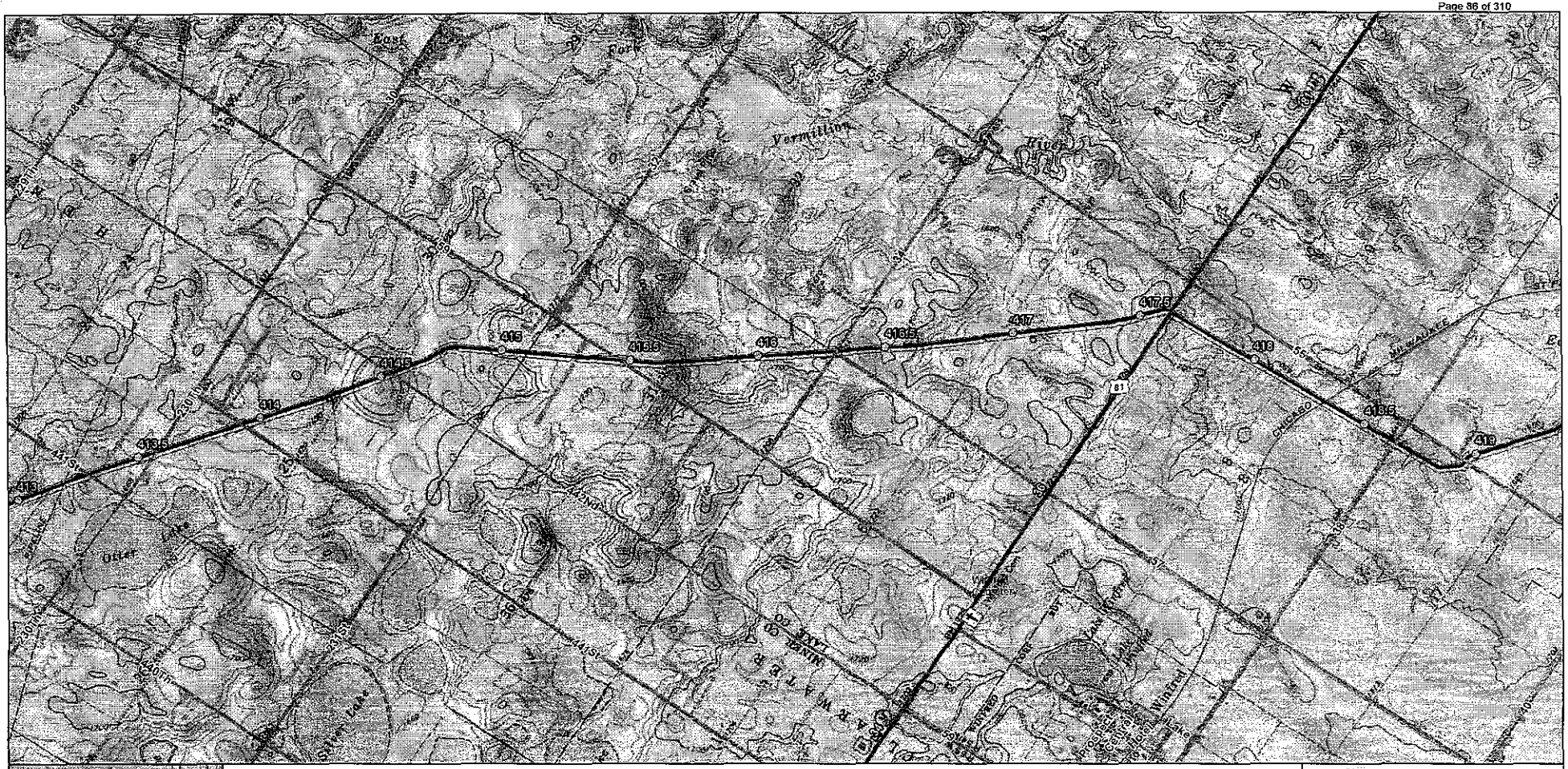

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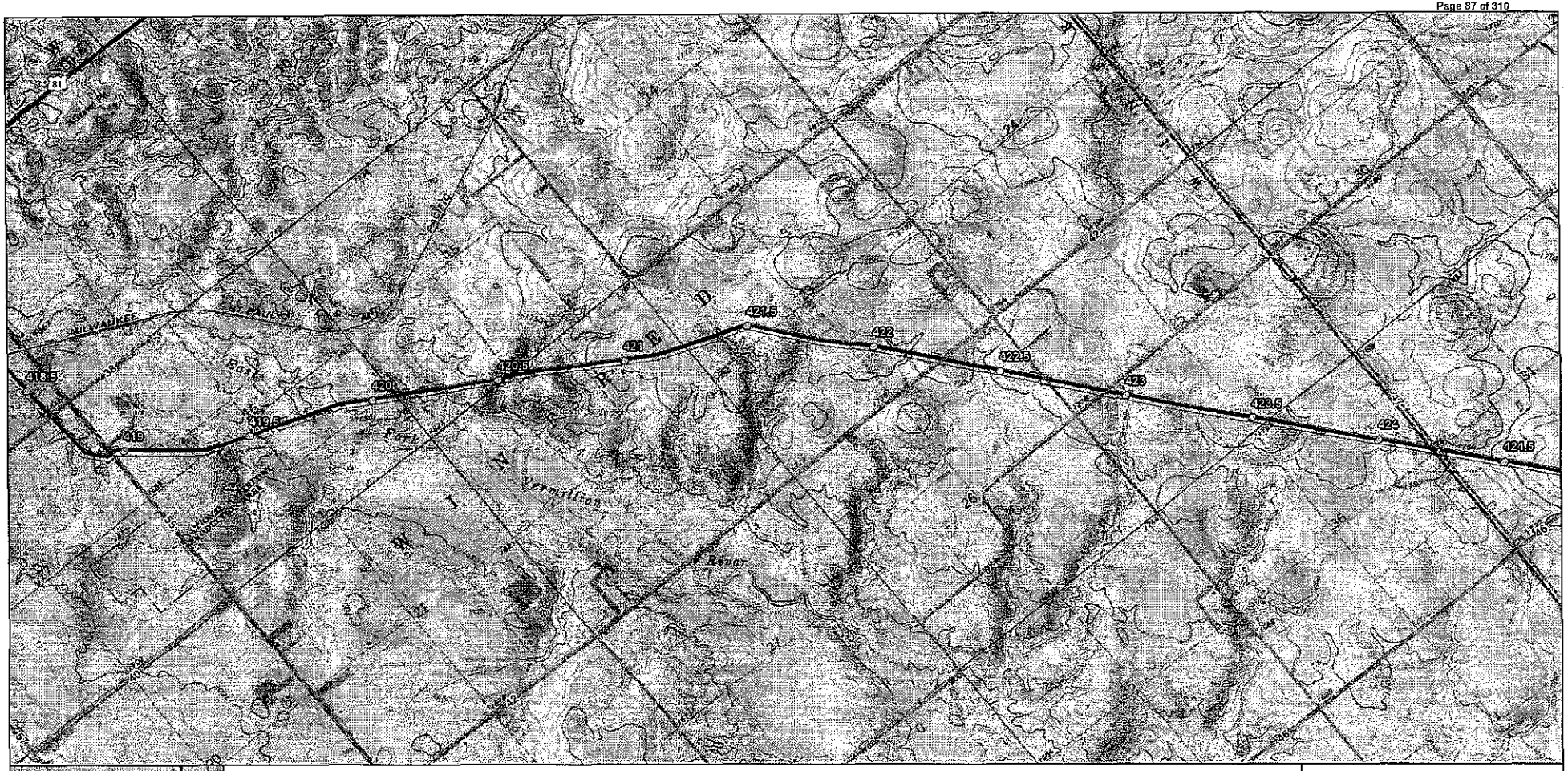

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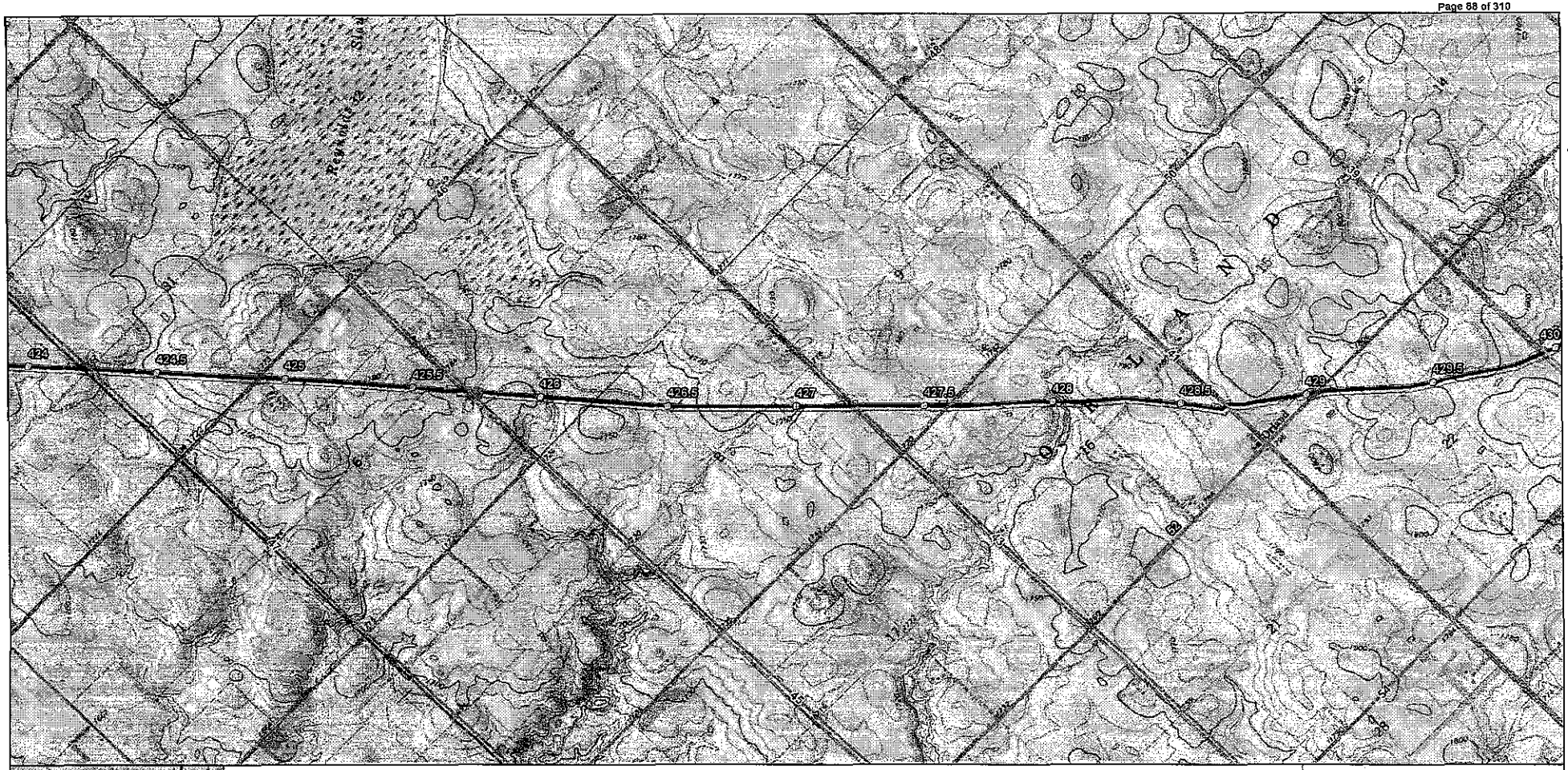

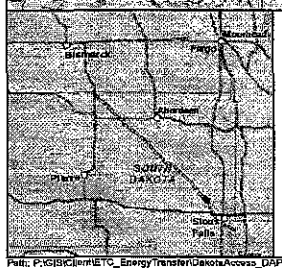

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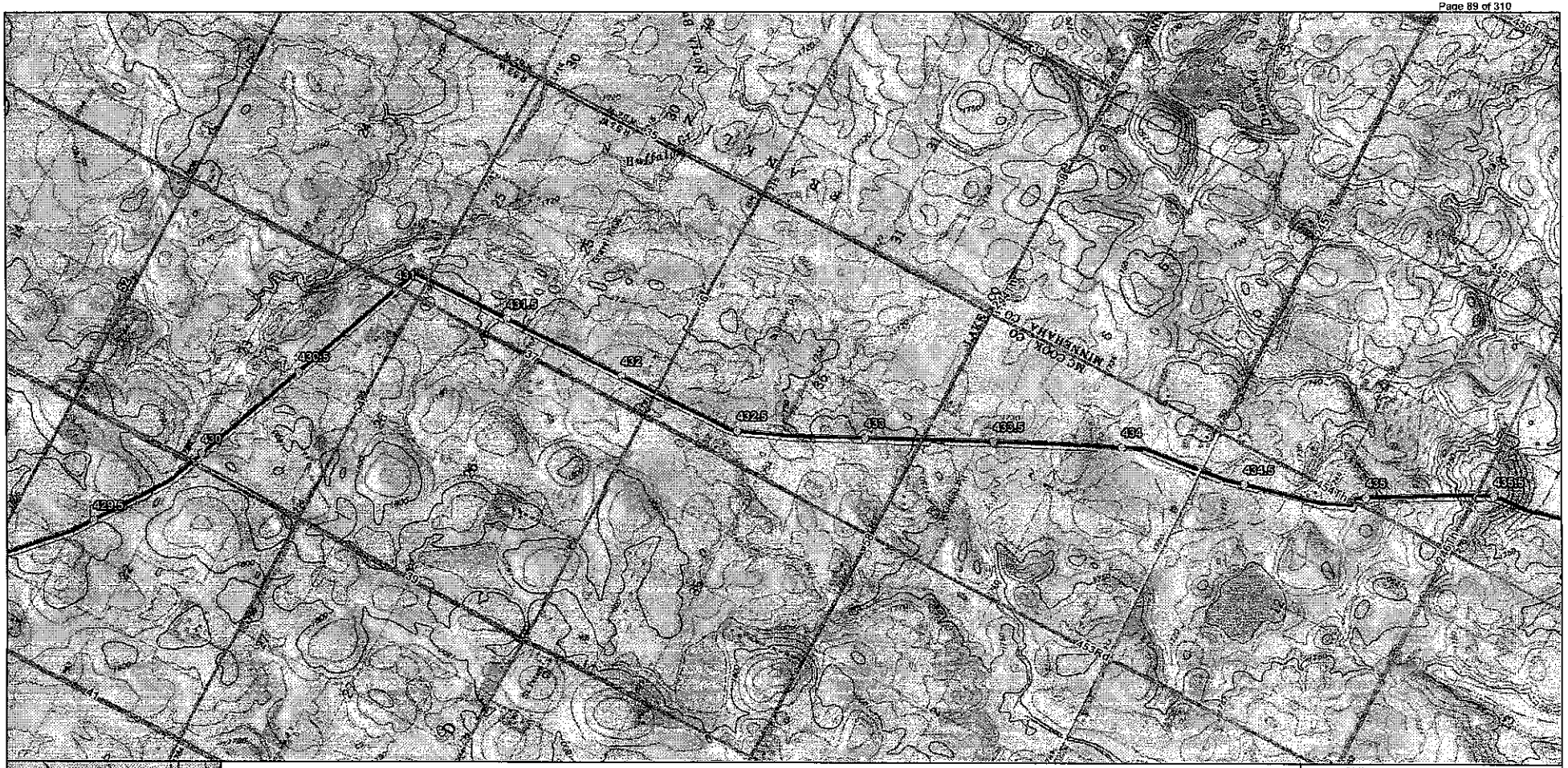

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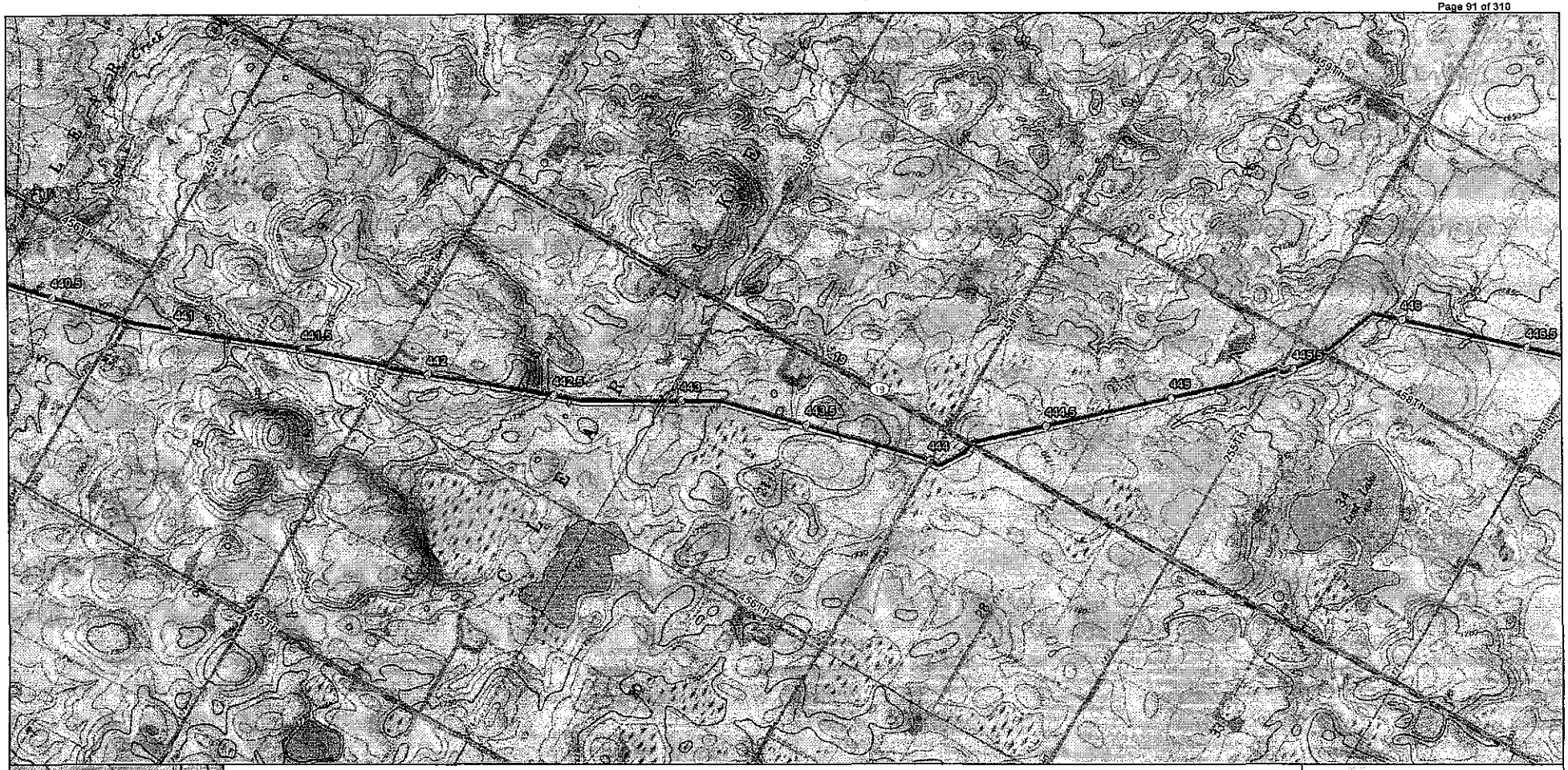

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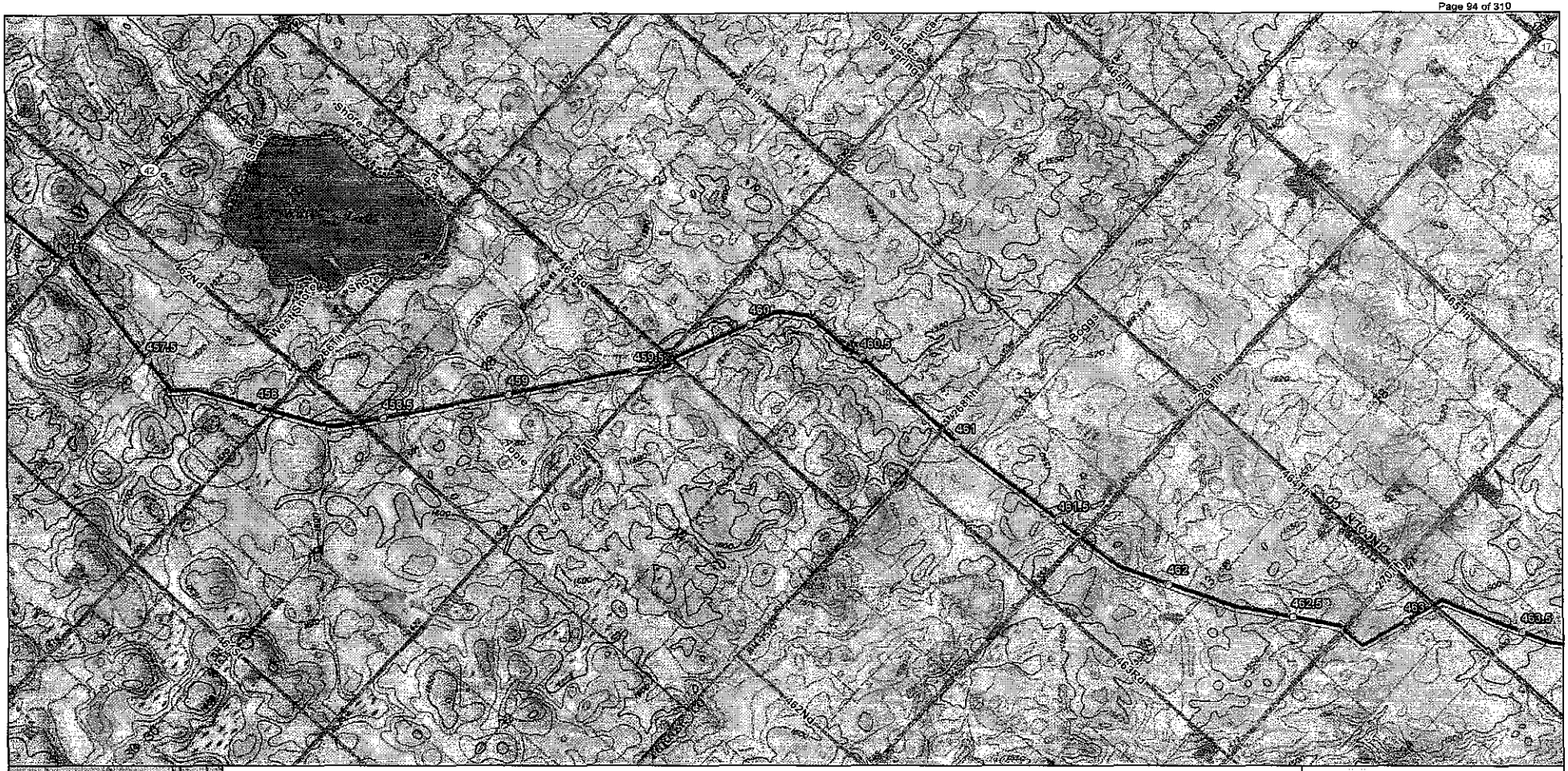

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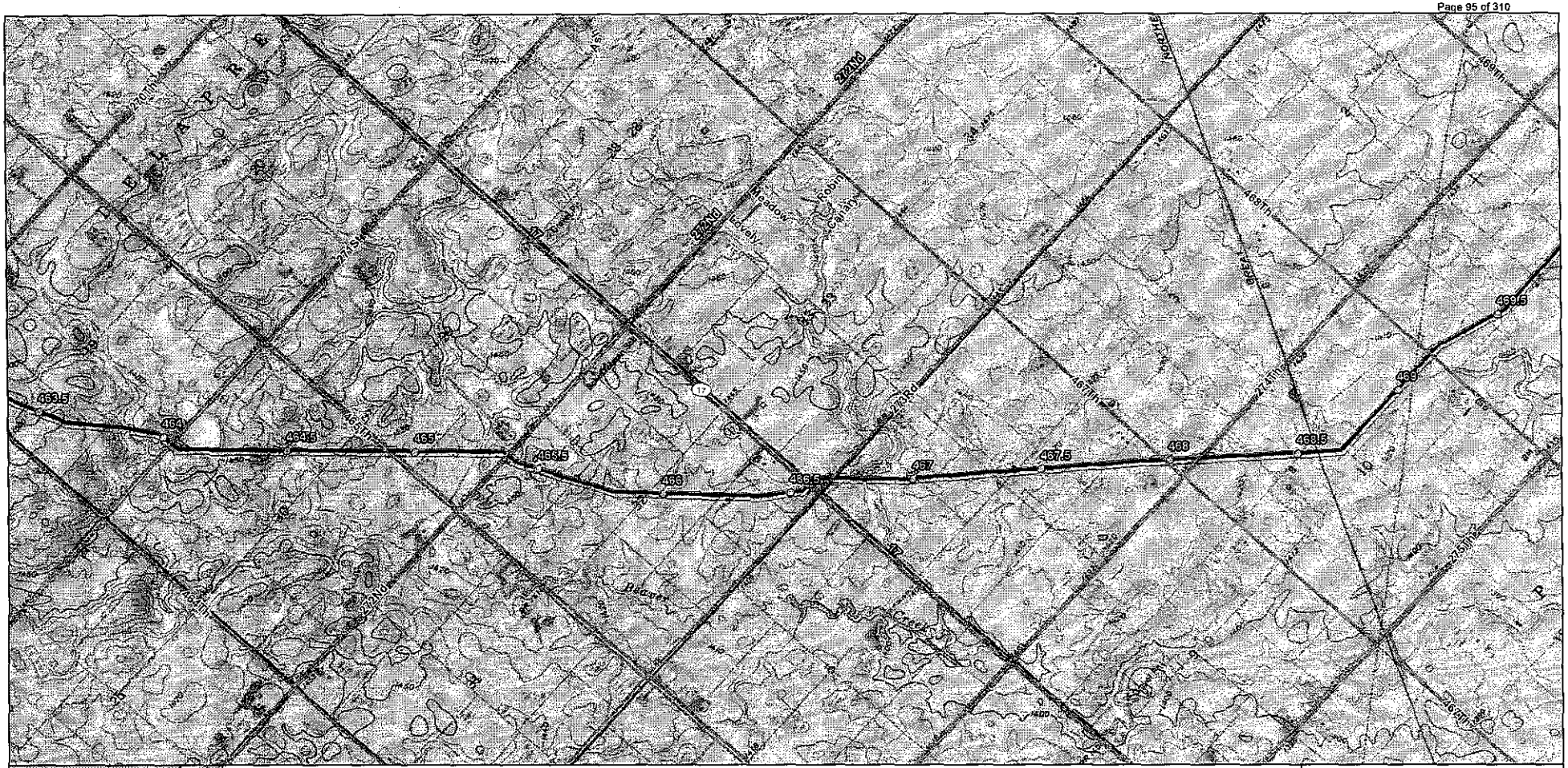

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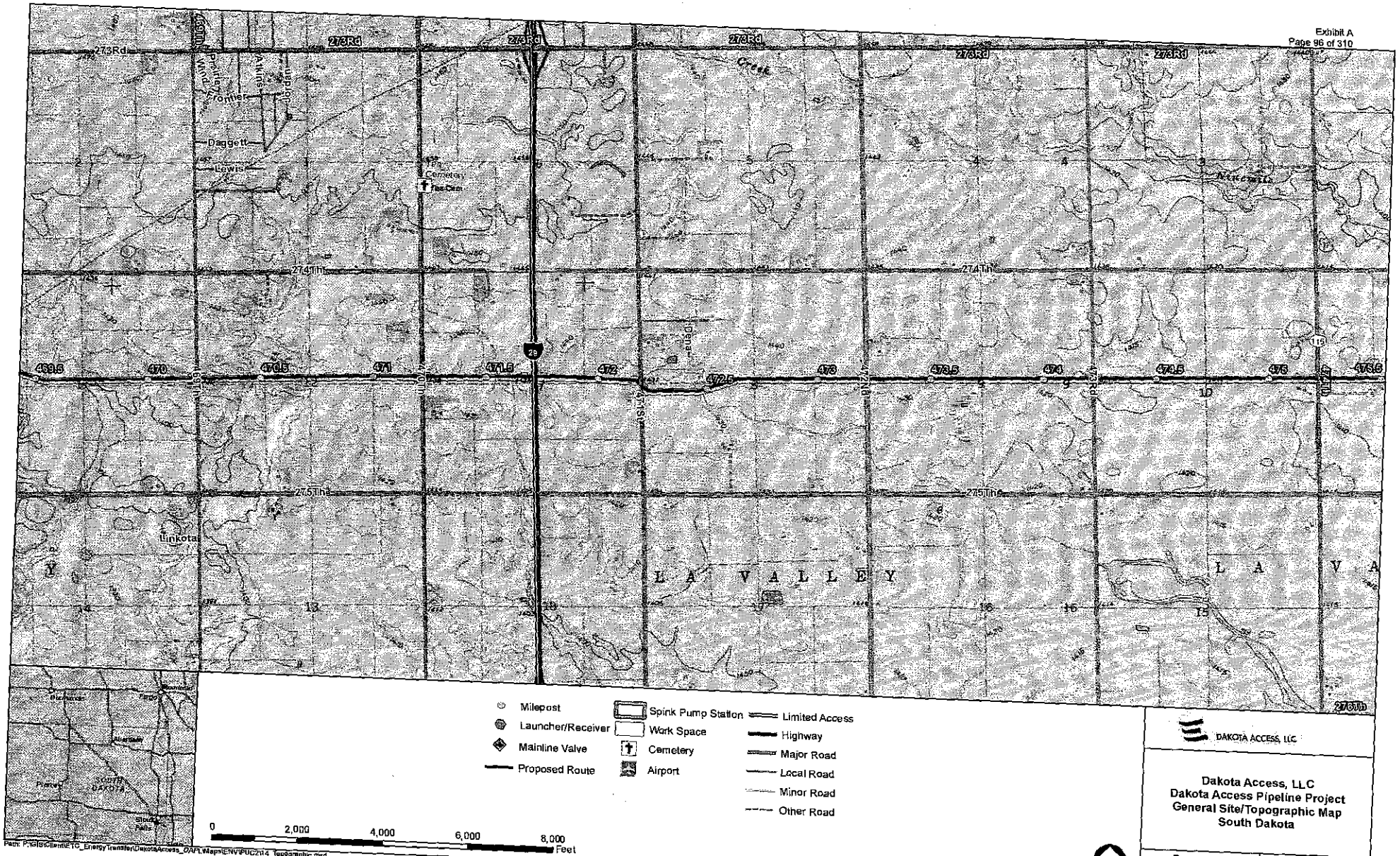
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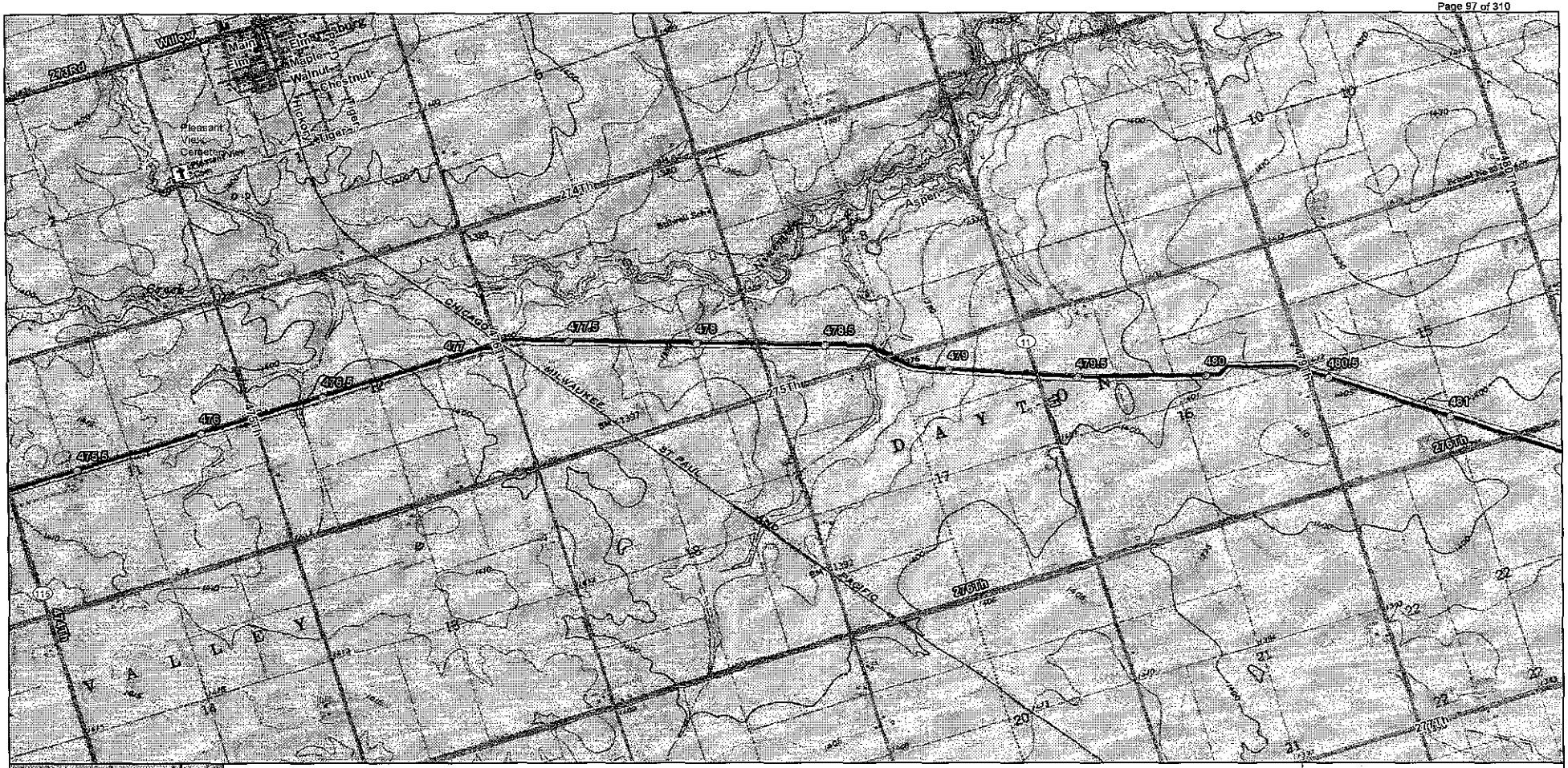

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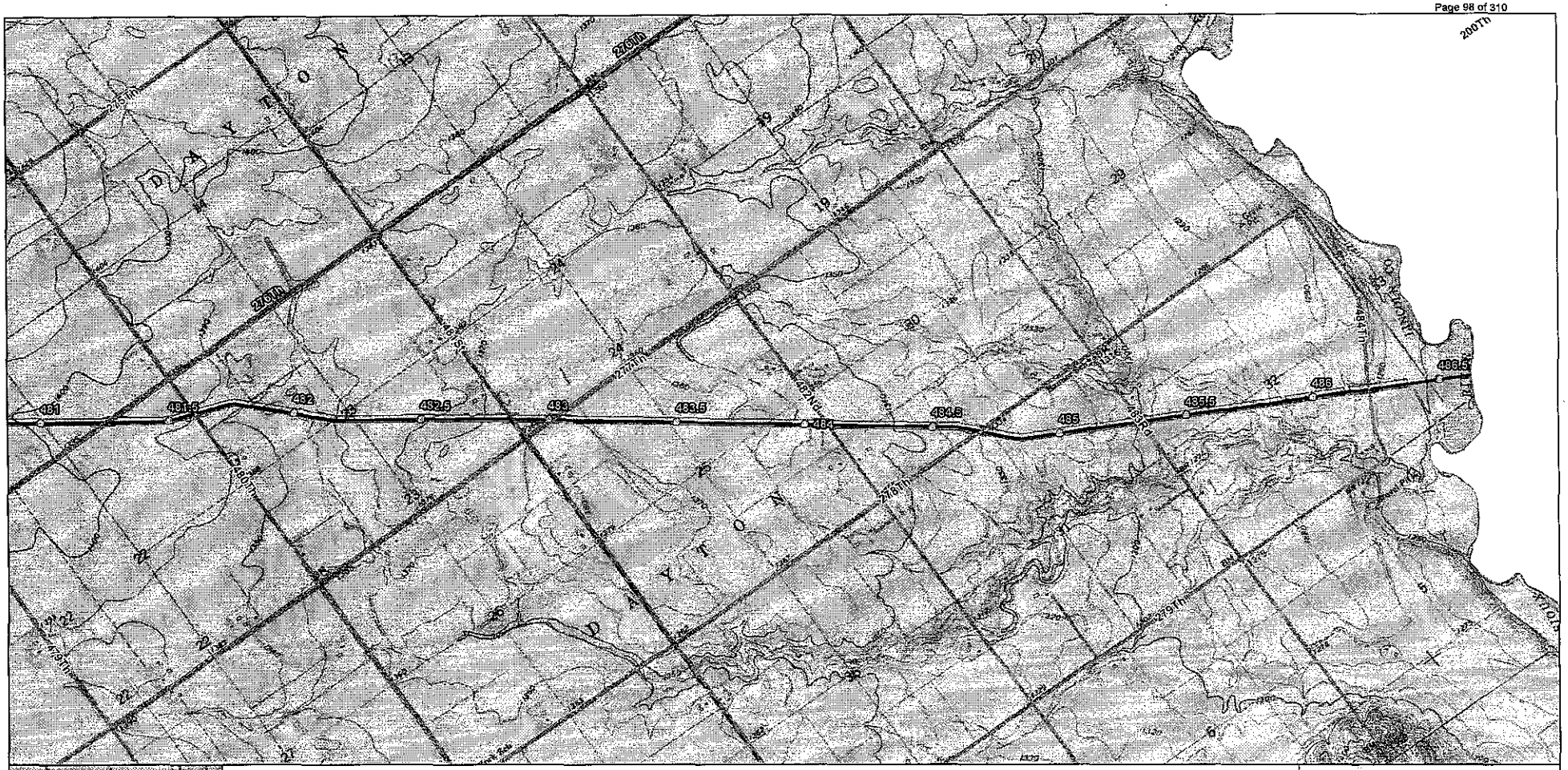
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GeoEngineers

Memorandum

3050 South Delaware, Springfield, Missouri 65804, Telephone: 417.831.9700, Fax: 417.831.9777 www.geoengineers.com

To:	Jack Edwards, Dakota Access, LLC
From:	Mark Miller MM Craig Erdman CE for CE
Date:	April 17, 2015
File:	18782-011-00
Subject:	Response to South Dakota Public Utilities Commission Dakota Access Pipeline Project – Proposed Alignment in South Dakota
Attachments:	Figures 1 through 4. Overburden Thickness

INTRODUCTION

At your request, we have prepared this memorandum to respond to three comments (Data Response No. 11 through 13) provided by the South Dakota Public Utilities Commission (SDPUC). These comments are related to the proposed Dakota Access Pipeline (DAPL) alignment or route through South Dakota and were provided to us via email from Jack Edwards of Dakota Access, LLC on March 30, 2015.

Data Response No. 11:

SDPUC Comment: Please provide cross sections of the bedrock geology and surficial geology to depict the major subsurface variations in accordance with Administrative Rules of South Dakota (ARSD) 20:10:22:14(3).

Reply:

ARSD 20:10:22:14(3) states "A written summary of the geological features of the plant, wind energy, or transmission site using the topographic map as a base showing the bedrock geology and surficial geology with sufficient cross-sections to depict the major subsurface variations in the siting area."

The Geology Mapbook in Appendix A of the preliminary geology and geologic hazards report (GeoEngineers, 2014) presents the geologic units exposed at the surface in the vicinity of the DAPL alignment. Bedrock is typically exposed at the ground surface near the alignment where it crosses from North Dakota into South Dakota (approximate MP 212). As shown within the mapbook, the geologic materials exposed at the surface along most of the alignment within South Dakota consist of Quaternary glacial drift deposits, eolian deposits, lacustrine deposits, and alluvium. Table A-2B of the preliminary geology and geologic hazards report (GeoEngineers, 2014) presents the geologic units exposed at the surface based on publically available data.

To further address the request, we reviewed the geologic map of bedrock prepared by Tomhave and Schulz (2004) and digital (GIS) data of bedrock occurrence and top of bedrock contours. The Quaternary units overlying the bedrock consist of a variety of glacial drift deposits (outwash, glacial till, and other associated deposits), interglacial deposits, and recent, lacustrine, eolian and alluvial deposits. These glacial and non-glacial deposits vary widely laterally and vertically.

Based on our review, it is our opinion that construction of a cross section along the entire alignment would be impractical. However, in response to the data request, we provide below an expanded discussion of the bedrock geology beneath the Quaternary deposits and the thickness of the surficial materials overlying the bedrock.

Based on the map by Tomhave and Schulz (2004), the bedrock underlying the Quaternary deposits within 5 miles of the proposed pipeline alignment consists of the Fox Hills Sandstone, Pierre Shale, Niobrara Limestone, Carlile Shale, Greenhorn Formation, Graneros Shale, Dakota Formation, undifferentiated Cretaceous rocks, and Sioux Quartzite. With the exception of the Sioux Quartzite, all of these rocks are Cretaceous (145 to 65 million years old). Only the Pierre Shale, the Niobrara Limestone, the Carlile Shale, the undifferentiated Cretaceous rocks, and the Sioux Quartzite are mapped beneath the proposed alignment.

The Pierre Shale underlies the Quaternary deposits along a majority of the alignment. The Pierre Shale consists of blue-gray to dark gray shale with occasional beds of bentonite, black shale and light-brown chalky shale. There are also minor beds of sandstone, conglomerate and carbonate or ferruginous concretions. The Pierre Shale is up to 1,000 feet thick. The Pierre Shale is mapped beneath the Quaternary deposits from the North Dakota-South Dakota state line (approximate MP 212) to approximate MP 319.4. Between MP 319.4 and approximate MP 361.7, the Pierre Shale is mapped beneath the alignment intermittently. The Pierre Shale is then mapped beneath the overburden along the alignment from approximate MP 363.5 to approximate MP 417.2 and then approximate MP 419.5 to approximate MP 420.4.

The Niobrara Limestone (also known as the Niobrara Formation) consists of white to dark gray argillaceous chalk, marl and shale, with occasional thin beds of bentonite, chalky carbonaceous shale, sand and small concretions. The Niobrara Limestone is up to 150 feet thick. The Niobrara Limestone, as mapped, appears to be consistent with potential karst areas along the alignment as shown on mapping by Tobin and Weary (2004). The Niobrara Limestone is mapped beneath the Quaternary deposits intermittently between MP 323 and approximate MP 363.5. The Niobrara Limestone is mapped beneath the Quaternary deposits along another segment from approximate MP 417.2 to approximate MP 419.5 and approximate MP 420.4 to approximate MP 432.3. The Niobrara Limestone is mapped beneath the Quaternary deposits along two separate segments near the southeastern end of the alignment in South Dakota. The first of these two segments extends from approximate MP 478.4 to approximate MP 479.8; the second segment extends from approximate MP 482.4 to approximate MP 485.4.

The Carlile Shale consists of dark gray to black silty to sandy shale with zones where concretions are found. There are reported to be up to three sandstone layers in the upper portion of the formation. The basal unit consists of sandy calcareous marl. The Carlile Shale is up to 330 feet thick. The Carlile Shale is mapped along the alignment at the surface or beneath the overburden from approximate MP 473.7 to approximate MP 478.4; from approximate MP 479.8 to approximate MP 482.4; and from approximate MP 485.4 to approximate MP 486.8.

The undifferentiated Cretaceous deposits consist of black opaline spiculite, gray to black shale, yellow-brown to gray chalk, gray silty clay and sandstone. The thickness of the undifferentiated Cretaceous deposits is up to 400 feet. The undifferentiated Cretaceous deposits are mapped beneath the Quaternary deposits or at the ground surface from approximate MP 441.4 to approximate MP 444.0, from approximate MP 454.3 to

approximate MP 462.1, from approximate MP 462.6 to approximate MP 466.2, from approximate MP 468.7 to approximate MP 470.6, and from approximate MP 472.4 to approximate MP 473.7.

The Sioux Quartzite consists of pink and reddish to tan, fine to coarse-grained iron-stained orthoquartzite with minor meta-conglomerate and metamorphosed mudstone. The thickness of the Sioux Quartzite is estimated to be greater than 1,000 feet. The Sioux Quartzite is mapped at the surface or beneath the Quaternary deposits between approximate MP 432.3 to approximate MP 441.4, from approximate MP 444.0 to approximate MP 454.3, from approximate MP 462.1 to approximate MP 462.6, from approximate MP 466.2 and approximate MP 468.7 and from approximate MP 470.6 to approximate MP 472.4.

Utilizing the top of bedrock contour data and a digital elevation model (DEM) of the ground surface from the U.S. Geological Survey, we developed an overburden thickness map. Bedrock is generally present at variable depths below the ground surface along the alignment, but is typically 50 feet or more below the ground surface along the alignment. Bedrock is relatively shallow (less than about 75 feet below the ground surface) along the alignment near the North Dakota-South Dakota state line, in the central portion of the alignment within South Dakota where bedrock highs occur along the Pierre Shale (between approximate MP 322 and 380), and in localized areas near the southeastern portion of the alignment. Although the overburden is relatively shallow along central portion of the alignment in South Dakota, the cover over the Niobrara Limestone is relatively deep (greater than 100 feet). This is because the Niobrara was exposed in old drainage systems that eroded through the Pierre Shale. These valleys were subsequently filled with sediment during glaciation in the Quaternary.

We present maps of portions of the alignment to show thickness of overburden, based on the locations where the Niobrara Limestone is mapped along the alignment (see Figures 1 through 4).

Data Response No. 12:

SDPUC Comment: In sections 14.7 and 14.8 (ARSD 20:10:22:14(7) and (8)), it is identified that the project will cross approximately 47.5 miles of karst terrain. Please expand on the potential for subsidence to occur along the project route and whether or not the pipeline would be damaged as a result of subsidence.

Reply:

It is important to note that the map by Tobin and Weary (2004), (a digital version of the karst terrain mapping by Davies et al., 1984), was compiled at a very small-scale (1:7,500,000) and is intended to show areas that may be susceptible to karst. Because of the scale of the map, we have found it at times to not be very accurate. In addition, bedrock in the area shown in the map may be susceptible to karst development, but the mapping does not necessarily indicate that karst features are present.

To provide the information requested, we developed maps showing the overburden thickness along portions of the alignment where carbonate rocks are present beneath the alignment (see Figures 1 through 4). Based on this analysis, and review of boring logs from the South Dakota Geological Survey (2015), the thickness of Quaternary deposits over the limestone formations with the potential for karst (specifically the Niobrara Limestone) is typically greater than 75 feet. In an area where the cover appears to be near the minimum, in the vicinity of MP 485, the Niobrara Limestone is estimated to be about 70 feet below the ground surface. In addition, the Niobrara Limestone also appears to be relatively thin (perhaps on the order of 15 to 20 feet)

since the underlying Carlile Shale is mapped nearby at a similar depths and based on explorations in the area that encountered Carlile Shale in areas that were mapped as Niobrara Limestone.

Based on the thickness of the Quaternary deposits overlying the Niobrara Limestone and the relatively thin nature of the limestone, we estimate that the risk of substantial karst formation within Niobrara Limestone and the subsequent subsidence of the ground surface to be low. We observed no indications of sinkholes in our review of aerial imagery. Furthermore, there is no mapping of sinkholes, caves, or springs in the vicinity of the alignment based on our research.

Data Response No. 13:

SDPUC Comment: In sections 14.8 (ARSD 20:10:22:14(8)), please expand on the steps Dakota Access will take to protect the pipeline from subsidence. Include a discussion on the known measures Dakota Access could take to protect the pipeline from subsidence.

Reply

ARSD 20:10:22:14(8) states that "An analysis of any constraints that may be imposed by geological characteristics on the design, construction, or operation of the proposed facility and a description of plans to offset such constraints."

Based on the information presented in the reply to Data Response No. 12 above, the risk of subsidence related to karst along the project alignment within South Dakota is estimated to be low, therefore, no additional measures beyond conventional best management practices for pipeline construction are anticipated.

Should voids or other signs of karst development be encountered during construction, further, site-specific evaluations could be completed using geophysical methods. Geotechnical borings could also be completed to confirm the presence of voids. Subsidence could be mitigated by grouting voids encountered. Given that the Niobrara Limestone is relatively thin, we anticipate that the size of voids, if encountered would likely be relatively small. In the unlikely event that larger voids or other substantial features are encountered, site-specific review and assessment by a qualified geologist or geotechnical engineer would be recommended.

REFERENCES

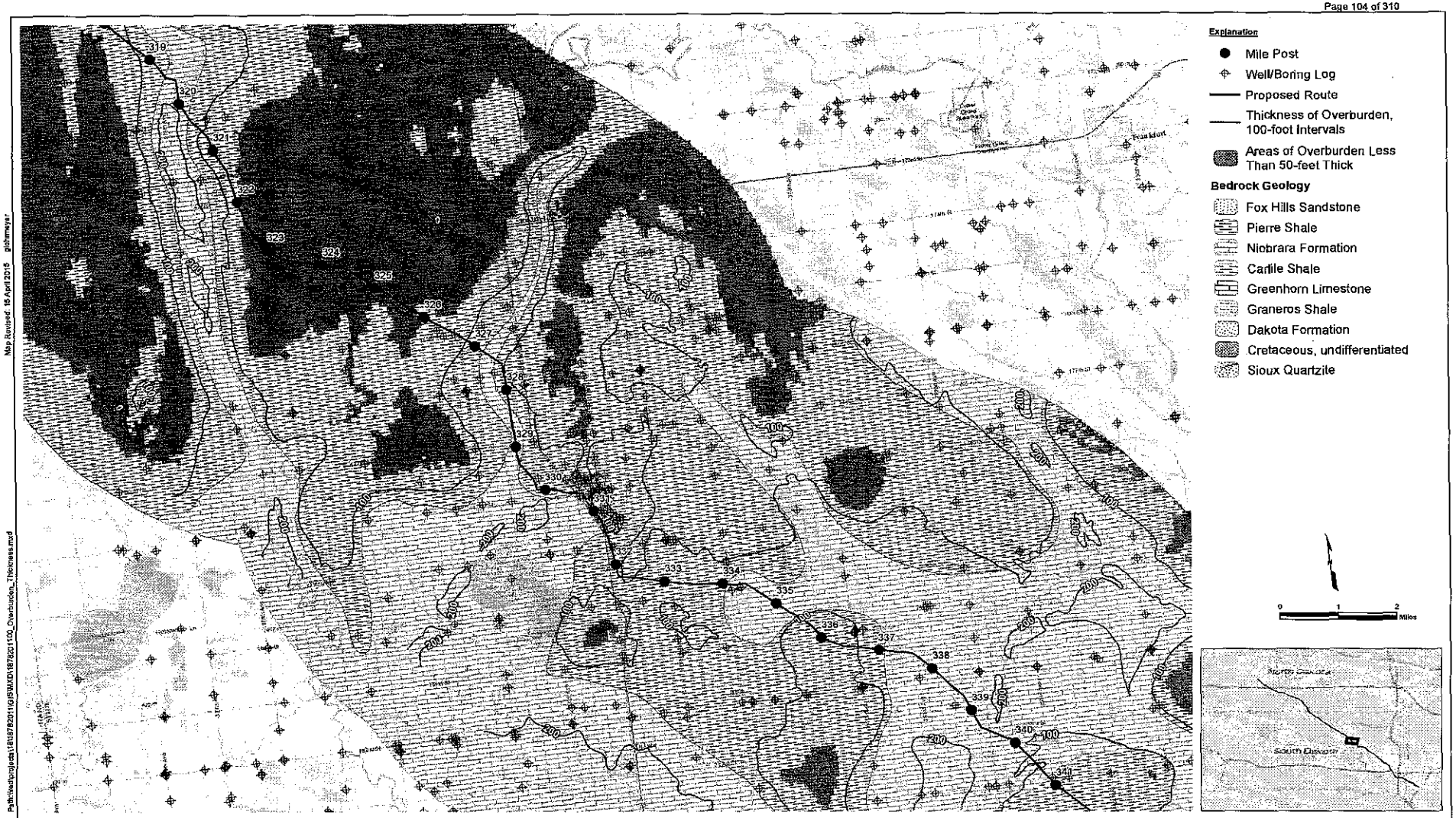
Davies, W.E., Simpson, J.H., Ohlmacher, G.C., Kirk, W.S., and Newton, E.G., 1984, Map showing engineering aspects of karst in the United States: Reston, Va., U.S. Geological Survey National Atlas of the United States of America, scale 1:7,500,000. Dated 1984.

GeoEngineers, Inc., 2014. "Preliminary Geology and Geologic Hazards Evaluation, ETC Dakota Access Pipeline North Dakota, South Dakota, Iowa, Illinois." Prepared for Energy Transfer Company. File No. 18782-011-00. Dated October 17, 2014

Tobin, T.D., and Weary, D.J., 2004. "Digital Engineering Aspects of Karst Map: A GIS Version of Davies, W.E., Simpson, J.H., Ohlmacher, G.C. Kirk, W.S., and Newton, E.G., 1984, 'Engineering Aspects of

Karst: U.S. Geological Survey, National Atlas of the United States of America.'" 1:7,500,000. United States Geological Survey Open-File Report OFR 2004-1352. Dated 2004.

Tomhave, Dennis W. and Schulz, Layne D., 2004. Bedrock Geologic Map Showing Configuration of the Bedrock Surface in South Dakota East of the Missouri River. 1:500,000. South Dakota Department of Environment and Natural Resources, Geological Survey. 1 plate. June 30, 2004.



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Well/Boring logs obtained from the South Dakota Department of Environment and Natural Resources Geological Survey Program (2014).
Bedrock geology of eastern South Dakota is digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014). The overburden thickness were developed from 10-meter digital elevation model (DEM) grid obtained from the U.S. Geological Survey (2014) and top of bedrock contours in digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014).

Coordinate System: GCS NAD 1983

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Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 1

Map Revised: 15 April 2015 glohmeyer

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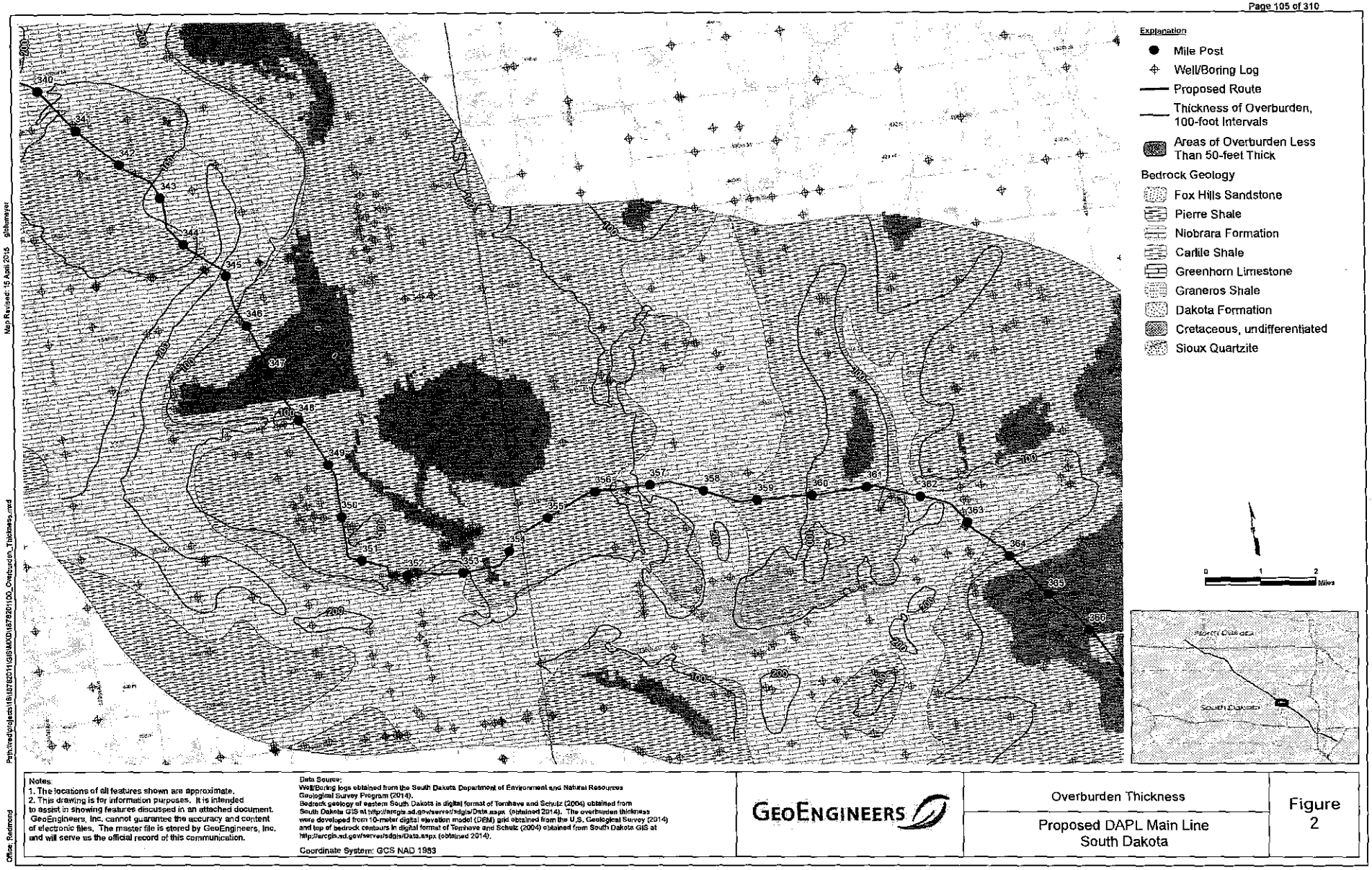

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Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 2

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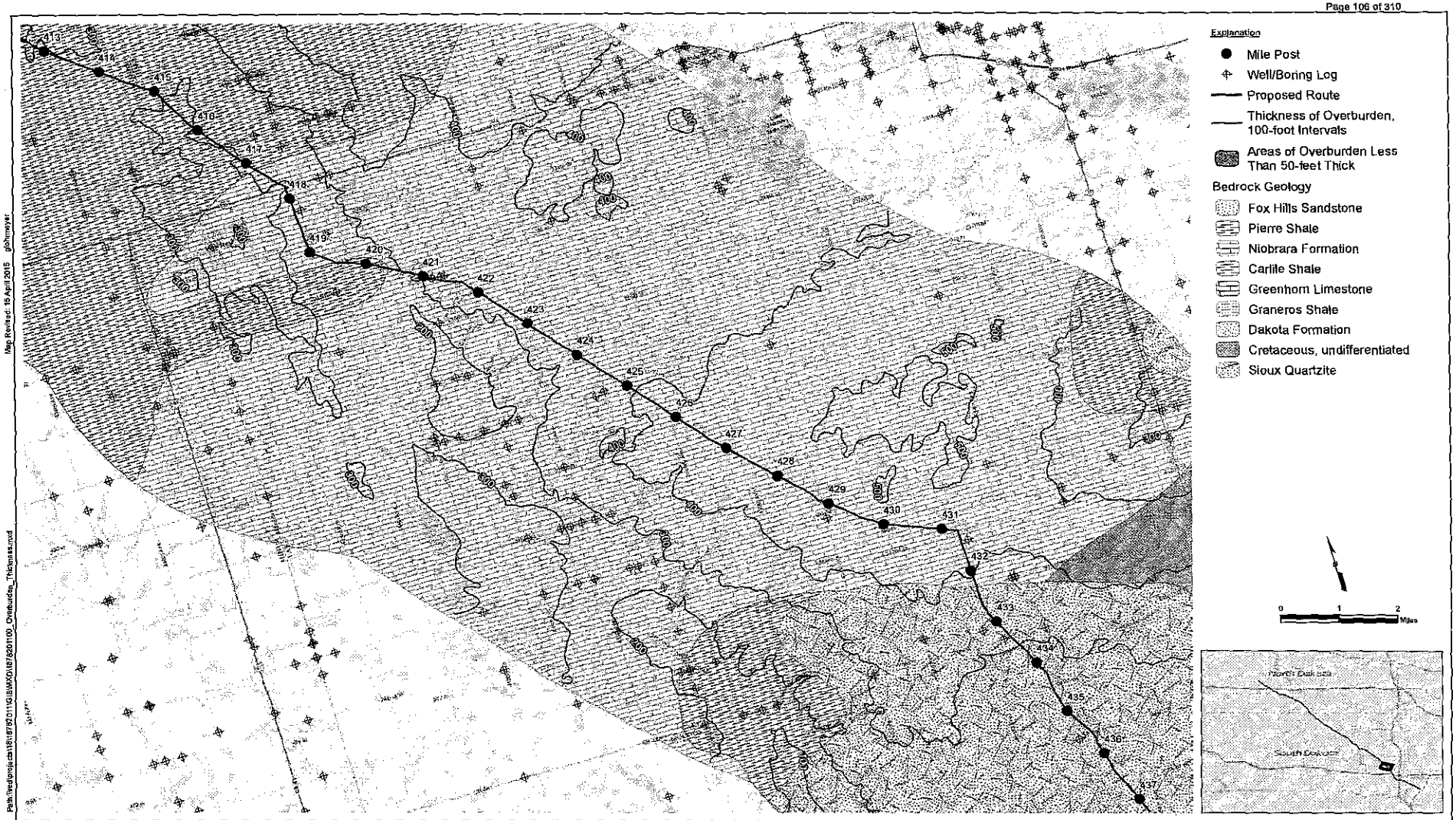

Map Revised: 15 April 2015 gjohnmeyer

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Office: Redmond

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Well/Boring logs obtained from the South Dakota Department of Environment and Natural Resources Geological Survey Program (2014).
Bedrock geology of eastern South Dakota is digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/sevver/sdgis/Data.aspx (obtained 2014). The overburden thickness were developed from 10-meter digital elevation model (DEM) grid obtained from the U.S. Geological Survey (2014) and top of bedrock contours in digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/sevver/sdgis/Data.aspx (obtained 2014).

Coordinate System: GCS NAD 1983

GeoEngineers

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 3

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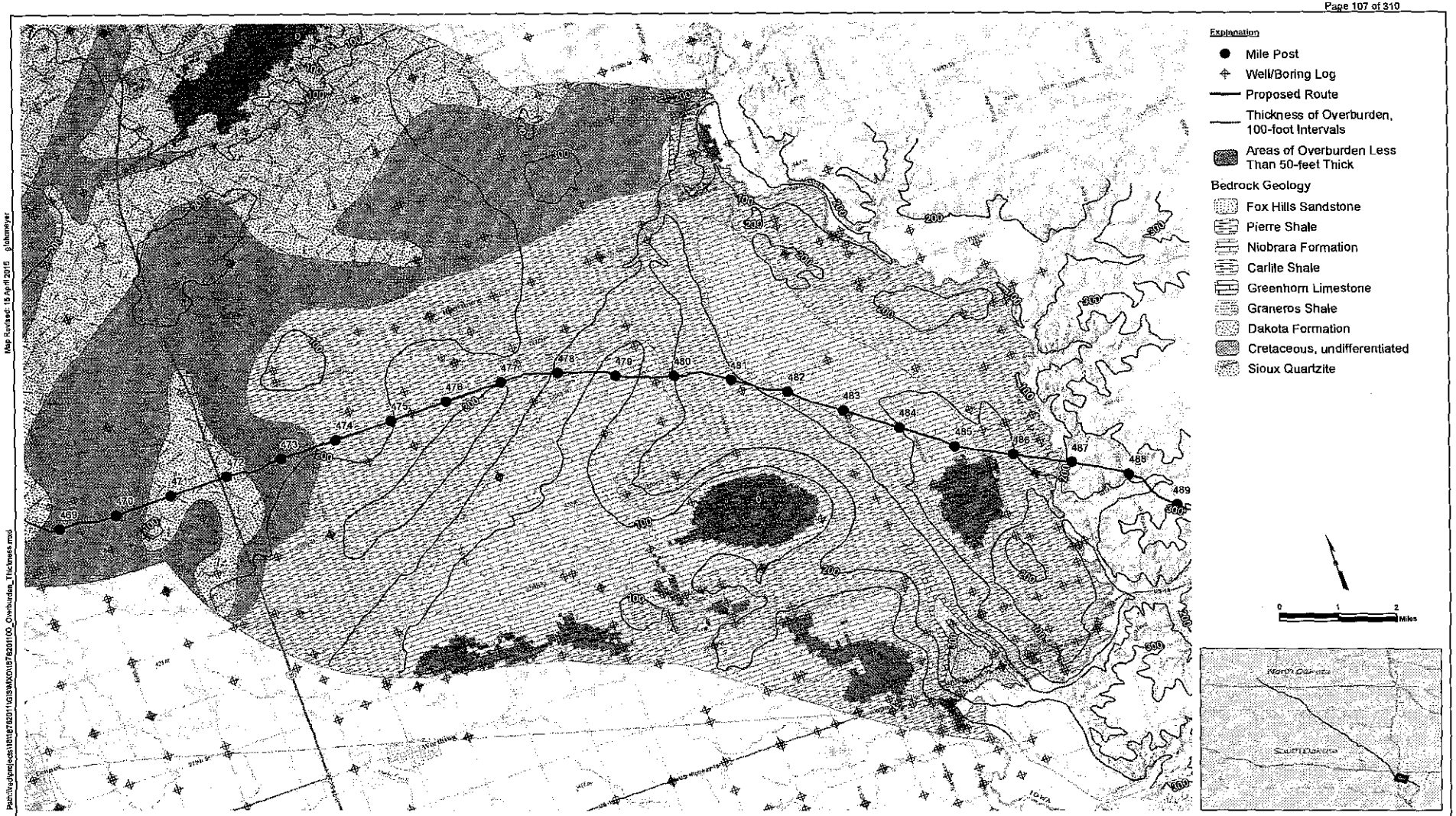

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Coordinate System: GCS NAD 1983

GeoEngineers

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure
4

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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.

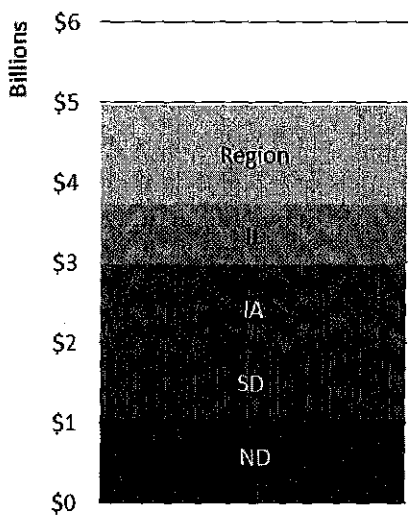
This report endeavors to estimate the economic and fiscal impacts of the pipeline project and to address these issues relating to crude oil transportation in the region.

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



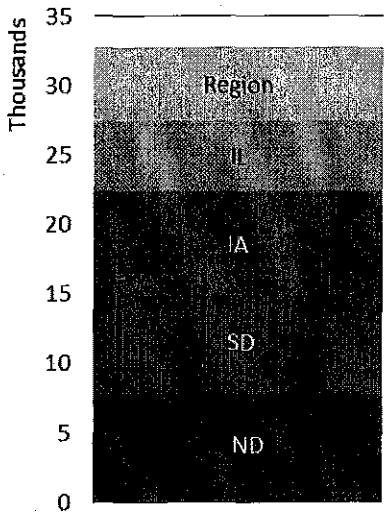
[1] The mileage numbers are approximations based on engineering plans

[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.

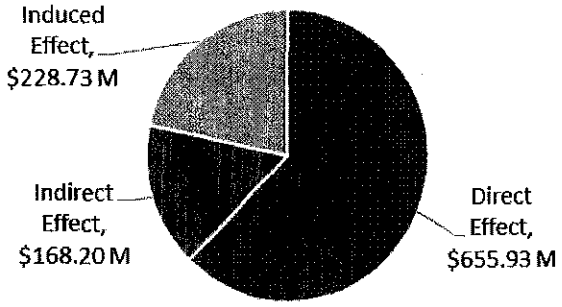
However, the most significant impact will be the felt by the annual taxes that the pipeline will generate for the state and local governments.

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.

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

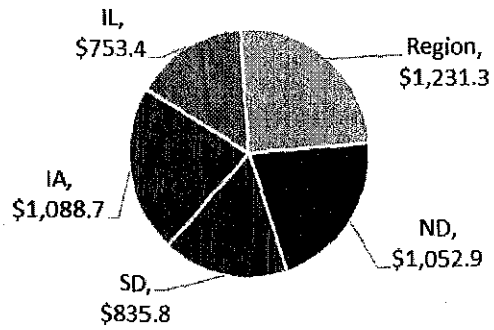
The South Dakota portion of the pipeline will be 267.4 miles long and is expected to cost $*819.6* Million. Of that amount, about 59%, or an estimated $485.6 Million, will result in direct spending in the South Dakota economy.

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.

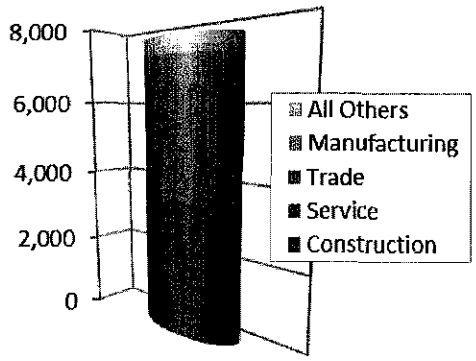
0.4 Impact on Iowa

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.

[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

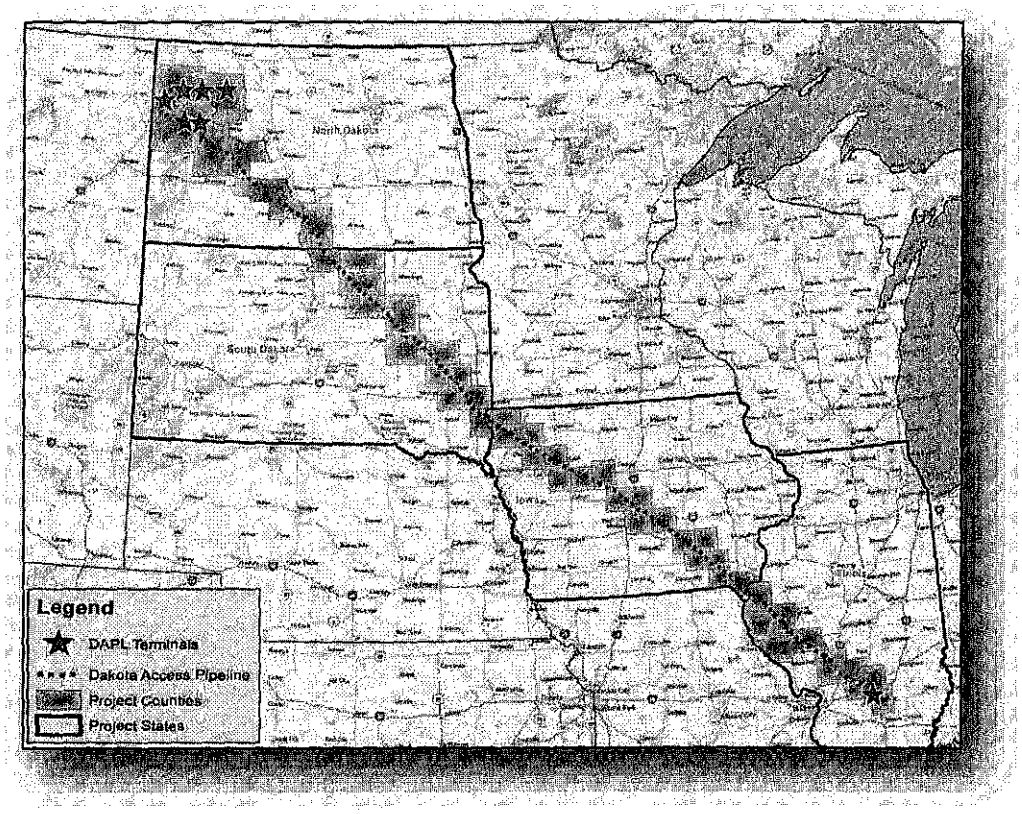
Source: Dakota Access, LLC

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.

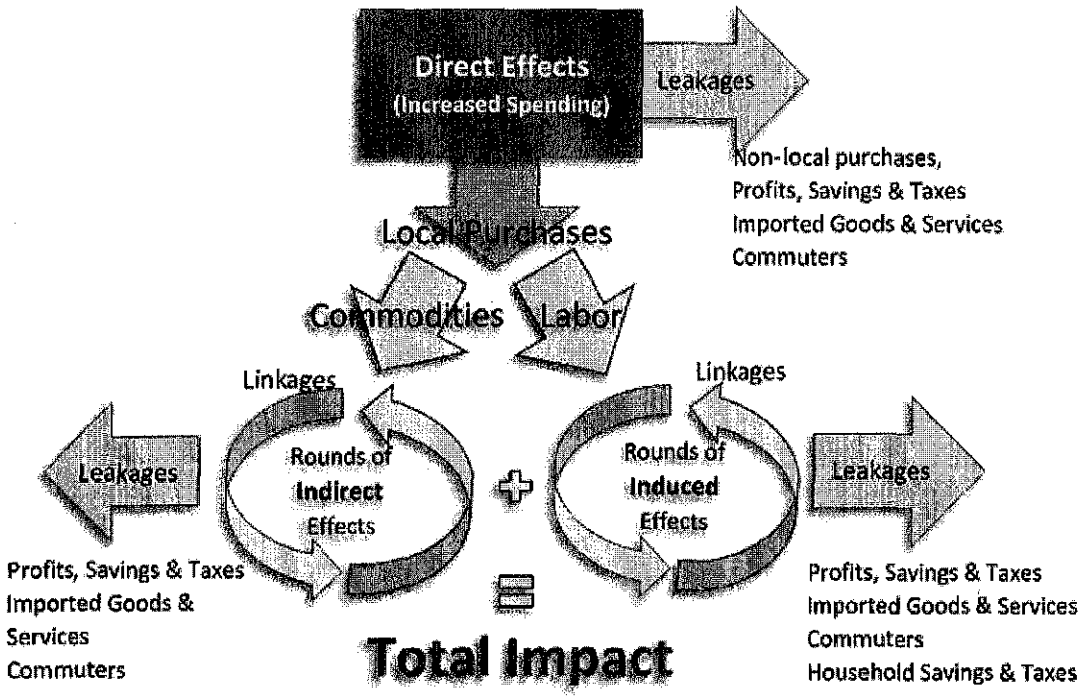
As producers purchase from suppliers that are located outside of the region, some of the spending leaks out of the system (leakages). Profits, savings, and net taxes are also part of the leakage. So, the initial infusion of spending will continue to generate economic activity within the region only until 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.

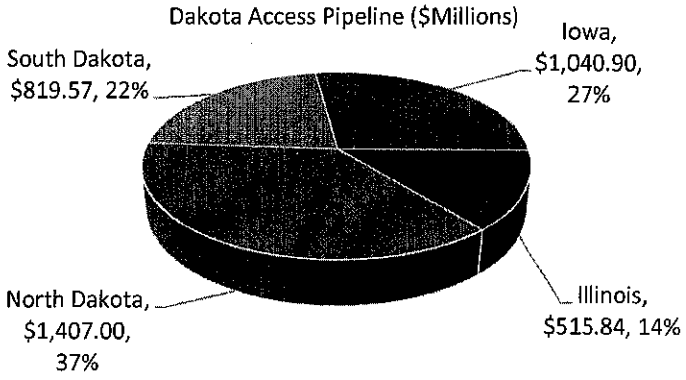
Table 7. IMPLAN Input Spending for the Construction Phase of the Pipeline ($Millions)

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

	Sales and Use Taxes			Gross Receipts/ Lodging Taxes		
State	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:

- **North Dakota** 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.

- **South Dakota** 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.

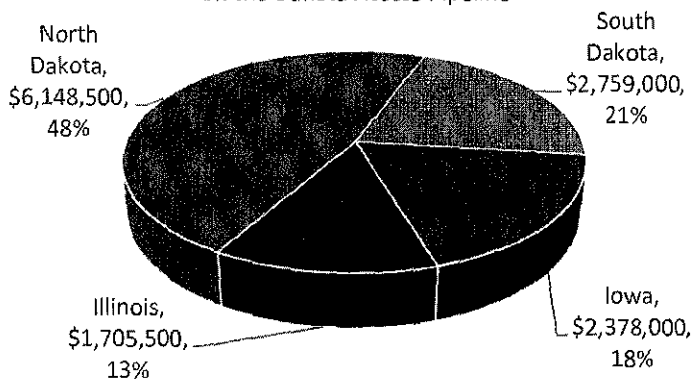
Table 19 shows the values of the spending inputs estimated by Dakota Access, LLC for each state by the appropriate spending categories. Operations and maintenance spending inputs will amount to nearly $13 Million each year for the region with 48% being spent in North Dakota, 21% in South Dakota, 18%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

[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]

[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.

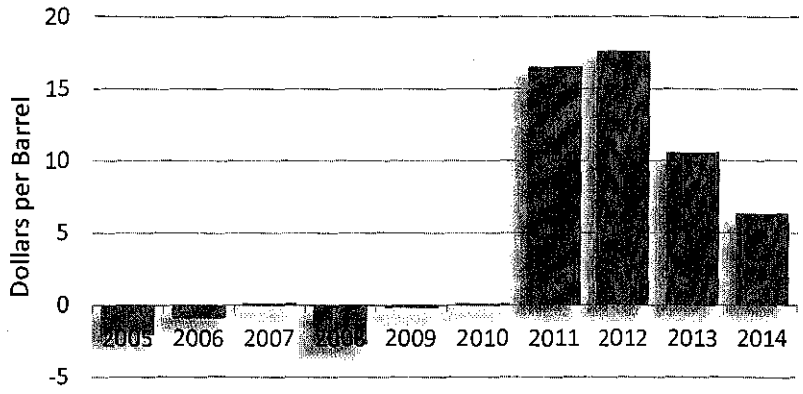
[43] Brent and WTI prices are from the Federal Reserve Bank of St. Louis FRED Economic data internet site accessed November 9, 2014 (http://research.stlouisfed.org/fred2/).; Cushing, OK crude oil inventory data are from the Energy Information Administration Internet site accessed November 9, 2014 (http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPCO_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

[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.

AGRICULTURAL IMPACT MITIGATION PLAN

Dakota Access Pipeline Project (DAPL)

Final Draft

State of South Dakota

Energy Transfer

September 2014

Revised April 2015 in response to PUC Data Request

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Acronyms and Abbreviations

DAPL	Dakota Access Pipeline, LLC (Project Sponsor)
EI/AI	Environmental Inspector/Agricultural Inspector

1 INTRODUCTION

Dakota Access Pipeline, LLC (DAPL) is planning a new 30-inch pipeline to transport crude oil from the Bakken Shale region of North Dakota to Illinois. The eastern terminus of the pipeline will connect with an existing pipeline that will transport the crude oil to the Gulf Coast for processing.

The South Dakota section of the pipeline comprises a 277-mile corridor that will run from north central South Dakota to southeast South Dakota. The proposed pipeline will enter South Dakota in Campbell County and diagonally traverse the state, exiting at the crossing of the Big Sioux River in Lincoln County, South Dakota.

The purpose of this document is to present the proposed measures for minimizing impacts to and restoring agricultural lands during and after pipeline construction.

2 PLAN LIMITATIONS

Mitigation measures identified in this plan apply only to agricultural land and do not apply to urban land, road and railroad right-of-way, interstate natural gas pipelines, mined and disturbed land not used for agriculture. The identified mitigation measures will be implemented as long as they do not conflict with federal, state, and local permits, approvals and regulations.

3 SEQUENCE OF CONSTRUCTION EVENTS AND SCHEDULE

Pipeline construction is anticipated to commence January of 2016 following the receipt of required permits and approvals. Pipeline construction will take approximately 9 months to complete.

The sequence of events for pipeline construction will begin with advance notification of landowners and governmental agencies. Following notification, activities will be undertaken in the following sequence:

- Complete final surveys, stake centerline and workspace;
- Access road installation;
- Grubbing and clearing of the construction corridor;
- Installation of stormwater and erosion control measures;
- Placement of pipe and other supplies along the construction corridor;
- Pipeline welding and bending where necessary
- Excavation of the pipeline trench;
- Temporary repairs to tile lines, if encountered;
- Placement of the pipeline with the trench;
- Permanent repairs to tile lines damaged during construction activities;
- Backfill of the trench and rough grading,
- Hydrostatic testing of the pipeline;
- Final grading and restoration;

- Revegetation and post restoration monitoring; and
- Removal of erosion control measures.

4 POINTS OF CONTACT

Each landowner will be provided the name, telephone number, email address, and mailing address of the DAPL landowner representative two weeks prior to construction. This DAPL representative will be the primary contact person for the landowner throughout construction for easement issues. Landowner representatives will be assigned to that geographic area and be responsible for the liaison activities on behalf of DAPL.

In addition to the landowner representative, a team of experienced Environmental and/or Agricultural Inspectors (EIs/AIs), will be involved in project construction, the initial restoration, and the post-construction monitoring and follow-up restoration. For agriculture construction related issues, the name and telephone number of the EI/AI will also be provided as a secondary contact during construction.

5 DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hayland or pasture and land in government set-aside programs.
Cropland	Land actively managed for growing row crops, small grains or hay.
Drainage Structures or Underground Improvements	Any permanent structure used for draining agricultural lands, including tile systems and buried terrace outlets.
Easements	The agreement(s) and/or interest in privately owned Agricultural Land held by DAPL by virtue of which it has the right to construct, operate and maintain the pipeline together with such other rights and obligations as may be set forth in such agreement.
Environmental Construction Plan (ECP)	Document to present basic environmental construction techniques will be implemented to protect the environment and to minimize potential effects of pipeline and related facilities construction and maintenance.
Pipeline	Any pipe, pipes, or pipelines used for the transportation or transmission of any solid, liquid, or gaseous substance, except water, in

	intrastate or interstate commerce.
Landowner	Person listed on the tax assessment rolls as responsible for the payment of real estate taxes imposed on the property.
Non-Agricultural Land	Any land that is not "Agricultural Land" as defined above.
Pipeline Construction	A substantial disturbance to agricultural land associated with installation, replacement, removal, operation or maintenance of a pipeline.
Soil Conservation Practices	Any land conservation practice recognized by federal or state soil conservation agencies including, but not limited to, grasslands and grassed waterways, hay land planting, pasture, and tree plantings.
Soil Conservation Structures	Any permanent structure recognized by federal or state soil conservation agencies including but not limited to toe walls, drop inlets, grade control works, terraces, levees, and farm ponds.
Right-of-Way (ROW)	Includes the permanent and temporary easements that DAPL acquires for the purpose of constructing and operating the Pipeline.
Tenant	Any person lawfully residing on or in possession of the land, which makes up the "Right-of-Way" (ROW) as defined in this Plan.
Tile	Any artificial subsurface drainage system including clay and concrete, tile, vitrified sewer tile, corrugated plastic tubing and stone drains.
Till	Till is to loosen the soil in preparation for planting or seeding by plowing, chiseling, disking, or similar means. Agricultural land planted using no-till planting practices is also considered tilled.
Topsoil	The upper part of the soil which is the most favorable material for plant growth and which can ordinarily be distinguished from subsoil by its higher organic content and darker color.
Surface Drains	Any surface drainage system such as shallow surface field drains, grassed waterways, open

	ditches, or any other constructed facilities for the conveyance of surface water.

6 AGRICULTURAL MITIGATION MEASURES

The following describes how DAPL proposes to minimize and repair impacts to agricultural lands.

a. CLEARING BRUSH AND TREES ALONG THE EASEMENT

DAPL will be responsible for negotiating compensation related to cutting of any brush and timber for construction of the pipeline with the landowner. Options for removal include: the landowner harvesting any marketable timber/vegetation, the contractor cutting and windrowing along the ROW for Landowner's use, chipped, burned, or hauled off for proper disposal. Unless otherwise restricted by federal, state or local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but are not limited to, burning, chipping, or removal from the property and be approved by the DAPL representative and coordinated with the landowner prior to implementation.

Unless otherwise restricted by federal, state of local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but not limited to burning, chipping or completed removal from the property and be approved by the DAPL Chief Inspector & Lead Environmental Inspector prior to implementation.

b. TOPSOIL SEPARATION AND REPLACEMENT

Topsoil and subsoil excavated for pipeline installation will be separated and segregated in separate stockpiles, and returned to the excavation in reverse order to restore the site to pre-construction condition. The depth of the topsoil to be stripped will be a maximum depth of 12 inches or actual depth of top soil if less than 12 inches or as agreed upon with the landowner. Upon request from the landowner, DAPL will measure topsoil depth at selected locations before and after construction.

The stored topsoil and subsoil will have sufficient separation to prevent mixing during the storage period. Topsoil will not be used to construct field entrances or drives, will not be stored or stockpiled at locations that will be used as a traveled way by construction, or be removed from the property, without the written consent of the landowner. Drainage gaps in the topsoil and subsoil piles will be left to avoid blocking drainage across the right of way.

Topsoil will not be removed where the pipeline is installed by plowing, jacking, boring, or other methods that do not require the opening of a trench.

The topsoil will be replaced so the upper portion of the pipeline excavation and the crowned surface, and the cover layer of the area used for subsoil storage, contains only the topsoil originally removed.

In most areas, ditch-line crowns will be installed to allow for and counter-act ditch settling. In the event the landowner will not allow a ditch-line crown, DAPL may have to regrade the right of way in

subsequent growing season. In this situation, DAPL may regrade the construction right of way and till down to 12 inches to manipulate the soil such that the original contours and elevation are restored. The depth of the replaced topsoil will conform as nearly as possible to the depth removed. Where excavations are made for road, stream, drainage ditch, or other crossings, the original depth of topsoil will be replaced as nearly as possible.

c. Prevention of Erosion

DAPL will follow best management practices and industry standards for erosion and sedimentation control during construction and post-construction. DAPL will develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will detail the project specific stormwater and soil erosion prevention measures. In addition to the SWPPP stipulations, all of the regulations and conditions associated with the required South Dakota DNR NPDES permit will require the Contractor's full compliance. An approved SWPPP and South Dakota DNR NPDES permit will be required before any earth disturbing construction activities can take place.

d. Aboveground Facilities

The location for any aboveground structures will be selected in coordination with respective landowners. If use of agricultural land use is appropriate and/or necessary, aboveground structures will be located in a manner to minimize interference with agricultural operations. Compensation for aboveground structures will be negotiated as part of landowner compensation.

e. Pumping Water from Open Trenches

Trench and/or pit dewatering is necessary due to accumulation of precipitation and/or groundwater in open trenches; the Contractor will locate discharges within the Project ROW whenever feasible to avoid potential impacts to adjacent areas. Should a discharge need to occur outside of the ROW, prior landowner approval will be obtained and the area will be restored to pre-construction conditions. Pumping will occur in a manner that will avoid damaging adjacent agricultural land, crops, and/or pasture. Erosion and sedimentation control measures will be implemented and may include the use of dewatering structures, splash plates, sediment bags, haybales, and silt fence. The removal and disposal of trench water will comply with applicable drainage laws and local ordinances relating to such activities as well as provisions of the federal Clean Water Act.

Prior to initiating dewatering activities, the EI must check the water discharge situation to ensure that the best management practices are applied in such a way to avoid erosion and sedimentation offsite.

At each location where dewatering is to be conducted, the contractor must consider the following conditions in planning the dewatering event.

a. **Water Discharge Setting** – The contractor shall assess each water discharge situation to include:

(1) Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to soak into the ground as compared to clay soils.

(2) Ground Surface - The topography in the area that would influence the surface flow of the discharged water.

(3) Adjustable Discharge Rate - The flow rate of the discharged water (which may need to vary) can be managed based on the site conditions to minimize instances of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may soak into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area)

(4) Discharge Outfall - The amount of hose and number/size of pumps needed to attempt to discharge water at a location, which drains away from waterbodies or wetlands.

b. **Pump Intake** - Use floating suction hose or other similar measures to prevent sediment from being sucked from bottom of trench.

c. **Overwhelming Existing Drainage** - If the discharge (assumed to be clean) does enter a stream, the flow added to the stream cannot exceed 50 percent of the peak storm event flow (to prevent adding high water volumes to a small stream channel that causes erosion due to imposing high flow conditions on the stream.

d. **Filtering Mechanism**

(1) All dewatering discharges will be directed through a filtering device as indicated below.

i) Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area through a geotextile filter bag. Geotextile bags need to be sized appropriately for the discharge flow and suspended sediment particle size.

ii) Straw Bale Dewatering Structure – Where the dewatering discharge point cannot be located in an upland area due to site conditions and/or distance, the discharge should be directed into a straw bale dewatering structure. The size of the straw bale dewatering structure is dependent on the maximum water discharge rate. A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.

iii) Alternative dewatering methods (e.g., use of water cannons) may be approved by DAPL on a site-specific basis.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair

can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

(1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

(2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

(3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

(4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

(1) All damaged, broken, or cracked tile will be removed.

(2) Only unobstructed tile will be used for replacement.

(3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

(4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

(5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

(6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

g. Removal of Rocks and Debris from the Right-of-Way

Excess rocks will be removed from the right-of-way. On completion, the topsoil in the easement area will be free of all rocks larger than three inches in average diameter that are not native to the topsoil prior to excavation, and similar to adjacent soil not disturbed by construction. The top 24 inches of the trench backfill will not contain rocks in any greater concentration or size than exist in the adjacent natural soils. Consolidated rock removed by blasting or mechanical means shall not be placed in the backfill above the natural bedrock profile or above the frost line. In addition, DAPL will examine areas adjacent to the easement and along access roads and will remove any large rocks or debris that may have rolled or blown from the right-of-way or fallen from vehicles.

Rock that cannot remain in or be used as backfill will be disposed of at locations and in a manner mutually satisfactory to the company's environmental inspector and the landowner. All debris attributable to the pipeline construction and related activities will be removed and disposed of properly; such debris includes spilled oil, grease, fuel, or other petroleum or chemical products. Such products and any contaminated soil will be removed for proper disposal or treated by appropriate in situ remediation.

h. Restoration after Soil Compaction and Rutting

Agricultural land compacted by heavy project equipment, including off right-of-way access roads, will be deep tilled to alleviate soil compaction upon completion of construction on the property. In areas where topsoil was removed, tillage will precede replacement of topsoil. At least three passes with the deep tillage equipment shall be made. Tillage shall be at least 18 inches deep in land used for crop production and 12 inches deep on other lands,(except where shallow tile systems are encountered), and shall be performed under soil moisture conditions which permits effective working of the soil. If agreed in advance, this tillage may be performed by the landowners or tenants using their own equipment.

Rutted land will be graded and tilled until restored as near as practical to its preconstruction condition. On lands where topsoil was removed, rutting will be remedied before topsoil is replaced.

i. Restoration of Terraces, Waterways and other Erosion Control Structures

Existing soil conservation practices and structures damaged by pipeline construction, such as surface drains, embankments and terraces, grass waterways will be restored to pre-construction elevation, grade and condition. Any drain lines or flow diversion devices impacted by pipeline construction will be

repaired or modified as needed. Soil used to repair embankments intended to retain water shall be well compacted. Disturbed vegetation will be reestablished, including a cover crop when appropriate. Restoration of terraces will be in accordance with Standard Drawings in Appendix A.

j. Revegetation of Untilled Land

Agricultural land not in row crop or small grain production at the time of construction, such as hay fields and land in conservation or set-aside programs, will be reseeded following completion of deep tillage and replacement of the topsoil. The seed mix used will restore the original or a comparable ground cover unless otherwise requested by the landowner.

Land that is normally used for crops that will not be planted due to pipeline construction will be seeded with an appropriate cover crop following replacement of the topsoil and completion of deep tillage, unless otherwise agreed to with the landowner. Cover crop seeding may be delayed if construction is completed too late in the year for a cover crop to establish and in such instances is not required if the landowner or tenant proposed to till the land the following year.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will consult with the landowner concerning the landowner's plans for these future actions.

l. Restoration of Land Slope and Contour

The slope, contour, grade, and drainage pattern of the disturbed area will be restored as nearly as possible to its preconstruction condition. However, the trench may be crowned to allow for anticipated settlement of the backfill. DAPL will remediate areas of excessive or insufficient settlement in the trench area where it visibly affects land contour or alters surface drainage. Disturbed areas where erosion causes excessive rills or channels or areas of heavy sediment deposition, will be regraded as needed. On steep slopes, methods such as sediment barriers, slope breakers, or mulching will be used as necessary to control erosion until vegetation can be reestablished.

m. Siting and Restoration of Areas Used for Field Entrances and Temporary Roads

The location of temporary roads to be used for construction purposes will be negotiated with the landowner and the Tenant. The temporary roads will be designed to not impede proper drainage and will be built to minimize soil erosion on or near the temporary roads.

Post construction and restoration temporary field entrances or access roads will be removed and the land made suitable for its previous use, in agreement with the landowner. Areas affected will be regraded and deep tilled as required. If by agreement or at landowner request, and approved by local public road authorities, a field entrance or road is left in place, it will be left in a graded and serviceable condition.

n. Construction in Wet Conditions

Construction in wet soil conditions will not commence or continue at times when or locations where the passage of heavy construction equipment may cause rutting to the extent that the topsoil and subsoil are mixed, or underground drainage structures may be damaged. To facilitate construction in soft soils, DAPL may elect to remove and stockpile the topsoil from the traveled way, install mats or padding, or use other methods.

7 Compensation for Damages

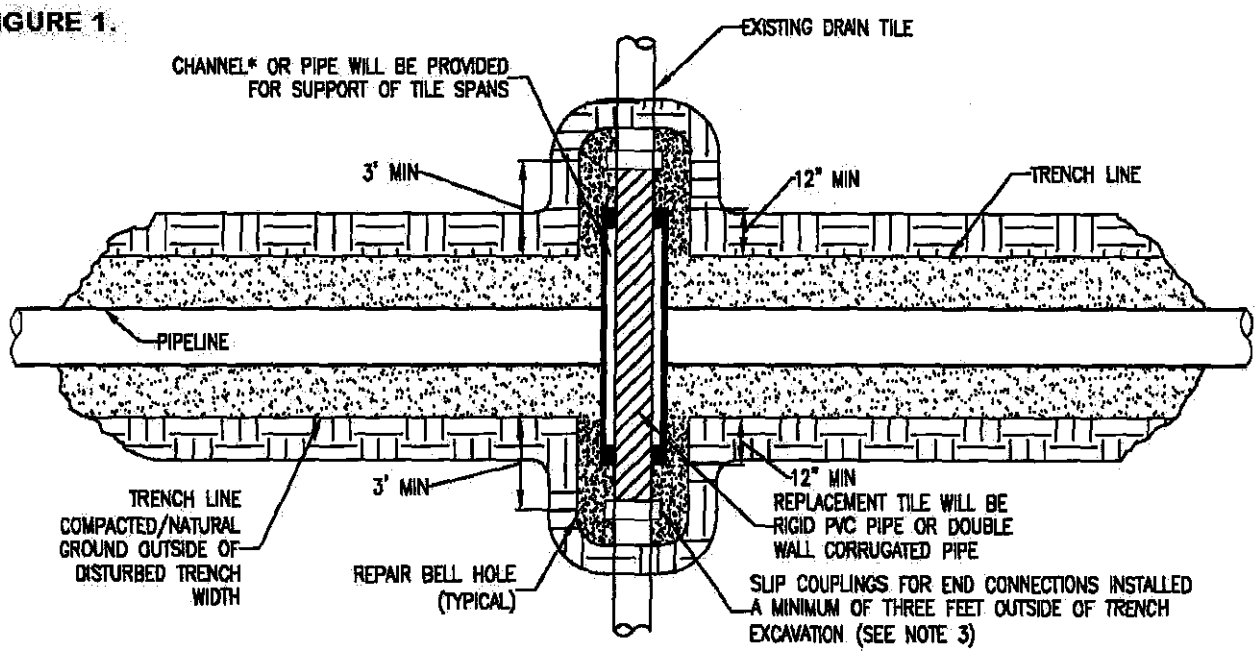
DAPL will be responsible for compensating the landowner for damages during construction. For crops, value of the loss will be established based on current crop values in the area of the impact per South Dakota Department of Agriculture statistics. DAPL will also compensate the landowner for loss of use of agricultural land, if attributable to pipeline construction. Supplemental soil sampling, testing and additional restoration activities to restore agricultural land to its pre-construction conditions will be undertaken by DAPL upon request of the landowner.

DAPL will also be responsible to compensate landowners for other physical property damage attributable to pipeline construction, such as fences, driveways and other structures.

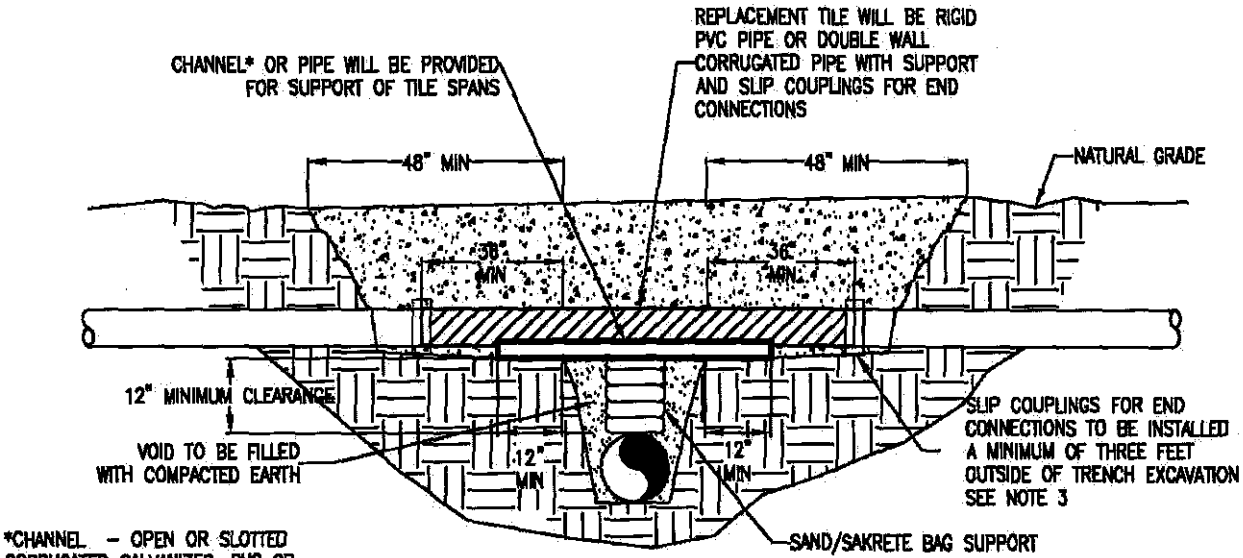
Appendix A

Tile Repair Drawings

FIGURE 1.



PLAN
N.T.S.



*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

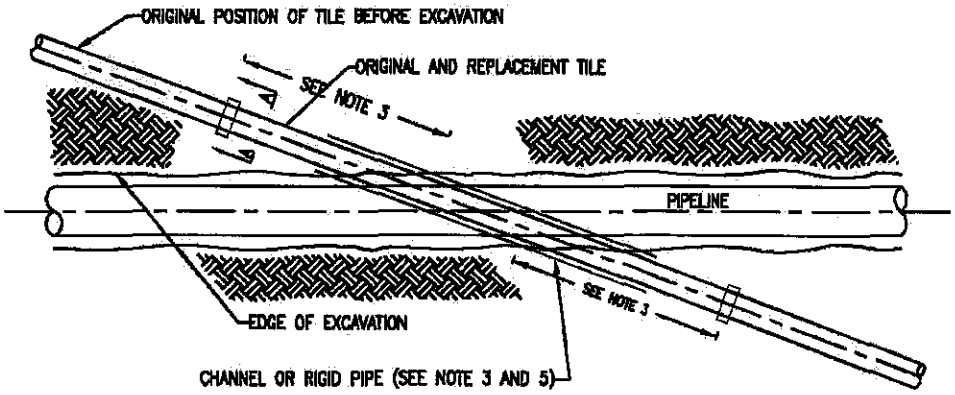
CROSS SECTION
N.T.S.

NOTE:

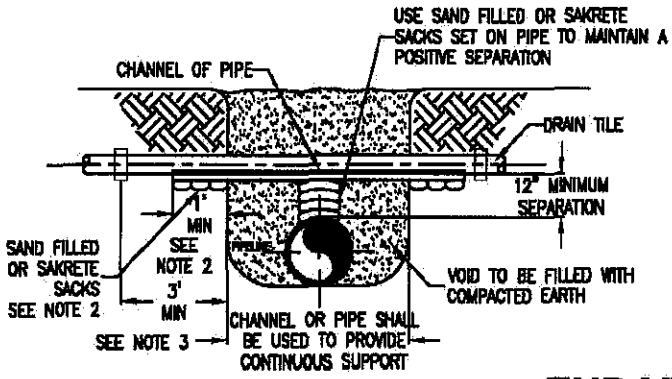
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

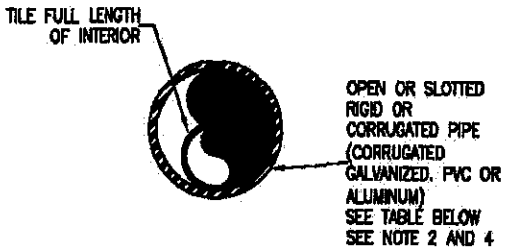
TEMPORARY DRAIN TILE REPAIR

FIGURE 2.



PLAN VIEW





END VIEWS

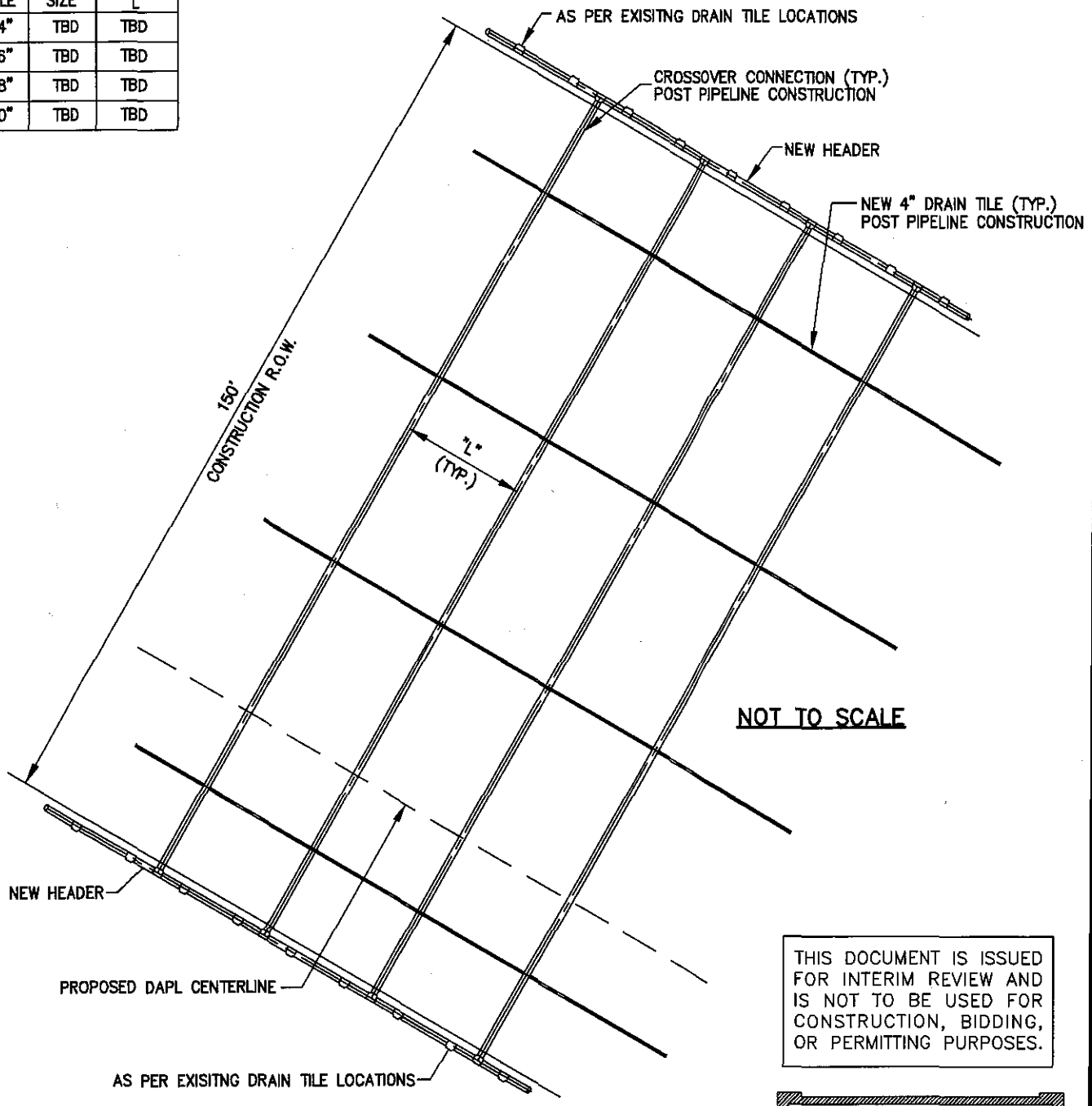
MINIMUM SUPPORT TABLE			
TILE SIZE	CHANNEL SIZE	PIPE SIZE	
3"	4" @ 5.4 #/ft	4"	STD. WT.
4"-5"	5" @ 6.7 #/ft	6"	STD. WT.
8"-9"	7" @ 9.8 #/ft	9"-10"	STD. WT.
10"	10" @ 15.3 #/ft	12"	STD. WT.

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.
2. 1'-0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAKRETE, OR SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).
3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.
4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.
5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.
6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.
7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

PERMANENT DRAIN TILE REPAIR

DRAIN TILE	HEADER SIZE	SPACING "L"
4"	TBD	TBD
6"	TBD	TBD
8"	TBD	TBD
10"	TBD	TBD



THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ISSUED FOR REVIEW
09/02/14

NOTES:
1. HEADERS WILL BE CONNECTED TO EXISTING DRAIN TILE PRE-CONSTRUCTION.
2. CROSSOVER PIPING WILL BE INSTALLED POST PIPELINE INSTALLATION.

REV.	DATE	BY	DESCRIPTION	CHK.
A	9/2/14	DAH	ISSUED FOR REVIEW	

PROJECT NO. 10395700

DAPL/ETCOP

TYPICAL DRAIN TILE HEADER SYSTEM

DRAWN BY: DAH	DATE: 09/02/14	DWG. NO.	REV.
CHECKED BY: DAH	DATE: 09/02/14	P12-49	A
SCALE: N.T.S.	APP.:		

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-1

State the name, current address, and telephone number of the person or persons answering these interrogatories.

Response:

See the individual responses for the information requested.

Prepared By: Stephen Veatch
Title: Senior Director - Certificates
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2024

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-2

As mentioned by commenters and intervenors in this case, the 10-K filed by Energy Transfer Partners, L.P. for the 2013 fiscal year states, "we cannot assure you that our current reserves are adequate to cover all future liabilities." Please explain why this should not be a concern to the public.

Response:

The language referred to in the South Dakota PUC question, is taken from one of the risk factors in the 2013 Energy Transfer Partners, L.P.10-K ("10-K"). That particular risk factor states that, given the nature of our business, there could be a potential impact to the company in the future from laws and regulations, particularly those related to environmental remediation. Similar to the other risks related to our business that are discussed in that section of the 10-K, this risk factor addresses the potential negative impacts that could occur in the future, regardless of whether those impacts are probable or remote or whether any associated potential liabilities can be reasonably estimated. It is simply stating that future events could occur, or information could come to light in the future, that could change what we need to reserve for those liabilities. It does not mean that we would not expect to have adequate liquidity to handle such obligations. This language in the 10-K is designed to warn and inform the various investors to make an informed decision when investing and to notify the investing public of the risks of investing into Energy Transfer and that with any investment into a publicly traded company, there is no way to guarantee the potential unknown or future liabilities and therefore there may or may not be adequate funds to cover those unknown or future liabilities, Please be assured that Energy Transfer Partners follows all applicable accounting and disclosure requirements for loss contingencies.

Prepared By: Jim Wright
Title: Deputy General Counsel
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2010

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-3

Does the surge tank that will be located at the pump station require an aboveground storage tank permit from the DENR?

Response:

No.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-4

Please provide the Company's analysis of the project's risk analysis to drinking water in Lincoln County, given the high water table.

Response:

Normal operation of the pipeline carries no risk to drinking water for humans or livestock. Analyses of risks due to leaks are currently being evaluated through spill modeling; appropriate mitigation measures will be implemented into the design and Facility Response Plan (FRP). The FRP will be filed prior to operation as required by state and federal law. The pipeline is being designed and will be operated to meet or exceed federal and industrial standards regardless of the depth to groundwater.

Please note that wellhead protection areas and source water zones were identified in consultation with the South Dakota Department of Environment and Natural Resources (SDDENR) and avoided during routing to further limit potential impacts to drinking water. None of these areas or zones were identified in Lincoln County.

Further, preconstruction activities include locating wells through data base searches, landowner contacts and physical surveys. The location of all wells within the survey corridor will be collected by global positioning system and excluded from the Project workspace.

Lastly, we are in discussions with water distribution companies to review processes for construction techniques where water distribution lines are encountered along the route. We expect those to include lower waterlines and install casing within the pipeline easement, maintaining a separation below pipeline, as required, at crossing locations.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-5

Outside of the single pumping station, does the applicant intend to construct any other buildings along the route? If so, where and for what purpose?

Response:

At each mainline valve where remote controlled communication equipment is proposed, a small data communications shed or building will be installed. These buildings are not intended to house staff or people, but rather to protect the sensitive equipment from the environmental elements. No utilities other than electricity are proposed with the shed or small building.

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-6

Please provide a general description of any pipeline markers and cathodic protection facilities, including their proposed locations.

Response:

According to Part 195.410 buried pipeline markers "must be located at each public road crossing, at each railroad crossing, and in sufficient number along the remainder of each buried line so that its location is accurately known". Test Leads will be installed with some of those pipeline markers. Cathodic protections facilities will be located as required along the pipeline, typical at road crossing and pipeline facilities.

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Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-7

Many commenters have expressed concern for a lack of decommissioning bonding or plan. Please explain why this should not be a concern to the public.

Response:

Energy Transfer and their partners are investing more than $3.8 Billion to serve the producers who have signed contracts and who will rely upon this pipeline to transport their product from the Bakken region. This is not a short term investment and there are no foreseeable plans for decommissioning. With proper design and operation, the longevity of a pipeline project can well exceed a century. Essentially all production in the Bakken would have to cease before this pipeline would be obsolete as pipelines are the cheapest and safest way to transport product from the Bakken. Should production in the Bakken region decline or the market tighten, this economical solution of pipeline transportation becomes even more important to producers to monetize their investment. With the value of this asset, and its value to the US economy, it is unreasonable to predict that it will not be utilized for the foreseeable future. When appropriate, decommissioning would take place according to prevailing rules and regulations making a decommissioning plan developed today obsolete.

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Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-8

If landowners are unaware of existing easements that DAPL easements violate, is the landowner liable for violation of the original easement?

Response:

In no event would a landowner be liable for any of DAPL's actions or if DAPL violated an easement term or a third party easement on private property. DAPL specifically indemnifies that landowner from any and all liability as it relates to actions caused by DAPL. If a landowner violated DAPL's rights under its easements or a third party land right, knowingly or not, they would be liable for any damages to DAPL or the third party for their negligence, just like anyone else in any other land situation where one person has a prescriptive or express right in land via ownership, easement, grant or any other form or legal land rights pursuant to state law.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2710

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-9

Per comments provided by Nancy Stofferahn in the docket, please provide any correspondence with Nortec Seeds regarding routing conflicts as a result of their plans to expand facilities. Does the company believe the proposed route threatens the economic integrity of Nortec Seeds? If so, what has been done or could be done to mitigate any such negative economic impact?

Response:

Dakota Access representatives have called or met with the owners of Nortec Seeds eleven times over a period of several months (November 10, 2014 – March 5, 2015) in an effort to obtain survey permission to determine the impact, if any, of the pipeline route with respect to Nortec's property or potential planned expansions; however, survey permission has been expressly and repeatedly denied. Dakota Access is not in possession of information regarding Nortec Seeds' current economic integrity nor any plans or details relative to a business expansion. The route is currently greater than 700 feet north of the Nortec Seed shed referenced in the letter and the route extends in a north northwesterly direction thus providing additional distance between the remainder of the route and the existing structures on this property. With respect to any planned expansions, the permanent easement would only prohibit permanent structures from being constructed within the fifty foot wide permanent easement, thus providing approximately 650 feet of possible expansion for structures after installation of the pipeline (550 prior to pipeline construction).

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Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-10

Per comments provided by Matthew Anderson in the docket, please address his concern that the AIMP "leaves many exceptions for Dakota Access not to repair drainage tile back to its original condition."

Response:

A discussion of the temporary and permanent repair of drain tiles is addressed in Sections 6f. and 6k. the Agriculture Impact Mitigation Plan and provided again below. A revised copy of the Plan is attached to this filing.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

(1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

(2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

(3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

(4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
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d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

(1) All damaged, broken, or cracked tile will be removed.

(2) Only unobstructed tile will be used for replacement.

(3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

(4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

(5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

(6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will

Dakota Access, LLC
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Response to South Dakota Public Utilities Commission
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consult with the landowner concerning the landowner's plans for these future actions.

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Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-11

Per comments provided by John Peterson in the docket, please address his concern that red bellied dace, sticklebacks, and river otters may be affected by the project.

Response:

Based on review of aerial photography and topographic mapping, there are two waterbodies present on the subject property; an unnamed tributary of the Big Sioux River and a secondary tributary. The Dakota Access route maintains a distance of approximately 500 feet to the unnamed tributary and only crosses the secondary tributary.

Dakota Access conducted environmental surveys within a 400-foot corridor centered on the pipeline across the subject property in April 2015. Based on the field data the secondary tributary that is crossed has no defined channel or ordinary high water mark at the crossing location and was recorded as an emergent wetland; however was documented as channelized and defined elsewhere within the survey corridor and was dry at the time of survey. The proposed crossing location is not suitable habitat for the fish species referenced in the letter. While it is possible for river otters from the Big Sioux River to utilize this area for intermittent foraging, this species is highly mobile, would avoid the area during construction, and adverse impacts cannot be reasonably assumed.

As provided in their initial application, Dakota Access will comply with the U.S. Army Corps of Engineers Nationwide Permit 12 conditions for crossing the wetland on this subject property. Dakota Access will implement best management practices to mitigate for potential construction related impacts associated with stormwater runoff and sedimentation off the right-of-way or into to the tributaries. Additionally, Dakota Access will implement the Spill Prevention Control and Countermeasure Plan to protect sensitive resources from inadvertent releases during construction activities.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-12

In case of erosion, should the pipeline become shallow at any point, will the company be responsible for the costs of adding to the ground cover?

Response:

Yes, DAPL is responsible for the costs of any maintenance to ensure adequate ground cover over it pipeline. If the loss of soil is intentional caused by the action of a third party, DAPL may have the right to seek relief in court to seek fair compensation or remediation of the direct action that caused the soil loss. However for any natural erosion, DAPL would be responsible to provide replacement cover or to lower the line pursuant to Federal standards for cover pursuant to 49 CFR Part 195.

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Title: Director – Environmental Science
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Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-13

Describe Applicant's plan to restore drainage tile to working condition following construction.

Response:

As answered in response to Interrogatory 1-10 herein, Dakota Access has outlined their proposed procedures for temporary and permanent repair of drain tiles in Sections 6f. and 6k. the Agriculture Impact Mitigation Plan. A revised copy of the Plan is attached to this filing.

Prepared By: Jack Edwards
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AGRICULTURAL IMPACT MITIGATION PLAN

Dakota Access Pipeline Project (DAPL)

Final Draft

State of South Dakota

Energy Transfer

September 2014

Revised April 2015 in response to PUC Data Request

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A Tile Repair Drawings

Acronyms and Abbreviations

DAPL	Dakota Access Pipeline, LLC (Project Sponsor)
EI/AI	Environmental Inspector/Agricultural Inspector

1 INTRODUCTION

Dakota Access Pipeline, LLC (DAPL) is planning a new 30-inch pipeline to transport crude oil from the Bakken Shale region of North Dakota to Illinois. The eastern terminus of the pipeline will connect with an existing pipeline that will transport the crude oil to the Gulf Coast for processing.

The South Dakota section of the pipeline comprises a 277-mile corridor that will run from north central South Dakota to southeast South Dakota. The proposed pipeline will enter South Dakota in Campbell County and diagonally traverse the state, exiting at the crossing of the Big Sioux River in Lincoln County, South Dakota.

The purpose of this document is to present the proposed measures for minimizing impacts to and restoring agricultural lands during and after pipeline construction.

2 PLAN LIMITATIONS

Mitigation measures identified in this plan apply only to agricultural land and do not apply to urban land, road and railroad right-of-way, interstate natural gas pipelines, mined and disturbed land not used for agriculture. The identified mitigation measures will be implemented as long as they do not conflict with federal, state, and local permits, approvals and regulations.

3 SEQUENCE OF CONSTRUCTION EVENTS AND SCHEDULE

Pipeline construction is anticipated to commence January of 2016 following the receipt of required permits and approvals. Pipeline construction will take approximately 9 months to complete.

The sequence of events for pipeline construction will begin with advance notification of landowners and governmental agencies. Following notification, activities will be undertaken in the following sequence:

- Complete final surveys, stake centerline and workspace;
- Access road installation;
- Grubbing and clearing of the construction corridor;
- Installation of stormwater and erosion control measures;
- Placement of pipe and other supplies along the construction corridor;
- Pipeline welding and bending where necessary
- Excavation of the pipeline trench;
- Temporary repairs to tile lines, if encountered;
- Placement of the pipeline with the trench;
- Permanent repairs to tile lines damaged during construction activities;
- Backfill of the trench and rough grading,
- Hydrostatic testing of the pipeline;
- Final grading and restoration;

- Revegetation and post restoration monitoring; and
- Removal of erosion control measures.

4 POINTS OF CONTACT

Each landowner will be provided the name, telephone number, email address, and mailing address of the DAPL landowner representative two weeks prior to construction. This DAPL representative will be the primary contact person for the landowner throughout construction for easement issues. Landowner representatives will be assigned to that geographic area and be responsible for the liaison activities on behalf of DAPL.

In addition to the landowner representative, a team of experienced Environmental and/or Agricultural Inspectors (EIs/AIs), will be involved in project construction, the initial restoration, and the post-construction monitoring and follow-up restoration. For agriculture construction related issues, the name and telephone number of the EI/AI will also be provided as a secondary contact during construction.

5 DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hayland or pasture and land in government set-aside programs.
Cropland	Land actively managed for growing row crops, small grains or hay.
Drainage Structures or Underground Improvements	Any permanent structure used for draining agricultural lands, including tile systems and buried terrace outlets.
Easements	The agreement(s) and/or interest in privately owned Agricultural Land held by DAPL by virtue of which it has the right to construct, operate and maintain the pipeline together with such other rights and obligations as may be set forth in such agreement.
Environmental Construction Plan (ECP)	Document to present basic environmental construction techniques will be implemented to protect the environment and to minimize potential effects of pipeline and related facilities construction and maintenance.
Pipeline	Any pipe, pipes, or pipelines used for the transportation or transmission of any solid, liquid, or gaseous substance, except water, in

	intrastate or interstate commerce.
Landowner	Person listed on the tax assessment rolls as responsible for the payment of real estate taxes imposed on the property.
Non-Agricultural Land	Any land that is not "Agricultural Land" as defined above.
Pipeline Construction	A substantial disturbance to agricultural land associated with installation, replacement, removal, operation or maintenance of a pipeline.
Soil Conservation Practices	Any land conservation practice recognized by federal or state soil conservation agencies including, but not limited to, grasslands and grassed waterways, hay land planting, pasture, and tree plantings.
Soil Conservation Structures	Any permanent structure recognized by federal or state soil conservation agencies including but not limited to toe walls, drop inlets, grade control works, terraces, levees, and farm ponds.
Right-of-Way (ROW)	Includes the permanent and temporary easements that DAPL acquires for the purpose of constructing and operating the Pipeline.
Tenant	Any person lawfully residing on or in possession of the land, which makes up the "Right-of-Way" (ROW) as defined in this Plan.
Tile	Any artificial subsurface drainage system including clay and concrete, tile, vitrified sewer tile, corrugated plastic tubing and stone drains.
Till	Till is to loosen the soil in preparation for planting or seeding by plowing, chiseling, disking, or similar means. Agricultural land planted using no-till planting practices is also considered tilled.
Topsoil	The upper part of the soil which is the most favorable material for plant growth and which can ordinarily be distinguished from subsoil by its higher organic content and darker color.
Surface Drains	Any surface drainage system such as shallow surface field drains, grassed waterways, open

	ditches, or any other constructed facilities for the conveyance of surface water.

6 AGRICULTURAL MITIGATION MEASURES

The following describes how DAPL proposes to minimize and repair impacts to agricultural lands.

a. CLEARING BRUSH AND TREES ALONG THE EASEMENT

DAPL will be responsible for negotiating compensation related to cutting of any brush and timber for construction of the pipeline with the landowner. Options for removal include: the landowner harvesting any marketable timber/vegetation, the contractor cutting and windrowing along the ROW for Landowner's use, chipped, burned, or hauled off for proper disposal. Unless otherwise restricted by federal, state or local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but are not limited to, burning, chipping, or removal from the property and be approved by the DAPL representative and coordinated with the landowner prior to implementation.

Unless otherwise restricted by federal, state of local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but not limited to burning, chipping or completed removal from the property and be approved by the DAPL Chief Inspector & Lead Environmental Inspector prior to implementation.

b. TOPSOIL SEPARATION AND REPLACEMENT

Topsoil and subsoil excavated for pipeline installation will be separated and segregated in separate stockpiles, and returned to the excavation in reverse order to restore the site to pre-construction condition. The depth of the topsoil to be stripped will be a maximum depth of 12 inches or actual depth of top soil if less than 12 inches or as agreed upon with the landowner. Upon request from the landowner, DAPL will measure topsoil depth at selected locations before and after construction.

The stored topsoil and subsoil will have sufficient separation to prevent mixing during the storage period. Topsoil will not be used to construct field entrances or drives, will not be stored or stockpiled at locations that will be used as a traveled way by construction, or be removed from the property, without the written consent of the landowner. Drainage gaps in the topsoil and subsoil piles will be left to avoid blocking drainage across the right of way.

Topsoil will not be removed where the pipeline is installed by plowing, jacking, boring, or other methods that do not require the opening of a trench.

The topsoil will be replaced so the upper portion of the pipeline excavation and the crowned surface, and the cover layer of the area used for subsoil storage, contains only the topsoil originally removed.

In most areas, ditch-line crowns will be installed to allow for and counter-act ditch settling. In the event the landowner will not allow a ditch-line crown, DAPL may have to regrade the right of way in

subsequent growing season. In this situation, DAPL may regrade the construction right of way and till down to 12 inches to manipulate the soil such that the original contours and elevation are restored. The depth of the replaced topsoil will conform as nearly as possible to the depth removed. Where excavations are made for road, stream, drainage ditch, or other crossings, the original depth of topsoil will be replaced as nearly as possible.

c. Prevention of Erosion

DAPL will follow best management practices and industry standards for erosion and sedimentation control during construction and post-construction. DAPL will develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will detail the project specific stormwater and soil erosion prevention measures. In addition to the SWPPP stipulations, all of the regulations and conditions associated with the required South Dakota DNR NPDES permit will require the Contractor's full compliance. An approved SWPPP and South Dakota DNR NPDES permit will be required before any earth disturbing construction activities can take place.

d. Aboveground Facilities

The location for any aboveground structures will be selected in coordination with respective landowners. If use of agricultural land use is appropriate and/or necessary, aboveground structures will be located in a manner to minimize interference with agricultural operations. Compensation for aboveground structures will be negotiated as part of landowner compensation.

e. Pumping Water from Open Trenches

Trench and/or pit dewatering is necessary due to accumulation of precipitation and/or groundwater in open trenches; the Contractor will locate discharges within the Project ROW whenever feasible to avoid potential impacts to adjacent areas. Should a discharge need to occur outside of the ROW, prior landowner approval will be obtained and the area will be restored to pre-construction conditions. Pumping will occur in a manner that will avoid damaging adjacent agricultural land, crops, and/or pasture. Erosion and sedimentation control measures will be implemented and may include the use of dewatering structures, splash plates, sediment bags, haybales, and silt fence. The removal and disposal of trench water will comply with applicable drainage laws and local ordinances relating to such activities as well as provisions of the federal Clean Water Act.

Prior to initiating dewatering activities, the EI must check the water discharge situation to ensure that the best management practices are applied in such a way to avoid erosion and sedimentation offsite.

At each location where dewatering is to be conducted, the contractor must consider the following conditions in planning the dewatering event.

a. **Water Discharge Setting** – The contractor shall assess each water discharge situation to include:

(1) Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to soak into the ground as compared to clay soils.

(2) Ground Surface - The topography in the area that would influence the surface flow of the discharged water.

(3) Adjustable Discharge Rate - The flow rate of the discharged water (which may need to vary) can be managed based on the site conditions to minimize instances of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may soak into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area)

(4) Discharge Outfall - The amount of hose and number/size of pumps needed to attempt to discharge water at a location, which drains away from waterbodies or wetlands.

b. **Pump Intake -** Use floating suction hose or other similar measures to prevent sediment from being sucked from bottom of trench.

c. **Overwhelming Existing Drainage -** If the discharge (assumed to be clean) does enter a stream, the flow added to the stream cannot exceed 50 percent of the peak storm event flow (to prevent adding high water volumes to a small stream channel that causes erosion due to imposing high flow conditions on the stream.

d. **Filtering Mechanism**

(1) All dewatering discharges will be directed through a filtering device as indicated below.

i) Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area through a geotextile filter bag. Geotextile bags need to be sized appropriately for the discharge flow and suspended sediment particle size.

ii) Straw Bale Dewatering Structure – Where the dewatering discharge point cannot be located in an upland area due to site conditions and/or distance, the discharge should be directed into a straw bale dewatering structure. The size of the straw bale dewatering structure is dependent on the maximum water discharge rate. A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.

iii) Alternative dewatering methods (e.g., use of water cannons) may be approved by DAPL on a site-specific basis.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair

can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

   (1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

   (2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

   (3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

   (4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

   (1) All damaged, broken, or cracked tile will be removed.

   (2) Only unobstructed tile will be used for replacement.

   (3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

   (4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

   (5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

   (6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

g. Removal of Rocks and Debris from the Right-of-Way

Excess rocks will be removed from the right-of-way. On completion, the topsoil in the easement area will be free of all rocks larger than three inches in average diameter that are not native to the topsoil prior to excavation, and similar to adjacent soil not disturbed by construction. The top 24 inches of the trench backfill will not contain rocks in any greater concentration or size than exist in the adjacent natural soils. Consolidated rock removed by blasting or mechanical means shall not be placed in the backfill above the natural bedrock profile or above the frost line. In addition, DAPL will examine areas adjacent to the easement and along access roads and will remove any large rocks or debris that may have rolled or blown from the right-of-way or fallen from vehicles.

Rock that cannot remain in or be used as backfill will be disposed of at locations and in a manner mutually satisfactory to the company's environmental inspector and the landowner. All debris attributable to the pipeline construction and related activities will be removed and disposed of properly; such debris includes spilled oil, grease, fuel, or other petroleum or chemical products. Such products and any contaminated soil will be removed for proper disposal or treated by appropriate in situ remediation.

h. Restoration after Soil Compaction and Rutting

Agricultural land compacted by heavy project equipment, including off right-of-way access roads, will be deep tilled to alleviate soil compaction upon completion of construction on the property. In areas where topsoil was removed, tillage will precede replacement of topsoil. At least three passes with the deep tillage equipment shall be made. Tillage shall be at least 18 inches deep in land used for crop production and 12 inches deep on other lands,(except where shallow tile systems are encountered), and shall be performed under soil moisture conditions which permits effective working of the soil. If agreed in advance, this tillage may be performed by the landowners or tenants using their own equipment.

Rutted land will be graded and tilled until restored as near as practical to its preconstruction condition. On lands where topsoil was removed, rutting will be remedied before topsoil is replaced.

i. Restoration of Terraces, Waterways and other Erosion Control Structures

Existing soil conservation practices and structures damaged by pipeline construction, such as surface drains, embankments and terraces, grass waterways will be restored to pre-construction elevation, grade and condition. Any drain lines or flow diversion devices impacted by pipeline construction will be

repaired or modified as needed. Soil used to repair embankments intended to retain water shall be well compacted. Disturbed vegetation will be reestablished, including a cover crop when appropriate. Restoration of terraces will be in accordance with Standard Drawings in Appendix A.

j. Revegetation of Untilled Land

Agricultural land not in row crop or small grain production at the time of construction, such as hay fields and land in conservation or set-aside programs, will be reseeded following completion of deep tillage and replacement of the topsoil. The seed mix used will restore the original or a comparable ground cover unless otherwise requested by the landowner.

Land that is normally used for crops that will not be planted due to pipeline construction will be seeded with an appropriate cover crop following replacement of the topsoil and completion of deep tillage, unless otherwise agreed to with the landowner. Cover crop seeding may be delayed if construction is completed too late in the year for a cover crop to establish and in such instances is not required if the landowner or tenant proposed to till the land the following year.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will consult with the landowner concerning the landowner's plans for these future actions.

l. Restoration of Land Slope and Contour

The slope, contour, grade, and drainage pattern of the disturbed area will be restored as nearly as possible to its preconstruction condition. However, the trench may be crowned to allow for anticipated settlement of the backfill. DAPL will remediate areas of excessive or insufficient settlement in the trench area where it visibly affects land contour or alters surface drainage. Disturbed areas where erosion causes excessive rills or channels or areas of heavy sediment deposition, will be regraded as needed. On steep slopes, methods such as sediment barriers, slope breakers, or mulching will be used as necessary to control erosion until vegetation can be reestablished.

m. Siting and Restoration of Areas Used for Field Entrances and Temporary Roads

The location of temporary roads to be used for construction purposes will be negotiated with the landowner and the Tenant. The temporary roads will be designed to not impede proper drainage and will be built to minimize soil erosion on or near the temporary roads.

Post construction and restoration temporary field entrances or access roads will be removed and the land made suitable for its previous use, in agreement with the landowner. Areas affected will be regraded and deep tilled as required. If by agreement or at landowner request, and approved by local public road authorities, a field entrance or road is left in place, it will be left in a graded and serviceable condition.

n. Construction in Wet Conditions

Construction in wet soil conditions will not commence or continue at times when or locations where the passage of heavy construction equipment may cause rutting to the extent that the topsoil and subsoil are mixed, or underground drainage structures may be damaged. To facilitate construction in soft soils, DAPL may elect to remove and stockpile the topsoil from the traveled way, install mats or padding, or use other methods.

7 Compensation for Damages

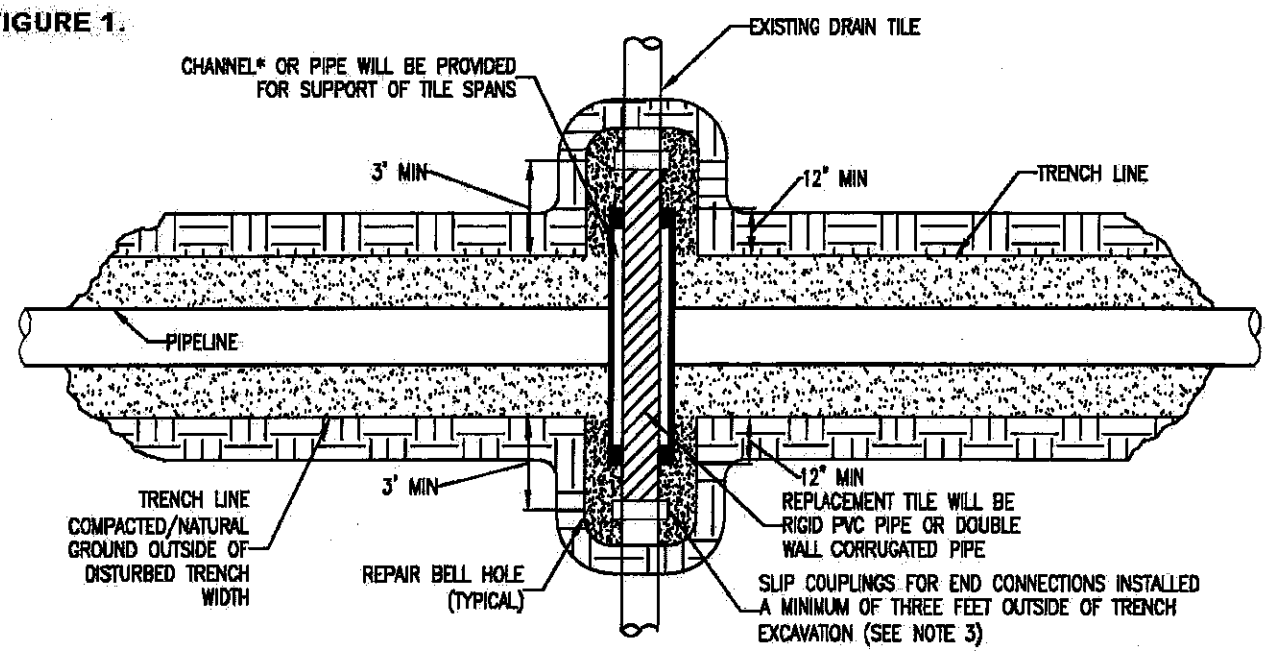
DAPL will be responsible for compensating the landowner for damages during construction. For crops, value of the loss will be established based on current crop values in the area of the impact per South Dakota Department of Agriculture statistics. DAPL will also compensate the landowner for loss of use of agricultural land, if attributable to pipeline construction. Supplemental soil sampling, testing and additional restoration activities to restore agricultural land to its pre-construction conditions will be undertaken by DAPL upon request of the landowner.

DAPL will also be responsible to compensate landowners for other physical property damage attributable to pipeline construction, such as fences, driveways and other structures.

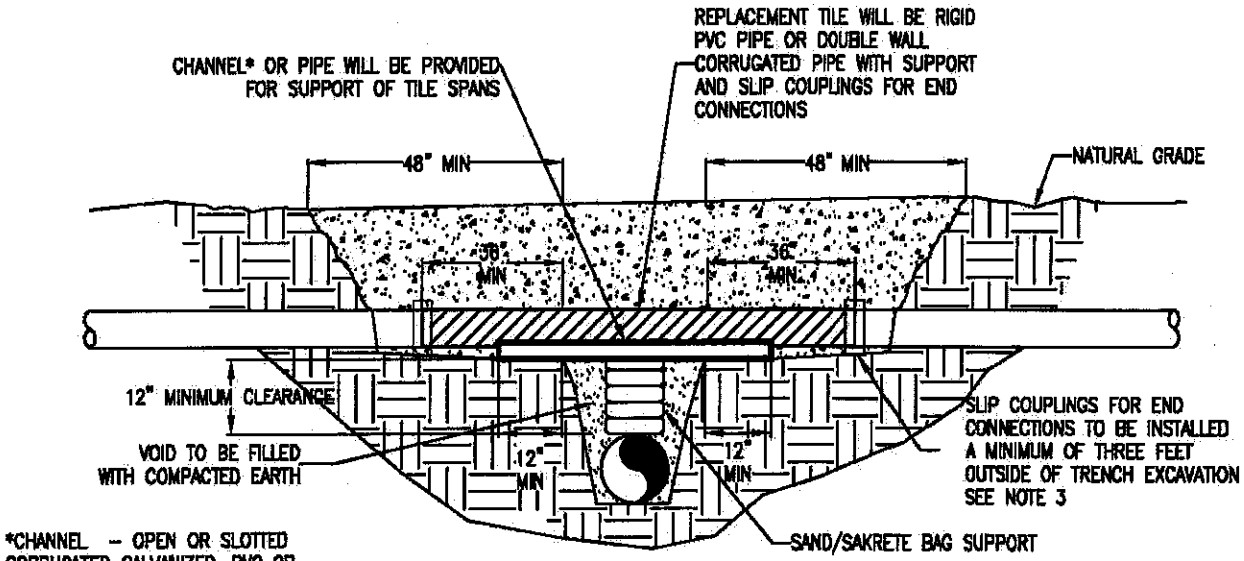
Appendix A

Tile Repair Drawings

FIGURE 1.



PLAN
N.T.S.



*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

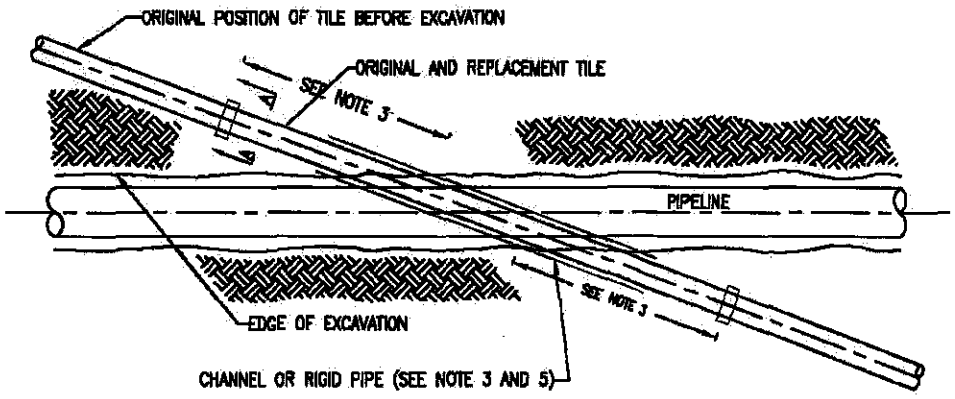
CROSS SECTION
N.T.S.

NOTE:

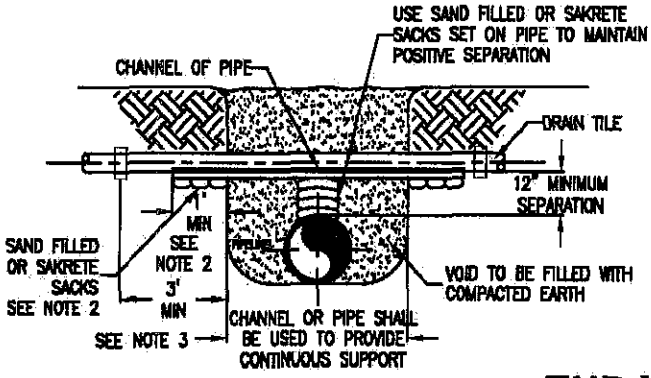
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

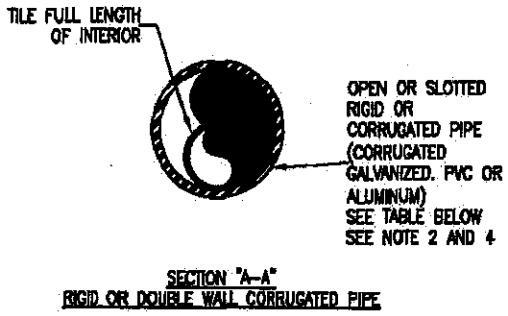
TEMPORARY DRAIN TILE REPAIR

FIGURE 2.



PLAN VIEW





SECTION "A–A"
RIGID OR DOUBLE WALL CORRUGATED PIPE

END VIEWS

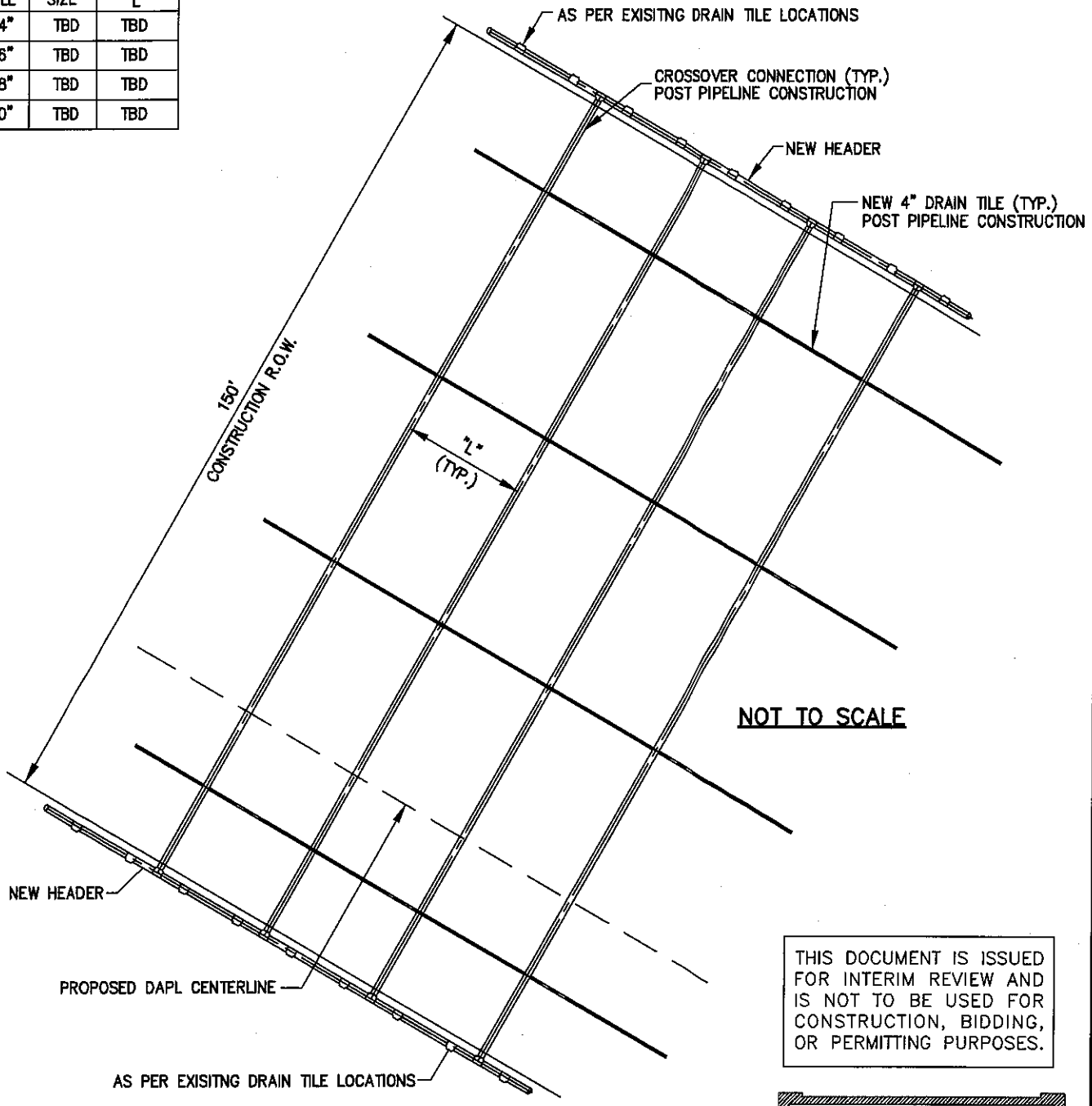
MINIMUM SUPPORT TABLE			
TILE SIZE	CHANNEL SIZE	PIPE SIZE	
3"	4" @ 5.4 #/ft	4"	STD. W.T.
4"-5"	5" @ 6.7 #/ft	6"	STD. W.T.
8"-9"	7" @ 9.8 #/ft	9"-10"	STD. W.T.
10"	10" @ 15.3 #/ft	12"	STD. W.T.

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.
2. 1'–0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAKRETE, OR SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).
3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.
4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.
5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.
6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.
7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

PERMANENT DRAIN TILE REPAIR

DRAIN TILE	HEADER SIZE	SPACING "L"
4"	TBD	TBD
6"	TBD	TBD
8"	TBD	TBD
10"	TBD	TBD



NOT TO SCALE

THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ISSUED FOR REVIEW
09/02/14

NOTES:
1. HEADERS WILL BE CONNECTED TO EXISTING DRAIN TILE PRE-CONSTRUCTION.
2. CROSSOVER PIPING WILL BE INSTALLED POST PIPELINE INSTALLATION.

REV.	DATE	BY	DESCRIPTION	CHK.
A	9/2/14	DAH	ISSUED FOR REVIEW	

PROJECT NO. 10395700

DAPL/ETCOP

TYPICAL DRAIN TILE HEADER SYSTEM

DRAWN BY: DAH	DATE: 09/02/14	DWG. NO. P12-49	REV. A
CHECKED BY: DAH	DATE: 09/02/14		
SCALE: N.T.S.	APP.:		

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-1

State the name, current address, and telephone number of the person or persons answering these interrogatories.

Response:

See the individual responses for the information requested.

Prepared by: Stephen Veatch
Title: Senior Director - Certificates
Address: 1300 Main St. Houston, TX 77002
Telephone Number: 713-989-2024

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-2

Briefly explain the status of any civil actions pending in South Dakota Circuit Court(s) regarding the Dakota Access Pipeline. Does Dakota Access anticipate the Circuit Courts(s) will take action prior to the date of the evidentiary hearing in this proceeding?

Response:

Dakota Access was denied survey access by property owners on various tracts of land along the route. As a result, Dakota Access requested the Circuit Court in relevant counties to enter an Order permitting access to property for the purpose of conducting necessary surveys. Dakota Access anticipates the Circuit Court will take action prior to the evidentiary hearing. Please advise if Staff would like additional information including property owner name, Circuit Court file numbers or any additional level of detail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-3

Referring to DAPL's Response to Staff's March 18, 2015, Data Request No. 3: Are shipping contracts take or pay contracts? In addition to oil fields production forecasts, refining capacity, and shipping contracts, are there any other assurances DAPL can provide to the public that the pipeline will be utilized over the near-term and mid-term?

Response:

The term used in the Shipper's contract is a "transportation and deficiency" contract. This term is synonymous with a "take or pay" contract, except the former is typically used in relation to the utilization of capacity and the latter typically relates to the receipt of the commodity. In summary, a "transportation and deficiency" contract is one under which the committed shipper agrees to pay the carrier for the availability of transportation service, even during periods when that transportation service is not actually utilized by the committed shipper. In addition to the applicable fees paid by the committed shipper for volumes actually transported in a month, the committed shipper pays a "deficiency payment" to the carrier for the volume of crude petroleum not transported within the committed shipper's committed volume of pipeline capacity. In terms of utilization in the near-term and mid-term, 100% of the committed shippers of Dakota Access have entered a transportation and deficiency contract with a term of 5 years or greater, and 98.6% of the committed shipper volume is under transportation and deficiency contracts with a term of 7 years or greater. Additionally, North Dakota has very limited refining capacity within the state; accordingly, the crude oil production in North Dakota must be transported to reach markets where it can be sold.

Prepared by: Damon Daniels
Title: Vice President – Commercial Operations
Address: 1300 Main Street Houston, Texas 77002
Telephone Number: 713-989-7920

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-4

Referring to DAPL's Response to Staff's March 18, 2015, Data Request No. 33: Specifically address the claims made by land owners that the notice they received contained either an incorrect name or address and how DAPL performed a Quality Assurance/Quality Control check to verify all landowners properly received notice according to SDCL 49-41B-5.2.

Response: The list of landowners entitled to notice, was generated through tax records kept by each local county government office. Notice letters were sent to landowner addresses on file. Two Hundred Eighty Three (283) letters were returned undeliverable based on the name and address on record with the local government office. The returned letters were all cross-checked against the tax record generated list. None of the letters were returned due to a printing error.

In addition to the letters, DAPL published notice per South Dakota code and provided notice to all county auditor offices.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota AccessAddress: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-5

Regarding the pump station in Spink County, please provide any known concerns from neighboring residences. Further, please identify any reasonable measures that DAPL plans to implement in order to mitigate concerns such as noise levels and viewshed deterioration that the pump station may cause.

Response: Neighboring residents have voiced noise level concerns. The pumps will be fully enclosed in buildings designed for noise abatement. Noise levels will be reduced to 55 dBA at the pump station property line. Dakota Access will add landscaping and/or paint highly visible components at the pump station to blend in with the landscape as a measure to minimize visual impacts.

Prepared by: Chris Srubar
Title: Engineer
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2879

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-6

Please provide references to any specific sections of the Application, any responses to discovery requests, and any other evidence that DAPL intends to use for demonstrating the Applicant meets the burden of proof to establish that "[t]he proposed facility will comply with all applicable laws and rules." [SDCL 49-41B-22(1)]

Response:

From Federal Pipeline Safety regulations to local county ordinances, Dakota Access is subject to all applicable rules and regulations. Every part of the pipeline's construction and operation is regulated by overlapping levels of government regulation. Table 5.0-1 in the Application lists the various government agencies or bodies which regulate or permit the process during the construction process and beyond. Dakota Access will comply with all rules and regulations of all listed agency or government body. In addition, Dakota Access is subject to all South Dakota Codified laws just as any other business in the State of South Dakota.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-7

In section 14.5 of the Application, page 13, it is identified that DAPL has retained an agricultural consultant to develop specific mitigation measures for work in shallow Natric soils. Please provide the name of the agricultural consultant that DAPL references.

Response:

Aaron DeJoia
DURAROOT ENVIRONMENTAL CONSULTING
4626 WCR 65 • Keenesburg, CO 80643

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-8

In section 16.3 of the Application it is identified that final results of field surveys and input from resource agencies were pending at the time the application was submitted. Please provide an update on the field surveys and agency consultation that has occurred since the application was filed. Moreover, please provide a copy of any finalized filed surveys and mitigation/protection measures to be implemented to protect sensitive, threatened, and endangered species.

Response: Field surveys are complete for all tracts with granted survey access. The only federally listed species potentially encountered along the project in South Dakota is the Topeka shiner at select locations. Dakota Access intends to HDD some of these streams and will comply with the Programmatic Biological Opinion for select Nationwide Permits in South Dakota for the Topeka shiner (October 2014) where the streams would be open cut; this has been communicated with the USACE regarding our submitted Nationwide Permit 12 Preconstruction Notifications that are pending verification.

The Class III cultural resource survey report was submitted to the South Dakota State Historic Preservation office on June 5, 2015.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-9

In section 17.1.1 of the Application it is stated that: "To minimize impacts to aquatic resources, appropriate remedial measures will be implemented to meet federal and state standards designed to ensure protection of aquatic biota." Please provide a discussion on the federal and state standards the project will need to meet and the Applicant's plan to implement the appropriate remedial measures to meet the standards.

Response: With respect to aquatic resources, the project will comply with all applicable sections of the Clean Water Act and South Dakota Codified Law regarding water quality. Dakota Access has submitted a verification request to the USACE for authorization under the Nationwide 12 permit. Dakota Access will comply with all conditions defined in the Nationwide 12 permit and issued verifications, including conditions required by the SD Department of Environment and Natural Resources 401 water quality certification that has been issued for Nationwide permit 12 to minimize impacts to aquatic resources.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-10

In section 17.4 and 17.4.1 of the Application, on page 30, it is identified that "pending final results of field surveys and input from resource agencies, appropriate mitigation and protection measures will be implemented to minimize potential impacts [to the Topeka shiner]." Please provide the status of final surveys and consultation with resource agencies. Also please provide results of any completed surveys and agency coordination that specifies the mitigation and protection measures deemed to be appropriate to protect the Topeka shiner.

Response: This is addressed in the response to interrogatory 2-8. The USACE and USFWS indicated that the Topeka shiner may be present at select locations along the project route in South Dakota. Dakota Access intends to HDD some of these streams and will comply with the Programmatic Biological Opinion for select Nationwide Permits in South Dakota for the Topeka shiner (October 2014) where the streams would be open cut; this has been communicated with the USACE regarding our submitted Nationwide Permit 12 Preconstruction Notifications that are pending verification.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-11

Please identify each parcel of property to be impacted by the pipeline that is owned by the State of South Dakota.

Response: See Interrogatory No. 2-11 Attachement No. 1

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-12

Please explain how any State of South Dakota owned land falls within the predictive model used to identify cultural resources and historic properties.

Response: The Project crosses one parcel of state owned property. The parcel was identified as having a high and moderate probability for cultural resources. The predictive model was based on environmental factors and known cultural resources to predict the likely locations of unidentified cultural resources.

Surveys have been completed at this tract; one archaeological site was encountered and the alignment was shifted to avoid the site. Survey results were included in the cultural resource reporting which in currently under review with the SD SHPO. No impacts to cultural resources are expected to impacted on this tract.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-13

Has Dakota Access applied for, or received, a permit from the State Archeologist to conduct filed investigations on State of South Dakota owned land? If answered in the affirmative, please provide a copy of the permit from the State Archeologist. If answered in the negative, will Dakota Access be filing for a permit from the State Archeologist in order to conduct field investigations on State of South Dakota owned land?

Response: A State Permit was obtained for this survey and is attached as SD PUC Interrogatory 2-13 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-14

Please provide any information or reports on Dakota Access's efforts made to identify cultural and historic sites sensitive to Native American Tribes along the project route.

Response: Dakota Access has not conducted any Traditional Cultural Properties (TCP) studies for the Project nor have they been requested. The cultural resource survey protocol was developed by Dakota Access in compliance with the applicable South Dakota and federal standards and was reviewed and approved by the SHPO prior to initiating field surveys. Dakota Access' surveys documented some potentially eligible sites for listing in the National Register of Historic Places. These sites have been largely avoided through route modifications and consultation is ongoing with the SHPO. Lead federal agencies (the USACE and USFWS in this case) are responsible for conducting government to government tribal consultations as they deem necessary in regard to their respective federal actions on the Project.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-15

In response to interrogatory 59 in DRA's first request for discovery, DAPL identifies that there will be three mainline construction spreads. In the revised application, DAPL identifies there will be two large construction spreads. Please clarify the number of construction spreads, and construction jobs associated with those spreads, that will occur during the construction phase in South Dakota.

Response:

Dakota Access plans to have three pipeline construction Spreads in South Dakota. Spread 5 (~124 Miles) will be entirely in South Dakota. Spread 4 (~ 127 Miles) will be in South Dakota and extend into Iowa to the southeast and Spread 6 will be in South Dakota and extend into North Dakota to the northwest.

Each pipeline construction spread will include approximately 700 to 1,000 persons per spread.

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-16

Please provide an update on consultation with the U.S. Fish and Wildlife Service. Has the agency provided Dakota Access with a biological opinion? If so, please provide a copy of the biological opinion and any mitigation measures or recommendations issued by the U.S. Fish and Wildlife Service for the Dakota Access Pipeline. If not, please identify when Dakota Access expects to receive the biological opinion.

Response: Please see responses to 2-8 and 2-10 above.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-17

Describe any measures DAPL will take to ensure that the source water for hydrostatic testing does not exceed water quality standards, such that the discharge of such water could result in a violation of hydrostatic testwater discharge quality limits.

Response: In accordance with required permits, Dakota Access will test source water prior to withdrawal and will take appropriate measures to ensure that discharges comply with applicable permit thresholds.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-18

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," on page 3 it states: "When used from this point forward in this Plan, "EI" will refer to the responsible person, whether it is the EI, CI, Health, Safety and Environmental (HSE) Coordinator, or Project Manager or other responsible person." Please provide a consistent definition of "EI" across the project plans and defined roles and responsibilities between the EI, the contractor, and other members of the construction team.

Response: Dakota Access has revised the Draft Stormwater Pollution Prevention Plan and it addresses this request. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-19

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," please clarify the following apparent discrepancy: On page 3 it is identified that "The Project's EI is responsible for determining the schedule and placement of BMPs." Although DAPL's SWPPP leaves this to the EI's discretion, the South Dakota General Permit states that the plan must comply with Section 3.9 as follows:

> **3.9 Erosion Control and Stabilization**
> The permittee shall stabilize disturbed portions of the site as soon as possible with appropriate BMPs, but in no case more than 14 days after construction activity has temporarily or permanently ceased on any portion of the site. An exception to this effluent limit is allowed if earth-disturbing activities will be resumed within 21 days. All other exceptions shall be approved on an individual basis by the Secretary.

Response: The EI's determination will meet or exceed (less time) than that stated in the South Dakota General Permit. The revised draft Stormwater Pollution Prevention Plan clarifies this. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-20

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," on page 4 it states: "The following represents a typical sequence of major soil-disturbing events during the Project and the control measures that will be implemented." Please provide a description of front-end grading and topsoil/subsoil storage.

Response: Appropriate descriptions have been incorporated into the attached revised Draft Stormwater Pollution Prevention Plan. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-21

Referring to the excerpt from the Application provided below, as found on page 14 of the Application, please define "specialized construction techniques." Would this include some kind of poly wrap or coating?

As outlined in Section 14.7– Seismic and Subsidence, desktop studies have identified a potential for karst geology along certain portions of the route. Dakota Access will conduct pre-construction training to educate personnel on the identification of karst features during excavation. If karst features are identified along the route, Dakota Access will take steps to ensure the integrity and safety of the pipeline, which may include realignment or specialized construction techniques.

Response:

See SD PUC Interrogatory No. 2-21 – Attachment No. 1

Prepared by: Mark Miller/Craig Erdman
Title: Group Leader-Principal/Senior Engineering Geologists
Address: 3050 S. Delaware Springfield, MO 65804
Telephone Number: 417-831-9700

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-22

Referring to the excerpt from the Application provided below, as found on page 16 of the application, please confirm that the need for water appropriations permits for the use of surface and groundwater has been addressed in the application.

15.3 SURFACE WATER AND GROUNDWATER

Dakota Access may utilize surface waters as a water source for hydrostatic testing. Exact locations of the hydrostatic testing and discharge sites will be determined by the selected contractor, additional information on testing and discharge areas is provided in Hydrology Section 15.5– Discharge Water. Additional information on surface waters within the Project area is included in Sections 17.0– Effect on Aquatic Ecosystems and 20.0– Water Quality.

15.4 AQUIFERS

Dakota Access anticipates utilizing surface water for hydrostatic testing purposes. Groundwater is not currently proposed for use during construction and operation of the Project.

Response: Groundwater appropriations have not been addressed in the application as no use of groundwater is proposed. Dakota Access will obtain the necessary permits required for utilization of surface waters, as identified in Table 5.0-1 of the application.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-1

Please provide copies interrogatories from other parties served upon Applicant and Applicant's answers as they become available.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-2

Please provide copies of responses of other parties to Applicant's interrogatories and requests for production of documents, as well as any related follow-up contacts or demands when they are received.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-3

Please produce any document requested in, or used in DAPL's response to, any of the interrogatories submitted above.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-4

In section 23.6 of the application, it is identified that an Unanticipated Discovery Plan will be submitted to SHPO for approval. Please produce the Unanticipated Discovery Plan and any communications received from SHPO approving the plan.

Response: Dakota Access has submitted the draft unanticipated discovery plan to the SHPO for review; no response has been received to date. See SD PUC Request 2-4 – Attachment No. 1

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-5

Please provide record of any consultation with SHPO by Dakota Access or any other governmental agency for review and comment on activities regarding jurisdictional cultural resources as identified in Table 5.0-1 of the application.

Response: Copies of email correspondence from Dakota Access to the SHPO is included in SD PUC Request 2-5 – Attachment No. 1. Dakota Access has not been privy to any copies of consultations by other agencies to the SHPO to date.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-6

Referring to DAPL's Response to Staff's March 19, 2015, Interrogatory 1-5: As stated in the revised Application, DAPL identifies all valves will have remote actuators and, thus, a communications shed adjacent to the valves. If any valve locations were changed since filing of the Application please provide the most current design drawings for the pipeline that shows the location of motor operated valves, manually operated valves, check valves, cathodic protection test sites, pig launchers/receivers, and pump station. Please provide this information as a map and GIS shapefile if changes were made since the shapefiles produced in response to Staff's first interrogatories.

Response:

See SD PUC Request 2-6 Attachment No. 1 are maps of requested motor operated valves, pig launcher/receivers, and pump stations. At this time DAPL does not have any check or manual valves. Test leads will be located at road/railroad crossings, along fences, and generally at least one every mile.

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-7

In section 16.3 of the Application it is stated that: "Early coordination and informal consultation with the USFWS, the South Dakota Natural Heritage Program (SDNHP), and South Dakota Game, Fish and Parks (SDGFP) was initiated in 2014." Please provide any official correspondences that document the consultation completed.

Response: There is little record of official correspondence regarding early coordination and informal consultation with the agencies, as it largely consisted of phone calls and emails. All of the agencies identified were contacted in May and June 2014 with respect to data gathering for performing a desktop analysis of the Dakota Access Project. A South Dakota interagency agency meeting was held the last week in June in Pierre, SD where Dakota Access representatives first introduced the project and discussed regulatory requirements, schedules, etc; representative(s) from the SHPO's office and South Dakota Game, Fish and Parks were in attendance.

Correspondence between Dakota Access and the USFWS-SD field office consisted of phone calls and emails to discuss listed species and respective habitats, and permit coordination.

Dakota Access followed-up with the SHPO office in August to get approval on the proposed cultural resource survey protocols (copy of email correspondence is provided in response to 2-5 above), and routinely in 2014 to perform Class 1 literature reviews as were needed on route adjustments.

Early coordination with the SDNHP and SD Game, Fish and Parks Department consisted of phone calls and emails to discuss listed species and occurrence data to utilize during surveys and habitat assessments. The Department confirmed that no formal authorization from SDNHP and the SD Game Fish and Parks Department is required for the project.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-8

In section 23.6 of the Application it is identified that reports detailing the comprehensive cultural resource filed investigations will be prepared that include recommendations for additional investigations to determine NHRP eligibility and/or avoidance measures. Please provide a copy of any report produced in accordance with this section of the application and any correspondence showing the reports were filed with SHPO for review.

Response: A Class III report for all survey activities performed in 2014 and 2015 was submitted to the SHPO on June 5, 2015; no comments have been received to date. A Class III report for all areas under jurisdiction of the USFWS easements in SD was provided to the USFWS Region 6 archeologist (May 7 for all but one tract that remained to be surveyed and an addendum for the outstanding tract on June 2); no comments on the reports have been received to date. This documentation was supplied in response to the Yankton Sioux response previously.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-9

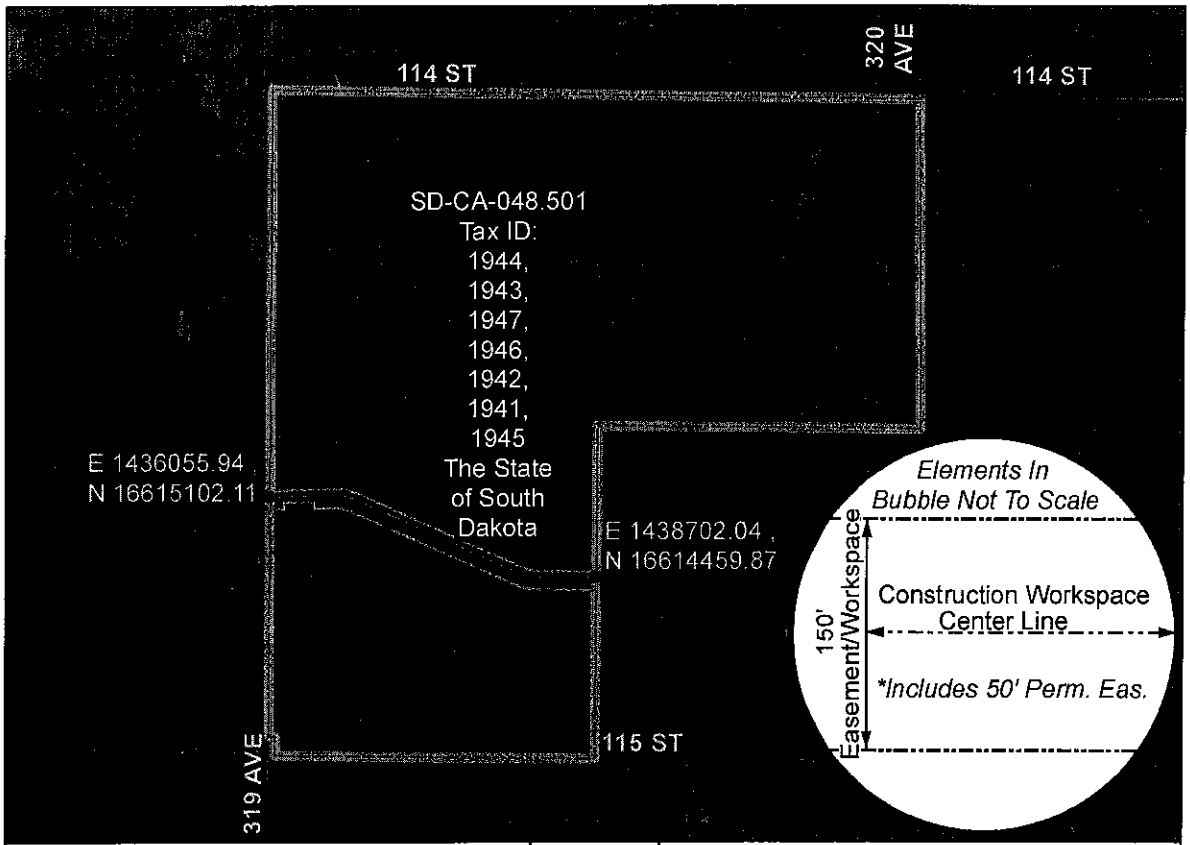
Within the application, DAPL uses language such as "in the unlikely event of spill" (see pages 7, 26, 41, and 47 of application). Please provide a risk assessment, or other similar analysis, that shows the potential volumes, frequencies, and probabilities of spill events along the South Dakota portion of the proposed pipeline that supports the use of language identifying spills are unlikely.

Response: The spill model is currently under development and a draft version is being finalized. The spill model will allow the worst case discharge to be identified for the pipeline, which by definition, is highly improbable.

Prepared by: Todd Stamm
Title: Vice President – Pipeline Operations
Address: One Flour Daniel Drive Sugar Land, TX 77478
Telephone Number: 281-637-6581

Exhibit A

CAMPBELL COUNTY, SD
S16-R74W-T126N



ROW Length: 2778.03 Ft. = 168.37 Rods
Proposed Permanent Easement: 3.19 AC
Temp Easement/ Workspace: 6.1 AC
Add Temp Easement/ Workspace: 0.13 AC

Linear/Areal Calc = NAD 1983 UTM Zone 14N

Feet
0 1,000 2,000

Tract No.: SD-CA-048.501

DAKOTA ACCESS, LLC

Proposed Pipeline Easement Across:
The State of South Dakota

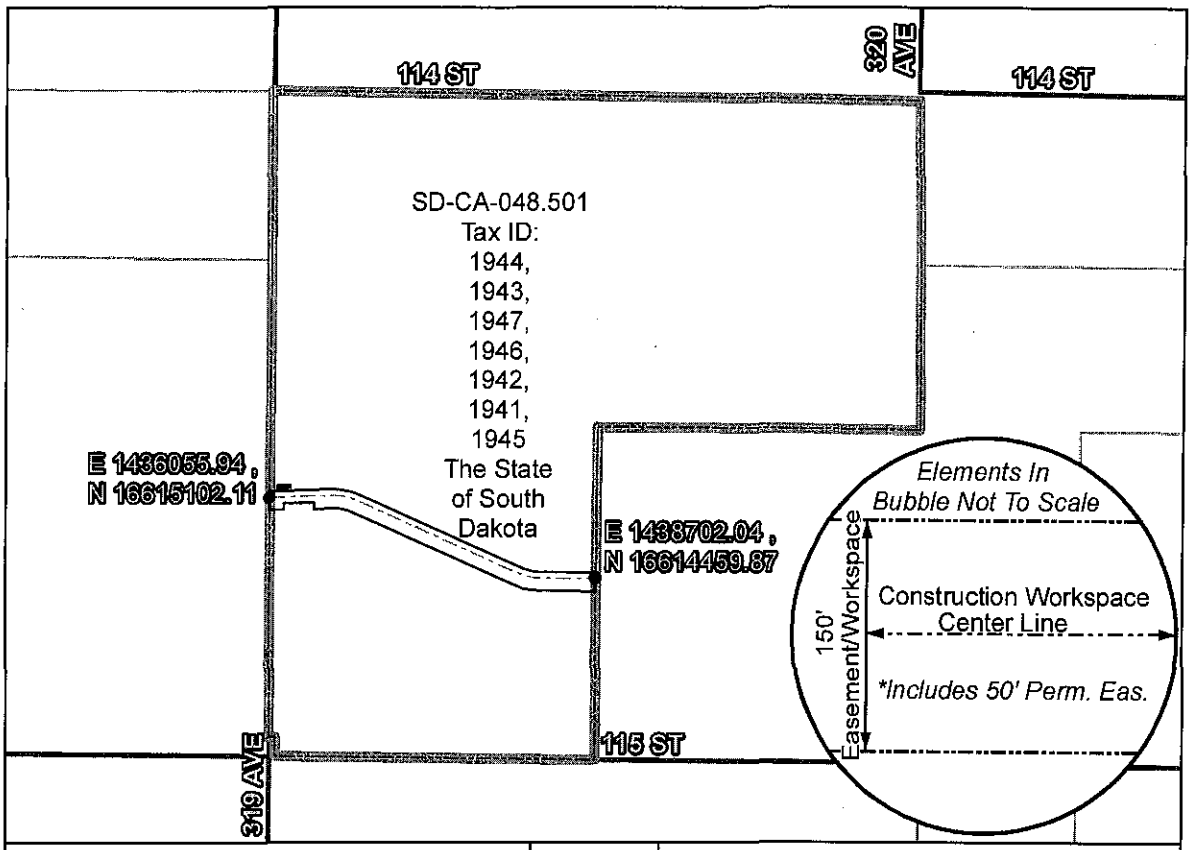
- Entry/Exit
- Centerline
- Easement/Workspace
- Property Boundaries
- Additional Temporary Easement - Workspace
- Adjacent Property Boundaries

Grantor hereby agrees that Grantee shall have the right to and is hereby authorized, with or without the joinder of Grantor, to file Exhibit A-1 by affidavit, to amend this Agreement to include such new Exhibit A-1 or to attach such new Exhibit A-1 to this Agreement, and to record or re-record such affidavit, amendment, or Agreement with the new Exhibit A-1. Grantee shall provide Grantor with a copy of the recorded affidavit, amendment or re-recorded Agreement.

_____
Landowner Initials

Exhibit A

CAMPBELL COUNTY, SD
S16-R74W-T126N



ROW Length: 2778.03 Ft. = 168.37 Rods
Proposed Permanent Easement: 3.19 AC
Temp Easement/ Workspace: 6.1 AC
Add Temp Easement/ Workspace: 0.13 AC

Linear/Areal Calc = NAD 1983 UTM Zone 14N

Feet
0 1,000 2,000

Tract No.: SD-CA-048.501

DAKOTA ACCESS, LLC

Proposed Pipeline Easement Across:
The State of South Dakota

- Entry/Exit
- Centerline
- Easement/Workspace
- Property Boundaries
- Additional Temporary Easement - Workspace
- Adjacent Property Boundaries

Grantor hereby agrees that Grantee shall have the right to and is hereby authorized, with or without the joinder of Grantor, to file Exhibit A-1 by affidavit, to amend this Agreement to include such new Exhibit A-1 or to attach such new Exhibit A-1 to this Agreement, and to record or re-record such affidavit, amendment, or Agreement with the new Exhibit A-1. Grantee shall provide Grantor with a copy of the recorded affidavit, amendment or re-recorded Agreement.

_____
Landowner Initials

SOUTH DAKOTA
STATE HISTORICAL SOCIETY
DEPARTMENT OF TOURISM

December 10, 2014

Beth McCord
Gray & Pape, Inc.
5807 North Post Road
Indianapolis, IN 46216

RE: Request for State Permit under the Archaeological Exploration Act (SDCL1-20) and the Cemetery and Burial Records Act (SDCL 34-27) for the 2014 Dakota Access Project (DAPL), Campbell County, South Dakota

Dear Beth:

We have received your application for a Permit Under the Archaeological Exploration Act (39SDCL 1-20) and the Cemeteries and Burial Records Act (39SDCL 34-27) for the 2014 Dakota Access Project (DAPL), Campbell County, South Dakota on lands administered by the State of South Dakota. Please consider this you're your notice to proceed under SDCL1-120) and SDCL 34-27). Upon completion, please send a draft copy of the report for review addressed to myself (digital copy is acceptable) and a final hard copy report for our library.

This portion of South Dakota is archaeologically rich, most likely do to the net erosion in the area which reveals sites more abundantly that other locations in the state. Should you have any problems in the field please feel free to call on my personal cell 605-484-8341.

Stipulations:
1. Culturally diagnostic artifacts recovered on state land will be collected, placed in a labeled bag and sent to me personally for curation. Do to the time constraint and my personal interest in this region of the state this will not require a curation agreement.
2. The identification of human remains are to be reported to law enforcement and this office.

Thank you for your continued support in the identification and protection of the cultural resources of South Dakota.

Sincerely,

Michael Fosha
Assistant State Archaeologist

Enclosure: SDCL 1-10 and SDCL 34-27 permit fee.

DAKOTA ACCESS PIPELINE (DAPL) PROJECT

&

ENERGY TRANSFER CRUDE OIL PIPELINE (ETCOP) PROJECT

Stormwater Pollution Prevention Plan

DAKOTA ACCESS, LLC

June 2015

REV	DATE	DESCRIPTION	ORIG	CHK	APPR
A	8-26-2014	Issued for Review	JCD	JW	DJ
B	09-11-2014	Issued for Approval	JCD	JW	DJ
C	06-15-2015	Issued for Approval	JRF	MH	

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LIST OF APPENDICES

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1.0 Introduction

Dakota Access, LLC and Energy Transfer Crude Oil Company, LLC (COMPANY) will implement this Stormwater Pollution Prevention Plan (SWPPP) during construction of the Dakota Access Pipeline (DAPL) Project and the Energy Transfer Crude Oil Pipeline (ETCOP) Project (Project). The primary purpose of the SWPPP is to minimize the impacts of stormwater runoff during Project construction activities through the implementation of Best Management Practices (BMP).

1.1 Responsibility for Implementation

The Environmental Inspectors (EI) are responsible for directing, and inspecting efforts regarding implementation of the SWPPP and will fulfill the responsibilities as described herein. As stated in the construction contract or as otherwise agreed, once selected, the Construction Contractor (Contractor) will be responsible for all or part of the implementation of the SWPPP as described herein.

2.0 Site Description

2.1 Project Name, Location, and Purpose

Project Name: Dakota Access Pipeline (DAPL) Project and Energy Transfer Crude Oil Pipeline (ETCOP) Project.

Project Purpose: ETC's primary objective for the proposed Project is to allow for transport of approximately 400,000BPD of crude oil between Stanley, ND and Nederland, TX. The crude oil transported will provide supplemental crude oil supply for markets in the United States. In addition, the proposed project will open railroad transport for other products produced locally that otherwise would not be accessible to other markets.

Project Location: The DAPL and ETCOP projects consist of a Gathering Area, a Mainline Transmission Pipeline, and the Conversion of an existing natural gas transmission line to crude oil. The Gathering System commences at Stanley, North Dakota and ends at Johnson Corner, North Dakota. There are six proposed pump stations along the Gathering System, namely Stanley, Ramberg, Epping, Trenton, Watford City, and Johnson Corner. The Mainline Transmission Pipeline begins at Johnson Corner, North Dakota and ends southeast of the proposed Illinois Patoka Custody Transfer and Metering Station. Approximately 992 miles of mainline make up the DAPL project. The ETCOP project begins at the Patoka Custody Transfer and Metering Station and consists of approximately 24 miles of new Mainline Transmission Pipeline. This will eventually tie into the future expansion of 757 miles of conversion pipeline that extends from Johnsonville, Illinois to Nederland, Texas.

There will be tanks constructed at the six pump stations along the Gathering System. There will be one 50,000 barrel tank at Stanley, one 200,000 barrel tank and one 100,000 barrel tank at Ramberg, one 100,000 barrel tank at Epping, one 100,000 barrel tank at Trenton, two 100,000 barrel tanks at Watford City, and one 200,000 barrel tank at Johnson Corner.

There will be mainline valve sites on both sides of major water body and major highway crossings for isolation in the event of emergency shutdown. In addition to the mainline valves, multiple pump stations and one custody transfer metering station will also be installed along the Mainline Transmission Pipeline. The proposed custody transfer station will be located near Patoka, Illinois.

Launcher and Receiver traps will also be installed along the Mainline Transmission Pipeline at locations less than 100 miles apart.

A proposed rail yard and rail loading facility will also potentially be integrated into the DAPL project. The location of the rail yard will be on the east side of Historical Route 66 and on the west side of Niemanville Trail / Co Rd 225E in Litchfield, Illinois.

2.2 Nature of the Construction Activity

ETC proposes to install the new pipeline within a variable-width construction right-of-way (ROW). Actual workspace width will depend on site engineering and available workspace constraints. In general, the pipeline will be constructed using an approximate 150-foot-wide construction ROW, which includes a new proposed 50-foot-wide permanent easement and 100-foot-wide temporary easement. The temporary easement will be allowed to revert to its original land use following construction. All pump stations and mainline valve sites to be constructed will be located on tracts of sufficient size to accommodate all aboveground appurtenances along the ROW.

2.3 Sequence of Major Soil Disturbing Events

The following represents a typical sequence of major soil-disturbing events during the Project:

- Installation of stabilized construction entrances and surface water (including wetlands) protection BMPs.
- Clearing of the Project ROW area as necessary. This may include clearing of brush and trees to create ROW needed for temporary workspace, soil storage, construction activities, and areas needed for access to particular construction sites within the Project area.
- Topsoil removal and storage.
- Grading of the Project ROW as necessary. Areas of the ROW, including temporary workspace may be graded to allow the safe passage of equipment and meet the bending limitations of the pipe.
- Installation of additional BMPs for erosion and stormwater management, as needed.
- Pipe stringing, bending, welding, and testing.
- Excavation of ditch (trackhoes or similar equipment will be used to excavate the ditch to the required depth).
- Installation of pipe in ditch.
- Tie-ins of the sections of pipeline which will be welded together in the ditch.
- Backfilling the ditch line (excavated soil will be used to cover the pipe).
- Hydrostatic testing of the pipeline as necessary.
- Removal of temporary erosion/sediment controls when other construction activity is completed and final stabilization is achieved.

3.0 Controls

This section describes controls used to prevent or control stormwater pollution. The COMPANY BMPs are based on the current best accepted practices endorsed by the American Gas Association,

Gas Research Institute, Association of Pipeline Contractors, EPA, and USACE. Appendix A contains diagrams showing typical installation of BMPs.

The Project's EI is responsible for determining the schedule and coordinating with the Contractor for placement of BMPs. The Contractor will stabilized disturbed portions of the site as soon as possible with appropriate BMPs, but in no case more than 14 days after construction activity has temporarily or permanently ceased on any portion of the site. An exception to this effluent limit is allowed if earth-disturbing activities will be resumed within 21 days. See Section 3.1.3 for more details regarding the BMPs installation timeframes. This plan will be updated by the Contractor, EI, and/or CI to identify the location and schedule of planned or installed controls as the need for these controls is determined.

The following represents a typical sequence of major soil-disturbing events during the Project and the control measures that will be implemented.

- Clearing of the Project area as necessary. This may include clearing of brush and trees in the ROW, in areas adjacent to the ROW needed for soil storage, and/or in areas needed for access to particular construction sites within the Project area. The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to any soil-disturbing activities, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Topsoil Removal and Storage. To minimize potential impacts on soil productivity, topsoil will be segregated during trench excavation in agricultural land, unsaturated wetlands, and if applicable, other areas where soil productivity is an important consideration. Unless otherwise requested by the landowner, topsoil will be removed to a maximum depth of 12 inches from the trench and spoil storage area and stored separately from the trench spoil in accordance with figures provided in Appendix A. After the trench is backfilled, topsoil will be returned to its approximate original location in the soil horizon.

- Grading of the Project area as necessary. Grading of the ROW may be necessary in areas where a level or tiered workspace is required to facilitate a safe working environment. Areas where grading occurs will be undertaken with the understanding that original contours and drainage patterns shall be re-established to the extent practicable following construction. On steep slopes, or wherever erosion potential is high, temporary erosion control measures such as temporary slope breakers, silt fencing, and hay/straw bales will be implemented by the Contractor. Additional BMPs for erosion and stormwater management will be installed as needed based on existing site conditions.

- Excavation of ditch (trackhoes or similar equipment will be used to excavate the ditch to the required depth). The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to excavation activities, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Backfilling the ditch line (excavated soil will be used to cover the pipe). The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to backfilling, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Performing cleanup and stabilization. This phase will begin after backfilling and will continue throughout the remainder of the Project's construction. This phase will include minor grading to level small areas, and revegetation. Project areas to be stabilized by vegetation will be seeded and mulched.

- The Contractor will remove temporary erosion/sediment controls when other construction activity is completed and final stabilization is achieved.

3.1 Erosion and Sediment Controls

3.1.1 Short and Long Term Goals and Criteria (as applicable)

(a) The construction phase erosion and sediment controls are designed to retain sediment on-site to the greatest extent practicable.

(b) Control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicate that a control has been installed and/or used inappropriately and/or incorrectly, the control shall be replaced and/or modified as needed.

(c) If sediment escapes the Project area, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impact (e.g., fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

(d) Sediment must be removed from sediment traps when capacity has been reduced by 50 percent.

(e) Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

3.1.2 Temporary Erosion Control Measures

The following temporary erosion and sediment controls will be utilized as necessary:

Temporary Slope Breakers: Temporary slope breakers (water bars/terraces) will be installed as necessary (at the EI's discretion) diagonally across the ROW on slopes to control erosion by reducing and shortening the velocity, length and concentration of runoff according to the figures provided in Appendix A. These breakers will divert water to a well-vegetated area. If a vegetated area is not available, erosion control barriers will be installed to filter the runoff at the outlet of the slope breakers and off of the construction ROW. Silt fence, hay/straw bales, or sandbags may be used in place of temporary slope breakers at the discretion of the EI.

Natural vegetation acts as an effective filter medium for silt removal from surface runoff. Its use as a sediment barrier results in less disturbance to the land than other methods. In areas where natural vegetation is not present or does not constitute a suitable barrier, temporary sediment and/or erosion control barriers will be installed. Temporary sediment barriers, typically hay/straw bale filters or silt fences, dissipate the energy of flowing water to allow settlement of sediment from surface water runoff.

Silt Fence/Hay/Straw Bales: Silt fences and hay/straw bales will be installed in accordance with figures provided in Appendix A. The silt fences and/or hay/straw bales will be installed as necessary to prevent erosion and sediment laden runoff from stormwater discharges. These measures will remain in place until permanent revegetation measures have been judged successful.

Silt fence and hay bale structures are also used to control erosion and sedimentation for hydrostatic test water discharges. Bale filters are effective for small rills that can be spanned by one or two bales. Bales are constructed of hay (or straw) that is securely bound to form a berm, which is held in place by two stakes driven through each bale. The first stake is driven at an angle toward the previously positioned bale, and the second stake is driven perpendicular to ground surface. The bindings of the bales will be horizontal. Filter fabric fences (silt fences) perform the same function as hay bale berms, but have the advantage of ease of installation, versatility, and light weight.

A silt fence is a geotextile fabric with fence posts spaced no more than 10 feet apart. Both silt fences and hay/straw bales will be installed according to the manufacturer's instructions where site conditions allow. Otherwise, the silt fence will be imbedded in the ground a minimum of 6 inches. Where two sections are joined, they will be overlapped a minimum of 6 inches. Accumulated sediment will be removed regularly and the silt fencing inspected to ensure the bottom of the silt fence remains imbedded in the ground. A sufficient stockpile of silt fence will be maintained on-site for emergency use.

Hay bales may be left in place. These barriers are required after the initial disturbance of the soil and are typically installed at the following locations:

- At the outlet of a temporary slope breaker when vegetation is not enough to control erosion.
- Along banks of waterbodies between the graded ROW and the waterbody after clearing.
- Downslope of any stockpiled soil in the vicinity of waterbodies and wetlands.
- At the base of slopes adjacent to road crossings where vegetation has been disturbed.
- At sideslope and downslope boundaries of the construction where runoff is not otherwise directed by temporary slope breakers.
- In the ROW at boundaries between wetlands and adjacent disturbed upland areas to prevent flow of sediment into the wetland where runoff is not otherwise directed by a temporary slope breaker.
- At the edge of the ROW to prevent siltation of ponds, wetlands, or other waterbodies adjacent to the downslope of the ROW or as necessary to contain spoil and sediment within the ROW.
- For hydrostatic test water discharges, the water should be released directly into the silt fence/hay bale structures in conjunction with other approved velocity dissipating devices.

Temporary Trench Plugs: Temporary trench plugs prevent water diversion from waterbodies or drainage tiles into upland portions of the pipeline trench during construction and prevent silt-laden stormwater from flowing down the trench into waterbodies. The EI or CI will determine the need for and spacing of trench plugs. Otherwise, the Contractor will install hard trench plugs (undisturbed soil) on either side of waterbody crossings or drain tiles. Topsoil will not be used for trench plugs.

3.1.3 Stabilization Practices

The stabilization measures of the pipeline ROW incorporate permanent erosion and sedimentation measures. However, in the event that final restoration cannot be implemented immediately post-

construction, temporary erosion and sedimentation control measures will be employed as specified by the Contractor until the weather is suitable for final cleanup.

For pipeline construction in areas with sloping terrain, COMPANY will use permanent trench plugs for soil stabilization.

3.1.3.1 Upland Areas

Temporary Stabilization:

- Temporary stabilization measures will be initiated as soon as practicable in portions of the ROW where construction activities have temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day is precluded by weather, stabilization measures will be initiated as soon as machinery is able to access the ROW. If activities resume within 21 days from when the activities ceased, stabilization measures do not have to be initiated by the 14th day following cessation of the activity. These guidelines are based on National Pollutant Discharge Elimination System (NPDES) requirements and may be modified based on state-specific PDES regulations.

- In the event that construction is completed more than 30 days before the seeding season for perennial vegetation, areas adjacent to waterbodies will be mulched with 3 tons/acre of straw, or its equivalent, to a minimum of 100 feet on either side of the waterbody. These guidelines are based on NPDES requirements and may be modified based on state-specific PDES regulations.

- Temporary sediment barriers may be removed from an area when that area is successfully revegetated (i.e., if the ROW surface condition is similar to adjacent undisturbed lands). These guidelines are based on NPDES requirements and may be modified based on state-specific PDES regulations.

Permanent Stabilization:

- Erosion and sedimentation control practices (installation of structures, revegetation, and maintenance practices) will be implemented to minimize the potential for soil erosion or sedimentation of streams and to restore the ROW and any other disturbed areas. Final grading will be completed within 10 days of construction completion (including the installation of permanent erosion control measures in the areas of steep slopes only), weather permitting. Construction debris will be removed from the ROW and the ROW will be graded so that the soil is left in proper condition for planting.

- The ROW on off-road sections will be graded to preconstruction contours, as practical, with a small crown of soil left over the ditch to compensate for settling, as approved by the CM, EI, and/or CI. Openings will be left in the completed crown to restore lateral surface drainage to preconstruction patterns.

- Where topsoil has been segregated, the topsoil will be spread back along the ROW in an even layer.

- Fences that were cut and replaced by gaps during construction will be repaired to at least their equivalent state during preconstruction activities.

- Permanent slope breakers will be constructed after final grading and prior to seeding in accordance with the applicable regulations to replace temporary barriers at pedestrian, trail, road, waterbody, and wetland crossings.

3.1.3.2 Revegetation and Seeding

Seed, fertilizer, and agricultural lime application will be accomplished at the following rates and mixtures unless otherwise instructed by applicable permits or land managing agency requirements:

- Seed Mixture: German Foxtail Millet "hulled" at a rate of 20 pounds per acre, with "hulled" Bermuda grass at a rate of 10 pounds per acre.
- Fertilizer: 5-19-19 at a rate of 300 pounds per acre.
- Agricultural Lime: at a rate of 2,000 pounds per acre.
- Final revegetation standards that will be used by COMPANY for stabilization of the ROW will be determined through discussions with the individual state and local agencies and through the permit process.
- The ROW will be seeded after final grading in accordance with recommended seeding dates, weather and soil conditions permitting.
- Turf, ornamental shrubs, and other landscaping materials will be restored in accordance with landowner agreements. Selection is based on adaptation of plants to the soils and climate, ease of establishment, suitability for specific use, longevity or ability to re-seed, maintenance required, aesthetic values, and landowner agreement. Personnel familiar with local horticultural and turf establishment practices must perform the restoration work.
- Where broadcast or hydro seeding is to be done, the seedbed will be prepared as necessary to ensure sites for seeds to lodge and germinate.
- Where hand broadcast seeding is used, the seed will be applied at one-half the rate in each of two separate passes.
- The seedbed will be prepared to a depth of 3 to 4 inches using appropriate equipment to provide a firm, smooth seedbed that is free of debris.
- The Project area should be seeded as deemed appropriate by the CM and/or EI. If seeding cannot be done soon after final grading, temporary erosion and sediment controls will be used and seeding of permanent cover will be done at the beginning of the next seeding season. Meanwhile, temporary stabilization measures will be implemented as appropriate.
- Slopes steeper than 3:1 will be seeded immediately after final grading in accordance with recommended seeding dates, weather permitting.
- Seed will be purchased in accordance with the Pure Live Seed (PLS) specifications for seed mixes and used within 12 months of testing.
- Legume seed will be treated with an inoculant specific to the species. The manufacturer's recommended inoculant rates will be used.
- The seed will be uniformly applied and covered 0.5 to 1 inch deep, depending on seed size. A seed drill equipped with cultipacker is preferred, but broadcast or hydro seeding can be used at double the recommended seeding rates. Where broadcast seeding is used, the seedbed will be firmed with a cultipacker, roller, or similar method after seeding.

- Other alternative seed mixes specifically requested by the landowner or land-managing agency may be used.
- Areas that are seeded after the recommended seeding date should be mulched if permitted.

3.1.3.3 Wetland Restoration

- COMPANY's approach to wetland mitigation and restoration involves a combination of impact minimization during construction, substrate and hydrology restoration, and vegetation establishment involving successful natural processes as a key component.
- The construction workspace for the Project will be been designed to limit impacts to wetlands.
- During the restoration phase, segregated topsoil will be replaced over the trenchline and wetland contours and drainage patterns will be restored to approximate original condition. Surface rocks and boulders that had been windrowed during the construction phase will be distributed in a natural pre-construction configuration in the temporary work areas. Following restoration of the substrate, wetlands will typically be seeded with annual ryegrass or other seed mixture as directed by regulatory agencies.

3.1.3.4 Riparian Areas

Riparian areas are defined as "on or pertaining to the bank of a natural course of water" (stream, pond, lake, or wetland). The EPA defines "riparian areas" as areas adjacent to streams and lakes where the high water table creates distinct soil and vegetative characteristics from the adjacent uplands.

- Following installation of the pipeline, stream banks and riparian areas will be re-contoured and stabilized. Banks will typically be stabilized with an herbaceous mixture and erosion control fabric such as jute netting. Rock riprap may be used to stabilize particularly erosive or unstable areas at the recommendation/approval of the state agencies and by the USACE.

3.1.4 Other Surface Applications

Other surface applications will be applied as outlined below unless otherwise instructed by applicable permits or land managing agency requirements:

(a) Mulch: After seeding, mulch may be applied by the Contractor as determined necessary by the EI at a rate of approximately 2 tons/acre on the entire ROW except on wetlands, lawns, agricultural crop areas, and areas where hydro-mulch is used. Mulching before seeding may be done if construction or restoration activity is interrupted for an extended period, such as when seeding cannot be completed due to seeding period restrictions. Except for site-specific locations that may be identified during construction, mulch before seeding if final cleanup (including final grading and installation of permanent erosion controls in the areas of steep slopes) is not completed in an area within approximately 10 days after construction completion.

If mulching occurs before seeding, the Contractor shall increase mulch application on slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre. Up to 1 ton/acre of wood chips may be added to mulch if areas are top-dressed with 11 pounds/acre available nitrogen (at least 50 percent of which is slow release).

If a mulch blower is used, the strands will not be shredded to less than 8 inches in length to allow anchoring. The mulch will be anchored immediately after placement to minimize loss by wind and water. When anchoring by mechanical means, the Contractor shall use a mulch-anchoring tool to properly crimp the mulch to a depth of 2 to 3 inches. When anchoring with liquid mulch binders, the Contractor shall use the rates recommended by the manufacturer. The Contractor shall not use liquid mulch binders within 100 feet of wetlands or waterbodies.

(b)Matting/Netting: Matting or netting consists of jute, wood excelsior, or similar materials, and will be installed by the Contractor to anchor mulch and stabilize the surface of the soil during the critical period of vegetative establishment, where directed by the EI.

Matting or netting will be applied to critical, sensitive areas (e.g., steep slopes, banks of waterbodies, bar ditches) as specified by the EI. On waterbody banks, the matting or netting will be installed at the time of the final bank re-contouring. In the event that erosion control fabric is not readily available, the Contractor will temporarily use mulch anchored via crimping (or some other means) or hydromulch until the erosion control fabric material becomes available. Matting or netting will be anchored with pegs or staples as recommended by the manufacturer.

3.2 Stormwater Management

Stormwater management will be conducted through stormwater flow attenuation, velocity dissipation devices, and water filtration. COMPANY's construction procedures describe the criteria for placement and use of stormwater control methods/devices. The EI will have the authority to determine the location of these controls.

If herbicides or pesticides are to be used for vegetation maintenance, the applications of those substances will be in accordance with applicable landowner and land management or state agency specifications. COMPANY will not use herbicides or pesticides in or within 100 feet of any waterbody except as specified by the appropriate land management or state agency.

3.3 Other Controls

3.3.1 Waste Materials

(a) Trash, litter, and debris will be collected for off-site disposal; it will not be discarded along the ROW. Refuse will be disposed of according to state and local regulations.

(b) Solid waste that contains (or at any time contained) oil, grease, solvents, or other petroleum products, falls within the scope of the oil and hazardous substances control, cleanup, and disposal procedures of COMPANY's Spill Prevention Control and Countermeasures (SPCC) plan. This material shall be segregated for handling and disposal as hazardous waste under the provisions of the plan.

3.3.2 Offsite Vehicle Tracking

(a) A stabilized construction entrance will be used, if appropriate, to reduce vehicle tracking of soil and sediments. Access to the ROW will normally be from existing public roads. Attempts will be made to locate roadway crossings/access points to ensure that safe and accessible conditions exist throughout the construction phase. Use of 50-foot-long crushed stone access pads, sweeping, culvert installation, matting, and other forms of rutting protection may be used subject to local permit conditions. Periodic sweeping and scraping will remove sediment tracked onto

public roads. If crushed stone access pads are used in active agricultural areas, the stone will be placed on a synthetic fabric to facilitate later removal.

(b) The stabilized construction entrances will be installed before clearing and grading. Once other construction activities permanently cease in an area, that area will be stabilized by reseeding and/or mulching as needed. Once revegetation has been judged successful, temporary erosion/sediment control structures will be removed.

4.0 Maintenance

Erosion and sediment control measures and other protective measures identified in this SWPPP must be maintained in effective operating condition. If site inspections required by Section 5 of this SWPPP identify erosion control devices that are not operating properly, maintenance shall be performed before the next anticipated storm event, or as necessary to maintain the continued effectiveness of erosion controls. If maintenance prior to the next anticipated storm event is impractical, maintenance must be scheduled and accomplished as soon as practicable. Temporary sediment barriers will remain in place until permanent revegetation measures have been judged successful.

5.0 Inspections

The EI will inspect disturbed areas of the Project area that have not been finally stabilized (including areas used for storage of materials that are exposed to precipitation, staging areas, temporary contractor yards, access roads, structural control measures, and locations where vehicles enter or exit the site). The Project area should be considered stabilized when construction activity ceases and a uniform vegetative cover (see below) has been established.

Areas that are not revegetated should be considered to have achieved final stabilization when they have a permanent cover that will prevent erosion of soil by wind or water. At that time, activity under this plan, including inspections, will cease. Inspections shall be conducted as follows and/or in accordance with the applicable National or State-Specific Pollution Discharge Elimination System guidelines:

- Conduct **daily inspections and following any storm event of 0.5 inch of precipitation or greater**, except those portions of the site that have been finally or temporarily stabilized, for which inspections will be conducted at least weekly. Inspections should continue until disturbed areas are completely stabilized (for areas to be revegetated, this means that perennial vegetation cover has reached a uniform cover of at least 70 percent of the preconstruction cover).

- **Inspect control measures** daily in areas of active construction or equipment operation and on a weekly basis in areas with no construction. Inspect within 24 hours of the end of a storm event that is 0.5 inch of rainfall or greater. Control measures will be maintained in good working order; if repair is necessary, it should be initiated within 24 hours of report.

- **Inspect disturbed** areas for evidence of or potential for pollutants entering the drainage system. Sediment from silt fences should be removed regularly and the fence inspected to ensure that the bottom of the fence remains imbedded in ground. Damaged hay/straw bales will be replaced with new bales as necessary.

- **Inspect material storage areas** where materials are exposed to precipitation for evidence of potential for pollutants entering the drainage system.

- **Inspect vehicle entrances** for evidence of off-site sediment tracking.
- **Inspect discharge points**, if accessible, to determine if erosion control measures are effective in preventing significant impacts to receiving waters. If these points are inaccessible, inspectors should inspect nearby downstream locations.
- **Inspect vegetation** after the first and second growing season after seeding to determine the success of revegetation. Wetland revegetation is considered successful if at least 80 percent of the total cover is native species and the level of diversity of the native species present after construction is at least 50 percent of the level originally found in the wetland. Restoration shall be considered successful if the ROW surface condition is similar to adjacent undisturbed lands.
- **Complete an inspection report** of each inspection. Inspection forms and form instructions provided in Appendix C provide additional guidance.

See Section 7 for additional detail on requirements for construction activity and inspection documentation and record keeping.

6.0 Plan Modification

This plan may need to be modified and/or updated based on information and experience gathered during actual construction activities (e.g., include or modify BMPs designed to correct problems, etc.). If changes to the design, construction, or maintenance that can have significant effect on the potential for discharging pollutants in stormwater at the site occur, this plan should be modified accordingly by the Contractor, EI, and/or CI. In addition, if the plan proves to be ineffective in controlling pollutants, any necessary modifications to the application of the practices presented in this plan should be made by the Contractor, EI, and/or CI in order to prevent the discharge of pollutants into stormwater.

7.0 Required Reports, Documentation, and Record Keeping

7.1 Records Retention

All permit-related documents will be retained as part of the SWPPP for at least three years from the date that the site is finally stabilized as required by COMPANY's document retention policies. The following documentation will be kept on file at the construction site:

- A copy of this SWPPP and referenced attachment(s)
- Inspection reports
- Log of construction and BMP installation/maintenance activities and/or construction alignment sheets/construction plans showing the placement of BMPs.
- Notice of Intent and Notice of Termination (if applicable)

7.2 Inspection Reports

A separate report will be developed for each inspection. Inspection reports will identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report will contain a certification that the facility is in compliance with this SWPPP. In addition, inspection reports should:

- Summarize the scope of the inspection.

- Provide the name(s), title(s), and qualifications of personnel making the inspection.
- Indicate the date(s) of the inspection.
- Provide weather information and a description of any discharges occurring at the time of the inspection.
- Provide weather information for the period since the last inspection (or since commencement of construction activity if first inspection), including:
  - A best-estimate of the beginning of each storm event
  - Duration of each storm event
  - Approximate amount of rainfall for each storm event (in inches)
  - If any discharges occurred
- Indicate the location(s) of discharges of sediment or other pollutants from the site.
- Indicate the location(s) of BMPs that need to be maintained.
- Indicate the location(s) of BMPs that failed to operate as designed or proved inadequate for that particular location and plans for correction of the problem (including implementation dates of corrective action).
- Indicate location(s) where additional BMPs are needed that did not exist at the time of inspection.

7.3 Log of Construction and BMP Installation and Maintenance Activities

In addition to inspection and maintenance reports, keep a record of construction activity on the site with this SWPPP. In particular, keep record of the following:

- The dates when major grading activities occur in a particular area.
- The date when construction activities cease in an area, temporarily or permanently.
- The date when an area is stabilized, temporarily or permanently.
- Erosion control maintenance activities.

8.0 SWPPP Certification

8.1 Company's Certification

I certify under penalty of law that this document and its appendices were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____ Date: _____

Print Name: _____

Title: _____

Company: _____

8.2 Contractor's/Subcontractor's Certification

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: _____ Date: _____

Print Name: _____

Title: _____

Company: _____

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: _____ Date: _____

Print Name: _____

Title: _____

Company: _____

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: _____ Date: _____

Print Name: _____

Title: _____

Company: _____

APPENDIX A

BEST MANAGEMENT PRACTICES FIGURES

APPENDIX B

SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN

APPENDIX C

INSPECTION FORMS AND INSTRUCTIONS

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Signature of Inspector: _____

Printed Name of Inspector: _____

Title of Inspector: _____

Qualifications of Inspector: _____

Date: _____

Current Weather Information: _____

Weather Information Since Last Inspection: _____

Beginning Date/Time of Last Storm Event: _____

Duration of Last Storm Event: _____

Amount of Rainfall: _____ Inches

Discharges Since Last Inspection/Storm Event: _____

NOTE: Inspection documents are to be maintained for a minimum of 3 years.

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Earth Dikes/Berms

Is the dike stabilized? _____

_____

Is there evidence of washout or over-topping? _____

_____

If water is present in the drainage ports, does it:

- Have a sheen on it? _____
- Have an acceptable TDS? _____
- Show excessive turbidity? _____

Maintenance required for Earthen Dike: _____

_____

_____

To be performed by: _____ On or before: _____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Roads and Locations Where Vehicles Enter or Exit the Construction Site

Are sediment traps or barriers along road construction zones preventing runoff into adjacent wetlands, lakes, etc.?_____

_____

_____

_____

At locations where construction equipment exits onto paved roads, are the existing best management practices successfully minimizing off site tracking of sediments? _____

_____

_____

_____

Maintenance Required: _____

_____

_____

To be performed by: _____ On or before: _____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

_____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Straw Bale and Filter Fence Barriers

Do the barriers have tears or holes in them? _____

Are there any missing barriers? _____

Are the barriers properly aligned? _____

Where sediment has reached one-third the height of the barrier, has it been removed? _____

_____

Have straw bales with excessive sediment saturation been replaced? _____

_____

Maintenance required for barriers: _____

_____

_____

To be performed by: _____ On or before: _____

SWPPP Upgrades:

If any deficiencies in pollution control structures or procedures were identified above, have those deficiencies been corrected and the Storm Water Management Plan modified, if appropriate?

Explain: _____

_____

_____

_____

_____

_____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

_____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

General

Have there been any uncontrolled releases of mud or muddy water or measurable quantities of sediment found off site? _____Yes _____No

If **Yes**, describe measures taken to clean up fugitive sediment: _____

_____

_____

_____

_____

If **Yes**, describe measures taken to prevent a future occurrence: _____

_____

_____

_____

_____

_____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Location	Diversion Structure	Sediment Trap	Date Excavated	Date Filled	Date Dressed	Signs of Erosion	Stabilized ?	Ground Covered?	Date of Inspection

NOTE: If signs of erosion become apparent, stabilize by backfilling and leveling and use of mulch, sod, seeding, or other means of preventing further erosion.

Date: _____ Inspector's Name (Print and Initial) _____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Maintenance required for: _____

_____

_____

_____

To be performed by: _____ On or before: _____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

NOTE: Inspection documents are to be retained for a minimum of 3 years.

NOTE: Check flowline trenches for the following:

- Settlement below natural grade
- Washouts of spoil along excavated trenches
- Muddy/contaminated rainwater
- Placement of spoil upslope of trench

_____

GeoEngineers

Memorandum

3050 South Delaware, Springfield, Missouri 65804, Telephone: 417.831.9700, Fax: 417.831.9777 www.geoengineers.com

To:	Tom Siguaw, Dakota Access, LLC
From:	Craig Erdman, Mark Miller and Jon Robison
Date:	June 12, 2015
File:	18782-011-00
Subject:	Dakota Access Pipeline Project – Response to Interrogatory 2-12 from the South Dakota Public Utilities Commission Regarding Special Construction Techniques in Karst Terrain

We understand that Dakota Access, LLC (DAPL) has received the following interrogatory from the South Dakota Public Utilities Commission (SDPUC) regarding special construction techniques that might be used in areas of karst terrain:

Interrogatory 2-21

Referring to the excerpt from the Application provided below, as found on page 14 of the Application, please define "specialized construction techniques." Would this include some kind of poly wrap or coating?

"As outlined in Section 14.7 – Seismic and Subsidence, desktop studies have identified a potential for karst geology along certain portions of the route. Dakota Access will conduct pre-construction training to educate personnel on the identification of karst features during excavation. If karst features are identified along the route, Dakota Access will take steps to ensure the integrity of the pipeline, which may include realignment or specialized construction techniques."

Response:

In general, although the proposed DAPL alignment does pass through some regions where karst is possible based on the underlying bedrock geology, we believe the risk of encountering karst-related voids or other features during the construction process to be low. See GeoEngineers memorandum titled "Response to South Dakota Public Utilities Commission, Dakota Access Pipeline Project - Proposed Pipeline in South Dakota," dated April 17, 2015. Should karst related voids be encountered, however, a geotechnical professional or geologist should be consulted to provide input and site-specific mitigation measures. These measures might include minor alignment adjustments (if possible) to avoid the feature, or specialized construction techniques such as the following:

1. Over-excavating the trench and then placing biaxial geosynthetic grid (geogrid) across shorter intervals of openings in the rock, placing crushed rock over the geogrid and compacting, then placing pipeline bedding material over the crushed rock,
2. Filling small to modest sized voids (up to perhaps 30 cubic yards in volume) with a flowable fill (lean mix concrete).

We recommend addressing caves, or other significant karst features, if encountered, on a case-specific basis with a geo-professional as described above.

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.

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 be 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

2. If the EI believes that the discovery is a cultural 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. Dakota Access or its representative will arrange for the discovery to be evaluated by a qualified archaeologist in accordance with applicable regulations. The archaeologist will evaluate the remains and provide recommendations for how to manage the resource under the appropriate State's Historic Preservation Plan.

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 activity.

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 the Interior's Standards and Guidelines for Archaeological Documentation (48 CFR 44734--44737); the Advisory Council on Historic Preservation (ACHP) publication "Treatment of Archaeological Properties" (ACHP 1980); and follow the guidelines set forth by the applicable State(s) Historic Preservation Office.

C. PROCEDURES FOR THE DISCOVERY OF HUMAN REMAINS

In the event that human remains are encountered during either construction or maintenance activities, the following plan outlines the specific procedures to be followed. These procedures meet or exceed the Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects set forth by the National Historic Preservation Act (Public Law [PL] 89-665), its implementing regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800); the Native American Grave and Repatriation Act (43 CFR Part 10); Procedures for the Protection of Historic Properties (33 CFR 325 Appendix C); the Archaeological and Historic Preservation Act; and Consultation and Coordination with Indian Tribal Governments (EO 13175): South Dakota's state burial law (South Dakota Codified Law [SDCL] 34-27) and its accompanying Administrative Rules (ARSD 24:52).

All activity that might disturb the remains shall cease and may not resume until authorized by appropriate law enforcement officials or the State Archaeologist. Any human remains, burial sites, or burial related materials that are discovered during construction will at all times be treated with dignity and respect. If any member of the construction work force believes that human remains are encountered the following plan will be implemented:

1. Any activity that may disturb the unmarked burial site, human skeletal remains, or burial artifacts associated with the site will immediately cease on discovery. The site will be carefully covered and secured for protection from degradation by weather or unauthorized individuals.

2. The EI will be notified and responsible for taking appropriate steps to protect the discovery. This will include fencing off the immediate area of discovery and flagging the area as an exclusion zone.

No activity may resume until authorized by the agency authority governing the disposition of the human remains.

3. The EI will notify the Project Environmental Manager, who will contact the Project archeologist, specific county law enforcement agency and the coroner of the jurisdiction where the site or remains are located. The State Archaeologist will also be contacted to assist with identifying the remains.

4. If the unmarked burial site, human skeletal remains, or funerary objects can be shown to have ethnic affinity with a living Native American tribe, a the Environmental Project Manager will notify the appropriate federal agency with jurisdiction and/or SDSHPO to assist in determining the tribe(s), if any, who may have historic ties to the region and represent descendants of any Native American remains. If direct relations to a Native American tribe are verified, the tribe will have control of the disposition of the human skeletal remains.

5. If the District Coroner finds that the unmarked burial site is over 50 years old and that there is no need for a legal inquiry by their office or for a criminal investigation, and if no direct relations to any Native American tribe are found, then the SHPO will have jurisdiction of the site, human skeletal remains, and the burial artifacts.

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: Jack Edwards
Telephone (o) 515-777-7723 (c) 832-421-5691
Email: Jack.Edwards@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 Historic Preservation Program

Contact: Jay D. Vogt/SHPO
Telephone: (605) 773-3458
E-mail: Jay.Vogt@state.sd.us
Address: South Dakota State Historical Society
900 Governors Dr. 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

Abby Peyton

From: Olson, Paige <Paige.Olson@state.sd.us>
Sent: Monday, August 18, 2014 10:43 AM
To: 'Beth McCord'
Cc: Abby Peyton
Subject: RE: DAPL proposed SOW

Good morning,

Thank you for the opportunity to review the proposed scope of work. I do have several comments that I hope can be taken into consideration.

1. My first comment concerns the use of at least one shovel test to provide information on a site's integrity. If the goal is to determine a site's integrity (vs. presence / absence) I would recommend using a 1x1 in an area with the best potential for intact subsurface deposits.
2. Is it possible to be informed when your survey methods are refined based on what you're seeing in the field?
3. I recommend gathering GPS coordinates for all shovel tests, not just positive shovel tests.
4. On the second page, 8th paragraph, last sentence, "Should an eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." Can you please explain why testing will be conducted if the sites determined eligible?

Finally, the Archaeological Research Center's database should reflect the most up to date information from the mortuary surveys. If you find that this is not the case please let me know.

Thanks,
Paige

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Friday, August 15, 2014 1:40 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: DAPL proposed SOW

Paige,

Thanks for meeting with us. We certainly benefitted from the conversation. I wanted to present our proposed scope of work for your comment based on our meeting. I have attached it for your review. Our approach is to run this as a

Section 106-like project. Please let me know if you have any comments or require clarification on these procedures. We are hopeful that this approach will satisfy the SHPO.

I also wanted to inquire on how we might receive copies of the recent mound surveys you mentioned. We will be crossing Beadle, Campbell, Edmunds, Faulk, Kingsbury, Lake, Lincoln, McCook, Minnehaha, Miner, McPherson, and Spink counties. Any information from these counties would be great.

We look forward to working with you.

Thank you,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

Abby Peyton

From: Beth McCord <bmccord@graypape.com>
Sent: Wednesday, June 03, 2015 2:23 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: RE: Areas with buried site potential
Attachments: SD DAPL Geoarchaeological Methods.pdf

Paige,

Attached is the plan for your review. Please let me know if you need any additional information or have questions.

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

From: Olson, Paige [mailto:Paige.Olson@state.sd.us]
Sent: Wednesday, June 03, 2015 9:37 AM
To: Beth McCord
Subject: RE: Areas with buried site potential

Hi Beth,

It really depends on when you submit the methods. I will be out of the office next Tuesday – Friday. But in general the review would probably take a day or two.

Thanks,
Paige

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Tuesday, June 02, 2015 3:28 PM
To: Olson, Paige
Subject: Areas with buried site potential

Paige,

As we mentioned in the management summary for the DAPL project we have a couple of stream crossings that have low energy deposition and have the potential for buried cultural deposits. Currently, the streams will not be avoided by HDD. In the scope of work for the Level III survey we submitted to you in August, we had noted that we would submit a work plan to conduct the geoarchaeological assessment for your review. We believe the best method to identify cultural deposits will be a few backhoe trenches at each location. I was wondering when we submit our methods how long it would take you to review the plan. Could you let me know?

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

Abby Peyton

From: Olson, Paige <Paige.Olson@state.sd.us>
Sent: Friday, June 05, 2015 2:14 PM
To: 'Beth McCord'
Cc: Abby Peyton; Haug, Jim; Fosha, Mike
Subject: RE: Areas with buried site potential

Thank you for the opportunity to review the proposed methods for identifying deeply buried deposits. I have no concerns with the proposed methods provided that the trenching matches or exceeds the depth of the pipeline.

Thank you,

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

From: Beth McCord [mailto:bmccord@graypape.com]
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Cc: Abby Peyton
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Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

June 11, 2015

Jim Haug
Archaeological Research Center
South Dakota State Historical Society
217 Kansas City Street
Rapid City, SD 57701

RE: Level III Intensive Cultural Resources Survey of Dakota Access Pipeline Project for Campbell, McPherson, Edmunds, Faulk, Spink, Beadle, Kingsbury, Miner, Lake, McCook, Minnehaha, Turner, and Lincoln Counties, South Dakota

Dear Mr. Haug,

On behalf of Dakota Access, LLC, we are submitting the draft report referenced above. The survey was conducted in coordination with the state Public Utilities Commission requirements in compliance with SD 1-19A-11.1. Dakota Access, LLC is independently coordinating with federal agencies for Section 106 requirements for those portions of the Project that traverse federally-managed easements or jurisdictional areas.

A copy of the report has also been submitted to the Paige Olson at the SHPO office. If you have any questions feel free to contact me at 317-541-8200. Should you wish to defer your review at this time, please notify me.

Sincerely,

Beth McCord
Indiana Branch Manager

cc: Monica Howard, Energy Transfer, Monica.Howard@energytransfer.com
Abby Peyton, Perennial Environmental, APeyton@Pernnialenv.com

June 11, 2015

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501

RE: Level III Intensive Cultural Resources Survey of Dakota Access Pipeline Project for Campbell, McPherson, Edmunds, Faulk, Spink, Beadle, Kingsbury, Miner, Lake, McCook, Minnehaha, Turner, and Lincoln Counties, South Dakota

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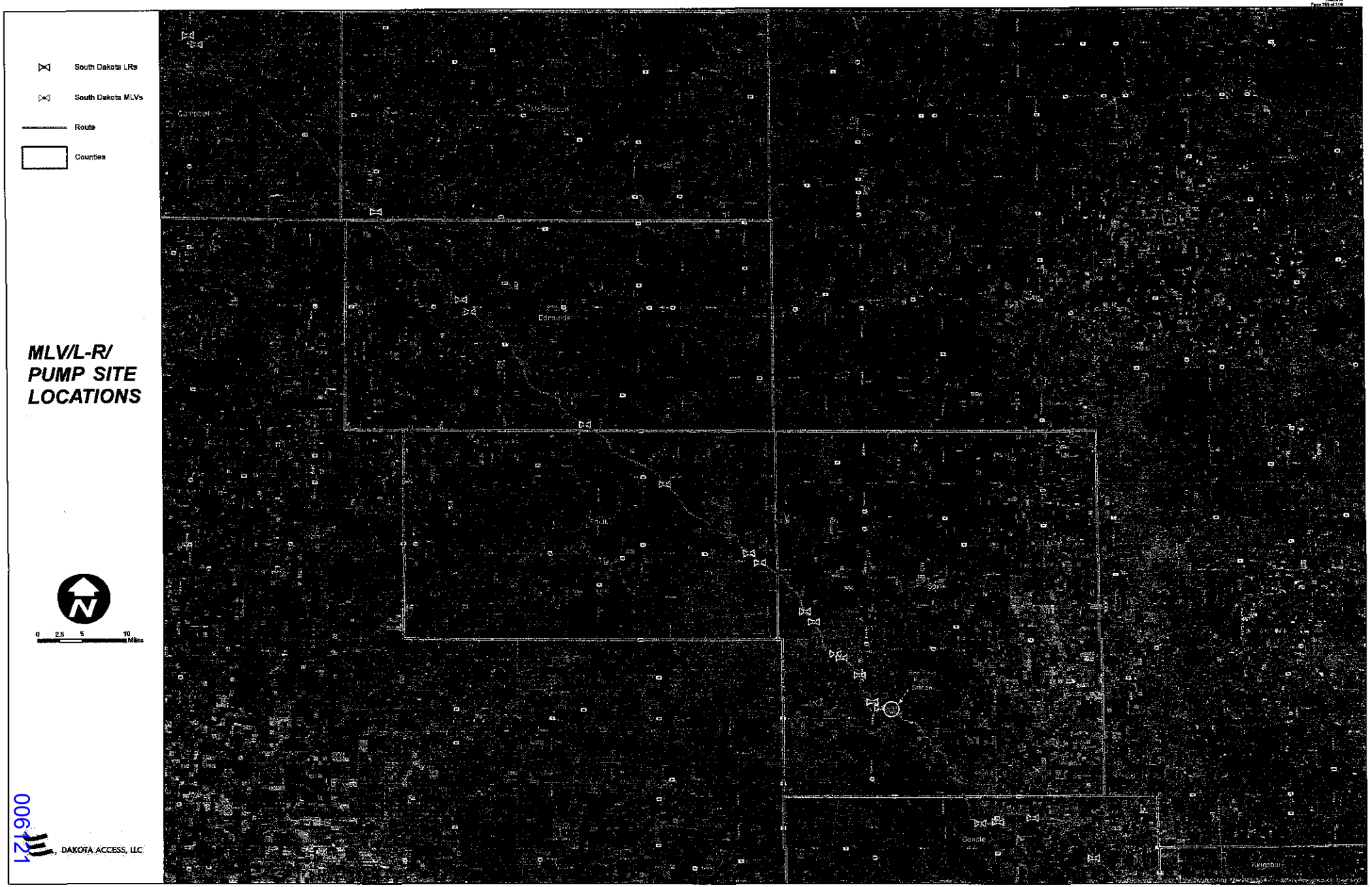
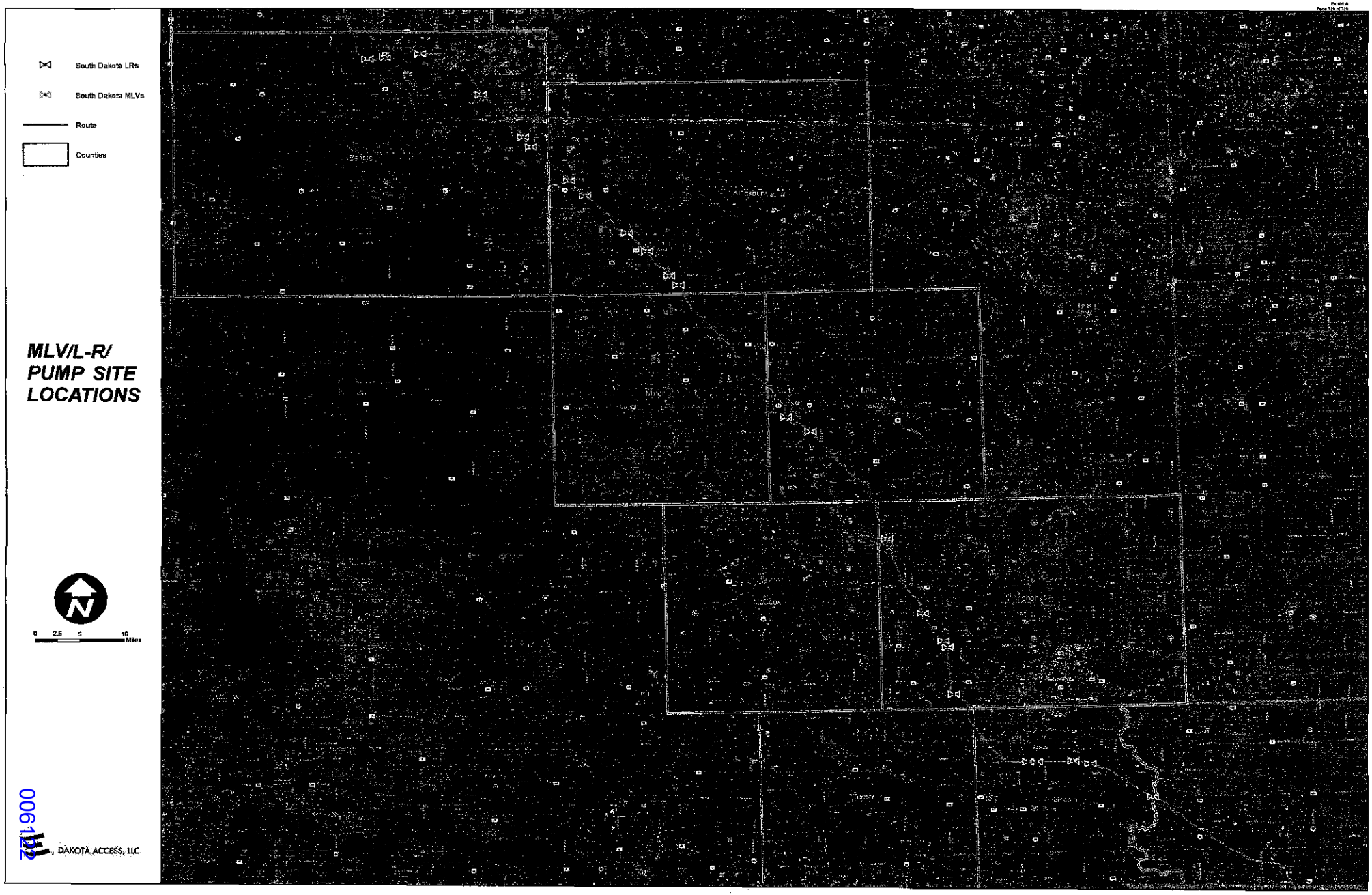
A copy of the report has also been submitted to the Jim Haug at the Archaeological Research Center. If you have any questions feel free to contact me at 317-541-8200. Should you wish to defer your review at this time, please notify me.

Sincerely,

Beth McCord
Indiana Branch Manager

cc: Monica Howard, Energy Transfer, Monica.Howard@energytransfer.com
Abby Peyton, Perennial Environmental, APeyton@Pernnialenv.com


South Dakota LRs
South Dakota MLVs
Route
Counties
MLV/L-R/
PUMP SITE
LOCATIONS
0 2.5 5 10
Miles
Campbell
Edmunds
Faulk
Spink
Day
Clark
Codington
Roberts
DAKOTA ACCESS, LLC
006121


South Dakota LRs
South Dakota MLVs
Route
Counties
MLV/L-R/
PUMP SITE
LOCATIONS
N
0 2.5 5 10
Miles
DAKOTA ACCESS, LLC

DARREN D. KEARNEY

500 E Capitol Ave · Pierre, SD 57501· 605-773-3201
Darren.Kearney@state.sd.us

EDUCATION:

UNIVERSITY OF SOUTH DAKOTA, Vermillion, South Dakota
Beacom School of Business
Master's in Business Administration (GPA 4.0) *June 2013 – May 2015*

UNIVERSITY OF ST. THOMAS, Minneapolis, Minnesota
Opus College of Business
Pursued Master's in Business Administration (GPA 3.95) *November 2011 – December 2012*

UNIVERSITY OF MINNESOTA, Minneapolis, Minnesota
College of Biological Sciences
Bachelor of Science, Biology (GPA 3.347) *December 2003*

EXPERIENCE:

SOUTH DAKOTA PUBLIC UTILITIES COMMISSION, Pierre SD
Utility Analyst *February 2013 - Present*

- Ensured public utility company filings are in compliance with South Dakota statutes and regulations.
- Analyzed transmission facility siting dockets and helped draft settlement agreements when appropriate.
- Analyzed energy efficiency, telecom tariff, telecom certificate of authority, and electric service territory dockets.
- Reviewed proposed EPA rules and authored comments in response to the proposed rules.
- Participated in regional transmission planning discussions.
- Attended a number of trainings on electric grid operation, regional transmission planning, public utility policy issues, and ratemaking.

XCEL ENERGY, Minneapolis MN
Plant Environmental Analyst III *October 2009 – February 2013*

- Reviewed power plant processes and made modifications as necessary to ensure the plant was in continued compliance with environmental permits and regulations.
- Coordinated environmental related testing (e.g. annual stack tests required by Air Permit/CAA).
- Worked on Title V Air Permit and NPDES Permit renewals/amendments.
- Reviewed plant air and water emissions data and generated compliance reports for Air and NPDES/SDS Permits.
- Performed plant compliance inspections/audits to ensure permits, policies, and procedures were properly executed.
- Provided environmental training to plant staff.
- Conducted root cause investigations on spills and permit non-compliance incidents, developed corrective actions to prevent incident reoccurrence, and then implemented the corrective actions as directed by plant management.
- Acted as point of contact during regulatory agency inspections and internal audits.
- Managed the facility's hazardous waste program for compliance with county waste rules and RCRA.

Environmental Analyst II *August 2006 – October 2009*

- Subject matter expert for AST/UST compliance, the Oil Pollution Act of 1990 (SPCC) and Industrial Stormwater.
- Managed an Environmental Incident Response Program that involved training individuals on reporting and/or cleanup requirements for oil/chemical spills and power plant permit non-compliance incidents.
- Mobilized company and contractor resources to spills and directed spill cleanups.
- Negotiated with regulators (e.g. Minnesota Pollution Control Agency) to secure aboveground storage tank permits.

ADECCO TECHNICAL, Edina MN
Contract Biologist - Xcel Energy Environmental Analyst *June 2004 – August 2006*

- Developed monitoring plans, conducted field monitoring/sampling, performed statistical analysis on data collected, and authored reports for biological studies at Xcel Energy power plants as required by State and Federal Rules.
- Established knowledge of environmental permits and Federal, State, and Local environmental regulations.

ACHIEVEMENTS

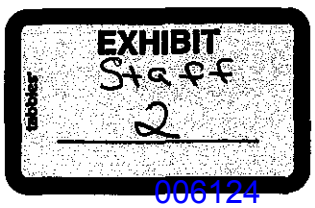
- Academic: Beta Gamma Sigma International Honor Society (Business School)

BEFORE THE
PUBLIC UTILITIES COMMISSION
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

DOCKET HP14-002

PREFILED TESTIMONY OF BRIAN WALSH
ON BEHALF OF THE COMMISSION STAFF
July 6, 2015



Q. State your name.

A. Brian Walsh.

Q. State your employer.

A. State of South Dakota.

Q. Specify the department for which you work.

A. Department of Environment and Natural Resources (DENR) – Ground Water Quality Program

Q. Explain your role and duties within your department.

A. I am an Environmental Scientist III with the Ground Water Quality Program. My role is to provide technical expertise and departmental oversight while enforcing the applicable state laws and rules on projects impacting or having the potential to impact groundwater resources in South Dakota.

My duties include serving as the department's coordinator for hazardous material pipeline projects and staffing the South Dakota Underground Pipeline Task Force, administering the department's Underground Injection Control Class II

program, preparing source water assessment reports, and overseeing the cleanup of regulated substance releases cases.

Q. On whose behalf was this testimony prepared?

A. This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission.

Q. Have you reviewed the Application and its amendments?

A. Yes, I have reviewed the portions of the Application relevant to my job duties and responsibilities.

Q. When would your agency have jurisdiction of Dakota Access?

A. DENR would have regulatory jurisdiction of the Dakota Access Pipeline under the following situations:

- Temporary water use permit for construction activities, drilling, or hydrostatic testing;
- Temporary discharge permit for dewatering and/or discharge of hydrostatic test water;
- In the event temporary construction camps are needed and depending on the design of the camp, the following areas may be regulated by

DENR; surface water discharge, septic systems design, water rights, or drinking water;

- In the event Dakota Access causes the release of a regulated substance DENR would direct and oversee the cleanup of the release in accordance with state soil and ground water standards;
- Dakota Access must submit a Crude Oil Spill Response Plan to DENR for review and approval prior to operating the pipeline.

Q. What has been your involvement with Dakota Access?

A. In general, my involvement with Dakota Access has been to act as DENR's project coordinator, facilitate communication between Dakota Access and DENR during project development, follow the Dakota Access permitting process before the South Dakota Public Utilities Commission (PUC), and respond to public inquires about the proposed pipeline. Specific examples of my involvement with the project are described below:

- June 2014 – organized and participated in a project kick-off meeting involving Dakota Access, DENR, South Dakota Game Fish and Parks, South Dakota State Historical Preservation Office, the US Army Corps of Engineers, the US Fish and Wildlife;
- June 2014 – provided Source Water and Wellhead Protection geographical information system (GIS) data to a Dakota Access contractor for use in route development;

- October 2014 – provided information on Dr. DeBoer's research on the impacts of crude oil on plastic waterlines and on crude oil pipeline / waterline crossings to a Dakota Access contractor for use in route development and project design;
- October 2014 – Attended Dakota Access public information meetings in Ipswich, Huron, Madison and Sioux Falls hosted by Dakota Access;
- January 2015 – Attended PUC public hearings on the proposed pipeline in Bowdle, Redfield, Iroquis and Sioux Falls;
- February 2015 – provided Lincoln County and Minnehaha County Source Water and Wellhead Protection GIS data to a Dakota Access contractor for use in route development;
- May 2015 – provided Zone A and Zone B Wellhead Protection GIS data within 5-miles of the proposed pipeline route to a Dakota Access contractor for use in route development;

Q. Did you provide any recommendations to Dakota Access during route development? If so, what were those recommendations and did Dakota Access accept your recommendations when developing the currently proposed route?

A. Yes, I recommended Dakota Access develop the route to avoid crossing any Zone A Wellhead or Source Water Protection Areas because they designate areas that may directly contribute drinking water to public water supplies. Also,

because an initial route crossed portions of the Minnehaha County Wellhead Protection area I recommended Dakota Access alter the route to avoid intersecting this area. Based on my review, the proposed route does not cross any Zone A Wellhead or Source Water Protection Areas and the route was altered to avoid the Minnehaha County Wellhead Protection area.

In addition, because DENR is not directly responsible for the development of local wellhead protection areas, I recommended Dakota Access contact the affected county governments to ensure they had the most up-to-date information about the protection areas and any ordinances or restrictions that may apply in those areas. I do not know if Dakota Access complied with this recommendation.

Q. Are there any geological and/or hydrological sensitive areas crossed by the proposed route? If so, can Dakota Access mitigate or minimize the risks associated with those sensitive areas?

A. Yes, the proposed route crosses approximately 0.8 miles of the Kingsbury County Zone B Wellhead Protection Area and approximately 1.8 miles of the Lake County Zone B Wellhead Protection Area. The areas represent portions of mapped, shallow or surficial aquifers that are outside of the critical Zone A areas but have still been designated as part of the protection area by the local authority.

Although the proposed route does cross these areas, the crossing distance is small, therefore, if the pipeline is constructed and operated as designed and in

compliance with all applicable laws, regulations and permit conditions the risk to these areas is minimized.

Q. Does this conclude your testimony?

A. Yes.

Brian J. Walsh

South Dakota Department of Environment and Natural Resources
523 East Capitol Ave.
Pierre SD 57501
605-773-3296
Brian.Walsh@state.sd.us

Professional Experience

South Dakota Department of Environment and Natural Resources

Hydrologist June 2003 to July 2004.
Senior Hydrologist July 2004 to January 2008.
Hydrology Specialist / Environmental Scientist III January 2008 to Present.

- Underground Injection Control Class II program (Oil and Gas injection wells).
- Powertech's proposed in-situ uranium mine.
- Hazardous material pipeline projects.
- Ground Water Quality Conference.
- South Dakota Underground Pipeline Task Force.
- Oversee regulated substance release cases.

Arizona Department of Water Resources

Hydrologist II January 2001-September 2002.
Hydrologist III September 2002 – June 2003.

- Perform technical reviews on applications for underground storage facility permits.
- Provide technical advice and consultation to the Recharge Programs legal staff.
- Perform appropriability checks on groundwater wells.
- Perform technical reviews on hydrologic portions of grant applications to the Arizona Water Protection Fund.

Education/Training

- Governor's Leadership Development Certificate Program. University of South Dakota, graduated November 2010.
- 1994-1998 BS Environmental Science, Co-Major Biology, Creighton University, Omaha, Nebraska.

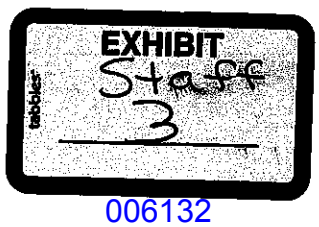
BEFORE THE
PUBLIC UTILITIES COMMISSION
STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

DOCKET NO. HP14-002

PREFILED TESTIMONY OF KIMBERLY L MCINTOSH ON BEHALF OF THE COMMISSION STAFF

July 6, 2015



Q. State your full name.

A. Kimberly Lorrene McIntosh.

Q. State your employer.

A. South Dakota Department of Environment and Natural Resources.

Q. Explain the specific program for which you work.

A. Ground Water Quality Program - Spill Assessment and Cleanup Section. The spill section is responsible for documenting all reported regulated substance releases: petroleum, chemical, pesticide, fertilizer, metals, etc. The spill section maintains the program files and the environmental events database which contains information on each reported release. This section investigates complaints and releases, obtains environmental samples, provides direction to responsible parties, environmental consultants and local officials on state laws and rules, and issues letters directing the assessment and cleanup of contamination. This section is responsible for the SARA (Superfund Amendment and Reauthorization Act) Title III Program which requires that chemicals stored in certain quantities be reported to the state. The spill section also is responsible for other projects such as emergency planning and response, methamphetamine issues, low level radiation issues, and homeland security issues.

Q. State what you do for this program.

A. I direct and oversee the staff in the spill section. I evaluate information and data to identify and name responsible parties. I direct environmental contractors and responsible parties on emergency response activities, assessment and cleanup activities associated with spills, releases and un-permitted discharges. I manage the State Regulated Substance Response Fund and the Environmental Livestock Fund. I am responsible for the selection and hiring of contractors to be used in the event that a responsible party is unable to perform a cleanup or refuses to perform a cleanup and the Regulated Substance Response Funds are necessary to remedy a situation. I am responsible for the evaluation of spills and releases to insure that the cleanup meets state requirements.

Q. Explain the range of activities and duties your program covers and what you specifically do for the program.

A. I review consultant reports detailing sampling of soil and ground water contamination associated with all types of spills and releases of regulated substances. I review and approve cleanup plans and act as the team leader, directing day to day work activity of the spill section. Activities included in the spill section include the Superfund Amendment and Reauthorization Act (SARA) Title III activities, department emergency response activities, homeland security activities, and state emergency and disaster planning activities. I also represent the state on the Regional Response Team acting as a state liaison with EPA, and other federal agencies in the event of an incident of national significates, federally declared disaster or a large oil spill to navigable waters.

Q. On whose behalf was this testimony prepared?

A. This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission (Staff).

Q. What state environmental laws and rules address petroleum spills?

A. State: SDCL 34A-2, SDCL 34A-12, SDCL 34A-18 and ARSD Chapter 74:34:01, ARSD Chapter 74:54:01, ARSD Chapter 74:56:03, ARSD Chapter 74:56:05 and ARSD Chapter 74:10:05.

Q. Which of those laws or rules do you personally work with?

A. All of the above.

Q. What level of cleanup is required in the case of a petroleum spill?

A. All petroleum spills are evaluated to determine what damage has occurred and what risk to human health and the environment exists based on the specifics of each release: substance released, amount released, location of release, depth to ground water, threat to surface water, threat to basements, water wells, or utilities, etc. The department has established cleanup criteria and standards in which each release is evaluated against to protect human health and the environment, so not all petroleum releases are cleaned up to the same level of contamination.

Q. Can there be hydrocarbon left in the soil after a cleanup?

A. Yes, petroleum contamination may be left in the soil after a cleanup if the department determined that the remaining contamination does not pose a risk to human health or further risk to the environment.

Q. What kind of remediation activities are conducted in response to a hydrocarbon spill in soil?

A. Excavation and off-site disposal/treatment of impacted soil, excavation and onsite treatment of impacted soil and in-situ soil vapor extraction.

Q. What kind of remediation activities are conducted in response to a hydrocarbon spill in groundwater?

A. Excavation of impacted soil and soil venting may be conducted in conjunction with ground water sparging. Ground water monitoring is required to document ground water conditions.

Q. Explain other activities you use for remediation.

A. Soil can be excavated and incinerated to destroy hydrocarbons. Bioremediation activities may also be performed to treat contaminated soil and ground water.

Q. What are the leak size requirements for a reportable spill?

A. SDCL 34A-12: A release or spill of a regulated substance (petroleum) must be reported to DENR immediately if any one of the following conditions exists:

1. The discharge threatens or is in a position to threaten the waters of the state (surface water or ground water);
2. The discharge causes an immediate danger to human health or safety;
3. The discharge exceeds 25 gallons; (For crude oil see bullet #8)
4. The discharge causes a sheen on surface water;
5. The discharge of any substance that exceeds the ground water quality standards of ARSD chapter 74:54:01;
6. The discharge of any substance that exceeds the surface water quality standards of ARSD chapter 74:54:01;
7. The discharge of any substance that harms or threatens to harm wildlife or aquatic life;
8. The discharge of crude oil in field activities under SDCL chapter 45-9 is greater than 1 barrel (42 gallons).

Q. Has there been any permanent natural resources damage in South Dakota as a result of a hydrocarbon pipeline leak?

A. I am not aware of any permanent natural resource damage from a petroleum pipeline release in South Dakota.

Q. Are there spills that cannot be remediated?

A. I do not believe there are any petroleum spills that can't be remediated given sufficient time and resources.

Q. Who is obligated to remediate a spill?

A. SDCL 34A-12 identifies that the person or persons who caused the release are responsible to assess and cleanup the contamination. SDCL 34A-18-8 identifies that each crude oil pipeline operator must implement their response plan regardless of the party responsible for the release.

Q. How do you remediate hydrocarbon contaminated wells?

A. It depends on the level of contamination present in the well and in the ground water. Depending on the concentration of contamination in the well and ground water the water from the well may be treated with a carbon filter system that removes (strips) the hydrocarbons.

Q. What if you can't achieve remediation of a well?

A. The responsible party is required to supply the well owner/user with an alternate source of drinking water. This may require drilling a new well in a different location, drilling a deeper well in a deeper formation or hooking the well user up to rural or city water supply.

Q. What is the extent of landowner involvement in remediation?

A. It depends on the situation. Some landowners want to be involved in the cleanup but most allow the department to work with the responsible party to get the cleanup work performed to state standards. The department copies the land owner on all written correspondence with the responsible party and consultant. If the land owner wishes to be involved with the cleanup, meetings may be held to address the concerns of the landowner and other interested parties. Copies of assessment and remediation documents can be provided if the land owner wishes to receive them.

Q. Does DENR have the resources to deal with a spill from a hydrocarbon pipeline such as Dakota Access Pipeline?

A. The DENR has the resources necessary to oversee the assessment and cleanup of a crude oil release from existing crude oil pipelines and has the resources to oversee a release from the Dakota Access pipeline, if one should occur. The DENR manages a fund with sufficient resources to contain and initiate cleanup actions, if a release should occur, and the pipeline company is unable or refuses to perform the required response activities. Federal financial resources may also be available if the responsible party refuses or is unable to perform the assessment cleanup work.

Q. Does this pipeline place any additional burden on your program?

A. The Dakota Access Pipeline does not place additional burden on the Ground Water Quality Program.

Q. Please explain the State's Regulated Substance Response Fund that may be available to help fund a remediation project if the responsible party is unable or unwilling to perform the work.

A. Please see Attachment 1. Attachment 1 is a copy of Appendix I from the "Findings Report" dated December 1, 2008 from the *South Dakota Underground Pipeline Task Force* report. This attachment is information on the South Dakota Regulated Substance Response Fund. This information was previously compiled and provided to the South Dakota Underground Pipeline Task Force.

Q. Is the information provided in Attachment 1 still accurate or has there been any change?

A. The information provided in this document is accurate with the exception with the last sentence. The balance of the Regulated Substance Response Fund as of 06/30/2014 was $2,753,000.00.

Q. Please explain the Federal Oil Spill Liability Trust Fund and/or any other program available to help fund a remediation project.

A. Please see Attachment 2. Attachment 2 is a copy of "NPFC Mission Overview" produced by the U.S. Coast Guard National Pollution Funds Center. This attachment contains information on the federal Oil Spill Liability Trust Fund.

Q. Any other information you believe the commission and the public will find useful.

A. Staff in Ground Water Quality Program has extensive experienced in overseeing the assessment and cleanup of all types of petroleum releases. In addition, the Federal Environmental Protection Agency and U.S. Coast Guard have extensive technical expertise and experience in responding to major crude oil incidents across the country.

Appendix I

South Dakota Regulated Substance Response Fund

(Attachment 1)

REGULATED SUBSTANCE RESPONSE FUND DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

CONTACTS:
Steve Pirner, Secretary
Tim Tollefsrud, Director

INTENT I USE I PURPOSE:

The money in the Regulated Substance Response Fund is continuously appropriated to provide funding for the clean up of regulated substance discharges. The Secretary of the Department of Environment and Natural Resources may expend funds from the response fund to provide for the costs of investigations, emergency remedial efforts, corrective actions, and managerial or administrative activities associated with such activities.

SUMMARY:

In 1988 SDCL: 34A-12-3 created the Regulated Substance Response Fund. The fund was created through an appropriation from general fund, a one-time contribution from the petroleum release compensation fund, and a temporary pesticide registration fee.

Ongoing deposits into the fund come from; money from civil actions or administrative proceedings for violation of environmental statutes or upon damage to the environment, including actions for administrative expense recoveries, civil penalties, compensatory damages, and money paid pursuant to any agreement, stipulation, or settlement in such actions or proceedings; and interest attributable to investment of the money in the response fund. Before the fund can be used, there must be a discharge of a regulated substance, but then the money is continuously appropriated to provide funds for the clean up of regulated substance discharges. The department may file civil actions or liens on property owned by the responsible person to cost recover.

REQUIREMENTS:

The Secretary of the Department of Environment and Natural Resources may expend funds from the response fund to provide for the costs of investigations, emergency remedial efforts, corrective actions, and managerial or administrative activities associated with discharges of regulated substances. For a substance to be classified as a regulated substance, it must be defined in either statute or rule. SDCL 34A-12-I exempts sewage and sewage sludge from being classified as a regulated substance.

The secretary's use of the response fund shall be based upon the following:

(1) In the case of an investigation, when the secretary determines that a discharge requiring an emergency remedial effort may have occurred and that the general operating budget of the department for such purposes is not adequate to cover the costs of the necessary investigatory activities;

(2) In the case of an emergency remedial effort, when the secretary determines that a discharge has occurred and that corrective actions shall be immediately undertaken to protect an imminent threat to the public health or safety or to contain a discharge which, if not immediately contained, shall in time pose a significantly greater threat to public health or safety or to the environment of this state than if such action is not immediately taken;

(3) In the case of a discharge not of an emergency nature when the secretary determines that a discharge has occurred, that a responsible party or liability fund capable of performing the corrective actions either cannot be identified or refuses to undertake corrective actions, and that corrective actions shall be undertaken to protect the public health, safety, welfare, or environment of the state.

SDCL 34A-12-12 makes the responsible person strictly liable for any corrective action costs expended from the Regulated Substance Response Fund, and the department may file either civil actions or liens on property owned by responsible persons to cost recover.

STATUTES:

34A-12-3. Regulated substance response fund established - Purpose - Source of funds - Continuous appropriation - Informational budget - Annual legislative review -There is hereby established in the state treasury an operating fund to be known as the regulated substance response fund for the purpose of providing funds for the clean up of regulated substance discharges. In addition to the money from the petroleum release cleanup fund as provided in § 34A-12-2 and the temporary pesticide registration fee increase provided by § 38-20A-9, funds from the following sources shall be deposited into the response fund:

(1) Direct appropriations to the response fund from the general fund;
(2) Money, other than criminal fines assessed in criminal actions, recovered by the state in any action or administrative proceeding based upon violation of the state's environmental statutes or upon damage to the environment, including actions for administrative expense recoveries, civil penalties, compensatory damages, and money paid pursuant to any agreement, stipulation, or settlement in such actions or proceedings;
(3) Interest attributable to investment of the money in the response fund;

(4) Money received by the department in the form of gifts, grants, reimbursements, or appropriations from any source intended to be used for the purposes of the response fund. All money in the response fund is continuously appropriated for the purposes specified in § 34A-l 2-4. All money received by the department for the response fund shall be set forth in an informational budget pursuant to § 4-7-7.2 and be annually reviewed by the Legislature.

Source: SL 1988, ch 291, § 4.

34A-12-2. One-time contribution from petroleum release compensation fund to response fund- Annual contribution to groundwater protection fund -- The petroleum release compensation fund established pursuant to § 34A-13-l 8. shall make a one time contribution of three hundred fifty thousand dollars, to the response fund within one year after March 1, 1988, and shall contribute one hundred thousand dollars annually for five years to the groundwater protection fund to fund the groundwater research and education program established pursuant to § 46A-1-85. Source: SL 1988, ch 291, § 3; 1989, ch 306, § 55.

34A-12-4. Expenditure of funds by secretary - Grounds for expenditures -- When necessary in the performance of the secretary's duties under §§ 23A-27-25. 34A-l-39, 34A-2-75. 34A-6-l.4 34A-6-l.3 l, 34A-l l-9, 34A- ll -10. 34A-1 l-l2, 34A-11-14. 34A-12-l to 34A-l2 15. inclusive, 45-6B-70. 45-6C-45, 45-6D-60. and 45-9-68 and Title 34A relative to discharges, the secretary may expend funds from the response fund to provide for the costs of investigations, emergency remedial efforts, corrective actions , and managerial or administrative activities associated with such activities. The secretary's use of the response fund shall be based upon the following:

(1) In the case of an investigation, when the secretary determines that a discharge requiring an emergency remedial effort may have occurred and that the general operating budget of the department for such purposes is not adequate to cover the costs of the necessary investigatory activities;
(2) In the case of an emergency remedial effort, when the secretary determines that a discharge has occurred and that corrective actions shall be immediately undertaken to protect an imminent threat to the public health or safety or to contain a discharge which, if not immediately contained, shall in time pose a significantly greater threat to public health or safety or to the environment of this state than if such action is not immediately taken;
(3) In the case of a discharge not of an emergency nature when the secretary determines that a discharge has occurred, that a responsible party or liability fund capable of performing the corrective actions either cannot be identified or refuses to undertake corrective actions, and that corrective actions shall be undertaken to protect the public health, safety,

welfare, or environment of the state. Source: SL 1988, ch 291, § 5; 1992, ch 158, § 55A; 1999, ch 182,§ 3.

34A-12-12. Strict liability for costs of corrective action. Any person who has caused a discharge of a regulated substance in violation of § 34A-I 2-8 is strictly liable for the corrective action costs expended by the department pursuant to §§ 23A-27-25. 34A-1-39. 34A-12-I to 34A-12-I5. inclusive, 38-20A-9, 45-6B-70. 45-6C-45. 45-6D-60, and 45-9-68. Source: SL 1988, ch 291, § 13.

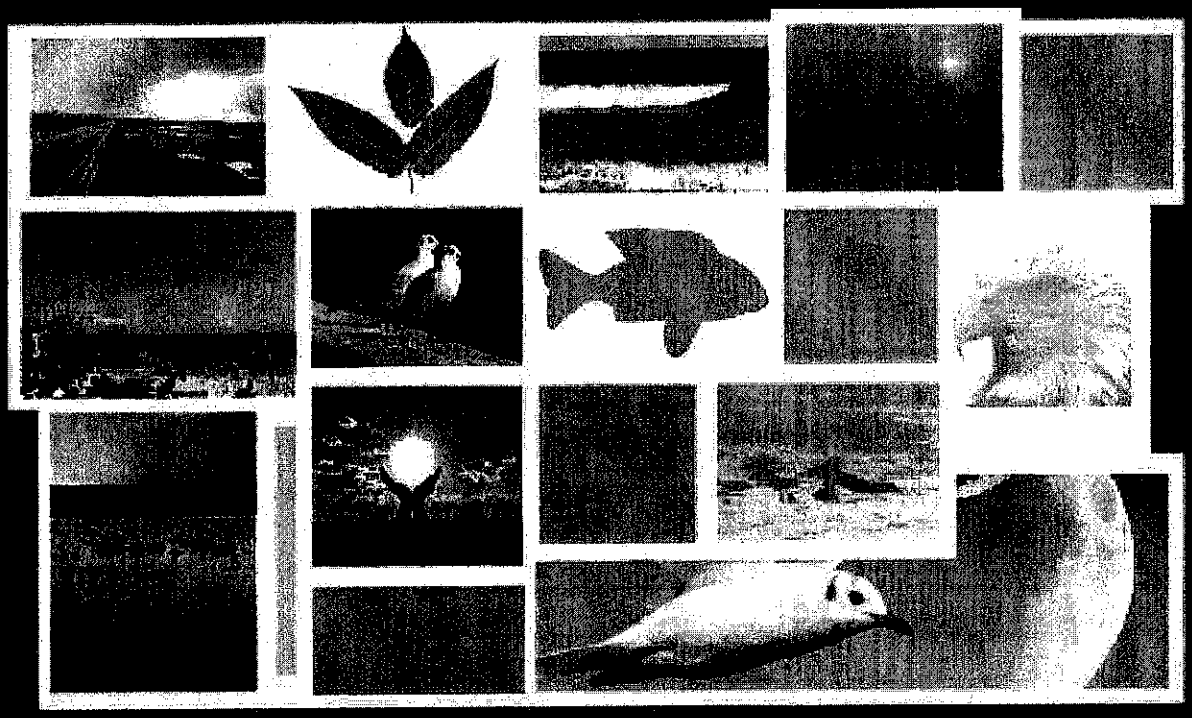
CURRENT STATUS

The Department of Environment and Natural Resources currently has six (6) contracts in place with environmental consulting firms to provide response capabilities. These contracts are 4 year contracts with extension provisions. Currently the department has contracts with the following firms: Geotek Engineering & Testing Services (Sioux Falls); Leggette, Brashears & Graham (Sioux Falls); Terracon Consultants (Rapid City and Omaha); West Central Environmental (Morris, Minnesota); BayWest (St. Paul, Minnesota); and American Engineering Testing Services (Pierre and Rapid City).

The balance of the Regulated Substance Response Fund as of 06/30/2008 was $2,575,500.00.

National Pollutions Fund Center (Federal Oil Spill Liability Trust Fund)

(Attachment 2)



NPFC Mission Overview

Department of Homeland Security

U.S. Coast Guard
National Pollution
Funds Center

006148

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Introduction

Craig A. Bennett
Director, NPFC

As millions of gallons of oil are transported and stored across the United States every day, we are faced with the possibility of an accidental spill that can devastate wildlife, endanger our water, and impact our economy.

The U.S. Coast Guard's National Pollution Funds Center (NPFC), committed to protecting America's environment, provides protection up-front by certifying that oil-carrying vessels have the financial ability to pay in the case of an oil spill. When spills do occur, the NPFC provides funding for quick response, compensates claimants for cleanup costs and damages, and takes action to recover costs from responsible parties.

Oil Pollution Act

In 1990, Congress passed the Oil Pollution Act (OPA) to help address a wide range of issues associated with preventing, responding to, and paying for oil pollution. It does so by creating a comprehensive prevention, response, liability, and compensation regime to deal with oil pollution to U.S. navigable waters caused by vessels or facilities. OPA significantly increased federal oversight of maritime oil transportation, while providing greater environmental safeguards. This was accomplished by setting new requirements for vessel construction and crew licensing and manning, mandating contingency planning, enhancing federal response capability, broadening enforcement authority, increasing penalties, creating new research and development programs, increasing potential liability limits, and significantly broadening financial responsibility requirements.

Title I of OPA established new and higher liability limits for oil spills, with commensurate changes to financial responsibility requirements. It substantially broadened the scope of damages, including natural resource damages, for which polluters are liable. It also provided for the use of a billion Oil Spill Liability Trust Fund (OSLTF or Fund) to pay for expeditious oil removal and uncompensated damages. OSLTF administration was delegated to the U.S. Coast Guard by Executive Order; and on February 20, 1991, the NPFC was commissioned to perform this function.

CERCLA and Superfund

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) gave the Federal government the authority and the funding (i.e., Superfund) to clean up sites contaminated by hazardous waste. CERCLA response authority includes response to intentional releases of industrial or military hazardous materials by terrorists, resulting in an overlap of pollution response and homeland security. Although the EPA administers Superfund, the Coast Guard responds to releases and substantial threats of releases of hazardous materials in the coastal zone, the Great Lakes, and inland river ports.

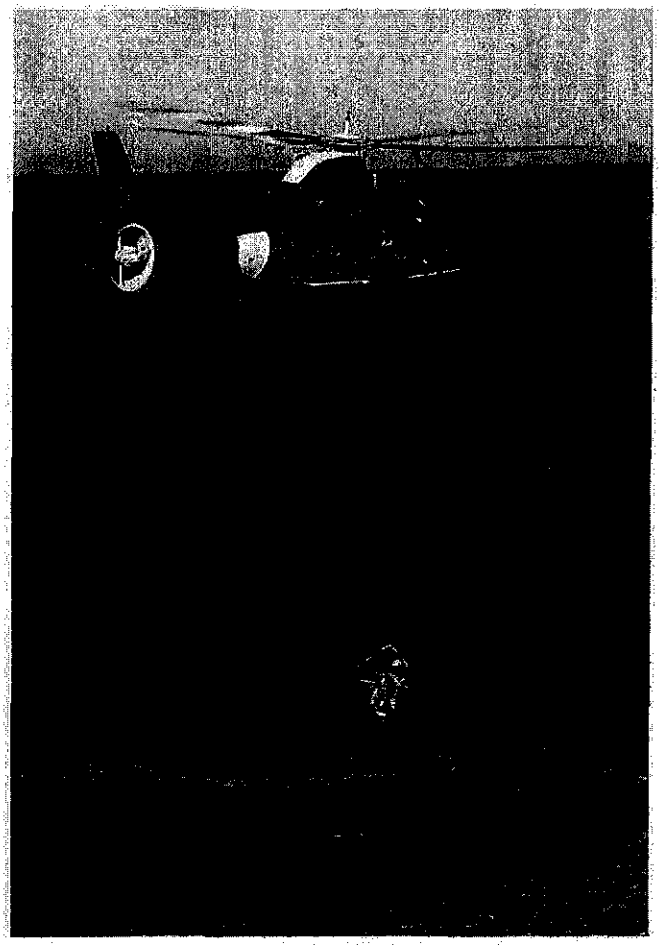
Since its establishment, the NPFC has served as the fiduciary agent for the portion of the Superfund used by the Coast Guard. EPA provides the funds to the Coast Guard through Inter-Agency Agreements (IAGs); the funds are used for costs incurred in removal operations following a CERCLA incident and for the ongoing costs of building and maintaining response capabilities (training, equipment, personnel).

Disaster Funding

The Stafford Act provides federal assistance to state and local governments impacted by a significant disaster or emergency, such as hurricanes or terrorist acts. These events fall under the National Response Plan (NRP).

If the President issues a Federal Disaster Declaration, FEMA-administered Stafford Act funds become available for a wide variety of emergency Mission Assignments. The Coast Guard has frequently been called upon to conduct operations supporting these Mission Assignments, which routinely include response to oil and hazardous materials spills/releases and periodically may involve search and rescue, law enforcement, and marine debris removal.

The NPFC serves as the fiduciary agent for the portion of the Stafford Act funding assigned to the Coast Guard for pollution response. Disaster relief funds for pollution response (ESF-10) are made available to the Coast Guard through IAGs. The funds are used for costs incurred in removal operations following a Presidential disaster declaration.



Vision & Mission

NPFC Vision Statement

The NPFC aspires to be the model fiduciary manager of a federal trust fund and the implementing agency of a premiere financial responsibility program. We realize our vision through quality; equitable and timely customer service; innovative leveraging of technology to increase productivity; and continuous focus on our regulatory mandates, as well as our stakeholders' diverse interests.

NPFC Mission Statement

The NPFC has fiduciary responsibility to administer the OSLTF, manage the portion of the Superfund that the Coast Guard uses, and oversee the vessel financial responsibility provisions of OPA. In accordance with OPA and other pertinent legislative mandates, the NPFC implements programs to accomplish these seven objectives:

1. ***Administer the Oil Spill Liability Trust Fund***

   The past decade has seen a wide range of laws passed by the Congress to improve financial management in the Federal government. Two prominent examples are the Chief Financial Officer (CFO) Act and the Debt Collection Improvement Act. The NPFC has enhanced its business processes as a result of these laws, employing rigorous fiduciary management and reporting systems to meet statutory requirements established for federal trust funds such as the OSLTF.

2. ***Provide funding for federal removal actions in response to a discharge or a substantial threat of discharge of oil to navigable waters of the United States***

   When an oil or hazardous substance spill occurs in U.S. navigable waters, or there is a substantial threat of such a spill, the Responsible Party (RP) is expected to act promptly. The NPFC maintains a system that provides funds 24-hours-a-day for Federal On-Scene Coordinator (FOSC) needs, either to immediately respond or to monitor the RP's cleanup activities. Funds may also be accessed by states for oil removal actions.

3. ***Compensate claimants for OPA removal costs or damages***

   OPA expands the scope of damages claimants can recover and does away with the traditional admiralty ship owners' protection. Traditional protection generally limited the scope of pure economic damages to only those who owned property physically impacted by oil and often limited the extent of liability of the ship owner to the value of the ship. The NPFC compensates those who have suffered certain damages or incurred removal costs because of a discharge or a substantial threat of a discharge of oil to U.S. navigable waters.

4. ***Provide funding to natural resource trustees for Natural Resource Damage Assessment (NRDA) and restoration***

   For oil spills affecting natural resources, trustees may choose to submit a request to conduct the initiation of an NRDA. This established procedure allows the trustees, acting through a Federal Lead Administrative Trustee (FLAT), to gain access to OSLTF funds to complete these "pre-assessment" activities. The NPFC provides responsive adjudication of claims and distributes information to potential claimants and the public for NRD claims.

5. ***Recover OPA removal costs and damages from responsible parties (RPs)***
   An underlying principle of OPA is to reduce the probability of an oil spill incident. The law is designed to motivate potential polluters to act more responsibly by holding them strictly liable for costs and damages resulting from oil spills into U.S. navigable waters. Such action is encouraged by enforcement of cost recovery under OPA. NPFC's goals are to ensure that:
   - Parties responsible for oil pollution or substantial threat of oil pollution are identified
   - All removal costs and damages are documented accurately and submitted promptly
   - RPs pay such costs and damages
6. ***Issue certificates of financial responsibility (COFRs) for vessels***
   OPA substantially increased the scope and limits of liability for vessel owners and operators. Operators of U.S.- and foreign-flag vessels over 300 gross tons generally are prohibited from operating in U.S. waters without first demonstrating their financial ability to pay for pollution removal costs and damages. The NPFC is responsible for issuing vessel COFRs in accordance with OPA and CERCLA. The Coast Guard and U.S. Customs Service field units enforce the COFR requirement. Currently, about 19,000 vessels carry COFRs issued by the Coast Guard.
7. ***Provide funding for Coast Guard responses to discharges or the substantial threats of a discharge of hazardous substances***
   CERCLA and the Hazardous Substance Superfund give the Federal government flexibility in identifying and addressing releases of hazardous substances and provide monies to identify, prioritize, and clean up the nation's uncontrolled hazardous waste sites. The NPFC provides funding for removal action from a portion of the Superfund to FOSCs for incidents in the coastal zone, Great Lakes, and inland river ports.

Core Values

The NPFC recognizes that our values directly influence the manner in which we carry out our missions and fulfill our vision. NPFC's values are:

- To conduct our activities with the highest standards of professionalism and ethics and to treat all of our customers fairly.
- To recognize our people as our most important asset and to fully empower them to carry out their assigned responsibilities, supported with necessary resources, held accountable for what they do, and rewarded for their accomplishments.
- To ensure success and a balanced work-life environment through teamwork, fostering motivation, diversity, challenge, wellness, and personal growth.
- To maximize productivity through the use of innovative information technology (IT).
- To value and seek out input from our customers and use that input to continuously improve our work processes.
- To embrace the Coast Guard's core values of honor, respect, and devotion to duty.

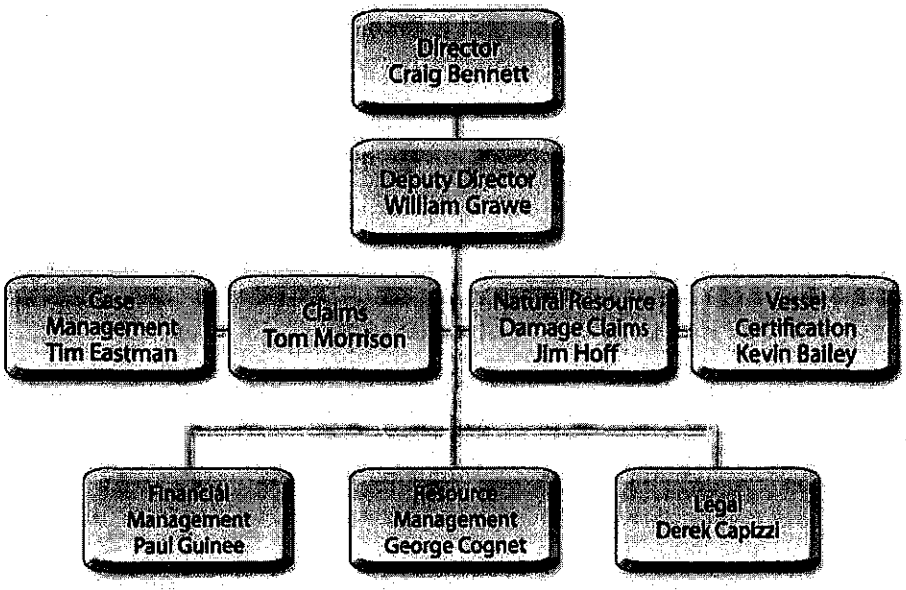
Whom Do We Touch?

The NPFC routinely interacts with multiple public and private entities to include:

- Coast Guard and U.S. Environmental Protection Agency (EPA) FOSCs and other components of the National Response System
- 7,400 vessels operators and 2,600 owners plus a myriad of port agents, Protection and Indemnity Club correspondents, and attorneys
- 2,700 RPs and their associated staffs
- 1,500 private third-party claimants (from citizens with oil on their seawall to major shipping companies)
- The environmental staff of states and their governors' offices
- All designated natural resource trustees—Federal, state, and Indian tribe
- All representatives on the National Response Team

Organization

NPFC is organized into seven divisions as shown in the organizational chart below.



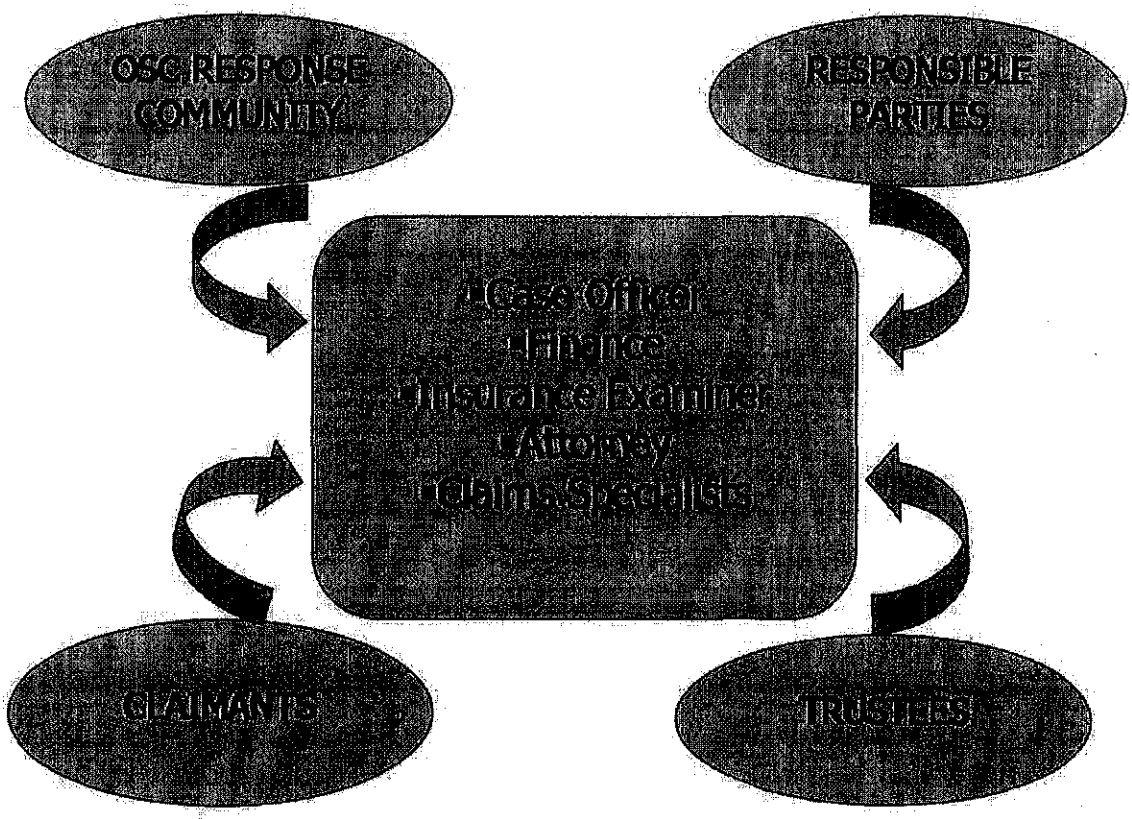
- **Vessel Certification** – Certifies vessel operators' maintenance of financial responsibility for oil/hazardous substance pollution from vessels in U.S. waters. Receives and processes enforcement inquiries. Provides information to the field concerning the detainment and release of U.S.- and foreign-flag vessels under the certification enforcement program.
- **Case Management** – Ensures emergency funding is available to support responses to the substantial threat or actual discharge of oil or the release of hazardous substances into U.S. navigable waters. Acts as the primary point of contact with the pollution response community. Provides for accurate cost documentation and effective cost recovery.
- **Claims** – Adjudicates claims for uncompensated removal costs and OPA-specified damages from a discharge of oil or the substantial threat of discharge of oil into U.S. navigable waters.
- **Natural Resource Damage (NRD) Claims** – Provides funding for the Initiation of NRD activities and adjudicates NRD claims and loss-of-use subsistence claims caused by a discharge of oil or the substantial threat of a discharge into U.S. navigable waters. (NRD claims can only be submitted by federal, state, Indian tribe, or foreign trustees, as designated pursuant to OPA, Executive Order, and federal regulations.)
- **Financial Management** – Provides fund management and oversight for OSLTF, CERCLA, and pollution-related disaster funds under the Stafford Act and the NRP. Coordinates all budgeting functions, including planning and programming. Prepares financial statements in accordance with the Chief Financial Officers Act.
- **Resources Management** – Provides administrative and technical support for human resources, information technology, facilities management, information dissemination, and records management by leveraging available resources and technology to enable NPFC to consistently deliver services in a way that balances performance, quality and cost.
- **Legal** – Provides legal support for the Command, including advice on funding cleanups, adjudicating claims, cost recovery, and the legal aspects of vessel financial responsibility. Provides litigation support to the U.S. Department of Justice (DOJ).

Cross-Functional Coordination

Although the NPFC is organized by division, it also operates as a matrix-based organization centered around four regional Case Teams, each with its own geographic responsibility as described on the following page. A Regional Manager serves as the central internal coordinator and external point of contact for the pollution response community and leads each Case Team. Case Teams are composed of case officers and technical experts from each functional area, including the following:

- An Attorney
- A Financial Manager
- An Insurance Examiner
- A Claims Manager
- An NRD Claims Manager
- Other specialists as required

The Case Team is part of the National Response System, consisting of federal, state, and local agencies. The Case Team works closely with the FOSC and other members of the response community. The Case Team acts as a natural working group to manage all fund-related aspects of cases to ensure appropriate OSLTF/CERCLA fund access, effective cost recovery, education through outreach efforts, and resolution of other related financial issues.



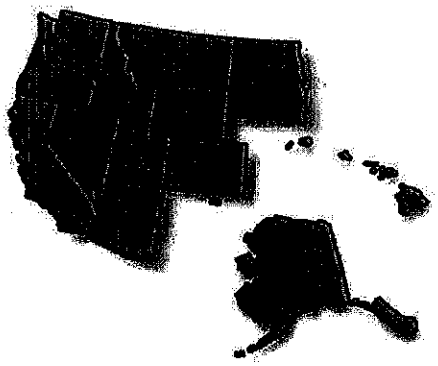
Regional Case Teams

Team I

Responsible for most of the Coast Guard District 8 (CGD8) (including MSD Minneapolis-St. Paul AOR) and EPA Regions VI and VII. Includes Texas, New Mexico, Louisiana, Arkansas, Oklahoma, Missouri, Kansas, Nebraska, and Iowa. Does not include CGD8 Mobile, Memphis, Paducah, Louisville, Huntington, and Pittsburgh Captain of the Port (COTP) zones.

Team II

Responsible for CGD7, portions of CGD5 and CGD8, EPA Region II (Caribbean Section), and EPA Region IV. Includes CGD8 Mobile, Memphis, Paducah, Louisville, Huntington, and Pittsburgh COTP zones; CGD5 Hampton Roads and Wilmington COTP zones; and the U.S. Virgin Islands, Puerto Rico, Florida, Georgia, South Carolina, Tennessee, North Carolina, Kentucky, Alabama, Mississippi, Virginia (COTP Hampton Roads zone only), and Pennsylvania (COTP Pittsburgh zone only).



Team III

Responsible for CGD11, CGD13, CGD14, CGD17, and EPA Regions VIII, IX, and X. Includes Arizona, California, Nevada, Utah, Colorado, North Dakota, South Dakota, Wyoming, Montana, Idaho, Washington, Oregon, Alaska, Hawaii, Guam, and American Samoa.

Team IV

Responsible for CGD1, CGD9, portions of CGD5, and EPA Regions I, II (less Caribbean Section), III, and V. Includes CGD5 COTP Philadelphia and Baltimore zones, Minnesota (less MSD Minneapolis-St. Paul AOR), Michigan, Wisconsin, Illinois, Indiana, Ohio, New York, Vermont, New Hampshire, New Jersey, Connecticut, Rhode Island, Massachusetts, Maine, Virginia (less COTP Hampton Roads zone), West Virginia (less COTP Huntington), Pennsylvania (less COTP Pittsburgh zone), Maryland, Delaware, and Washington, D.C.

Oil Spill Liability Trust Fund (OSLTF)

History of the Fund

In August 1990, when President George H. W. Bush signed OPA into law and authorized use of the OSLTF, the Fund was already four years old. Congress created the Fund in 1986, but did not pass legislation to authorize the use of the money or the collection of revenue necessary for its maintenance. It was only after the T/V Exxon Valdez grounding and the passage of OPA that authorization was granted. In addition to authorizing use of the OSLTF, OPA consolidated the liability and compensation requirements of certain prior federal oil pollution laws and the supporting funds, including the:

- Federal Water Pollution Control Act (FWPCA)
- Deepwater Port Act
- Trans-Alaska Pipeline System (TAPS) Authorization Act
- Outer Continental Shelf Lands Act

With the consolidation of those funds and the collection of a tax on the petroleum industry, the Fund increased to $1 billion. Fund uses were delineated by OPA to include:

- Payment of removal cost authorized by FOSC under the National Contingency Plan (NCP)
- State access for removal actions
- Payments to federal, state, and Indian tribe trustees to conduct natural resource damage assessments and restorations
- Payment of claims for uncompensated removal costs and damages
- Research and development, and other specific appropriations to Federal Agencies

The Energy Policy Act of 2005 reinstated the tax effective April 1, 2006. In November 2008 the Energy Improvement and Extension Act of 2008 increased the tax from 5 cents/barrel (bbl) to 8 cents/bbl through December 31, 2016 and to 9 cents/bbl from then until December 31, 2017. This increase was effective immediately.

Revenue Sources

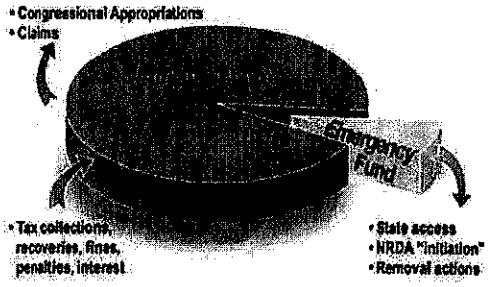
The OSLTF has several recurring and nonrecurring sources of revenue.

- **Barrel Tax** – The largest source of revenue has been a 5-cent per barrel tax, collected from the oil industry on petroleum produced in, or imported to, the U.S. The tax was suspended on July 1, 1993, because the Fund reached its statutory limit. It was reinstated on July 1, 1994, but ceased on December 31, 1994, because of the "sunset" provision in the law. The 2005 Energy Policy Act reinstated the tax effective April 1, 2006. The Energy Improvement and Extension Act of 2008 increased the tax from 5 cents/bbl to 8 cents/bbl through December 31, 2016 and to 9 cents/bbl from then until December 31, 2017. This increase was effective immediately.
- **Transfers** – A second major source of revenue has been transfers from other existing pollution funds listed above. Total transfers into the Fund since 1990 have exceeded $550 million. No additional funds remain to be transferred to the OSLTF.
- **Interest** – Another recurring source of OSLTF revenue is the interest on the Fund principal from U.S. Treasury investments. As a result of historically low interest rates, interest income has declined significantly in recent years.
- **Cost Recoveries** – Cost recovery from RPs is another source of revenue; those responsible for oil incidents are liable for costs and damages. NPFC bills RPs to recover costs expended by the Fund. As these monies are recovered, they are deposited into the Fund.
- **Penalties** – In addition to paying for clean-up costs, RPs may incur fines and civil penalties under OPA, the FWPCA, the Deepwater Port Act, and the TAPS Authorization Act.

Fund Components

The OSLTF has two major components—the Emergency Fund for FOSC removal activities and the initiation of an NRDA, and the Principal Fund for all other authorized uses. OPA requires these components to be used for separate, distinct purposes. Expenditures from the Fund for any one oil pollution incident are limited to $1 billion, and natural resource damage assessments and claims in connection with any single incident are limited to $500 million.

OSLTF Components



- **Emergency Fund** – To ensure rapid, effective response to oil spills, the President has the authority to make available, without Congressional appropriation, up to $50 million each year to fund removal activities and initiate NRDAs. Funds not used in a fiscal year are available until expended. To the extent the $50 million is inadequate, up to $100 million from the OSLTF may be advanced to fund removal activities.
- **The Principal Fund** – The Principal Fund, that portion of the OSLTF exclusive of the Emergency Fund, is used primarily to carry out three functions:
  - ★ Adjudication and payment of claims for certain uncompensated removal costs and damages (appropriation from Congress not required)
  - ★ Implementation, administration, and enforcement of OPA through Congressional Appropriations
  - ★ Research and development through Congressional Appropriation

Removal Actions

The OSLTF provides funding for oil pollution removal activities when oil is discharged into the navigable waters, adjoining shorelines, and the Exclusive Economic Zone (EEZ) of the United States. Funding is also provided to prevent or mitigate the substantial threat of such an oil discharge. The Emergency Fund may be used for the following types of removal activities and costs. The list includes, but is not limited to, the following:

- Containing and removing oil from water and shorelines
- Preventing or minimizing a substantial threat of discharge
- Monitoring the activities of RPs

Examples of removal costs include:

- Contract services (e.g., cleanup contractors)
- Equipment used in removals
- Chemical testing required to identify the type and source of oil
- Proper disposal of recovered oil and oily debris
- Costs for government personnel and temporary government employees hired for the duration of the spill response
- Completion of documentation
- Identification of RPs

The Coast Guard has responsibility for removal actions in the coastal zone, while EPA has responsibility in the inland zone.

State Access

State access to the OSLTF is provided by OPA and is a process through which states can directly receive federal funds for immediate removal costs in response to an actual or substantial threat of a discharge of oil, after coordination with and approval by the FOSC. In accordance with OPA, states are limited to $250,000 per incident for removal costs, consistent with the NCP. State access does not supersede or preclude the use of other federal payment regimes. States may also obtain federal funding for oil spill removal actions by supporting the FOSC or by using the claims process. Neither of these methods is subject to the $250,000 limit per incident.

Claims

Claims may be presented to the NPFC using several vehicles depending on the classification of the claim. The Claims Adjudication Division accepts claims for uncompensated removal costs incurred and damages suffered as a result of an oil pollution incident. The NRD Claims Division accepts claims from authorized claimants for damages to natural resources (NRD claims are described more fully on the next page). Both divisions have developed internal procedures for processing and adjudicating claims for consistency with the law and regulations as described in the following two sections.

To centralize the OSLTF claims process, the Coast Guard received an unlimited delegation of authority from the President to adjudicate claims presented to the OSLTF. This authority was further delegated to the NPFC on March 12, 1992. The NPFC's claim procedures attempt to strike a reasonable balance between the objectives of compensating deserving claimants and acting as a fiduciary for the Fund by ensuring that the funds are spent properly. Before claimants can be compensated, they must satisfy the statutory requirements of OPA. For example, the incident must involve a discharge of oil or a substantial threat of a discharge of oil into U.S. navigable waters, and the claim must be submitted within prescribed time periods (three years for damages, six years for removal costs). Additionally, a claimant must claim a damage or removal cost compensable under OPA and must have first presented the claim to the RP or guarantor except in certain circumstances.

The most common claim type received by the NPFC is removal cost claims. These claims may be submitted by any person who has incurred costs for removal actions that are consistent with the NCP. Removal cost claimants include state governments, putative RPs who can show that the oil came from another source, cleanup contractors who have not been paid by the hiring RP, and members of the public who have discovered a spill and responded to the need for cleanup. In all instances, the removal activity should be coordinated with the FOSC for purposes of establishing that there was a discharge or substantial threat of a discharge of oil into navigable waters and that the actions taken were consistent with the NCP. The NPFC will reimburse the reasonable uncompensated cost of oil removal.

All claims submitted to the NPFC must first be submitted to the RP, generally the owner or operator of the source of the discharge or substantial threat of discharge of oil into the navigable waters of the United States. One exception to this is that state governments may submit claims for uncompensated removal costs directly to the NPFC.

As a result of this exception, the NPFC Removal Claims Branch has been able to develop an expedited claims procedure for state governments. The state government representatives and the NPFC claims representatives reach agreement ahead of time on the evidence to be submitted by the state, the labor and equipment rates to be used in all responses, and the level of coordination required with the FOSC. In some cases, this process has shortened the adjudication time for state government claims to less than a week. Other exceptions allow a claim to be presented directly to the Fund when the Fund advertises for such claims or when an RP presents a claim based on an OPA defense or liability limit.

Funding for Natural Resource Damages

Under OPA, "natural resources" include land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including resources of the EEZ), any state or local government or Indian tribe, or any foreign government.

Designated federal, state, Indian, and foreign natural resource trustees can request funding for natural resource damages under OPA. The President has designated the U.S. Departments of Commerce (NOAA, DOC), Interior, Defense, Agriculture, and Energy as the federal trustees. State trustees are designated by each state's governor. The head of a foreign government designates the trustee who shall act on behalf of that government. The governing body of any Indian tribe designates tribal officials who may act on behalf of the tribe or its members. Further, an Indian tribe must be recognized as eligible for special programs and services provided by the United States because of their status as Indians, and must have governmental authority over lands belonging to or controlled by the tribe.

NRDA Initiate Requests

In response to an OPA incident, the Emergency Fund of the OSLTF can be used to pay for the initiation of natural resource damage assessment (INRDA) conducted by designated natural resource trustees. In the preassessment phase, outlined in 15 CFR §990, Subpart D, trustees must determine jurisdiction, undertake preliminary data collection, assess the effectiveness of the response, identify feasible restoration measures, and provide a notice of intent to conduct restoration planning. Executive Order 12777 limits payments to the five federal trustees that may act to allocate funds for pre-assessment activities among all affected trustees.

The NPFC and the FLAT execute an IAG for each OPA incident requiring funds to initiate an NRDA. The FLAT submits a request for the initiation on behalf of the affected federal, state, Indian tribe, or foreign trustees to the NPFC's NRD Claims Division to coordinate access to the OSLTF. The IAG is reviewed for conformity with OPA requirements, applicable federal regulations, and NPFC operating procedures and ensures that the FOSC is notified that preassessment phase activities are being performed for the incident.

While the criteria for funding eligibility remain the same, the NPFC does not impose absolute time limits on federal trustees for NRDA Initiate IAGs. The length of time depends on the particular situation and is determined jointly by NPFC and the trustees.

NRD Claims

NPFC started paying claims for NRD in 1999. Until that time, the NPFC relied on a 1995 Comptroller General opinion that specified OPA provide for payment of NRD claims from the OSLTF only by appropriation. In late 1997, the DOJ Office of Legal Counsel made a determination that NRDs would be payable from the OSLTF Principal Fund without further appropriation, like other OPA damage and removal cost claims. As a result, the NPFC established and organized an NRD Claims Division to adjudicate and pay NRD claims, the first of which was paid in September 1999.

Under OPA, the trustees assess natural resource damages and develop and implement plans to restore damaged natural resources. The costs of damage assessment and restoration must be determined with respect to plans adopted by the trustee. These plans must be developed and implemented only after adequate public notice and consideration of all public comments.

To file an NRD claim with the NPFC, the statute of limitations under OPA is whichever is later: three years from the date the injury and connection with the discharge was reasonably discovered with due care, or three years from the date the assessment was completed in accordance with NRDA regulations (15 CFR 990, promulgated by NOAA).

Only designated trustees may submit OPA NRD claims. Notice of designation should be provided to the NPFC to establish the authority of the claimant who is submitting the claim.

The procedure for submission of the claim to the NPFC is the same for trustees as it is for other claimants. For example, the NRD claim should be presented to the RP or its guarantor before submission to the NPFC for payment through the OSLTF.

Agency Appropriations

Multiple federal agencies receive annual appropriations from the OSLTF to cover specific administrative, operational, personnel, enforcement, and research and development costs, as authorized in OPA and delegated by Executive Order 12777. Agency responsibilities for carrying out OPA requirements include regulation, administration and enforcement of changes in vessel construction; tighter controls on licensing and manning; new requirements for vessel and facility operations and response planning; stricter liability and compensation requirements including increased financial responsibility, management of the OSLTF, compensation to claimants, and cost recovery from responsible parties; and improved cooperative relationships among responding agencies and oil industry stakeholders, including periodic drills and implementation of changes to the NCP, Area Contingency Plans and National Response System (NRS).

Organizations currently receiving appropriations from the Fund are:

- Coast Guard
- Environmental Protection Agency
- Minerals Management Service (Department of the Interior)
- Pipeline Safety Administration (Department of Transportation)
- Department of the Treasury
- Prince William Sound Oil Spill Recovery Institute (OSRI)
- Denali Commission

Coast Guard Superfund Use

History

CERCLA established the Superfund to provide monies to identify, prioritize, and clean up the nation's uncontrolled hazardous waste sites. The Superfund, administered by EPA, was created as an important CERCLA component to give the Federal government flexibility in identifying and addressing potentially harmful releases of hazardous substances. The Superfund provides the funds that enable federal agencies to respond immediately to hazardous substance releases and contamination problems that pose a threat to public health and the environment. Removal costs are recovered from the RP(s) by EPA.

Coast Guard CERCLA Responses

Since August 1981, Coast Guard FOSCs have responded to releases and substantial threats of releases of hazardous substances, pollutants, or contaminants (HAZMAT) in the coastal zone, the Great Lakes, and inland river ports as designated in the NCP. The Coast Guard National Strike Force (NSF) Strike Teams provide highly trained personnel to support these responses. The NCP designates the NSF as a national resource available to all of the FOSCs conducting removal operations throughout the United States, its territories, and possessions.

Since its establishment, NPFC has served as the fiduciary agent for the portion of the Superfund used by the Coast Guard. EPA provides the funds to the Coast Guard through IAGs which are used for the ongoing costs of building and maintaining response capabilities (training, equipment, personnel) and for costs incurred in removal operations following a CERCLA incident.

The number of Coast Guard responses to releases of HAZMAT is externally driven by the number of such incidents that occur and are reported. Public awareness of the danger and adverse environmental impacts caused by these releases affects the number that is reported. The total cost per year is more dependent on the size of the responses than the number.

CERCLA authority includes response to intentional releases of industrial or military HAZMAT by terrorists, resulting in an overlap of pollution response and homeland security.

Coast Guard Disaster Responses

The Coast Guard, under the National Response Framework (NRF), is tasked with pollution response (oil and hazardous chemicals/pollutants/contaminants) under Emergency Support Function 10 (ESF-10). If the President declares a disaster and ESF-10 actions must be taken, FEMA can assign the Stafford Act funds for Coast Guard pollution response activity. Such activity can include FOSC-directed removals and the deployment of Strike Teams and other special teams. NPFC serves as the Coast Guard's financial manager for these responses.

During a disaster, the NPFC coordinates ESF-10 Funds among the responding Coast Guard FOSC's district offices, FEMA and EPA regional offices, and the Joint Field Offices (IFO) set up in each state, as prescribed by the NRF issued by DHS.

Vessel Financial Responsibility Certification

The United States depends on marine transportation for the majority of its imports and exports, including chemical- and petroleum-based products. Oil spill incidents occur from all types of vessels, not just tankers. Section 1016 of OPA requires operators of vessels over 300 gross tons, using the navigable waters of the U.S., or vessels of any size that lighter or transship oil in the EEZ of the United States, to provide evidence of their financial ability to satisfy liability claims for removal costs and damages up to the prescribed limits.

The primary goals of NPFC's Certificates of Financial Responsibility (COFR) program are to ensure that RPs are identified and held financially responsible to the full extent of the law for any expenses involved in dealing with any specific vessel water pollution incident. This certification is accomplished by issuing COFRs to vessel operators who have demonstrated adequate evidence of financial responsibility as established by law.

In 2006, the vessel limits of liability under OPA were amended as shown in the table below.

If the vessel is a/an:	The limits of liability are the greater of:
Tank vessel greater than 3,000 gross tons with a single hull, double sides only, or double bottom only	$3,000 per gross ton or $22,000,000.
Tank vessel less than or equal to 3,000 gross tons with a single hull, double sides only, or double bottom only	$3,000 per gross ton or $6,000,000.
Tank vessel greater than 3,000 gross tons with a double hull	$1,900 per gross ton or $16,000,000.
Tank vessel less than or equal to 3,000 gross tons with a double hull	$1,900 per gross ton or $4,000,000.
Any vessel other than a tank vessel	$950 per gross ton or $800,000.

Additional amounts are also applicable under CERCLA:

If the vessel is:	The limits of liability are the greater of:
Over 300 gross tons carrying hazardous substance as cargo,	$300 per gross ton or $5,000,000.
Any other vessel over 300 gross tons,	$300 per gross ton or $500,000.

Failure to establish acceptable evidence of financial responsibility, documented by a COFR, may result in prevention or cessation of operation, vessel detainment, denial of entry to a U.S. port, a civil penalty of up to $32,500 per day of violation, or seizure and forfeiture of the vessel. The law does not apply to public vessels. The financial responsibility requirements also do not apply to non-self-propelled barges carrying no oil as cargo or fuel or hazardous substances as cargo.

The NPFC processes thousands of COFR transactions each year, including new issues, name changes, renewals, and revocations.

The E-COFR Web site (www.uscg.mil/npfc/COFRs) gives enforcement officials access to COFR information on a daily basis. It also gives the international shipping communities the ability to submit COFR applications on-line and contact the COFR staff via e-mail.

Guidance Materials

The NPFC has an extensive library of guidance materials that provide customers with a wealth of information on the NPFC, its roles and missions, and funds access and use. All guidance materials are available online on the NPFC's Web site at www.uscg.mil/npfc.

- The **NPFC User Reference Guide** (eURG) serves as a single-source library for anyone who may need to gain access to the OSLTF or the portion of Superfund accessible to the Coast Guard. The User Reference Guide contains all of the Technical Operating Procedures (TOPs) listed below, as well as many other OSLTF access and financial management references. Visitors may download portions of the library as multiple files or may access each of its documents individually.
  - ★ The **TOPs** serve as Coast Guard guidance documents for Fund users. They provide an efficient means to compile and submit documentation. All NPFC TOPs are consolidated in the NPFC User Reference Guide. A brief description of each TOPs is provided below.
    - **Removal Cost TOPs** provide clear guidelines to determine valid and necessary removal costs for a substantial threat or an actual oil discharge.
    - **Resource Documentation TOPs** assist FOSCs in documenting and reporting resources associated with removal activities.
    - **State Access TOPs** describe the procedures for states to access the OSLTF, including requirements for documenting expenses, investigative requirements, and submitting documents for reimbursement.
    - **Designation of Source TOPs** aid FOSCs in conducting investigations to identify sources of a substantial threat or actual discharge of oil, duly notify the RPs and their guarantors, and designate the source so that claimants may submit their claims to the RPs.
  - ★ NPFC provides a number of **claims guidance** documents within the eURG, each one targeting a different type of claimant in order to meet the specific needs of each customer.
    - The **Claimant's Guide** provides information to potential claimants on how to file claims and on what types of claims they may submit. Although it provides an overview of the entire claims process, it is especially targeted to those submitting claims for damage to real or personal property, loss of profits or earning capacity, loss of government revenues, or increased cost of public services.
    - The Claims Process and **OSRO FAQs** (Frequently Asked Questions from Oil Spill Response Organizations) is designed to help OSROs better understand how to submit a claim for uncompensated removal costs and provides suggestions for making both preparation and approval processes easier.
    - The **Responsible Party Claim Submission Guidance** explains how RPs can submit a claim for reimbursement of removal costs and damages that asserts either an affirmative defense or an entitlement to a limit on liability.
    - The **NRD Funding Guidelines** provide guidance to trustees in preparing and submitting NRD claims and to Initiate Requests to the NPFC.
- The **NPFC Certificates of Financial Responsibility Web site** serves as a reference guide for Coast Guard field personnel and the Maritime Shipping Industry, with links to COFR and E-COFR applications. It is available on the COFR website at www.uscg.mil/npfc/COFRs.
  - ★ The COFR application contains information on vessels that have been issued COFRs. This data is updated daily (M-F) as vessels are added or deleted from the list.
  - ★ The E-COFR application permits users to apply for, renew, change, and pay the COFR filing fee via the Web.

Kimberly L. McIntosh
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SUMMARY OF QUALIFICATIONS

Experience and training in emergency response and remediation activities with experience directing the containment and cleanup of regulated substance releases on complex cases requiring coordination with numerous stakeholders: local fire departments, law enforcement agencies, county emergency managers, the public, land owners, and other state and federal agencies.

PROFESSIONAL EXPERIENCE - Department of Environment and Natural Resource

Environmental Scientist/Senior Scientist/Scientist Manager – Ground Water Quality Program

1990 to Present

- Directed assessment and clean up of 1000's of contaminated properties or regulated substance releases involving petroleum, crude oil, agricultural chemicals, and hazardous substances, requiring coordination with local emergency managers, law enforcement agencies, fire departments, emergency response teams, state and federal agencies, and the public.
- Member of work groups established to develop state plans for Anthrax, Weapons of Mass Destruction, Pandemic Flu, State Emergency Operations and DENR's Emergency Operations.
- Serves as South Dakota's representative to the Region VIII Regional Response Team.
- Provided expert testimony to the legislature, professional boards, and legal courts on technical data, state law and environmental issues.
- Manager for the State's Brownfield Program which includes federal grant applications, negotiated work plans and budget, for this state-wide program that assists in the funding of the assessment of contaminated properties.
- Assisted with the drafting of law, standards, procedures and processes for the reporting and clean up of regulated substance response releases.
- Manages the State Regulated Substance Response Fund including contracting and budgeting issues related to use of the funds.
- Serves as the department's main point of contact with the Environmental Protection Agency's Emergency Response Program to access federal resources in the event that federal resources are requested or needed in response to an environmental emergency.
- Team leader for the department's Spills Section, providing day to day work direction to team members on topics such as SARA Title III, radiological inventory, and spill notification and remediation.

Environmental Project Scientist – Waste Management Program

1989 to 1990

- Performed hazardous waste site inspections.

- Implemented and enforced state hazardous waste laws.
- Managed the program database which tracked data and information on regulated facilities.
- Reported information to the Environmental Protection Agency to comply with federal grant terms and conditions.
- Generated complex detailed inspection reports to be used in enforcement actions.

Environmental Scientist/Analyst – Air Quality Program

1987 to 1989

- Designed and implemented custom air monitoring stations for the collection of particulate matter, and other air contaminate parameters.
- Accountable for the collection, calibration and repair of testing equipment.
- Developed the department's procedural manual for the collection of particulate air contaminates.

Technician – Surface Water Quality Program

1987 to 1987

- Accountable for the collection of surface water quality samples and the maintenance of field sampling equipment, the department drill rig and auto fleet.
- Operated the department's auger drill rig.
- Obtained environmental samples and entered results into databases.
- Incorporated environmental data into portions of technical reports.

EDUCATION

University of South Dakota, Vermillion, South Dakota
1980-1984

- Bachelor of Science degrees in Earth Science and Anthropology

TRAINING

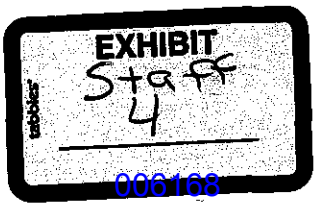
- Incident Command System Training – 100, 200, 300, I-401, I-402, IS-700 and IS 800.
- OSHA Hazardous Waste Site Refresher -2013.
- CPR and AED certified – 2013.
- Domestic Preparedness Senior Officials' Workshop - 2001.
- HazMat 2000 Spills prevention training on Risk Communications and Chemistry for Non-Chemists - 2000.
- Technical Assistance Emergency Responder, Nuclear, Biological and Chemical Responder Operations training.
- Management and Team Building – 2001
- EPA On-Scene Coordinator Superfund Training Academy -1992 (240 hours)
- State sponsored computer systems and management training courses. (ongoing)

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

DOCKET NO. HP14-002

Direct Testimony of Tom Kirschenmann
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: State your name.

A: Tom Kirschenmann

Q: State your employer.

A: State of South Dakota, Department of Game, Fish, and Parks

Q: State the program for which you work.

A: Division of Wildlife, Terrestrial Resources Chief

Q: State the program roles and your specific job with the department.

A: The role of the Terrestrial Resources section is to study, evaluate, and assist in the management of all wildlife and associated habitats. Management includes game and non-game wildlife populations, habitat management on public lands and technical assistance and habitat development on private lands, population and habitat inventory, and environmental review of local and landscape projects. As Chief of the Terrestrial Resources Section, I oversee all wildlife management and research, as well as habitat management consisting of the department's public lands and private lands programs.

Q: Explain the range of duties you perform.

A: Duties include leading the Terrestrial Resources section that includes three program administrators (Wildlife, Habitat, Wildlife Damage), 21 wildlife biologists, and two secretaries; oversee all wildlife research, management, and the establishment of hunting seasons for game species; oversee all private lands habitat programs; coordinate environmental review evaluations and responses related to terrestrial issues; serve as the Department's liaison for several state and federal agencies; and represent the Department on state and national committees.

Q: On whose behalf was this testimony prepared?

A: This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission.

Q: Have you reviewed the Application and its amendments?

A: Yes, the relevant sections.

Q Are there any sensitive wildlife areas crossed by the pipeline?

A: Game Production Areas

Four Game Production Areas are in close proximity to the pipeline route and could be considered as sensitive areas especially if the final route is immediately adjacent to or potentially need to cross these properties. All Game Production Areas contain extensive wetland resources, native and reestablished upland habitat for resident and migratory wildlife, and high public recreation use and value. Three of the four are Federal Aid acquired properties, so would require additional actions (NEPA driven) in order to grant any necessary easements that affect title.

Native Prairie

Native prairie remnants exist throughout eastern South Dakota, in particular in the northcentral portion of the state within the Missouri Coteau ecoregion. Native prairie habitats provide unique habitat due to the diversity of plant species for a multitude of wildlife species. The fragmentation of native prairie resulting from infrastructure is a concern and the potential affect it would have on a number of grassland dependent bird species. It would be recommended to consult range and prairie experts on appropriate seeding mixtures to complete restoration efforts if native prairie tracts are included in the pipeline route and necessary methods to minimize noxious weed infestation within the disturbed area.

Waterfowl Production Areas & Private Lands under Conservation Easements

Waterfowl Production Areas are federal wildlife management areas found throughout eastern South Dakota with some close to or possibly crossed pending final route. These areas consist of wetland and grassland habitats providing needed habitat for both resident and migratory wildlife to meet necessary components of their annual life cycle.

There are also private lands enrolled in wetland and grassland conservation easements through the Fish and Wildlife Service. These properties, like Waterfowl Production Areas, provide quality wildlife habitat especially for grassland dependent species.

Dakota Access would need to contact the US Fish and Wildlife Service for appropriate mitigation and approval steps.

Riparian & Stream Habitats

Streams and rivers of all sizes could be considered sensitive areas. Small streams are especially sensitive and stream fish species are sensitive to habitat impairment. Underground directional boring is one method of minimizing impacts to riparian/stream habitats.

A few known tributaries and rivers that could potentially be impacted, in particular when considering Topeka shiner, is Shue Creek, Pearl and Middle Pearl Creeks, Redstone Creek, Rock Creek, West Fork of the Vermillion, East Fork of the Vermillion, and the James River.

Q: Will any State or Federal threatened or endangered species be impacted by the route?

A: Topeka Shiner

The pipeline would go directly through the central part of the Topeka shiners known and largest remaining population across its range. Listed below are some general strategies and guidelines to minimize impacts.

1. Avoid construction activities within waterways from May 15 - July 15, which is the optimal spawning period for Topeka Shiner.

2. Methods that block a stream should not be constructed for extended periods of time. If temporary blocks are necessary, flexible water barriers should be used.

3. Disturbance to channel, streambank, and riparian areas should be kept to an absolute minimum and restored to pre-project evaluation. We suggest that strict criteria be used to prevent the use of option borrow areas that result in impacts to riparian and wetland areas.

4. Removal of vegetation and soil should be confined to those areas absolutely necessary to construction and should be accomplished in a manner to reduce soil erosion.

5. Riparian vegetation losses should be quantified and replaced on site. Grading operations and reseeding of indigenous species should begin immediately following construction to reduce sediment and erosion potential.

6. A post construction sediment and erosion control plan should also be implemented in order to provide interim control prior to re-establishment of permanent vegetative cover on the disturbed site.

Other Fish Species

Additional state listed species that could be impacted by construction include Banded killfish, Northern redbelly dace, Blacknose shiner, Sicklefin chub, and Sturgeon chub. Mitigation measures to be considered are those listed under the Topeka shiner section.

Bald Eagle

The Bald eagle is currently listed as a state threatened species, but has recently been proposed to be removed from the state list by the Game, Fish and Parks Commission. There is potential for bald eagles to establish nests close to the pipeline route. Provisions of the Bald and Golden Eagle Protection Act should be followed to avoid disturbance of nesting or wintering birds. General guidance to minimize impacts includes monitoring for active nests prior to and during

construction and the utilization of a 1 mile buffer consideration during the nesting season (Feb. 1 – Aug. 15).

Butterflies
The primary range of the Dakota Skipper and Poweshiek Skipperling occurs northeast of the pipeline route, however there are records of other rare butterflies dependent on native prairie closer to the proposed route. If the pipeline crosses native prairies it is recommended to minimize soil disturbance associated with construction activities and use appropriate native seed if any restoration or replanting is required.

Whooping Cranes
Whooping Cranes have been documented during spring and fall migration throughout most of the counties in the project area and may use some of the sensitive areas as migratory stop overs. Construction workers should be made familiar with the appearance of whooping cranes and consideration of temporarily suspending work if cranes choose to roost near pipeline work.

Sprague's Pipit
The Sprague's pipit is currently a federal candidate species. The recently completed South Dakota Breeding Bird Atlas included no confirmed records of this species. However, the northern portion of the pipeline crosses counties that likely support nesting for this species. Destruction of native habitats should be mitigated for by replacement with grassland plantings using native species.

Q: Does this conclude your testimony?

A: Yes.

Thomas R. Kirschenmann
2206 Stratford Place
Pierre, SD 57501
(605) 773-4192 (w) (605) 494-0241 (h)
Tom.Kirschenmann@state.sd.us (work)
kirsch@pie.midco.net (home)

Profile: 19 years as a professional wildlife biologist.

Education:

Eureka High School, Eureka, SD, 1989
BS: Wildlife and Fisheries Sciences, South Dakota State University, May 1993
MS: Wildlife Management, South Dakota State University, May 1996

Certifications:
Certified Wildlife Biologist, The Wildlife Society, July 2000
Level III Career Development Training, SD GF&P, 2007

Experience:

SOUTH DAKOTA GAME, FISH, AND PARKS, Pierre, SD
Chief of Terrestrial Resources (11/08 - present)
Supervisor: Tony Leif, Director, Division of Wildlife, 605-773-4518

- Coordinate the management and research of game and non-game species statewide.
- Coordinate the management of the Departments habitat programs, including the private lands programs, public lands management, access programs, terrestrial environmental assessments, and programs related to the federal Farm Bill.
- Oversee a staff that includes a Program Administrator for Wildlife, Habitat and Wildlife Damage programs, 21 biologists, and three secretaries in these sections.
- Serve as the Department's liaison or representative for several state and federal agencies and associated committees.
- Coordinate with non-government organizations, constituency groups, and agricultural groups on resource management programs, projects, and issues.
- Manage an annual budget of approximately $14.5M which includes research, direct payments to landowners for habitat, hunting access, and wildlife damage, and contracts to complete surveys, programs, and projects.
- Lead rules promulgation process for respective duties by presenting to the GFP Commission and assisting in writing administrative rules.

SOUTH DAKOTA GAME, FISH, AND PARKS, Pierre, SD
Wildlife Program Administrator, Game Management (12/07 – 11/08)
Supervisor: George Vandel, Assistant Director, Division of Wildlife, retired

- Coordinate the management and research of all game species statewide.
- Coordinate the accumulation and organization of data and regional suggestions in the development of hunting season recommendations.
- Draft action sheets and present season recommendations to GF&P Commission.
- Assist with the development and a team member that reviews hunting season applications and the Hunting Handbook.
- Supervise 9 biologists and 1 secretary stationed in five locations across the state.

- Serve as department representative on committees (wildlife disease boards and poultry advisory board) and liaison to the SDSU Diagnostic Lab and APHIS Wildlife Services for Avian Influenza monitoring.
- "Press Release" review team member.
- Oversee the Game Budget, including the contractual research projects with SDSU Wildlife and Fisheries Department and other academic institutions.
- Work with the media addressing game and related issues, including live interviews, newspaper articles, and the writing of short articles.
- Team member in the development and implementation of the Mentored Hunting Program.
- Present research and management information at regional meetings, Commission meetings, and to conservation organizations.

SOUTH DAKOTA GAME, FISH, AND PARKS, Huron, SD
Sr. Wildlife Biologist (1/05 – 12/07)
Supervisor: Tony Leif, Director, Division of Wildlife, 605-773-4518

- Oversee management and research of upland game species statewide.
- Direct internal upland game research, analyses, and reports.
- Part of game staff committee that provides recommendations on all game seasons and license allocations.
- Serve as Office Manager at the Huron GF&P District Office: directing day to day activities of Resource Biologist and Secretary within the Upland Game Section.
- Serve as field co-leader with waterfowl biologist in the coordination of statewide Avian Influenza (AI) sampling.
- Work with regional game staff on management, survey, research, and mortality projects.
- Administered the departments Wildlife Partnership Program for two years and continue to provide guidance and direction upon request.
- Assist with the coordination of meetings and trainings, including serving as chair person of the Prairie Grouse Technical Council (PGTC) meeting in October 2007.
- Serve as department representative on several committees such as Midwest Pheasant Study Group, PGTC, Sage Grouse Council, Poultry Advisory Board (AI matters), and the National Wild Turkey Federation Technical Representative.
- Write management and scientific reports, as well as magazine and newspaper articles.
- Conduct presentations internally, as well as landowner and sportsmen club meetings.

PHEASANTS FOREVER, INC., St. Paul, MN
Regional Wildlife Biologist
South Dakota & Wyoming (4/00 – 1/05)
Illinois & Indiana (7/95 – 4/00)
Supervisor: Richard Young, VP Field Operations, 877-773-2070

- Establish and maintain chapters comprised of grassroots volunteers and guide them in the development of habitat programs, fundraising efforts, and youth programs.
- Work with chapters to develop wildlife habitat programs designed to fit the needs for both local and regional areas.
- Direct and assist chapters with annual fund-raising events. Wrote grants to support local and state habitat efforts.
- Built partnerships between Pheasants Forever (both chapters and national) with local, state, and federal conservation agencies. Primary PF representative in developing SD Wildlife Habitat Extension Biologist (WHEB) program with SD GF&P and SD NRCS.
- Developed reporting system, submitted reports to GF&P, NRCS, and PF national, wrote grants, and some supervisory duties related to the WHEB program.
- Served on several state and federal habitat committees (State Technical Committee for both SD and WY, SD CRP sub-committee, WHIP sub-committee for SD and WY, SD School and

Public Lands, Northern Great Plains Joint Venture, Great Lakes and Upper Mississippi Joint Venture, IL Pheasant Fund Committee, IN DNR Gamebird Partnership Committee, IL DNR Conservation Congress).

- Organized and conducted wildlife habitat workshops for chapters, landowners, and other agency personnel.
- Established agenda, budget, and organized annual meeting for subgroup of co-Regional Wildlife Biologists, while serving as Mentor Group Leader.
- Wrote newspaper articles, interviewed for radio and TV shows, conducted presentations, and distributed newsletters.
- Educated volunteers about wildlife biology, habitat, wildlife interactions, and counsel on current, upcoming, and changes to state and federal conservation programs.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Graduate Research Assistant (4/93 - 7/95; graduated 1996)
Supervisor: Dr. Daniel Hubbard, Professor, 605-688-4780
Graduate Research Project.

- Research involved the comparison of avian and aquatic invertebrate abundances on conventional, organic, and no-till farming systems.
- Efforts included breeding waterfowl pair counts, waterfowl brood counts, wetland bird surveys, upland bird surveys, and aquatic invertebrate sampling.
- Other duties included surveying aquatic plants and collecting soil seed bank samples.
- Prepared bi-annual reports for USDA and EPA.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (3/92 - 8/92)
Supervisor: Diane Granfors, Graduate Research Assistant
Seasonal position.

- Assisted with wood duck study determining brood habitat and survival.
- Built, repaired, and placed wood duck nesting structures.
- Candled eggs, web tagged ducklings, banded hens, placed radio telemetry collars and acquired locations.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (10/90 - 3/91; 10/91 - 3/92)
Supervisor: Todd Bogenschutz, Graduate Research Assistant
Seasonal position.

- Aided on the research study that evaluated corn and sorghum as a winter food source for the ring-neck pheasant.
- Shared duties to feed pen birds on restricted diets.
- Sampled winter food plots.
- Assisted in extracting intestinal organs and taking anatomical measurements and weights.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (5/91 - 8/91)
Supervisor: John Lott, Graduate Research Assistant, 605-773-4508
Seasonal position.

- Worked on yellow perch food habit study.

- Used various equipment to sample fish and zooplankton. Aged fish and processed stomach contents. Sorted and tabulated zooplankton samples.

THE NATURE CONSERVANCY, Ordway Prairie, Leola, SD
Intern/Preserve Worker (5/90 - 8/90)
Supervisor: Andy Schollett, Preserve Manager
Seasonal position.

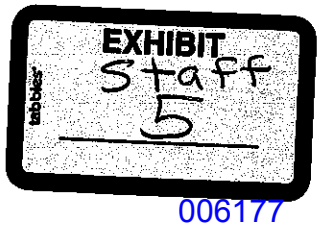
- Monitored grazing leases and rotations, conducted brome and prairie plant surveys, spraying of noxious weeds, fencing and general maintenance.

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

DOCKET NO. HP14-002

Direct Testimony of Derric L. Iles
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: Please state your name and business address.

A: Name: Derric Iles
Business address: Geological Survey Program, DENR
Akeley-Lawrence Science Center
414 East Clark Street
Vermillion, SD 57069-2390

Q: Describe your educational background.

A: 1977: Master of Science degree in Geology, Iowa State University
1975: Bachelor of Arts degree in Geology, University of Northern Iowa

Q: By whom are you now employed?

A: Geological Survey Program, South Dakota Department of Environment and Natural Resources

Q: What work experience have you had that is relevant to your involvement on this project?

A: I have been the State Geologist and Administrator of the Geological Survey Program, South Dakota Department of Environment and Natural Resources, since January 1998. In that capacity, I am responsible for planning, organizing, and directing activities conducted by the Geological Survey Program staff designed to locate, describe, map, and evaluate the natural resources of South Dakota.

Prior to that, beginning in 1977, I was a geologist/hydrologist with the Geological Survey Program and am the geologist of record on more than 800 test holes/wells in eastern South Dakota. During my time with the Geological Survey Program prior to January 1998, I performed the following functions.

- Designed and directed hydrogeologic investigations focused on water quantity, water quality, and the vulnerability of certain aquifers to surface sources of contamination.
- Planned and directed research on the movement of ground water through low permeability glacial till. Utilized test drilling, well installation, laboratory and field testing of sediment permeability, general water chemistry, stable isotopes, lithologic description, water levels, and hydraulic gradients to characterize hydrogeologic conditions.
- Directed drilling, well installation, and water sampling activities.
- Produced maps and written scientific reports.
- Reviewed and evaluated consultants' reports on hydrogeologic characterizations of future landfill sites. Assisted consultants in preparing work plans to gather hydrogeologic information necessary for the permitting

process related to solid waste disposal facilities in low-permeability geologic settings.

- Designed and implemented a statewide ground water quality monitoring network for South Dakota that is focused on long-term monitoring of the ambient quality of water in 25 of the state's surface aquifers.
- Provided expert witness testimony regarding the hydrology and geology of potential landfill sites on behalf of the South Dakota Department of Environment and Natural Resources.
- Compiled and evaluated existing hydrologic and geologic information in preparation for the planning of drilling and well installation projects.
- Planned field investigations based on existing information. Investigations were conducted in (1) highly variable glacial sediments (including buried and surficial glacial outwash aquifers), (2) Cretaceous age geologic units of Niobrara Formation, Carlile Shale, Greenhorn Formation, Graneros Shale, Dakota Formation, and Split Rock Creek Formation, and (3) Precambrian age Sioux Quartzite.
- Directed drilling and well installation for ground-water resource investigations wherein the extent, thickness, and water quality of various aquifers were studied. Investigations were performed to locate new or supplemental sources of drinking water for cities and rural water systems. Drilling and well depths ranged from very shallow to greater than 800 feet. The primary drilling method employed was the forward mud rotary method. Auger drilling (solid stem and hollow stem) was also used but to a much lesser extent.
- Planned and directed drilling and well installation activities to characterize the hydrogeology at potential or existing landfill sites.
- Planned and directed the investigation of sites contaminated with petroleum products (gasoline, diesel, fuel oil). Directed test drilling, well installation, and performed sampling of water and contaminants.
- Spent extensive time in the field with drilling projects as the well-site geologist and project director; logged and interpreted drill cuttings.
- Performed and interpreted results of geophysical logging of test holes (single-point resistivity, spontaneous potential, and natural gamma) to define subsurface geology.
- Used isotopic analysis of ground water to interpret paleo-hydrogeologic environment and age of the ground water.
- Interpreted surface and subsurface geology and hydrology in order to construct aquifer maps. The process included reconstruction of geologic history and an evaluation of all available hydrologic parameters.
- Developed wells, commonly using compressed air, and sampled wells for water quality analysis using a variety of methods (air lift, bailer, centrifugal pump, bladder pump).
- Collected water levels and used them to construct water table maps and potentiometric surface maps.
- Prepared maps, cross sections, and written reports for projects lasting a few months to several years.

- Made presentations of project results to city councils, rural water system boards of directors, consultants, other government officials, and the general public.

Additionally, I have experience as a Senior Hydrologist/Project Manager from November 1984-January 1986 with Twin City Testing Corporation, St. Paul, Minnesota, during which time I performed the following functions.

- Designed and directed investigations of sites having petroleum contamination in the subsurface. Field methods employed were drilling of test holes, installation of monitoring wells, collection of sediment and ground-water samples, and collection of water-level data.
- Worked on project sites ranging geographically from West Virginia to California encompassing bedrock, alluvial, and glacial geologic settings.
- Hired and directed subcontractors for project sites remote from the Minneapolis, Minnesota, area.
- Evaluated aquifer test data to assist in the understanding of subsurface hydrologic conditions.
- Used geologic, hydrologic, and contaminant data to interpret subsurface conditions, and to predict future environmental impacts of contamination.
- Designed and implemented remedial action at project sites to mitigate environmental impacts and to protect human health and safety.
- Prepared maps, cross sections, and written reports.

Q: What Professional Credentials do you hold?

A: I am a Certified Professional Geologist (CPG) through the American Institute of Professional Geologists

Q: On whose behalf was this testimony prepared?

A: I prepared this testimony on behalf of the Staff of the South Dakota Public Utilities Commission.

Q: Have you reviewed the Application and its amendments?

A: I have reviewed the portion of the Application that is relevant to my area of expertise.

Q: What methodology did you employ?

A: I looked at the proposed route of the pipeline and compared it to the surface geology that would be crossed. I also looked at maps showing shallow glacially derived aquifers that may be present along the proposed path of the pipeline.

Q: When would your agency have jurisdiction over Dakota Access?

A: The Geological Survey Program, South Dakota Department of Environment and Natural Resources, does not have regulatory authority. The Geological Survey Program would most likely become involved at the request of regulatory Programs in the Department and would provide interpretation of geologic and hydrologic conditions as requested.

Q: Did you provide any recommendations to Dakota Access during route development?

A: No

Q: Does the proposed pipeline route cross any areas where shallow aquifers have been identified?

A: Yes, I will mention them beginning in Campbell County, which contains the northwest end of the proposed route in South Dakota, and progress southeastward to Lincoln County.

- In Campbell County, the pipeline route crosses areas where the Spring Creek aquifer and the Selby aquifer have been mapped. Experience gained since the report that named these aquifers was published in 1970 leads me to suspect that these two aquifers are very likely much smaller than indicated in the report. Nevertheless, there are data from drill holes near the pipeline route that show some shallow sand and gravel to be present.
- In southwestern Spink County, the pipeline route crosses an area where the Tulare aquifer has been mapped. Recent work by the Geological Survey Program corroborates the presence of this shallow sand and gravel aquifer.
- In western Lake County, the pipeline route crosses the East Fork Vermillion River. A sand and gravel aquifer named the Vermillion-East-Fork has been mapped to occur in the river valley but the presence of shallow sand and gravel within the mapped aquifer area is not ubiquitous as demonstrated by maps of surface geology and test-hole data.
- At the southeastern end of the proposed pipeline route in South Dakota, the valley of the Big Sioux River is crossed. A sand and gravel aquifer named the Big Sioux aquifer is mapped in the valley. Although there are no test holes which have been drilled at the exact location of the proposed pipeline crossing, a nearby test hole and the presence of a nearby gravel pit indicate that shallow sand and gravel is likely in the river valley.

Q: Does this conclude your testimony?

A: Yes

Derric L. Iles

Work Experience

Jan. 1998 – Present **State Geologist and Administrator,** *Geological Survey Program, South Dakota Department of Environment and Natural Resources, Vermillion, South Dakota*

- Plan, organize, and direct the activities of the South Dakota Geological Survey to locate, describe, map, and evaluate the natural resources of South Dakota.
- Provide scientific advice and expertise to the South Dakota Department of Environment and Natural Resources, other governmental agencies, consultants, and the public.

1986 – 1993 **Adjunct Instructor,** *Department of Earth Sciences and Physics, University of South Dakota, Vermillion, South Dakota*

- Taught a 3-credit Environmental Earth Science course.
- Taught introductory earth science laboratories.

Feb. 1986 – Dec. 1998 **Hydrologist,** *Geological Survey Program, South Dakota Department of Environment and Natural Resources, Vermillion, South Dakota*

- Designed and directed hydrogeologic investigations focused on water quantity, water quality, and the vulnerability of certain aquifers to surface sources of contamination.
- Planned and directed research on the movement of ground water through low permeability glacial till. Utilized test drilling, well installation, laboratory and field testing of sediment permeability, general water chemistry, stable isotopes, lithologic description, water levels, and hydraulic gradients to characterize hydrogeologic conditions.
- Directed drilling, well installation, and water sampling activities.
- Produced maps and written scientific reports.
- Reviewed and evaluated consultants' reports on hydrogeologic characterizations of future landfill sites. Assisted consultants in preparing work plans to gather hydrogeologic information necessary for the permitting process related to solid waste disposal facilities in low-permeability geologic settings.
- Designed and implemented a statewide ground water quality monitoring network for South Dakota that is focused on long-term monitoring of the ambient quality of water in 25 of the state's surface aquifers.
- Provided expert witness testimony regarding the hydrology and geology of potential landfill sites on behalf of the South Dakota Department of Environment and Natural Resources.

Nov. 1984 – Jan. 1986 **Senior Hydrogeologist/Project Manager,** *Soil Exploration Company, Twin City Testing Corporation, Huntingdon Engineering and Environmental Inc., St. Paul, Minnesota*

- Designed and directed investigations of sites having petroleum contamination in the subsurface. Field methods employed were drilling of test holes, installation of monitoring wells, collection of sediment and ground water samples, and collection of water level data.
- Project sites ranged geographically from West Virginia to California and encompassed bedrock, alluvial, and glacial geologic settings.
- Hired and directed subcontractors for project sites remote from the Minneapolis, Minnesota, area.
- Evaluated aquifer test data to assist in the understanding of subsurface hydrologic conditions.

- Used geologic, hydrologic, and contaminant data to interpret subsurface conditions, and to predict future environmental impacts of contamination.
- Designed and implemented remedial action at project sites to mitigate environmental impacts and to protect human health and safety.
- Prepared maps, cross sections, and written reports.

June 1977 – Oct. 1984 **Geologist/Hydrologist**, *Geological Survey Program, South Dakota Department of Environment and Natural Resources, Vermillion, South Dakota*

- Compiled and evaluated existing hydrologic and geologic information in preparation for the planning of drilling and well installation projects.
- Planned field investigations based on existing information. Investigations were conducted in (1) highly variable glacial sediments (including buried and surficial glacial outwash aquifers), (2) Cretaceous age geologic units of Niobrara Formation, Carlile Shale, Greenhorn Formation, Graneros Shale, Dakota Formation, and Split Rock Creek Formation, and (3) Precambrian age Sioux Quartzite.
- Directed drilling and well installation for ground-water resource investigations wherein the extent, thickness, and water quality of various aquifers were studied. Investigations were performed to locate new or supplemental sources of drinking water for cities and rural water systems. Drilling and well depths ranged from very shallow to greater than 800 feet. The primary drilling method employed was the forward mud rotary method. Auger drilling (solid stem and hollow stem) was also used but to a much lesser extent.
- Planned and directed drilling and well installation activities to characterize the hydrogeology at potential or existing landfill sites.
- Planned and directed the investigation of sites contaminated with petroleum products (gasoline, diesel, fuel oil). Directed test drilling, well installation, and performed sampling of water and contaminants.
- Spent extensive time in the field with drilling projects as the well-site geologist and project director; logged and interpreted drill cuttings.
- Performed and interpreted results of geophysical logging of test holes (single-point resistivity, spontaneous potential, and natural gamma) to define subsurface geology.
- Used isotopic analysis of ground water to interpret paleo-hydrogeologic environment and age of the ground water.
- Interpreted surface and subsurface geology and hydrology in order to construct aquifer maps. The process included reconstruction of geologic history and an evaluation of all available hydrologic parameters.
- Developed wells, commonly using compressed air, and sampled wells for water quality analysis using a variety of methods (air lift, bailer, centrifugal pump, bladder pump).
- Collected water levels and used them to construct water table maps and potentiometric surface maps.
- Prepared maps, cross sections, and written reports for projects lasting a few months to several years.
- Made presentations of project results to city councils, rural water system boards of directors, consultants, other government officials, and the general public.

Education

1975-1977 **Master of Science, Geology**, *Iowa State University, Ames, Iowa*
1971-1975 **Bachelor of Arts, Geology**, *University of Northern Iowa, Cedar Falls, Iowa*

Additional Training

- 24-hour Mine Safety & Health Administration training, November 2006 and January 2009
- Legal Arena, SD Bureau of Personnel training
- various OSHA 8-hour refresher courses for hazardous materials
- Source Water Protection Workshop, December 1997
- Introduction to ArcView, March 1997
- Recognizing & Identifying Hazardous Materials Train-the-Trainer Course, December 1990
- Introduction to AutoCAD, August 1990
- Wellhead Protection Area Delineation, October 1988
- Sampling for Hazardous Materials (165.9), August 1988
- Safety at Hazardous Materials Sites: A Hands-On Workshop, May 1998
- Risk Based Corrective Action Training, December 1995
- Drug and Alcohol Detection Training Course for Supervisors, June 1995
- Personnel Protection and Safety (165.2), March 1988
- Incident Mitigation & Treatment Methods, September 1986
- Intermediate Hazmat Safety, April 1985

Memberships

American Institute of Professional Geologists, CPG 10986
Association of American State Geologists
National Ground Water Association

Awards

2005	John Paul Gries "Geologist of the Year" Award, *American Institute of Professional Geologists, South Dakota Section*
2001	Agency Person of the Year Award, *Black Hills Resource Conservation and Development, Inc.*
1998	Environmental Achievement Award, *U.S. Environmental Protection Agency, Region 8*

Publications/Reports

Iles, D.L. and Barari, A., 1978, *Ground-water study for the city of Redfield*: South Dakota Geological Survey Open-File Report UR-22, 23 P.

Iles, D.L. 1979, *Ground-water study for southern Union County*: South Dakota Geological Survey Open-File Report UR-28, 63p.

Iles, D.L., 1979, *Ground-water study for the city of Huron*: South Dakota Geological Survey Open-File Report UR-24, 37 p.

Iles, D.L. 1979, *Sanitary landfill investigations for the city of Huron*: South Dakota Geological Survey Open-File Report UR-26, 30 p.

Ludvigson, G.A. McKay, R.M., Iles, D.L., and Bretz, R.F., 1981, *Lithostratigraphy and sedimentary petrology of the Split Rock Creek Formation, late Cretaceous, of southeastern South Dakota*, in Brenner and others, *Cretaceous stratigraphy and sedimentation in northwest Iowa, northeast Nebraska, and southeast South Dakota*: Iowa Geological Survey Guidebook Series 4.

Hedges, L.S., Burch, S.L., Iles, D.L. Barari, R.A., and Schoon, R.A., 1982, *Evaluation of ground-water resources in eastern South Dakota and upper Big Sioux River, South Dakota and Iowa, Task 1: Bedrock topography and distribution; Task 2: Extent of aquifers; Task 3: Ground-water storage; Task 4: Computerized data base*: Department of Water and Natural Resources, Division of Geological Survey, Vermillion, South Dakota, Prepared for Planning Division, U.S. Army Corps of Engineers, Omaha, Nebraska, Contract DACW 45-80-C-0185.

Iles, D.L. 1984, *Platte petroleum spill*: (revised 1989), South Dakota Geological Survey Open-File Report UR-39, 38p.

Iles, D.L. 1984, *Pleistocene recharge to the Dakota Formation in Lincoln County, South Dakota,* in *Proceedings of the First C.V. Theis Conferences on Geohydrology; Geohydrology of the Dakota Aquifer*: held October 5-6, 1982, Lincoln, Nebraska, p. 135-146; published by the National Water Well Association.

Hedges, L.S., Burch, S.L., and Iles, D.L., 1985, *Evaluation of groundwater resources eastern South Dakota and upper Big Sioux River South Dakota and Iowa, Task 6: Average annual ground-water use in eastern South Dakota*: Department of Water and Natural Resources, Division of Geological Survey, Vermillion, South Dakota, Prepared for Planning Division, U.S. Army Corps of Engineers, Omaha, Nebraska, Contract DACW 45-80-C-0185.

Allen, J.C., Iles, D.L., and Petres, A.K., 1985, *Analysis of groundwater and streamflow data western Dakotas region of South Dakota, Tasks 3A. B. C. and 4A. B.: Groundwater resource inventory*: Department of Water and Natural Resources, Division of Geological Survey, Vermillion, South Dakota, Prepared for Planning Division, U.S. Army Corps of Engineers, Omaha, Nebraska, Contract DACW 45-82-C-0151.

Hedges, L.S., Burch, S.L., and Iles, D.L., 1985, *Evaluation of groundwater resources eastern South Dakota and upper Big Sioux River South Dakota and Iowa, Task 11: Artificial recharge potential*: Department of Water and Natural Resources, Division of Geological Survey, Vermillion, South Dakota, Prepared for Planning Division, U.S. Army Corps of Engineers, Omaha, Nebraska, Contract DACW 45-80-C-0185.

Iles, D.L. 1986, *Gregory petroleum leak*: South Dakota Geological Survey Open-File Report UR-38, 21 p.

Iles, D.L. 1986, *Tripp petroleum leak*: South Dakota Geological Survey Open-File Report UR-37, 17 p.

Iles, D.L., 1988, *Investigation of petroleum contamination at Washington High School, Sioux Falls, South Dakota*: South Dakota Geological Survey Open-File Report UR-53, 27 p.

Iles, D.L. and Dawson, P.M., 1988, *Hydrogeologic investigation for an alternate water source for the Brookings-Deuel Rural Water System near Clear Lake, South Dakota*: South Dakota Geological Survey Open-File Report UR-51, 79 p.

Iles, D.L., Meyer, M.R., Baron, L.R. and Markley, W.E., 1988, *Assessment of hydrogeologic and ground water contamination data in the vicinity of the Hayward Elementary School, West 12th Street, Sioux Falls, South Dakota*: South Dakota Geological Survey Open-File Report UR-44, 231 p.

Barari, A., Cowman, T.C., and Iles, D.L. 1988, *Evaluation of data on nitrate concentrations in the Big Sioux aquifer*: South Dakota Geological Survey Open-File Report UR-54, 30 p.

Iles, D.L., 1989, *Investigation of the Sioux Falls sanitary landfill*: South Dakota Geological Survey Open-File Report UR-58, 69p.

Barari, A., Iles, D.L., and Cowman, T.C., 1989, *Assessment of water resources and conceptual evaluation of a regional water supply for southeastern South Dakota*: South Dakota Geological Survey Open-File Report UR-60, 18 p.

Barari, A., Cowman, T.C., and Iles, D.L., 1989, *A summary of current hydrologic conditions in the Dolton aquifer*: South Dakota Geological Survey Open-File Report UR-59, 11 p.

Frykman, L.J., and Iles, D.L., 1990, *Hydrologic investigation of the Dakota Formation to identify additional municipal well sites for the city of Canton, South Dakota*: South Dakota Geological Survey Open-File Report UR-62, 79 p.

Iles, D.L. and Frykman, L.J., 1991, *Hydrogeology of the southern Skunk Creek management unit of the Big Sioux aquifer*: South Dakota Geological Survey Open-File Report UR-63, 171 p.

Iles, D.L., Hammond, P.D., and Schulz, L.D., 1992, *Effects of sampling methods on inorganic water chemistry results* in *Proceedings of National Groundwater Sampling Symposium*: held November 30, 1992, Washington, DC, p. 41-68; published by Grundfos Pumps Corporation, Environmental Products Division.

Barari, A., Iles, D.L., and Cowman, T.C., 1993, *Wellhead protection and monitoring options for the Sioux Falls airport wellfield, South Dakota* in Moore, B.A., editor, *Case studies in wellhead protection area delineation and monitoring*: Environmental Monitoring Systems Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Las Vegas, Nevada, Contract number 68-CO-0049.

Holly, D.E., Iles, D.L., and Barari, A., 1993, *Ground-water study for the TM Rural Water District in the vicinities of Dolton and Parker, South Dakota*: South Dakota Geological Survey Open-File Report UR-65, 112 p.

Iles, D.L., 1996, *Investigation of the Dakota Formation for the Lincoln County Rural Water System*: South Dakota Geological Survey Open-File Report UR-71, 12 p.

Iles, D.L., Barari, A., and Hedges, L.S., 1996, *Ground-water movement within till in Lincoln County, South Dakota*: South Dakota Geological Survey Open-File Report BAS-04, 82 p.

Frykman, L.J., and Iles, D.L., 1996, *Investigation of nitrate-nitrogen contamination in ground water in the vicinity of Alcester, South Dakota*: South Dakota Geological Survey Open-File Report UR-76, 50 p.

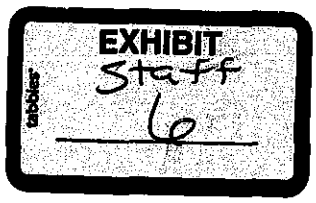
Davis, R.K., Iles, D.L., Schaefer, V.R., Kortran, J.M., Koch, B., and Peterson, E.W., 1997, *Hydrogeology and hydrochemistry of clayey till at the Sioux Falls landfill, Sioux Falls, South Dakota*: South Dakota Geological Survey Open-File Report BAS-09, 186 p.

BEFORE THE
PUBLIC UTILITIES COMMISSION
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

DOCKET HP14-002

PREFILED TESTIMONY OF PAIGE OLSON
ON BEHALF OF THE COMMISSION STAFF
July 6, 2015



Q. State your name.

A. Paige Olson.

Q. By who are you employed?

A. State of South Dakota.

Q. For what department or program do you work?

A. State Historic Preservation Office (SHPO)

Q. Please explain the program goals and your role and duties within SHPO.

A. The National Historic Preservation Act of 1966 is the foundation for the preservation work of the South Dakota State Historical Society (SDSHS). The State Historic Preservation Office (SHPO), a program under the SDSHS is charged to survey historic properties and maintain an inventory; identify and nominate properties to the National Register of Historic Places; advise and assist federal, state, and local government agencies in fulfilling their preservation responsibilities; provide education and technical assistance in historic preservation; develop local historic preservation programs, consult with federal and state agencies on their projects affecting historic properties; and advise and assist with rehabilitation projects involving federal assistance. My specific role is to

monitor federally funded, licensed or permitted projects and to ensure historic properties are taken into consideration. I provide technical analyses, reviews and assistance to government agencies to ensure compliance with state and federal guidelines. I am also responsible to ensure that archaeological resources are taken into consideration under South Dakota Codified Law 1-19A-11.1. I serve as the lead over the review and compliance function of SHPO.

From Class Specifications

Functions: (These are examples only; any one position may not include all of the listed examples nor do the listed examples include all functions which may be found in positions of this class.)

1. Reviews construction work plans for federally funded projects to determine if they are in compliance with state and federal preservation laws.

a. Assesses impact of the project on historic properties and ensures those properties are given due consideration during the planning and implementation of projects.

b. Concurs or disagrees with determinations of eligibility for historic properties and the effect of proposed project on those properties within legally mandated timelines.

c. Reviews archaeological survey reports and documentation submitted by principal investigators and Senior Archaeologists to determine if proper methodology and standards established by state and federal government are met.

d. Works with agency officials to determine appropriate mitigation techniques when resources cannot be avoided.

e. Negotiates with and assists agencies in developing legal agreements to mitigate effects to historic properties and agreements to provide for alternative review and compliance procedures.

2. Provides technical assistance to government officials, contractors, lending institutions and agencies, and the general public to help them understand federal and state laws and to suggest compliance requirements.

a. Reviews survey reports developed for construction projects to determine if findings are in compliance with appropriate federal and state rules and regulations.

b. Monitors additions, deletions, or changes in interpretation of federal rules and regulations.

c. Writes and recommends guidelines for government agencies or federal fund recipients.

d. Compiles and analyzes data from a variety of sources to determine if agencies are having difficulty complying with requirements.

e. Maintains a record of all determinations about construction projects to be used as the basis of reports and future federal funding requests.

3. Prepares and writes comprehensive plans to manage cultural resources in South Dakota and establish guidelines to ensure that cultural resources are identified and protected.

a. Determines eligibility of archaeological sites and makes recommendations for their inclusion in the National Register of Historic Places and contributes research to a statewide comprehensive historic preservation plan.

b. Responds to requests from property owners, government agencies, and others to provide technical information about significance of sites.

4. Develops effective public information programs to inform South Dakota citizens about archaeology, pre-history, and the need to preserve South Dakota's cultural heritage.

a. Develops and manages public education programs to inform amateur archaeology groups, students, and the general public.

b. Designs and develops educational handouts, brochures and presentations.

c. Manages and participates in archaeological excavation projects to maintain a working knowledge of South Dakota pre-history and to mitigate the impact of development on significant sites.

5. Oversees the maintenance of a computerized system that tracks information relating to archaeological sites in order to provide an accurate and effective data base for research projects.

6. Provides work direction and training for review and compliance program staff to ensure projects are reviewed in an accurate, consistent and timely manner.

a. Establishes program priorities.

b. Assigns and reviews work.

c. Sets goals and recommends changes in work plans.

d. Develops office procedures.

e. Recommends the hiring of new staff.

f. Makes budget recommendations.

7. Performs other work as assigned.

Q. On whose behalf was this testimony prepared?

A. This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission.

Q. State and explain the South Dakota laws and federal regulations that protect archaeological and historic resources in this state.

A. Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their project on historic properties. The federal regulations 36 CFR part 800 – Protection of Historic Properties explain how federal agencies take into consideration historic properties. In general, Section 106 is a four step process.

Step 1: Initiate Section 106 Process – the federal agency establishes if it has a federal undertaking. (A federal undertaking in general is any project, activity, or program funded, permitted or licensed by a federal agency. This also includes federal approval.) The agency determines if the federal undertaking has the potential to affect historic properties. (Historic properties are prehistoric or historic district, site building, structure, or object listed on the National Register of Historic Places or eligible for listing on the National Register. This term includes properties of religious and cultural significance to Indian tribes.) If the federal undertaking does not have the potential to affect historic properties the agency is done. If the agency determines the undertaking does have the potential to affect historic properties they go to step 2.

Step 2: Identify Historic Properties – the federal agency identifies historic properties within the project area or area of potential effect (APE). If after conducting the appropriate level of research the agency determines that no historic properties are located within the APE, the agency documents their findings and exits the process. If however, historic properties are identified the agency moves to the next step.

Step 3: Assess Adverse Effect – if historic properties are identified in the APE, the federal agency determines how the project will impact the identified properties. If the project can be modified or conditions are imposed as to minimize the impact of the project on historic properties the federal agency may determine the project will have a "No Adverse Effect". If this is the case, the agency consults with the consulting parties, documents their decision, and exits the process. However, if the agency determines the project will have an "Adverse Effect" on historic properties the agency moves to the final step.

Step 4: Resolution of Adverse Effect – the federal agency, in consultation with other consulting parties, develops a memorandum of agree to mitigate the adverse effects. Throughout this process the federal agency should be consulting with various parties as described in the regulations.

South Dakota Codified Law 1-19A-11.1 - Preservation of historic property – Procedures. The state or any political subdivision of the state may not undertake any project which will encroach upon, damage or destroy any property included in the State or National Register of Historic Places.

The National Historic Preservation Act supersedes SDCL 1-19A-11.1. However, the overall project has been segmented so there is no overarching lead federal agency for the

project. As a result, portions of the project will be reviewed under Section 106 of the National Historic Preservation Act and portions will be reviewed under SDCL 1-19A-11.1.

The difference between Section 106 of the National Historic Preservation Act and SDCL 1-19A-11.1 is that Section 106 requires the identification of properties listed in or eligible for listing in the National Register of Historic Places. SDCL 1-19A-11.1 requires only the identification of properties listed in the State or National Register of Historic Places. Another key difference between the two laws is consultation. Section 106 of the National Historic Preservation Act outlines who the consulting parties are and specifically speaks to the participation of American Indian tribes. SDCL 1-19A-11.1 does not provide for this type of interaction.

Q. Has DAPL, to the best of your knowledge, complied with the state and federal rules and regulations you described previously?

A. To the best of my knowledge DAPL has complied with SDCL 1-19A-11.1 for the centerline portions of the project. Compliance with Section 106 of the National Historic Preservation Act is the responsibility of a federal agency and will apply only on portions of the project for which there is a federal connection.

Q. Are there any archaeological and or historically sensitive areas crossed by DAPL?

A. It is unclear. On June 15, 2015, my office received the reports entitled "Level III Intensive Cultural Resource Survey for Dakota Access Pipeline Project for Campbell, McPherson, Edmunds, Faulk, Spink, beadle, Kingsbury, Miner, Lake, McCook, Minnehaha, Turner and Lincoln Counties, South Dakota, Volume I – V," prepared by Gray & Pape, Inc. The reports detail the results of the archaeological survey for portions of the proposed centerline. No information concerning ancillary facilities such as access roads, staging areas or utility corridors has been provided.

Consultation with American Indian tribes regarding the identification of historic properties is the responsibility of the federal agency under Section 106 of the National Historic Preservation Act. It is unclear if any efforts were made by DAPL to identify the concerns of American Indian tribes who have aboriginal lands along the pipeline route.

Q. Can the Applicant mitigate the risks associated with crossing those sensitive areas?

A. It is unclear as the identification of historic properties is not complete.

Q. Please provide any additional information that may be helpful or necessary for us to investigate further.

A. The full extent of federal involvement in this project has not been established. If the project is federalized, then Section 106 will apply to entire pipeline and all ancillary facility locations.

Q Do you have any outstanding questions about the survey reports?

A. The document entitled "Unanticipated Discoveries Plan Cultural Resources, Human Remains, Paleontological Resources & Contaminated Media," does not clearly address the unanticipated discovery of cultural resources or human remains.

B. "Procedures for the Discovery of Cultural Resources"

1. The plan delineates between private, state and federal lands. In order to avoid confusion, the discovery plan should be consistent for the entire state regardless of land ownership.

2. I assume Bullet 3. applies to state and private lands. The procedure directs the archaeologist to the "State's Historic Preservation Plan" (HPP). The HPP does not address the inadvertent discovery of cultural resources. Please explain this reference.

3. The discovery plan places the responsibility of identifying cultural resources on the members of the construction work force and Environmental Inspector (EI). Please clarify if the construction work force and EI will receive training in the identification of cultural resources.

4. Please clarify if the Secretary of the Interior's Qualification Standards apply to all professionals working in South Dakota or just in areas for which there is a federal connection.

C. "Procedures for the Discovery of Human Remains"

The current plan for the discovery of human remains does not provide adequate detail to ensure the protection of human remains and funerary objects pursuant to SDCL 34-27-25,

34-27-28, 34-27-31. I recommend using the discovery plan specific to South Dakota, attached below.

In the event of an inadvertent discovery of human remains or funerary objects the following steps shall be taken pursuant to South Dakota Codified Law Chapter 34-27-25, 34-27-28, 34-27-31:

1. The On-site manager/ Contractor 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.

a) Flag the buffer zone around the find spot.

b) Keep workers, press, and curiosity seekers, away from the find spot.

c) Tarp the find spot.

d) Prohibit photography of the find unless requested by an agency official.

e) Have an individual stay at the location to prevent further disturbance until a law enforcement officer arrives.

2. The On-site manager/ Contractor shall notify local 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 the discovery upon completion of the plan authorize by the State Archaeologist.

Contact Information:

James K. Haug, State Archaeologist

South Dakota State Historical Society

Archaeological Research Center

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Rapid City, SD 57709

(605) 394-1936

Katie Lamie, Repository Manager

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State Historic Preservation Office

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Pierre, SD 57501

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Amy Rubingh, Review and Compliance Archaeologist

South Dakota State Historical Society

State Historic Preservation Office

900 Governors Drive

Pierre, SD 57501

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No map was provided delineating the locations of where Section 106 of the National Historic Preservation Act or SDCL 11.1 applies. Without this information it is difficult

to formulate specific questions. With that stated, the following information should be clarified as appropriate.

1. Given that number of cultural resources located near the centerline, please explain how these resources will be avoided by construction activity.

2. On page 133 of the report volume 1, site 39BE175 is identified as a foundation, but in Appendix D, figure D45 a stone alignment is identified. Please provide the site number for the stone alignment.

3. The report identifies Deep Testing Location (DTL) Lake 1 and DTL Lincoln 3 as having the potential for deeply buried cultural deposits. Without knowing the depth of the potential deposits, please explain how deeply buried cultural deposits can be avoided through horizontal directional drilling (HDD).

PAIGE HOSKINSON OLSON
Pierre, SD 57501
Work (605)773-6004

Education

1998-2001 Master's of Arts, Anthropology
University of Montana, Missoula, MT
Major: Cultural Resource Management
Minor: Archaeology

1989-1995 Bachelor of Arts
University of Montana, Missoula, MT
Major: History
Minor: Political Science

1985-1989 Whitehall High School, Whitehall, MT

Professional Experience

January 2007 - Present Archaeological Review and Compliance Coordinator, South Dakota State Historical Society - State Historic Preservation Office (SHPO), 900 Governors Drive, Pierre, SD

- Assess impact of projects on historic properties and ensure those properties are taken into consideration during planning and implementation of project in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended and South Dakota Codified Law 1-19A-11.1.
- Assess properties eligibility for listing on the National Register of Historic Places in accordance with the criteria developed by the National Park Service.
- Review archaeological survey reports and documentation submitted by federal, state and contracting archaeologist to determine if proper methodology and standards established by state and federal government are met.
- Negotiate with and assist agencies in developing legal agreements to mitigate effects to historic properties, such as memorandums of agreement (MOA).
- Negotiate with and assist agencies in developing legal agreements to provide for alternative review and compliance procedures, such as programmatic agreements (PA).
- Provide technical assistance to government and tribal officials, contactors, and the general public concerning federal and state laws.
- Participate in consultation meetings to discuss project effects on historic properties with federal, state and tribal officials.
- Develop effective public information programs about state and federal preservation laws and archaeology.
- Ensure a database of all projects submitted for review is maintained and accurate for reports and future federal funding requests.
- Monitor changes in the interpretation of federal and state rules and regulations.
- Write and recommend guidelines for government agencies or federal fund recipients.
- Provide work direction and training for review and compliance program staff to ensure project are reviewed in an accurate, consistent and timely manner.
- Supervise student interns and volunteers in various projects.

- Manage Fort Pierre Chouteau National Historic Landmark.
- Prepare and write comprehensive plans to manage cultural resources in South Dakota and update established guidelines to ensure historic properties are identified and protected.
- Manage contracts focused on archaeology and maintenance at Fort Pierre Chouteau Nation Historic Landmark.
- Coordinate annual Archaeology Camp for fourth and fifth grade school children.
- Participated in State Hazard Mitigation Group.
- Participated as a member of the Social Cultural Economic Technical Team for the development of the Missouri River Ecosystem Restoration Plan.

June 2002 – January 2007

Historic Archaeologist, South Dakota State Historical Society - State Historic Preservation Office (SHPO), 900 Governors Drive, Pierre, SD

- Assessed impact of projects on historic properties and ensure those properties are taken into consideration during planning and implementation of project in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended and South Dakota Codified Law 1-19A-11.1.
- Assessed properties eligibility for listing on the National Register of Historic Places in accordance with criteria established by the National Park Service.
- Reviewed archaeological survey reports and documentation submitted by federal, state and contracting archaeologist to determine if proper methodology and standards established by the state and federal government are met.
- Negotiated with and assisted agencies in developing legal agreements to mitigate effects to historic properties, such as memorandums of agreement (MOA).
- Negotiated with and assisted agencies in developing legal agreements to provide for alternative review and compliance procedures, such as programmatic agreements (PA).
- Provided technical assistance to government officials, contactors, and the general public concerning federal and state laws and compliance requirements under Section 106 of the National Historic Preservation Act.
- Maintained a database of all projects submitted for review.
- Supervised student interns in various projects.
- Managed two National Historic Landmarks owned by the state.
- Updated state guidelines for cultural resource surveys and survey reports specifically for Section 106 review and compliance.
- Managed contracts focused on archaeology.
- Coordinated Archaeology/ Preservation Month.

April 2001- June 2002

Historic Preservation Specialist (Architectural Historian), South Dakota State Historical Society - State Historic Preservation Office (SHPO)
900 Governors Drive, Pierre, SD

- Functioned as West River Coordinator for National and State Register of Historic Places Programs, Certified Local Government program and historic preservation grant program.
- Apply National Register Criteria to make preliminary determinations of eligibility for listing properties on the National Register of Historic Places.
- Prepared and edited in house National and State Register Nominations.
- Surveyed commercial and residential districts to update existing National

Register nominations.
- Furnished technical advice and grant management services to local historic preservation organizations and the general public.
- Acted as contact for GIS Technical Advisory Group.
- Used GoeExplorer III for data collection and ArcView/Mapit to create accurate maps.
- Consulted on review and compliance issues under SDCL 19A-11.1.

January 2000 – April 2001 — Archival Technician, National Park Service, Grant-Kohrs Ranch National Historic Site, PO Box 790, Deer Lodge, MT

- Functioned as field archaeologist observing all ground disturbing projects and making onsite assessments for work associated with Natural Resource Damage Assessment.
- Acted as liaison between NPS personnel and University of Montana field research crews.
- Worked closely with Natural Resource Management Division to protect cultural and natural resources.
- Oversaw groundwater, soil, vegetation and range management research occurring at the Grant-Kohrs Ranch.
- Provided relevant information to University of Montana field crews to comply with state and federal laws.
- Drafted necessary documents involving Section 106 compliance for the Montana State Historic Preservation Office.
- Attended and represent the Grant-Kohrs Ranch at Natural Resource Damage Assessment meetings.
- Gathered financial information for Natural Resource Damage Assessment cost recovery.
- Maintained Administrative Record for Grant-Kohrs Ranch damage assessment.
- Worked with confidential and sensitive legal material.
- Completed a two-month detail in Atlanta, Georgia working directly with NPS Natural Resource Damage Assessment staff.

January 2000 – May 2001 — Thesis Project, Bureau of Land Management, Fort Missoula Road, Missoula, MT

- Updated Cultural Resource Inventory for Bureau of Land Management.
- Surveyed and recorded approximately 149 structures and features related to mining activities.
- Used GeoExplorer II for data collection to map structures and features.
- Documented current condition of structures and features using appropriate Bureau of Land Management forms and photographs.
- Completed literature search and develop comprehensive history of Coloma, Montana.
- Researched and compiled annotated bibliography.
- Supervised documentation of archaeology sites by volunteers.

February 2000 – May 2000 — Intern, Montana State Historic Preservation Office, Helena, MT

- Performed record searches and entered archaeology site data using Oracle databases: Cultural Resource Information System (CRIS), Cultural Resource Annotated Bibliography System (CRABS), and Project, Eligibility and Effect Reports System (PEERS).
- Compiled information to complete narrative and physical descriptions for

nomination of historic district.
- Completed National Register of Historic Places nomination for Slayton Mercantile, Lavina, Montana.
- Surveyed and evaluated historic structures located within historic district for nomination as National Historic Landmark.
- Reviewed and prepared site files to be assigned Smithsonian Numbers.

October 1999 – November 1999

Volunteer, Bureau of Land Management, Fort Missoula Road, Missoula, MT

- Participated in archaeological inventory for timber sale and land exchange.
- Walked 30 meter transects to identify historic and prehistoric artifacts and features.
- Identified and recorded prehistoric and historic sites.

August 1998 - December 1998

University of Montana Field School, Historic Structure at Fort Missoula
Department of Anthropology, Missoula, MT

- Laid out, excavated, and screened soil from excavation units.
- Conducted block style excavations.
- Mapped vertical and horizontal stratigraphy.
- Point plotted artifacts and established vertical provenience.
- Maintained detailed excavation notes.

July 1998

University of Montana Field School, Prehistoric Campsite
Department of Anthropology, Missoula, MT

- Laid out, excavated, and screened soil from excavation units.
- Conducted block style excavations.
- Mapped vertical and horizontal stratigraphy.
- Point plotted artifacts and established vertical provenience.
- Maintained detailed excavation notes.

Training

July 2001

Introduction to ArcView GIS Version 3.1
Kadrmas, Lee and Jackson
Pierre, SD

September 2002

Section 106 for Practitioners
National Preservation Institute, Tom King
Seattle, WA

July 2003

Archaeological Law Enforcement Class
Archaeological Resource Investigations, Martin McAllister, Wayne Dance and John Fryar
Pierre, SD

September 2004

Integrating Cultural Resources in NEPA Compliance
National Preservation Institute, Claudia Nissley
Honolulu, HI

September 2004

Section 106: How to Negotiate and Write Agreements
National Preservation Institute, Claudia Nissley
Honolulu, HI

August 2005	*Shenandoah-Dives Mill HAER Documentation and Historic Structure Assessment Workshop* San Juan Historical Society Silverton, CO
November2005 - December 2005	Native American Awareness Training Albert White Hat, Dorothy LeBeau, Wayne Evans, and Craig Howe Pierre, SD
February 2006	National Environmental Policy Act (NEPA) Training Federal Highway Administration Pierre, SD
May 2007	*Identification and Management of Traditional Cultural Places* National Preservation Institute, Claudia Nissley Seattle, WA
April 2008	Native American Sensitivity Training Curley Youpee and Russ Eagle Bear and Ben Rhodd Pierre, SD
June 2008	*Section 106 Essentials* Advisory Council on Historic Preservation, Nancy Brown and Tom McCulloch, Pierre, SD
August 2010	*National Register/ National Historic Landmark Workshop* National Park Service Virginia City, NV
September 2012	*Archaeological Damage Investigation and Assessment; Archaeological Violation Investigation Class* Martin E. McAllister Pierre, SD
May 2014	*Current Archaeological Prospection Advances for Non-Destructive Investigations in the 21st Century* National Park Service, Midwest Archeological Center Aztalan State Park., Aztalan, WI
June 2014	*Working in Indian Country* Larry D. Keown Rapid City, SD

Publications

A Cultural Site Evaluation Coloma, Montana, 2000. Missoula: University of Montana Press, 2001.

"Creations in Stone: Petroforms in East River SD", South Dakota History. Vol. 35, No. 4 (Winter 2005): 347-362.

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Michael Houdyshell
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015

Q: Please state your name and business address.

A: My name is Michael Houdyshell. My business address is 445 East Capitol Avenue, Pierre, SD 57501.

Q: On whose behalf was the testimony provided?

A: This testimony was provided on behalf of the staff of the South Dakota Public Utilities Commission.

Q: Describe your educational background.

A: I hold a B.S. from Black Hills State University (2003) and a J.D. from the University of South Dakota School of Law (2006).

Q: By whom are you now employed?

A: I am employed by the South Dakota Department of Revenue as the Director of the Property and Special Taxes Division.

Q: What work experience have you had that is relevant to your involvement on this project?

A: I have familiarity with how pipelines are assessed for purposes of ad valorem property taxation.

Q: What Professional Credentials do you hold?

A: I am licensed to practice law in South Dakota.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to explain how the Dakota Access Pipeline will be assessed for purposed of property taxation.

Q: Have you reviewed the Application and its amendments?

A: Yes, I have reviewed the sections relevant to property taxes.

Q: Can you please describe the real property taxation system in South Dakota?

A: South Dakota has an ad valorem system of property taxation, which means that the tax is imposed on the value of the property, rather than on its quantity or some other measure.

Q: Can you please describe the central assessment of pipeline property?

A: Yes. Central assessment means that the property is valued by the Department rather than by the county assessor. Certain industries and public utilities are centrally assessed pursuant to state law. Typically, these are companies that have property in multiple counties or states.

Q: Does South Dakota have specific laws for the taxation of pipelines?

A: Yes. SDCL ch. 10-37 contains laws specific to the taxation of pipeline companies. As used in that chapter, the phrase "pipeline companies" includes businesses that transport gasoline, oils or motor fuels via pipeline as a common carrier.

Q: Does SDCL ch. 10-37 govern the taxation of the Dakota Access Pipeline?

A: Yes. Dakota Access Pipeline is a pipeline company as defined in SDCL ch. 10-37.

Q: What are pipeline companies required to report to the Department of Revenue?

A: Pursuant to SDCL 10-37-3, a pipeline company must submit an annual statement detailing all of the property the pipeline company owns in South Dakota. The annual statement must include pipeline mileage in the state by county, the cost and present value of all buildings owned by the company, and the location and description of all pump stations.

Q: Can you please provide an overview of how a pipeline is centrally assessed for purposes of taxation?

A: Yes. Most centrally assessed companies, including pipeline companies, are assessed using the "unit value" method of assessment. There are three steps to the unit value approach. First, the Department determines the fair market value of the whole company as a unit. Then, the Department apportions a share of the total value of the company to South Dakota. Finally, the Department distributes the company's South Dakota value amongst all of the taxing districts where the company owns property in the state.

Q: How is the "unit value" determined?

A: SDCL 10-37-9.1 directs the Department to consider the cost approach, market approach, and income approach when valuing pipeline property. When using these approaches, SDCL 10-37-8 allows the Department to take into account everything which will enable the Department to make a just and equitable assessment of pipeline property.

Q: Can you please describe the cost, market, and income approaches to value?

A: Yes. The cost approach determines the estimated cost of replacing a particular property, taking into account the age and condition of the property, and obsolescence. The market approach looks at the price a particular property would bring in an arms-length, open market sale between a willing buyer and willing seller. The income approach capitalizes the income earned from the operation of the property to arrive at an estimate of value.

Q: Is equal weight given to all three approaches to value?

A: No. Depending on the type of property, one approach may be more reliable than another. For example, the market approach is not particularly reliable for centrally assessed companies, because sales of these types of properties are too infrequent to establish a market value.

Q: Once the "unit value" is determined, how is the South Dakota value determined?

A: After establishing a "unit value," the next step is to allocate a portion of that value to South Dakota. Simply stated, this is done by looking at the percentage of the company's operating assets located in South Dakota as compared to everywhere else. For instance, if 20 percent of a company's operating assets are in South Dakota, 20% of the "unit value" will be allocated and taxed in South Dakota.

Q: Once the South Dakota value is determined, how is it distributed to local taxing districts?

A: A company is required to report the total original cost in each of the taxing districts where the company has property, along with the total original cost in the entire state. The total original cost by taxing district is divided by the total state cost. The resulting percentage is then multiplied by the total state value to determine the value of the company in the taxing district. For example, if a taxing district has 10 percent of the total state cost in that taxing district, then it receives 10 percent of the state value. The Department is responsible for informing the county auditor of the company's value in each of the taxing districts within that particular county.

Q: **Is it possible to estimate the property taxes that will be paid by the Dakota Access Pipeline?**

A: It is extremely difficult to derive reliable estimates of the property tax liability of a nonexistent property such as the Dakota Access Pipeline. Doing so would require the Department to make several assumptions regarding valuation and

levy rates in the various taxing districts that would contain pipeline property. The relevant data is unknown to the Department at this time, so making an estimate is unwise and I decline to do so.

That said, there is generally no downside to adding value to a taxing district in regards to the impact on the property tax system. Typically when significant new value is added to a taxing district, local governments will receive more tax revenue and often other property taxpayers within the taxing district will see lower overall property taxes.

Q: **Do you agree with the property tax projections stated in the Dakota Access Pipeline?**

A: According to Dakota Access's responses to Data Request No. 26 and Dakota Request No. 27, the company is estimating Year 1 property taxes to total $12.34 million statewide. Per the response, "the only measure Dakota Access has to determine an approximate ad valorem tax value is to estimate the actual cost of the pipeline for the first year tax value as there is no operational or company data available to generate the 'value' of the pipeline, company or revenues or losses to determine the value of the company." Further, the response states that "Dakota Access is estimating it will pay approximately $12.34 million in ad valorem taxes for year 1 based strictly upon the cost of the pipeline and asset in South Dakota."

The estimate provided by the Dakota Access Pipeline highlights the difficulties in making a reliable estimate of the property tax liability of the pipeline. There simply is not enough data available at this time. The actual cost of the pipeline does not equal the fair market value of the property and likely overstates the year 1 value of the pipeline in South Dakota. Again, without the full array of data that Dakota Access readily admits is not available, any estimate made by Dakota Access is speculative at best.

Q: Does this conclude your testimony?

A: Yes.

Michael S. Houdyshell

320 North Highland Avenue
Pierre, SD 57501
605.295.3373
mhoudyshell@gmail.com

Experience

South Dakota Department of Revenue, Pierre, SD

Director, Property and Special Taxes Division, October 2011-present
Duties: Provide leadership and guidance to a staff of fourteen tax professionals; Establish priorities and goals for division; Draft, analyze, and lobby proposed legislation and administrative rules; Maintain relationships with state legislators, county officials, and private lobbyists; Analyze and issue opinions on complex tax laws; Oversee the collection of approximately $100 million of state taxes.

South Dakota Department of Public Safety, Pierre, SD

Staff Attorney, August 2008-October 2011
9-1-1 Coordinator, May 2010-October 2011
Duties: Advise department staff on a variety of legal matters; Monitor grants and agency programs to ensure compliance with federal regulations; Draft, analyze, and lobby proposed legislation and administrative rules; Review contracts and other legal documents; Represent the department in contested case hearings; Advise SD 9-1-1 Coordination Board; Coordinate statewide 9-1-1 services and assist counties/municipalities with 9-1-1 issues.

Smoot & Utzman, P.C., Rapid City, SD

Associate Attorney, August 2006-August 2008
Practice Areas: Family law, Real Estate law, Bankruptcy, Business law
Duties: Draft legal pleadings and documents; Conduct legal research and discovery; Perform client intake and advise clients of their legal rights, obligations, and available remedies; Represent clients in court proceedings; Negotiate settlements and plea agreements.

Education

University of South Dakota Graduate School

Post-baccalaureate certificate in Administrative Studies, November 2010
Governor's Leadership Development Program, Cohort Five

University of South Dakota School of Law

J.D., May 2006
Class Rank: 14/83
Honors and Activities:

- Editor-in-Chief, *Great Plains Natural Resources Journal* Vol. 10
- Teaching Assistant, *Legal Writing/Appellate Advocacy*
- Dean's List, Spring and Fall 2004

Black Hills State University

B.S., Social Sciences, *magna cum laude*, May 2003

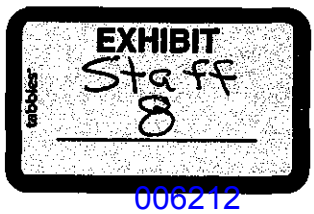
References available upon request

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Todd Bailey
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: Please state your name and business address.

A: My name is Todd Bailey. My business address is 445 East Capitol Avenue, Pierre, SD 57501.

Q: On whose behalf was the testimony provided?

A: This testimony was provided on behalf of the staff of the South Dakota Public Utilities Commission.

Q: Describe your educational background.

A: I hold a B.S. degree in Mathematics from the University of North Dakota (1994).

Q: By whom are you now employed?

A: I am employed by the South Dakota Department of Revenue as a Property Tax Specialist.

Q: What work experience have you had that is relevant to your involvement on this project?

A: I have been appraising pipelines for property tax purposes since 2006.

Q: What Professional Credentials do you hold?

A: I hold the Certified Appraiser Assessor certification from the South Dakota Department of Revenue.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to support Michael Houdyshell in explaining how the Dakota Access Pipeline will be assessed for purposed of property taxation.

Q: Have you reviewed the Application and its amendments?

A: Yes, I have reviewed the sections relevant to property taxes.

Q: Have you reviewed Michael Houdyshell's testimony in this case?

A: Yes.

Q: Do you concur with his testimony?

A: Yes.

Q: Does this conclude your testimony?

A: Yes.

TODD A. BAILEY

OBJECTIVE

To obtain a position in government, industry or real estate appraisal.

EDUCATION

1989-1994 University of North Dakota Grand Forks, ND

Mathematics

- B.S. in Mathematics

WORK EXPERIENCE

March 206 to Present South Dakota Department of Revenue Pierre, SD - Property Tax Division

Public Utility Appraiser/ Property Tax Specialist

- Conducting all aspects of the valuation process for centrally assessed utility property
- Creating a cost of capital study for all industries that are centrally assessed
- Defending valuations with company representatives during informal appeal hearings
- Managing the program for gross receipts tax for rural electric's and rural telephones
- Implemented the alternative tax program for commercial wind-farms
- Teaching introduction to real estate appraisal at annual assessor's school 2009-2014

April 2000 –March 2006 South Dakota Department of Revenue Pierre, SD – Property Tax Division

Senior Statistician

- Verifying the accuracy of county sale information for statistical publications
- Auditing the county abstracts to set the basis for levying the property taxes and inclusion in statistical publications
- Providing general property tax information to taxpayers and county staff

August 1996-February 2000 Mid-Central Federal Savings Bank Wadena, MN

Consumer Loan Officer

- Concentration in general loan application analysis, administration and approval
- Exposure to Commercial and Agricultural lending standards
- Experience in In-House and Secondary Market Mortgage lending

ADDITIONAL EDUCATION

- Certified Appraiser Assessor – SD Department of Revenue since 2001
- Tegarden Public Utilities Basic Appraisal Course - 2007, IAAO 101, IAAO 102, IAAO 201
- Wichita State Appraisal for Ad Valorem Taxation of Public Utilities Conference 2006-2014

References Available upon request

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BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Robert E. McFadden, P.E.
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015

Q: Please state your name and business address.

A: Robert Earle McFadden
5729 B Logan Lane, Houston, Texas 77007

Q: Describe your educational background.

A: I hold a Bachelor of Science in Civil Engineering from Louisiana Tech University

Q: By whom are you now employed?

A: I am employed by REM Pipeline Consultants, LLC.
I am President and majority owner of REM Pipeline Consultants, a pipeline engineering consulting firm which offers consulting services to midstream and oil and gas companies, investors, legal firms and governmental agencies on a wide variety of pipeline, pipeline facility and gas processing design and operational issues.

Q: What work experience have you had that is relevant to your involvement on this project?

A: I have over 40 years of experience in the pipeline industry in positions ranging from pipeline survey to engineering design, project management and supervision of transmission pipelines, gathering pipelines, pump stations, compressor stations, measurement, dehydration and treating facilities and virtually all aspects of pipelines, both onshore and offshore as well as domestic and foreign installations. As such, I am very familiar with the requirements of title 49 CFR Part 195 - Transportation of Hazardous Liquids by Pipeline and Part 194 – Response Plans for Onshore Oil Pipelines, which form the basis of the safe design and operation of Hazardous Liquids Pipelines in the US.

Q: What Professional Credentials do you hold?

A: I am a Licensed Professional Engineer in the State of Texas - License Number 99488

Q: What is the purpose of your testimony?

A: My testimony is to state my opinions developed from my review of relevant portions of the application filed by Dakota Access, LLC with the South Dakota Public Utilities Commission related to the proposed Dakota Access Pipeline Project Energy Transmission Facility: SDCL 49-41B, together with related Docket filings. I was requested to develop opinions as to whether or not the proposed facilities will meet the design, construction, testing, operation and other requirements of Federal Pipeline Safety Regulations (49 CFR 195 – all subparts) and other applicable federal and state regulations. The testimony includes

specific discussion of areas of required notification and approvals from the Pipeline and Hazardous Materials Safety Administration (PHMSA). Specific areas of concern will be addressed in the testimony that follows.

Q: What methodology did you employ?

A: Methodology used in developing my testimony includes a review of the permit application, Dakota Access Pipeline Project Energy Transmission Facility: SDCL 49-41B, Exhibits, responses to Interrogatories, and other documents included in Dakota Access, LLC Docket No HP 14-002. In addition I reviewed applicable areas of 49 CFR Part 195-Transportation of Hazardous Liquids by Pipeline, 49 CFR Part 194-Response Plans for Onshore Oil Pipelines, Part 190 – Pipeline Safety Programs and Rulemaking Procedures, Part 199 – Drug and Alcohol Testing, the National Pipeline Mapping System and PHMSA regulations.

Q: On whose behalf was this testimony prepared?

A: This testimony was prepared on behalf of the Staff of the South Dakota Public Utilities Commission.

Q: Is an oil pipeline such as the proposed Dakota Access Pipeline considered a Hazardous Liquids Pipeline?

A: Yes, the proposed Dakota Access Pipeline is considered to be a Hazardous Liquids pipeline and thus is subject to 49 CFR Part 195-Transportation of Hazardous Liquids by Pipeline

Q: What is the PHMSA permitting approval process for an oil pipeline in interstate commerce?

A: PHMSA is the agency that enforces the Pipeline Safety Regulations for the US Department of Transportation as defined in the Title 49 Subchapter D – Pipeline Safety, Parts 190 thru 199.Procedures used by PHMSA in carrying out its duties regarding pipeline safety laws are prescribed in Part 190 – Pipeline Safety Programs and Rulemaking Procedures.
Except for Part 194 – Response Plans for Onshore Oil Pipelines, PHMSA regulations do not require an operator to notify, apply for a permit or get approval from PHMSA for the construction or operation of a hazardous liquids pipeline. PHMSA receives copies of all Federal Energy Regulatory Commission (FERC) pipeline applications. FERC regulates the Interstate Transmission of Natural Gas, Electricity and Oil. PHMSA participates in FERC scoping meetings at their discretion and at the request of FERC. As such PHMSA monitors the design, construction and operations of interstate oil pipelines.

Q: What documents must be produced by the Applicant?

A: There are a number of plans and documents that are required to be developed by the pipeline operator by PHMSA regulations.
Specific plans and programs required under Part 195 – Transportation of Hazardous Liquids by Pipeline (Part 195) are as follows:

- Operating and Maintenance Procedures Manual which must contain emergency procedures
- Integrity Management Program
- Damage Prevention Program
- Continuing Public Education Program (also referred to as a Public Awareness Plan)
- Operator Qualification Program

Other PHMSA jurisdictional regulations also require written programs as indicated below:

- Part 194 – Response Plans for Onshore Oil Pipelines (Part 194) this plan will detail the requirements for the operators Oil Spill Response Plan.
- Part 199 – Drug and Alcohol Testing (Part 199) This section covers drug and alcohol testing of certain pipeline employees to be performed in accordance with:
  - Anti-drug plan
  - Alcohol Misuse Plan
- National Pipeline Mapping System- Section 15 of the Pipeline Safety Improvement Act of 2002 requires pipeline operators to submit geospatial and other data to the National Pipeline Mapping System (NPMS).

Q: **What documents produced by the Operator must be approved by PHMSA?**

A: As previously stated, plans, programs and specific documents are not approved by PHMSA. However, the PHMSA inspection process reviews the documents for adequacy during compliance audits. They note deficiencies and require the Operator to address such deficiencies.
Of the plans, programs and documents listed above, only the Oil Spill Response Plan requires specific approval from PHMSA.

Q: What are the federal requirements for the Oil Spill Response Plan approval?

A: PHMSA requires that two copies of the Oil Spill Response Plan be submitted to the Office of Pipeline Safety (OPS). PHMSA will review and approve the plan if it meets all of the requirements of Part 194 – Response Plans for Onshore Oil Pipelines. If PHMSA determines that the plan does not meet all of the requirements, PHMSA will notify the operator of any alleged deficiencies and will allow the operator to respond, including the opportunity for an informal conference on any proposed plan revisions and the opportunity to correct deficiencies. There is also an appeals process that the operator may initiate in the event that the operator does not agree with PHMSA's interpretation.

Part 194 requires that an operator of a pipeline for which a response plan is required, may not handle, store, or transport oil in that pipeline unless the operator has submitted a response plan meeting the requirements. Once the response plan is submitted to OPS, the operator may continue to operate the pipeline for up to two (2) years, pending approval or disapproval of the plan, provided that the operator has submitted a certification to OPS that the operator has obtained, through contract or other approved means, the necessary personnel and equipment to respond to the maximum extent practicable, to a worst case discharge or a substantial threat of such discharge. The certificate must be signed by the qualified individual or an appropriate corporate officer.

Q: Where is the Dakota Access Pipeline in this process?

A: The Operator states in interrogatories that they are in the process of developing the Oil Spill Response Plan for the Dakota Access Pipeline. PHMSA regulations require that the plan be submitted before the pipeline and related facilities are operated.

Q: What is PHMSA's inspection role during construction of the pipeline?

A: PHMSA inspections that take place during construction are to ensure that the pipeline is being built in compliance with the requirements of Part 195. PHMSA does not serve as the operator's quality control inspectors.
Based on the construction schedule submitted by the operator in the FERC application, PHMSA will notify the operator in advance of construction commencement of their plan to inspect certain activities and request a current construction schedule. The operator will be notified which phases of construction that PHMSA wishes to inspect and when it plans to do so. In addition to specific construction requirements of Part 195, PHMSA's inspections will verify that activities in the field follow the operator's specific written construction specifications and standards. Field visits will focus on areas where PHMSA has encountered problems with other pipeline construction in the past, such as the proper execution of welding procedures, pipe handling, lowering in and tie-ins.

Q: What is PHMSA's inspection role after construction?

A: After the pipeline has been placed into service, PHMSA's primary inspection role is to ensure that the operator is operating the pipeline in accordance with the operator's pipeline specific procedures, plans and programs, and in compliance with specific regulatory requirements. These include operating, maintenance and corrosion control procedures and integrity management activities. A primary focus will be on verification that tests, inspections, patrols, surveys and other routine actions are being performed within the stipulated time frames and in accordance with the operator's procedures. Ensuring that the individuals performing such tasks are qualified and subject to a compliant drug and alcohol program in accordance with Part 199 is an integral part of those inspections.

Q: What is PHMSA's role in decommissioning the pipeline?

A: Decommissioning is not a PHMSA regulated activity. However, if a pipeline is abandoned (i.e. permanently removed from service) operating and maintenance regulations must still be followed and are subject to PHMSA inspection. This usually occurs as a part of a regular compliance audit. PHMSA does require that the operator file a report of the abandonment with the NPMS.

Q: Are there parts of the operator's application that PHMSA does not review?

A: PHMSA does not review parts of the application that are not directly related to the design, construction and maintenance of the pipeline. These include such parts of the applications routing, necessity of the facilities and environmental impacts of construction.

Q: Does PHMSA have authority to grant special permits that waive compliance with one or more of the Federal pipeline safety regulations under Part 195?

A: Yes, PHMSA can grant waivers of compliance with certain regulations under Part 195, such as the maximum hoop stress percentage of Specified Minimum Yield Strength (SMYS) that a pipeline can be operated at in Class 1 areas being increased from 0.72% SMYS to 0.80% SMYS. Such Special Permits generally include additional requirements for testing and other restrictions and conditions.

Q: Has the Dakota Access Pipeline requested a special permit as described above?

A: No, Dakota Access Pipeline has not requested a Special Permit.

Q: Is the Dakota Access Pipeline following all PHMSA procedural requirements?

A: It appears that thus far, the Dakota Access Pipeline is following all PHMSA procedural requirements.

Q: What are HCA'S?

A: HCA's are High Consequence Areas. These are defined as

1. A commercially navigable waterway.
2. A high population area, which means an urbanized area delineated by the Census Bureau as having a population of 50,000 or more people or a population density of 1000 people per square mile.
3. Other populated area with a concentrated population such as an unincorporated town or designated commercial area.
4. An unusually sensitive area (USA), defined as a drinking water or ecological resource area that is unusually sensitive to environmental

damage from a hazardous liquids pipeline such as a community water intake, a source water protection area for aquifers, a wellhead protection area, an ecological resource, a migratory bird concentration area, an area containing endangered or imperiled species, as defined in Part 195 section 195.6.

Q: Does the Dakota Access Pipeline pass through any HCA's in South Dakota

A: According to Dakota Access Pipeline, the pipeline route does not pass through any HCA's in South Dakota. A preliminary review of the alignment maps furnished with the permit application does not indicate that the pipeline route passes through any HCA's.
Dakota Access Pipeline also states in their interrogatories that there are no USA's within the pipeline route. Additional study needs to be done to confirm this. I reserve the right to amend my testimony should additional information confirm that the pipeline route does pass through any USA's.

Q: Are main line block valves planned to be installed at the proper locations?

A: Part 195 requires that block valves be installed at each of the following locations:

1. On the suction end and discharge end of a pump station in a manner that permits isolation of the pump station equipment in the event of an emergency.
2. On each line entering or leaving a breakout storage tank area in a manner that permits isolation of the tank from other facilities.
3. On a mainline at locations along the pipeline system that will minimize damage or pollution from accidental hazardous liquid discharge, as appropriate for the terrain in open country, or for populated areas.
4. On each lateral takeoff from a trunk line.
5. On each side of a water crossing that is more than 100 feet wide from high-water mark to high-water mark unless the Administrator finds in a particular case that the valves are not justified.
6. On each side of a reservoir holding water for human consumption.

Dakota Access Pipeline maps provided with the original permit submission indicates that valves are planned for the locations as prescribed above. There are a total of 31 main line block valves which are in addition to valves at the single pump station and at the launcher/receiver locations. Main line block valves appear to be properly spaced. Additional information is needed on the width of several of the streams to confirm that additional main line block valves are not required at these locations. I reserve the right to amend my testimony if subsequent information is obtained that indicates that additional valves are required.

Q: Does Part 195 require that the pipeline be protected from external and internal corrosion?

A: Yes, it does. The pipeline is designed with an external corrosion coating of fusion bonded epoxy, 14-16 mils in thickness, which is an accepted industry standard for external corrosion protection on a pipeline. In addition, an impressed current will be designed to protect the pipeline. Internal corrosion will be controlled by limiting the water and sediment content of oil shipped through the pipeline. The applicant has stated that the design of the cathodic protection system will comply with Part 195 Subpart H and the National Association of Corrosion Engineers Recommended Practice 0169

Q: What provisions will be made for detecting leaks on the pipeline?

A: In addition to planned continuous monitoring of flows and pressures by Supervisory Control and Data Acquisition (SCADA) system to be installed with the pipeline, the applicant has committed to installation of a "state of the art" Computational Pipeline Monitoring software system, which will continuously monitor the pipeline for leaks.

Q. Does this conclude your testimony?

A: Yes.

Robert E. McFadden, P.E.

Experience Summary:

Forty years of international and domestic experience in management of a broad range of pipeline, oil and gas, fiber optic and associated facilities projects. Served as President of Universal Ensco, Inc. from October, 1999 to December of 2005, prior to that time worked for eighteen years in various positions from Project Manager to Vice President/Business Unit Director. Responsibilities have included all phases of project execution including conceptual layout, cost estimating, engineering design, direction of surveys, permitting, right-of-way acquisition, drafting, material specification and procurement, contract preparation, solicitation and evaluation of bids, contract negotiations, construction supervision, litigation management and expert testimony. Served as Vice President of Houston Operations for Energy Management and Services Co. from March of 2006 through August of 2007. Formed REM Pipeline Consultants, LLC in September, 2007.

Career highlights include:

- **President** of REM Pipeline Consultants, LLC providing strategic, management, conceptual design, economic evaluation, engineering, drafting, material procurement, logistics and support services for pipelines and related facilities for domestic and international projects.

- **President** and Chief Operating Officer of a major pipeline engineering firm. Managed fifteen Business Units with as many as 800 employees encompassing all phases of project management, engineering, survey, drafting, design, quality assurance, safety, construction management, inspection services and GPS equipment rental for pipelines, compressor stations, pump stations, tank farms, underground storage fields, production facilities, gathering systems, metering, SCADA and related facilities. Developed and implemented successful strategies to facilitate growth and maintain continuous profitability through volatile market conditions.

- **Provided** overall technical supervision for the design, material acquisition and construction management and logistics for the repair of an existing pipeline installation of three compressors and an Amine gas treating plant in Afghanistan for the Task Force for Business Stability Operations of the US Department of Defense. Provided training, planning, material procurement and logistics for an 89 km 12.75" OD new pipeline to ensure long term supply for existing needs and growth. Project included training local Afghan personnel to do the construction work themselves including specialized welding training and training in the operation of compressors, dehydration and gas treating equipment

- **Directed** project oversight for engineering of the Turkish portion of the Baku Ceyhan crude oil pipeline project.

- **Directed** and managed the process of obtaining ISO 9001 certification for all of company's work product processes.

- **Provided** expert witness services and testimony for pipeline related suits, arbitrations, and mediations.

- **Presented** a paper to an Underground Gas Storage Symposium held at the Dagang Oil Field in China in conjunction with provision of Design Supervision of the 4000 Km West to East Pipeline.

- **Project Director** for development of a major pipeline project to carry natural gas from Egypt to markets in Jordan. Project included a crossing of the Gulf of Aqaba in 3,000 feet of water.

- **Project Director** for numerous offshore pipelines, risers, subsea taps and subsea tie-ins including complete project management, design, MMS permitting, procurement, contractor selection and construction management in depths ranging from 10 fsw to 300 fsw.

- **Project Director** for alliance contracts with several major international energy companies. Projects performed include numerous crude oil, products and natural gas pipelines, pump stations, compressor stations and other facilities as well as planning and project implementation assistance for domestic and foreign pipeline system projects.

- **Traveled** over to twenty foreign countries on five continents to develop business, negotiate contracts and review ongoing operations.

- **Project Director** for CNG Transmission Corporation 8000 HP electric drive grass roots compressor station design, 49,000 HP Enron Bammel Station, and 12,000 HP Enron Gallup Station designs.

- **Project Director** for a pipeline engineering operation in Thailand, which furnished services to the Petroleum Authority of Thailand, including design and construction management of pipeline, metering, treating and fiber optic projects.

Education:

Bachelor of Science, Civil Engineering, Louisiana Tech University, 1974

Registration and Professional and Civic Organizations:

Professional Engineer Texas Registration No. 99488

Member US Department of Commerce District Export Council

Member American Society of Civil Engineers

Past Chairman - Board of Directors YMCA of Greater Houston

Past Chairman Board of Advisors Nick Finnegan Counseling Center

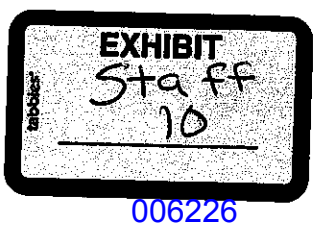
Houston Pipeliner's Club

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Dr. Michael Shelly
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: Please state your name and business address.

A: Michael Shelly, ERM, 1159 Pittsford-Victor Road, Suite 200, Pittsford, New York, 14534

Q: Describe your educational background.

A: I received a Bachelor of Science Degree in Economics with Geography from Queen Mary, University of London, England in 1981. I received a Master of Arts Degree in Economics from the University of Warwick, England in 1983. I received a Ph.D. in Economics from the University of Edinburgh, Scotland in 1988.

Q: By whom are you now employed?

A: Since May 2015 I have worked as a Senior Project Manager at ERM, attached to their office in Rochester, New York

Q: What work experience have you had that is relevant to your involvement on this project?

A: From 1990 to 1992 I was an Economic Analyst and dealt with energy issues at National Economic Research Associates in London, England. From 1992 to 2014 I was an environmental economist at Ecology and Environment, Inc., in Lancaster, New York.

Q: What work experience have you had that is relevant to your role on this project?

A: I have worked as an environmental economist for over 22 years and have worked on economic matters relating to the energy industry for 24 years. I have conducted economic impact studies using input-output models and am familiar with the IMPLAN modeling system.

Q: What methodology did you employ?

A: I reviewed Dakota Access, LLC's revised application to the South Dakota Public Utilities Commission, Dakota Access's responses to data requests from Public Utilities Commission staff, and the study prepared by the Strategic Economics Group of West Des Moines, Iowa entitled "An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois" dated November 12, 2014. I also reviewed the permit application to the South Dakota Public Utilities Commission for the Keystone XL Pipeline, entitled "Application to the South Dakota Public Utilities Commission for a Permit for the Keystone XL Pipeline Under the Energy Conversion and

Transmission Facility Act", dated March 2009, and the report entitled "Assessment of Socioeconomic Impacts Expected with the Keystone XL Pipeline Project" prepared by Dr. Michael K. Madden and dated October 2009. I also drew upon my professional experience in preparing socioeconomic sections of Environmental Impact Statements.

Q: Did you review sections 23.1 and 23.2 of the Revised Application and the Strategic Economics Group report titled "An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa, and Illinois" that address the expected socioeconomic impacts the project may have in South Dakota?

A: Yes.

Q: In your opinion, does the socioeconomic impact analysis completed by Dakota Access align with similar analysis done on other projects?

A: The level of detail provided in Dakota Access, LLC's application to the South Dakota Public Utilities Commission is similar to that provided in Keystone XL Pipeline's application. However, Dakota Access, LLC's application provides information on the results of economic impact modeling using the IMPLAN modeling system, whereas the Keystone XL Pipeline application did not.

Both applications contain less information on existing socioeconomic conditions (e.g., existing demographics, employment, etc.) than is typically found in the socioeconomic sections of Environmental Impact Statements prepared for Federal agencies. This means, for instance, that it is not possible, using the information provided in the Dakota Access LLC application, to determine if pipeline construction activities would take place in areas where there might be insufficient temporary housing to accommodate the construction crews or where the need to accommodate the construction crews might negatively impact other users of such housing, such as tourists.

The economic impact modeling summarized in the application and contained in "An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois" dated November 12, 2014 and prepared by the Strategic Economics Group is comparable to that undertaken for Environmental Impact Statements prepared for Federal agencies.

Q: In your opinion, do you believe the socioeconomic impact analysis completed by Dakota Access is complete and accurate? If so, please explain.

A: The socioeconomic analysis in the Dakota Access, LLC's application covers the types of impacts considered in Environmental Impact Statements and is complete in that sense. However, as I stated in my previous answer, the amount

of detail provided in the application is less than is typically found in the socioeconomic sections of Environmental Impact Statements prepared for Federal agencies.

With regard to qualitative accuracy, in his report entitled "Assessment of Socioeconomic Impacts Expected with the Keystone XL Pipeline Project", Dr. Michael K. Madden examined the socioeconomic impacts arising from an oil pipeline permitted in South Dakota in 2009. The types and nature (i.e., positive or negative) of the actual impacts of this pipeline were expected to be similar to those anticipated for the Dakota Access LLC pipeline.

With regard to quantitative accuracy, since the application presents anticipated impacts it will not be possible until after the pipeline is constructed to determine whether the scale of the anticipated impacts accords with actual outcomes.

Q: Do you generally agree that the socioeconomic analysis completed by Dakota Access is reflective of the impacts to occur as a result of the project?

A: I generally agree that the socioeconomic analysis completed by Dakota Access, LLC covers the types of socioeconomic impacts likely to occur as a result of the project

Q: In your opinion, are there any flaws in the socioeconomic analysis? If so, please explain each flaw in detail.

A: There are no apparent major flaws in the socioeconomic analysis. However, with regard to the economic impact analysis, there is an inconsistency between the information provided in the application and the results presented in "An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois" prepared by the Strategic Economics Group with regard to the number of permanent employees during the pipeline's operational phase. In the application the number of permanent employees is given as 12, generating $2 million in (annual) labor income (p.39); whereas in "An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois" it is stated that "Once the pipeline has been built, the yearly operations and maintenance spending will add 31 permanent jobs, $1.9 Million in labor income..." (p. 5).

For the sake of consistency, either the economic impact modeling for the operational period should be revised to reflect the lower number of permanent employees reported in the application and the labor income estimate recalculated; or the number of permanent employees stated in the application should be altered to match the number given in "An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois".

Q: Did you perform an independent analysis on the expected socioeconomic impacts on South Dakota as a result of the Dakota Access Pipeline? If so, please explain the analysis you completed and any differences between your results and the results of Dakota Access's analysis. If not, please explain why you believe Dakota Access's analysis is complete and accurate.

A: No, I did not. With regard to the economic impact analysis, I did not see any major flaws in the application of the IMPLAN modeling system and, consequently, I do not believe it necessary to undertake an alternative analysis on that basis.

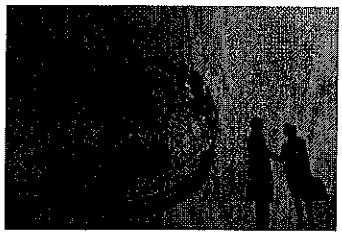
Q: In your opinion, do you believe that the Dakota Access pipeline will not pose a threat of serious injury to the social and economic condition of inhabitants or expected inhabitants in the siting area? Please explain.

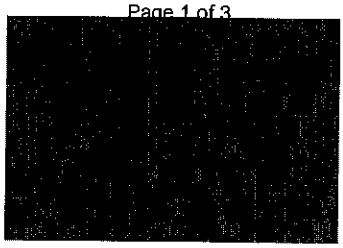
A: In my opinion, the Dakota Access pipeline will not pose a threat of serious injury to the social and economic condition of inhabitants or expected inhabitants in the siting area. During the construction period, there will be impacts to local communities resulting from the need to house construction workers. However, there will also be positive economic benefits to the local communities resulting from project expenditures in local areas, the employment of local workers and the payment of sales and use tax, gross receipts tax and tourism tax. During the operational period, there will be minor impacts to local communities due to the need to accommodate operational employees and their families. However, there will also be minor additional expenditures and tax contributions from the operation and maintenance of the pipelines and from the additional households. During the operational period, the project will generate substantial annual property tax payments (estimated in the work I reviewed at between $12 and $14 million per year). None of these impacts represents a threat of serious injury to the social and economic condition of inhabitants or expected inhabitants in the siting area.

Q: Does this conclude your testimony?

A: Yes.

Michael Shelly, PhD





Dr. Shelly is a Senior Project Officer within ERM based in Rochester, NY. He has 27 years of experience in the field of Economics.

He is a professional economist experienced in managing and completing complex environmental and environmental/health projects on five continents. He has specific experience on environmental, health, infrastructure and energy projects. He has been the project manager of multidisciplinary teams with strong analytical and quantitative skills. He has worked in a large multinational company, a specialist economics consulting company and environmental consulting.

Fields of Competence

- Economic analysis of projects
- Natural resource damage assessment
- Cost-benefit analysis
- Economic impact studies
- Environmental management plans
- Statistical and data analysis
- Hydrofracking
- Valuation of health impacts
- Climate change
- Report writing
- Proposals and SOQS

Key Industry Sectors

- Energy

Education

- Doctor of Philosophy (PhD), Economics, University of Edinburgh, Scotland, 1988
- Master of Arts (MA), Economics, University of Warwick, England, 1982
- B.Sc.(Econ), Economics, Queen Mary, University of London, England, 1981

Languages

- English, native speaker

Honors & Awards

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Key Projects

Marine Coal Spill Natural Resource Damages Claim, Colombia, Confidential Client. Author of a literature survey on the biological and chemical impacts of marine coal spills in defense of a mining company being sued by the government of Colombia for environmental damages.

Economic Impact Studies, United States, US Navy and Confidential Energy Client. Estimated the direct, indirect and induced changes in employment, earnings and economic output due to changes in personnel and aircraft numbers at military bases and for a proposed electricity transmission line linking wind energy sites to the transmission grid.

Financial Analysis of Water Supply Alternatives, State of Louisiana, State of Louisiana. Evaluated the financial viability and relative cost of alternative projects to reduce extraction from the state's five groundwater aquifers.

Naturally Occuring Asbestos Contamination, Washington State, US Environmental Protection Agency. Author of a statistical evaluation of house price impacts from naturally occurring asbestos contamination along rivers in Washington State.

Socioeconomic Impacts of Hydrofracking, New York State, Department of Environmental Conservation. Co-author of the section of New York State's Environmental Impact Statement for the hydraulic fracturing of natural gas wells ("fracking") that contained estimates of the potential income, jobs and local tax revenues arising from hydrofracking.

Health Impacts of Fertilizer Production, Morocco, Confidential Client. Author of a report on the health impacts of particulate emissions from phosphate mining and fertilizer manufacturing.

Estimation of Carbon Revenues for Electric Power Plants, New York State and Commonwealth of Pennsylvania, Confidential Clients. Estimated the revenues from potential carbon dioxide cap and trade programs for proposed coal-fired plants with carbon capture and sequestration in Jamestown and Lackawanna in New York State and a plant in Pennsylvania.

Kuwaiti Environmental Damage Claims, Kuwait and United States, State of Kuwait. Lead preparer of loss valuation reports for Kuwait's $3 billion in successful claims for environmental damage caused by Iraq during the 1990-91 Gulf War. Project manager of a large multidisciplinary, international team that prepared Kuwait's successful $109 million Gulf War environmental monitoring and assessment claims. Managed the writing of, and edited, nine programmatic management plans intended to guide field contractors as they implemented Kuwait's remediation/restoration projects funded by their Gulf War claims, and wrote the sections and reports dealing with environmental and social assessment procedures, reporting procedures, and organizational arrangements.

Natural Resource Damage Assessment and Restoration and Guidance Review, United States, Bureau of Land Management. Reviewer for the Bureau of Land Management's Natural Resource Damage Assessment and Restoration Guidance Manual.

Saudi Arabian Health Claims, Kuwait and United States, Kingdom of Saudi Arabia. Leader of the team that developed the Kingdom of Saudi Arabia's $18 billion claim for health damages resulting from the Gulf War. Appeared before the UNCC tribunal in Geneva in defense of the claim.

Smoking Health Care Costs, United States, Confidential Client. Author of a report on the impacts of smoking on health care costs related to states' multi-billion dollar toxic tort case against the tobacco companies. Used SAS to handle the data, probit analysis to model individual's decision to seek medical care, the negative binomial model to model the number of such events and used multiple regression to model medical costs.

Financial and Economic Analysis, China, World Bank and Asian Development Bank. Completed the financial and/or economic analysis of major infrastructure projects (totaling hundreds of millions of dollars) funded by the World Bank and the Asian Development Bank in China. The projects included natural gas production and distribution facilities, district heating plants, wastewater

treatment facilities, water supply projects, a cement plant, and hazardous waste treatment facilities.

Lake Clean Up Plans, China, Asian Developmen Bank and Asian Development Bank. Author of the section of the Tai Lake (near Shanghai) water quality improvement plan that suggested repayment sources for the China Development Bank proposed $2 billion loan. Prepared the implementation costs, benefit estimates and timetables, and nominated the responsible implementing agencies, for the Chao Lake (China) water quality improvement plan financed by the Asian Development Bank.

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE REVISED APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of David Nickel
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015

Q: Please state your name and business address.

A: David L. Nickel, Natural Resource Group, LLC (NRG) 1000 IDS Center, 80 S. 8th St., Minneapolis, MN 55402

Q: Describe your educational background.

A: I received my Bachelor of Liberal Arts Degree in 2002 from the University of Minnesota Duluth with a major in Environmental Studies.

Q: By whom are you now employed?

A: Natural Resource Group, an ERM Company from 2008 to 2010, and from 2013 to present as a Consultant and Health and Safety Representative.

Q: What work experience have you had that is relevant to your involvement on this project?

A: Over 10 years' of experience in either consulting to or working in environmental, health, and safety for the energy and general manufacturing industry. My current responsibilities have been to provide clients with environmental permitting services, including the preparation of the Reliability and Safety sections of Environmental Assessments and Environmental Impact Statements (EISs) under the National Environmental Policy Act and/or relevant state programs. I also represent the company as the company's Health and Safety Representative, which includes providing guidance to company employees on safe work and travel planning and practices.

Q: What Professional Credentials do you hold?

A: None.

Q: What is the purpose of your testimony?

A: I was asked to review portions of the Dakota Access Pipeline Project (Project) application and related interrogatories that was submitted to The South Dakota Public Utilities Commission (PUC) regarding the Project's risk assessment and pipeline safety.

Q: What methodology did you employ?

A: I completed a technical review of the Dakota Access Pipeline Project application and related interrogatories that were submitted to the South Dakota PUC by Dakota Access, LLC (Dakota Access). My primary focus was on the Project's risk assessment, high consequence areas, and unusually sensitive areas and the

associated management practices that will be implemented to safely operate Dakota Access' proposed pipeline.

Q: Based on your review of the Revised Application and any related interrogatories, do you agree with Dakota Access's conclusion that the project does not cross any high consequence areas (HCAs)? If not, please explain why you disagree.

A: Based on NRG's review of Dakota Access' Revised Application and related interrogatories, we agree that the Project will not cross any HCAs in South Dakota, except to the extent that the Project may cross several unusually sensitive areas (USAs, see testimony question and response below) given that a USA is included in the definition of HCA in 49 CFR 195.450. Dakota Access has stated they have modified the proposed pipeline route to specifically avoid HCAs as a result of their review of aerial imagery, physical site visits, and aerial reconnaissance of the proposed route.

Q: Based on your review of the Revised Application and any related interrogatories, do you believe the project will cross any unusually sensitive areas (USAs)? If so, please explain.

A: Based on NRG's review of Dakota Access' Revised Application and related interrogatories, we believe that the Project may cross USAs in South Dakota. A determination of whether an area is in fact "unusually sensitive" as defined by 49 CFR 195.6 is ultimately to be made by the governmental body with regulatory authority over the drinking water or ecological resource that is being crossed.

Dakota Access stated that they have consulted with the South Dakota Department of Environment and Natural Resources (SDDENR) during the Project's fatal flaws analysis and identified Zone A Wellhead Protection and Source Water areas within Minnehaha County. These areas define the boundaries and protection areas in which the land area contributes water to a well as a source of drinking water and could be identified as an USA drinking water source.

The Project crosses seven rural water systems within South Dakota including WEB, Mid Dakota, Kingbrook, Minnehaha, Lincoln, South Lincoln, and the Lewis and Clark system which overlaps the majority of these water districts that are located on the eastern border of South Dakota. These rural water systems could be identified as USAs.

Identified ecological USAs include eight waterbodies that will be crossed by the Project that have Topeka shiner occurrences, including the James River, Shue Creek, Pearl Creek, Middle Pearl Creek, Redstone Creek, Rock Creek, East Fork Vermillion River, and Big Sioux River. An additional waterbody, the West Fork Vermillion River, was also identified for occurrence; however, the Project crosses

at its headwaters where it is an emergent wetland with no perennial flowing water and therefore is not suitable habitat for the species. Additionally, the James and Big Sioux Rivers have been identified as habitat for the northern river otter.

The Project area is also within the migratory range of the whooping crane; however, this species is highly mobile and would likely avoid construction areas for the vast similar and suitable habitat throughout the area and region. Whooping crane habitat could be identified as an ecological USA.

Q: If you identified the project will cross any HCAs or USAs, do you believe Dakota Access has the proper mitigation measures in place? Please explain.

A: Based on NRG's review of Dakota Access' Revised Application, we believe that Dakota Access has or is working towards identifying the appropriate mitigation measures for the identified USAs. As previously noted, the Project will not cross any known HCAs in South Dakota as a result of Dakota Access modifying the proposed pipeline route to specifically avoid known HCAs.

For the identified Zone A Wellhead Protection and Source Water areas within Minnehaha County, Dakota Access, through the reroute process, has confirmed that the Project will avoid crossing this protected area. The closest point that the proposed pipeline route will be to the Minnehaha County Wellhead Protection Area is 0.43 mile. Dakota Access will continue to run spill models to ensure appropriate mitigation measures are in place to protect the Minnehaha County Wellhead Protection Area.

Dakota Access has stated that they are working with the rural water systems regarding the appropriate methods and measures for crossing their respective lines. Potential avoidance measures could include lowering waterlines and installing protective casings within the pipeline easement and maintaining a defined separation distance below the pipeline at crossing locations, as required.

Based on current survey data, Dakota Access has identified a potential to effect two listed aquatic species, the Topeka shiner and northern river otter. The James and Big Sioux Rivers will be crossed via HDD; therefore, impacts to Topeka shiner and the northern river otter within both of these rivers will be avoided. Dakota Access has stated that they will continue to coordinate with the USFWS regarding potential impacts to Topeka shiner within the other six suitable waterbodies (i.e., Shue Creek, Pearl Creek, Middle Pearl Creek, Redstone Creek, Rock Creek, and the East Fork Vermillion River) that will not be crossed via HDD and identify suitable construction and/or mitigation measures. NRG has recommended additional avoidance and mitigation measures in our testimony regarding threatened and endangered species.

Q: Based on NRG's review of Dakota Access's Revised Application, do you conclude that the pipeline will not pose a threat of serious injury to the environment?

A: Based on NRG's review of Dakota Access' Revised Application, we agree that the Project is not likely to pose a threat of serious injury to the environment.

Dakota Access has stated that over the operational life of the proposed pipeline there is a low likelihood of a crude oil release from the pipeline that could enter a surface water or drinking water supplies. The reasoning behind this justification is described below as part of the best management practices and controls that Dakota Access will implement as required by the proposed Project. These measures will minimize any potential adverse effects to the environment and public.

Dakota Access has committed to drafting and implementing a Facility Response Plan (FRP) and Oil Spill Response Plan (OSRP) consistent with industry practice and in compliance with applicable regulations, including 49 CFR Parts 194 and 195. If correctly implemented, these plans will establish the emergency response procedures and mitigation measures that Dakota Access will implement in the event of a release.

Dakota Access will also implement measures to prevent third-party excavation damage and corrosion issues. Examples of these measures include: pipeline constructed of high strength steel with a fusion bonded epoxy, impressed current cathodic protection systems, leak detection systems, signage, public awareness and damage prevention programs, participation in the South Dakota One Call Program, and routine aerial surveillance patrols. Lastly, Dakota Access will install isolation valves that will be remotely controlled from the Central Control Room to minimize and stop the flow of potential releases.

Q: Based on NRG's review of Dakota Access's Revised Application, do you conclude that the facility will not substantially impair the health, safety or welfare of the inhabitants?

A: Based on NRG's review of Dakota Access' Revised Application, we have concluded that the proposed Project is not likely to substantially impair the health, safety or welfare of the inhabitants of South Dakota.

See the response to the above question regarding the pipeline posing a threat or serious injury to the environment. Dakota Access has stated that the pipeline is being designed, routed, and will be constructed and operated in a manner to meet or exceed all state and Federal requirements which will minimize and avoid any substantial impairments to the health, safety, or welfare of the inhabitants adjacent to the proposed pipeline.

Q: Does this conclude your testimony?

A: Yes.

Dave Nickel

Email: david.nickel@NRG-LLC.com

an ERM Group company

Dave is a Consultant in Natural Resource Group, LLC's (NRG) Minneapolis office. He has been working in the industry since 2002 and specializes in Health, Safety, and Environmental (HSE) Compliance and is a project manager for NRG's Operational Compliance services. Dave is also a member of NRG's Corporate HSE Compliance Team serving as an Environmental, Health, and Safety Representative. As a part of the Corporate HSE Compliance Team, Dave has contributed to writing NRG's Corporate HSE Program. His previous experience have been both facility and pipeline based. Dave's most recent experience was with Northern Natural Gas Company serving as a Division Environmental Specialist, which provided him with natural gas pipeline operations experience.

Selected Project Experience

- Plains LPG Services, L.P., 2013 to 2014, environmental compliance services: Project team member responsible for drafting Compliance Matrices detailing compliance requirements for the U.S. Environmental Protection Agency (EPA), state, and local regulatory programs for multiple propane terminals; hazardous waste reporting and guidance; drafted/revised National Pollution Discharge Elimination System (NDPES) Stormwater Pollution Prevention Plans; and drafted/revised Spill Prevention, Control, and Countermeasure Plans (SPCC Plans).
- Plains All American Pipeline, L.P., 2013 to 2014, environmental compliance services for facilities located in Louisiana and Mississippi: Project team member responsible for drafting SPCC Plans; Indiana Department of Natural Resources underground storage cavern permitting and registration; and provided regulatory guidance for facility compliance.
- Petrogas Terminals, LLC, 2013 to 2014, environmental and safety compliance services for facilities located in Indiana and Washington: Project team member responsible for drafting a U.S. Department of Transportation (DOT) Site Security Plan and completing the associated Risk Assessment; and providing SPCC regulatory guidance for facility compliance.
- Big River Resources Boyceville, LLC, 2013 to 2014, environmental compliance services: Project team member responsible for requirements for EPA, state, and local regulatory programs for the facility; NPDES annual reporting and sampling; water well permitting; NDPES Stormwater Pollution Prevention Plan; and drafted/revised SPCC Plan.
- ONEOK, 2013 to 2014, Arsenal Road Federal Energy Regulatory Commission (FERC) Prior Notice project: Project team member responsible for assisting with drafting and preparing resource reports; Illinois NPDES construction storm water permitting; and prepared construction guidance documents for managing waste disposal, soil sampling, and restoration.
- BP Remediation, 2014, asbestos remediation and integrity management project for a BP terminal in Wood River, Illinois: Project team member responsible for drafting Health, Safety, Security, and Environmental programs to meet specific client requirements; drafting an Operations and Maintenance program for integrity management for facility assets; and interviewing subcontractors to ensure the subcontractors met the client safety requirements and metrics.
- Lake Charles LNG, 2014, FERC third-party Environmental Impact Statement (EIS): Project team member responsible for assisting with drafting the Reliability and Safety section for liquefied natural gas and pipeline operations for the EIS.

- Northern Natural Gas Company, 2010 to 2013, operational compliance and project management for pipeline and field operations in Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin: Division Environmental Specialist responsible for environmental compliance of Northern Natural Gas Company's north region field operations, pipeline system, pipeline facilities, and compressor stations; air permitting and reporting; spill reporting; post incident investigations; drafting and revising SPCC Plans; project construction permitting; hazardous and non-hazardous waste management; facility auditing; NPDES permitting and reporting for wastewater discharges; and providing training for permits/plans for field operations personnel.
- Northern Natural Gas Company, 2008 to 2010 and 2013 to 2014, operation and maintenance permitting for various gas pipeline maintenance projects in Iowa, Nebraska, and Wisconsin: Project Manager responsible for obtaining NPDES/construction stormwater permits; managing U.S. Army Corps of Engineer permits; U.S. Fish and Wildlife Service's threatened and endangered species consultations; and managing other site-specific agency consultations.
- BP Dome Petroleum Corp., 2008 to 2010, environmental compliance services: Project team member responsible for drafting Compliance Matrices detailing compliance requirements with DOT, U.S. Department of Homeland Security, EPA, state, and local regulatory programs for multiple propane terminals; drafting Spill Matrices detailing spill response and notification for response to facility-specific releases; providing aboveground storage tank guidance pertaining to newly implemented state rules for Michigan; drafting and revising NDPES Stormwater Pollution Prevention Plans; and drafting and revising SPCC Plans.
- BP Canada Energy Company, 2010, Environmental Health and Safety (EHS) program gap analysis: Project team member responsible for reviewing client-specific Canadian safety programs, identifying gaps in the programs when cross referenced with Occupational Safety and Health Administration (OSHA) safety regulations, and drafting a final deliverable in the form of a cross reference matrix.
- Mid-America Pipeline Company, LLC, 2009, DOT Compliance Digs located within wetlands and waterbodies in Wisconsin: Project Manager responsible for obtaining Wisconsin Department of Natural Resources Water Quality Certifications; managing Wisconsin Pollutant Discharge Elimination System Pit/Trench Dewatering Permits; and directing an environmental inspector to ensure compliance during maintenance activities.
- Alliance Pipeline L.P., 2009 to 2010, environmental compliance services and SPCC Plan for compressor stations located in North Dakota, Minnesota, Iowa, and Illinois: Task Manager responsible for reviewing and revising SPCC Plans for multiple compressor stations, and completing environmental reporting deadlines for Alliance Pipeline L.P.
- Red Trail Energy, LLC, 2010, environmental compliance services: Project team member responsible for providing EHS training for the facility, conducting a process hazard analysis for the facility's Risk Management Plan and Process Safety Management Program, and managing edits for environmental programs for facility additions.
- DENCO, LLC, 2010, EHS Training for facility start-up operations: Project team member responsible for providing EHS training for facility employees.

- OSAGE Bio-Energy, 2009 to 2010, Appomattox Bio Energy Facility, Virginia: Project team member responsible for drafting an OSHA Safety Program for ethanol facility start-up operations.
- Western Wisconsin Energy, LLC, 2010, environmental compliance services: Project team member responsible for conducting a Risk Management Plan audit, preparing an EPA Voluntary Self-Disclosure of Noncompliance Event, and managing submittal of a Risk Management Plan.
- Pioneer Trail Energy, LLC, 2007, ethanol facility start-up operations: Project team member responsible for drafting an Integrated Contingency Plan, registering the facility for DOT numbers, and SARA facility start-up notifications.
- Buffalo Lake Energy, LLC, 2009, environmental compliance services: Project team member responsible for reviewing and revising a Facility Response Plan based on noted deficiencies stemming from an EPA inspection.
- Pacific Ethanol, LLC, 2008, ethanol facility start-up operations and environmental compliance services: Project team member responsible for revising Integrated Contingency Plans and drafting Safety Programs.
- Panhandle Energy, 2008, compressor station SPCC Plan gap analysis project for several compressor stations in Texas, Kansas, and Oklahoma: Project team member responsible for performing SPCC Plan gap analysis audits and coordinating a small project team during the audit process.

Education and Training

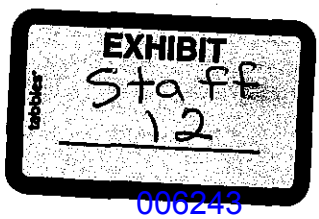
- B.L.A., Environmental Studies, University of Minnesota, Duluth, Minnesota, 2002
- Certified Design of Construction Stormwater Pollution Prevention Plans, University of Minnesota, 2012
- FERC Environmental Review, Permitting, and Compliance, Natural Resource Group, LLC, 2010
- Certified OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training, Knutson Beyer Group, Inc., 2009

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Ann Curnow
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: Please state your name and business address.

A: Ann M. Curnow

Q: Describe your educational background.

A: B.S. Geological Engineering South Dakota School of Mines

Q: By whom are you now employed?

A: Natural Resource Group, an ERM Group Company

Q: What work experience have you had that is relevant to your involvement on this project?

A: Over 25 years of experience in air quality consulting for industry, institutions, and government.

Q: What Professional Credentials do you hold?

A: B.S. Geological Engineering (1987)

Q: What is the purpose of your testimony?

A: Review assessment of air permitting requirements associated with the construction of the Dakota Access pipeline and their proposed mitigation measures to reduce air quality impacts.

Q: What methodology did you employ?

A: Technical Review

Q: Did you review section 21.0 of the Revised Application that addresses the project's impacts to air quality?

A: Yes.

Q: Regarding the pump station, do you agree with Dakota Access's statement, "Dakota Access anticipates that no permit will be required?"

A: Yes. The pump will be electrically driven. The pump station will have a backup power supply for the operation of critical equipment but the power will not be from a fossil-fuel fired generator engine. No stationary combustion sources will be onsite. The only other potential sources of air emissions at the pump station will be volatile organic compounds (VOCs) from the surge tank, maintenance activities, and leaks. The surge tank is used to store product in the event of an

upset condition. Since upsets are expected to be infrequent, the annual throughput and resulting emissions will be low. Additionally, emissions from maintenance activities and leaks will also be low. Emissions at the pump station are expected to be below permitting thresholds.

Q: Does Dakota Access's proposed construction techniques and mitigation measures adequately minimize fugitive particulate emissions?

A: Yes. Dakota Access proposes to minimize exposed soil areas, reduce vehicle driving speeds, and water the ROW as needed.

Q: Do you have any additional recommendations for Dakota Access to further mitigate the impacts the project may have on Air Quality?

A: Yes.

- Require that the primary contractor ensure that all construction equipment is properly tuned and maintained.
- Minimize idling.
- Evaluate the use of a chemical suppressant in addition to water for dust control. Any chemicals used for dust suppression should be reviewed and approved by all applicable regulatory agencies.
- The water truck should be onsite at all times.
- Vehicles transporting materials with significant dust content to/from the site should be covered with dustsheets.

Q: Does this conclude your testimony?

A: Yes.

Ann Curnow

Email: ann.curnow@NRG-LLC.com

an ERM Group company

Ann is a Senior Consultant in Natural Resource Group, LLC's (NRG) Minneapolis office. She has been working in the environmental field since 1988, specializing in providing air permitting and regulatory compliance services for industrial, institutional, and utility clients across the United States. Ann has served as the Project Manager for multiple air permitting projects, where she was responsible for obtaining all necessary permit authorizations, performing environmental reviews, and supporting public hearings.

Selected Project Experience

- Aux Sable Midstream, LLC, Construction Permit, Tioga, North Dakota: Task Manager responsible for compiling the required information to obtain authorization from North Dakota Department of Health (NDDH) to construct a flare at a crude oil pumping station in North Dakota.
- CenterPoint Energy, Capped Permit Application, Burnsville, MN. Compiled documentation to obtain Capped Permit for CenterPoint's Dakota Station to replace their existing Registration D permit issued by the MPCA. Dakota Station is a liquid natural gas and propane storage and transmission facility.
- CenterPoint Energy, RICE Compliance, Project involved developing documentation of initial and ongoing compliance with applicable requirements for corporate inventory of reciprocating internal combustion engines.
- City of Fresno, Waste Gas Turbine Permitting, Fresno, California: Task Manager responsible for completing the air quality analysis and permitting for a waste gas combustion turbine for the City of Fresno. The project was located in a serious non-attainment area for ozone and was under the jurisdiction of the San Joaquin Valley Air Pollution Control District.
- Cronus Ammonia and Urea Plant, Application for Construction Permit/Prevention of Significant Deterioration (PSD) Approval, Tuscola, Douglas County, Illinois. Prepared a PSD construction permit application for a green field facility for the conversion of natural gas to urea and ammonia. The application included completing a BACT review for all criteria pollutants and GHGs.
- Heartland Petroleum, Environmental Review and Permitting, Columbus, Ohio: Completed a compliance review and past releases of air emissions for the oil re-refinery facility as part of satisfying a court order.
- NRG Thermal, Dover Energy Center, Dover, Delaware: Task Manager responsible for preparing and submitting a major permit amendment to allow the construction of a combustion turbine and package gas boilers at an existing power plant.
- ONEOK, Identification of Air Permitting and Regulatory Requirements, Task Manager responsible for preparing a matrix of federal and state permitting and regulatory requirements for petroleum storage tanks.
- Plains Gas Solutions, LLC, Patterson Gas Processing Plant, April 2013, Patterson, Saint Mary Parish, Louisiana. Task manager responsible for preparing a Part 70 permit application for the installation of six compressor engines at an existing gas processing plant. The additional compressor capacity changed the status of the facility from a minor source of air emissions to a major source of air emissions requiring a Part 70 permit.

- Plains Marketing L.P., Moss Point Rail Project, Moss Point Mississippi: Task Manager responsible for preparing the application to construct and operate a petroleum storage and transfer facility in Mississippi.
- Seneca Resources East, Pennsylvania Department of Environmental Protection (PADEP) annual emission inventory and annual GHG reporting for their exploration and production (E&P) and midstream operations, PADEP GP-5 and Request for Determination (RFD) Permits for compressor engines, GHG Monitoring Plan and regulatory review in Pennsylvania and New York: Project Team Member responsible for reviewing the reports for accuracy.
- US Development Group, Minor Source Permit, New Town, North Dakota: Task Manager responsible for preparing and submitting a minor source permit application for a crude oil truck to rail transportation facility in Mountrail County, North Dakota. Because the site location was within the boundaries of a Fort Berthold Indian Reservation the EPA Region 8 was the permitting authority.

Education and Training

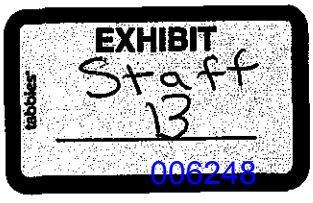
- B.S., Geological Engineering, South Dakota School of Mines and Technology, Rapid City, South Dakota, 1987

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Andrea Thornton
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: Please state your name and business address.

A: Andrea Thornton, Natural Resource Group, LLC (an ERM Group Company), 1500 SW 1st Ave, Suite 885, Portland, OR, 97201.

Q: Describe your educational background.

A: I received my Bachelor's degree in 2006 from Northeastern University in Boston, MA with a duel major in Environmental Geology and Environmental Studies. During my schooling I completed a six month internship at Camp Dress & McKee soils lab in Cambridge, MA.

Q: By whom are you now employed?

A: I have been employed by Natural Resource Group, LLC (an ERM Company) since 2007. I currently hold the position of Consultant 2 in our Regulatory Group.

Q: What work experience have you had that is relevant to your involvement on this project?

A: Since working at NRG my responsibilities have included providing clients in the pipeline and transmission line industries with environmental permitting and environmental review services including assisting in the preparation of Environmental Impact Statements and Environmental Assessments under the National Environmental Policy Act and/or applicable state programs. I have worked on projects across the United States including two recent natural gas pipeline projects in the Dakotas where I have been the lead on soils and geology. I also worked on a feasibility study for a confidential client/project that had a similar alignment to the proposed Project. Prior to working at NRG I completed an internship at a soils lab in Cambridge, Massachusetts where I performed a variety of physical soils tests including grain size distribution, soil density, organic content, permeability, and soil classification.

Q: What is the purpose of your testimony?

A: I evaluated the Soils, Erosion and Sedimentation, Seismic and Subsidence, and Geological Project Constraints sections (Sections 14.5, 14.6, 14.7, and 14.8 respectively) of the Dakota Access LLC (Dakota Access) Revised South Dakota Public Utilities Commission Application (PUC) for a permit to construct the Dakota Access Pipeline under the Energy Conservation and Transmission Facility Act. My evaluation was to determine whether a sufficient level of detail was provided to characterize geology and soils (specifically erodible soils, soils with revegetation concerns, and karst terrain) as well as soil-related limitations and potential hazards associated with pipeline construction. I also evaluated Dakota Access's Agricultural Impact Mitigation Plan and Draft Stormwater Pollution Prevention Plan (SWPPP) and Section 16.1 (Vegetation) to further

review the level of detail provided for erosion control and revegetation mitigation measures to assess that areas affected by construction of the proposed project would be restored to pre-construction conditions within a reasonable timeframe after construction.

Q: What methodology did you employ?

A: I assessed the information provided in Sections 14.5, 14.6, 14.7, 14.8 and 16.1 of Dakota Access's Revised Application by comparing it to information which is normally provided in comparable industry-standard applications for state and federal permits. I also assessed the information provided in the SWPPP and the Agricultural Impact Mitigation Plan by comparing it to multiple project-specific construction mitigation plans used for projects in a similar geographic region. In addition I applied my knowledge of soil characteristics and limitations as well as my knowledge of the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) to determine if soils were properly classified by their limitations and if the appropriate mitigation measures were applied. I also reviewed Dakota Access's responses to PUC staff's data requests where Dakota Access provided additional information on certain topics.

Q: Did you review sections 14.5, 14.6, 14.7, and 14.8 of the Revised Application that address soil types and geological features along the proposed route?

A: Yes I reviewed sections 14.5, 14.6, 14.7, and 14.8 and the Revised Application as well as sections 16.1, the SWPPP, the Agricultural Impact Mitigation Plan, and Dakota Access's responses to PUC staff's data requests that were applicable to soils, geology, and revegetation.

Q: Does the proposed route cross any soil types that have the potential for erosion? If so, please explain.

A: Yes the proposed route crosses soil types that have the potential for erosion. The industry standard for evaluating soils (including soils that are erodible by water or wind) is to use the SSURGO database, which is a digital version of NRCS soil surveys. This database provides the most detailed level of soils information available for natural resource planning and management and is linked to an attribute database that provides the proportionate extent of the component soils and their properties for each soil map unit.

Highly erodible soils are typically identified based on three soil parameters available in the SSURGO database that are directly related to the susceptibility of a soil type to erosion by water or wind. These parameters are: land capability subclass; slope; and wind erodibility group (WEG). Typically, map units with a land capability subclass designation of 4e through 8e (which are considered to have severe to extreme erosion limitations for agricultural use), and/or soils with

an average slope greater than 8 percent are identified as susceptible to water erosion. Wind erodibility is assessed using WEG designations. A WEG is a grouping of soils that have similar surface-soil properties affecting their resistance to soil blowing, including texture, organic matter content, and aggregate stability. Soils in WEG 1 and 2 include sandy-textured soils with poor aggregation and are typically classified as highly erodible by wind.

Section 14.5 of the Dakota Access Revised Application states that "*soils with a land capability class and subclass of Ve through VIIIe are considered to be highly erodible. Soils with a land capability class and subclass of IIIe through IVe are considered to be moderately erodible. The remaining capability classes and subclasses are considered to have low erodibility.*" The section goes on to discuss soils with slopes greater than 8 percent, however wind erodible soils are not discussed separately from general soil erodibility.

Revised Exhibit C lists the soil characteristics for each soil map unit within the Project area by county (including erosion potential and slopes greater than 8 percent). Revised Exhibit A3 provides maps which accurately identify locations of specific soils along the proposed pipeline right-of-way. The Revised Application does not provide any quantifiable measurement for the magnitude of erodible soils. Using Exhibit C I was able to add up the pipeline crossing lengths provided to determine that 28,057 feet (8.3 miles) are classified as having a high erosion potential and 196,700 feet (37.3 miles) are classified as having a moderate erosion potential. In addition 8,493 feet (1.6 miles) are classified has having steep slopes (greater than 8 percent) that were not also classified as having a high or moderate erosion potential.

In order to determine where the areas are along the proposed pipeline one would need to have Revised Exhibit A3 and Revised Exhibit C side by side to run through the mapping and soil limitations. A Federal Energy Regulatory Commission (FERC) Minimum Filing Requirement is to provide a milepost by milepost description of impacts on soils. This is typically done by providing a milepost in/out crossing table of soil units and their characteristic and limitations. This type of table would be useful for helping to determine the locations of erodible soils along the proposed pipeline.

Q: Does Dakota Access propose any methods for mitigating erosion during construction or operation of the pipeline? If so, please explain.

A: Yes, Dakota Access proposed measures for mitigating erosion during construction and operation of the pipeline within the SWPPP and the Agricultural Impact Mitigation Plan. Section 3.1 of the SWPPP lists temporary and permanent erosion control measures that would be taken during construction and operation of the proposed pipeline including temporary slope breakers, silt fences, hay/straw bales, temporary trench plugs, permanent slope breakers, and

revegetation. Sections 6b and 6c of the Agricultural Impact Mitigation Plan describes topsoil separation and replacement and prevention of erosion.

Q: In your opinion, does the Stormwater Pollution Prevention Plan adequately mitigate erosion?

A: The SWPPP provides standard erosion protection and mitigation measures seen across the board in the pipeline industry, however, it does not address any locations that will require site-specific erosion and sediment control plans. Dakota Access has stated that they will work with landowners and land managing agencies through the construction/restoration process and also provided Revised Exhibits A3 and C which combined can help identify areas with higher erosion potential. Neither the Revised Application nor the SWPPP state that final pre-construction design efforts will include site-specific drawings and plans that will identify and locate the type of BMPs proposed for specific locations with highly erodible soils. I recommend that the PUC require that pre-construction design efforts include BMPs specific to locations with higher erosion potential.

Q: Do you have any additional recommendations for mitigating erosion concerns?

A: In addition to having final pre-construction design efforts include BMPs specific to locations with a higher risk of erosion potential, I recommend the PUC require a milepost in/out table showing the areas that are more prone to erosion so the Environmental Inspectors (EIs) can have the data more readily accessible during construction and restoration to know where the more "problem areas" are expected to be. This table should include wind erodible soils if any are crossed by the proposed Project.

Neither the Revised Application nor the SWPPP make mention of winter construction or stabilization procedures. If construction is to take place over the winter months, I recommend that the PUC require a Winter Construction Plan be provided to address these erosion control and stabilization techniques prior to issuing Dakota Access a permit. The FERC Plan (Section III part I) requires projects that have planned construction during winter weather conditions to have a project-specific winter construction plan that addresses winter construction procedures, stabilization and monitoring procedures, and final restoration procedures. Another industry specific guidance document is the INGAA Foundation *Planning Guidelines for Pipeline Construction During Frozen Conditions.*

The SWPPP is also vague in stating that "*temporary sediment barriers will remain in place until permanent revegetation measures have been judged successful.*" I would recommend the PUC require a more quantifiable measurement to determine when revegetation is successful before granting a permit. For example, a typical standard for pipeline projects is that revegetation

in non-agricultural areas will be considered successful if the vegetative cover is sufficient to prevent the erosion of soils on the disturbed ROW and density and cover are similar to that in adjacent undisturbed areas. Sufficient coverage in upland areas is defined when vegetation has a uniform 70 percent vegetative coverage. Revegetation efforts are to continue until revegetation is successful.

Q: Does the proposed route cross any geological features that have the potential for subsidence or land movement? If so, please explain.

A: Yes the proposed route crosses geologic features that have the potential for subsidence or land movement. As indicated in the Revised Application, "*potential karst is present from MP 316.5 to MP 348.3, as well as, MP 455.8 to MP 471.5*". The Revised Application goes on to state that the Project crosses about 188 miles of the Pierre Shale which is the only geologic formation in the project area that is susceptible to landslides. Upon review of the USGS Landslide Incidence and Susceptibility GIS data, the majority of the proposed Project crosses land with a low landslide incidence and susceptibility. The only lands with moderate and high susceptibility in the Project area occur in Campbell County associated with the Missouri River (which would not be crossed in South Dakota) and a portion of Turner County which would not be crossed by the proposed alignment.

As stated in Dakota Access's March 18, 2015 Data Request Responses Nos. 12 and 13, as well as Dakota Access's June 12, 2015 Interrogatory Response 2-21, while the proposed Project crosses regions that have the potential for karst topography based on the underlying bedrock, this does not mean that karst topography is present. I agree with this determination. South Dakota has deep glacial drift deposits which overlay the carbonate rock formations that have the potential for karst topography, thereby limiting the risk of surface subsidence.

Q: In your opinion, does Dakota Access address the concerns with subsidence or land movement in a manner that is consistent with industry standard practices during pipeline routing?

A: Yes, given the low risk of potential subsidence or land movement in the proposed Project area I agree that Dakota Access's proposed mitigation methods are consistent with industry standards. If voids or other signs of karst topography are found during construction Dakota Access is proposing to conduct further site-specific evaluations by a qualified geologist or geotechnical engineer to provide input on mitigation measures. Dakota access provided examples of specialized construction techniques which may be used as mitigation measures if karst is found during construction, however, mitigation would be determined on a case by case basis.

Q: Do you have any additional recommendations for Dakota Access with regards for mitigating risks associated with subsidence or land movement?

A: No I do not have any additional recommendations with regard to mitigating risks associated with subsidence or land movement.

Q: Does the proposed route cross any soil types that could inhibit future revegetation of ground disturbed during construction activities? If so, please explain.

A: Yes, the proposed route crosses soil types that could inhibit future revegetation of ground disturbed during construction activities. Revised Exhibit C shows, by map unit, the revegetation potential for each map unit within the Project area. Section 14.5 of the Revised PUC states that *"The majority of soils impacted by the Project have moderate to high revegetation potential. Soils with low revegetation potential typically have high compaction and/or erosion potential, have slopes greater than 8 percent, and are not classified as prime farmland."* The Revised Application does not identify which soil characteristics and/or limitations where used to make these revegetation potential categories.

In my experience using SSURGO databases to analyze soil characteristics, the industry standard way to identify soils with revegetation concerns is to look at the component soil series that have a surface texture of sandy loam or coarser, are moderately well to excessively drained, and have an average slope greater than or equal to nine percent. Not knowing exactly how Dakota Access determined their revegetation potential categories I cannot be certain if their groupings are consistent with industry standards. Using the categories provided in Exhibit C I was able to add up the pipeline crossing lengths provided to determine that 65,917 feet (12.5 miles) are classified as having a low revegetation potential.

As stated earlier in my testimony, in order to determine where the areas are along the proposed pipeline one would need to have Revised Exhibit A3 and Revised Exhibit C side by side to run through the mapping and soil limitations. A FERC Minimum Filing Requirement is to provide a milepost by milepost description of impacts on soils. This is typically done by providing a milepost in/out crossing table of soil units and their characteristic and limitations. This type of table would be useful for helping to determine the locations of soils with revegetation concerns along the proposed pipeline.

Dakota Access does not identify if any areas with saline, sodic, and saline-sodic soils would be crossed by the proposed Project. These soil types can be linked to revegetation issues and loss of agricultural productivity if soils are not handled properly during construction.

Q: In your opinion, does Dakota Access have the proper plans in place to manage these soil types in order to facilitate revegetation after pipeline construction?

A: Dakota Access does not provide any specific mitigation measures in the SWPPP that would be used in areas with revegetation concerns. The SWPPP states that one seed mix would be used along the entire alignment in South Dakota (unless otherwise instructed by applicable permits or land managing agency requirements). The SWPPP does not state if Dakota Access consulted with the NRCS regional soil scientists to receive seed mix recommendations.

The SWPPP does state that Dakota Access will use fertilizer and agricultural lime and that final revegetation standards will be determined through discussions with the individual state and local agencies through the permit process, however, it is unclear as to whether site-specific measures will be developed for areas with revegetation concerns.

Q: Do you have any additional recommendations for Dakota Access in regards to handling these soil types in order to enhance revegetation after pipeline construction?

A: I recommend that Dakota Access consult with regional NRCS Soil Scientists (or provide documentation of consultation if already taken place) to determine any seed mix changes needed for the lands with revegetation concerns or any recommended site-specific mitigation measures.

I also recommend creating a milepost in/out table showing the areas that have revegetation concerns so the ELs can have it on hand during construction and restoration to know where the more "problem areas" are expected to be.

The Revised Application, SWPPP, and Agricultural Impact Mitigation Plan do not mention winter construction, stabilization procedures during frozen conditions, or seeding over winter. If construction is to take place over the winter months, I recommend that the PUC require a Winter Construction Plan be filed prior to issuing Dakota Access a permit. Please refer to my earlier testimony for examples of industry standard documents that provide recommendations for winter construction plans.

Q: Does this conclude your testimony?

A: Yes.

Andrea Thornton

Email: andrea.thornton@NRG-LLC.com

an ERM Group company

Andrea is a Consultant in Natural Resource Group, LLC's (NRG) Portland office. She has been working in the industry since 2007 and has experience in field survey coordination; agency consultation; preparation of geology, soils, and land use sections of environmental impact statements (EIS), environmental assessments (EA), and resource reports; soils data analysis; physical soils testing; and laboratory environmental safety inspections.

Selected Project Experience

- Spectra Energy, Atlantic Bridge Project, 2015 to Present, Approximately 18 miles or varying size natural gas pipeline and associated aboveground facilities in New York, Connecticut, and Massachusetts: Deputy Project Manager on a Federal Energy Regulatory Commission (FERC) third-party EA, planning workloads, coordinated agency and public meetings, and responsible for Socioeconomics section of EA.

- ExxonMobil, Alaska LNG Third-Party EIS Project, 2014 to Present, Approximately 800 miles of new 42-inch diameter pipeline in Alaska: Section Lead responsible for preparation of Soils section of a Federal Energy Regulatory Commission (FERC) third-party EIS.
- Venture Global, Venture Global Liquefaction Project, 2014 to Present, Approximately 42 miles of 42-inch diameter pipeline in Louisiana and new LNG terminal: Section Lead responsible for researching and writing soils resource report.

- Dominion Transmission Inc., Atlantic Coast Pipeline, 2014 to Present, Approximately 296 miles of 42-inch diameter pipeline, 178 miles of 36-inch diameter pipeline, 76 miles of 20-inch diameter pipeline, and 3 miles of 16-inch diameter pipeline in Virginia, West Virginia, and North Carolina: Section Lead responsible for researching and writing soils resource report. Agency coordination to plan for soil surveys on national forest land.

- Dominion Transmission Inc., Supply Header Pipeline, 2014 to Present, Approximately 35 miles of 36-inch diameter pipeline and 4 miles of 30-inch diameter pipeline in West Virginia and Pennsylvania: Section Lead responsible for researching and writing soils resource report.

- WBI Energy, Wind Ridge Pipeline Phase II Project, 2014 to Present, Approximately 96 miles of new 16-inch diameter pipeline in North Dakota: Section Lead responsible for researching and writing soils resource report and client prepared EA.

- Dominion Virginia Power, Haymarket 203 kilovolt (kV) Transmission Line Project Environmental Route Review, 2014 to Present, Approximately 6 miles of new 230 kV transmission line in Prince William County and the Town of Haymarket in Virginia: Section Lead responsible for route review and preparation of Land Use, Recreation, Geology, and Soils sections of Routing Study, State Corporation Commission (SCC) Application, and Department of Environmental Quality (DEQ) supplement documents.

- Paiute Pipeline Company, Elko Expansion Project, January 2014 to Present, Approximately 35 miles of new 8-inch diameter pipeline in Elko County Nevada: Section Lead responsible for resource report review and preparation of Geology, Soils, and Water resource sections of the EA.

- Spectra Energy, Algonquin Incremental Project, 2013 to Present, Approximately 38 miles of varying size natural gas pipeline and associated aboveground facilities in New York Connecticut, Rhode Island, and Massachusetts: Section Lead responsible for resource report review and preparation of Geology and Soils sections of EIS.

- Dominion Virginia Power, Remington CT – Warrenton 230 kV Double Circuit Line, Vint Hill – Wheeler and Wheeler – Louden 230 kV Transmission Lines Project Environmental Route Review, 2013 to Present, Approximately 6 miles of 230 kV new and existing electric transmission line in Fauquier and Prince William counties Virginia: Section Lead responsible for route review and preparation of Land Use, Recreation, Geology, and Soils sections of Routing Study, State Corporation Commission (SCC) Application, and Department of Environmental Quality (DEQ) supplement documents.

- Quanta Services, Bluegrass Memphis Pipeline Project, 2013 to 2014, Approximately 91 miles of new NGL pipeline in Tennessee, Arkansas, and Mississippi: Project Team Member responsible for survey tracking and coordination with sub consultants on edits to daily progress reports.

- Spectra Energy, Patoka Express Constraints Analysis, August 2013 to October 2013, Approximately 1,500 miles of 30-inch diameter pipeline and 32 pump stations in Montana, Wyoming, Nebraska, Kansas, Missouri, and Illinois: Project Team Member responsible for researching and writing various sections of the Constraint Study including environmental features, state and federal permits, and issues analysis.

- ONEOK, Sterling III Pipeline Project, July 2013 to October 2013, Approximately 550 miles of 16-inch NGL pipeline in Oklahoma and Texas: Project Team Member responsible for writing the Request for Proposal to Provide Post-Construction Restoration Services and working with bidders through the process.

- Quanta Services, Texas Gas Abandonment Project, January 2013 to December 2013: Project Team Member responsible for survey tracking; Section Lead responsible for preparing resource reports and associated plans for Geology, Soils, and Land Use sections.

- Portland General Electric Company, Cascade Crossing Transmission Project, 2012 to 2013, 210 miles of new 500 kilovolt (kV) electric transmission line, upgrade of an existing 230 kV line, and related facilities in Oregon: Project Team Member responsible for contributing to the preparation of a third-party EIS for the U.S. Forest Service (FS); and preparing the Geology, Soils, and Recreation sections and portions of the Land Use, Water Resources, and Vegetation sections of the EIS.

- Williams Gas Pipeline, Kalama Lateral Pipeline Project, 2011 to 2012, 3.1 miles of 16-inch-diameter natural gas pipeline to provide 62,888 Dth/d of natural gas to a proposed 346 megawatt (MW) natural gas-fired combustion turbine power plant in southwestern Washington: Project Team Member responsible for preparing Soils section and collaborating in preparation of other Resource Reports with authors and client as needed.

- Questar JL 47 Loop Pipeline Project, April 2012 to December 2012, Approximately 15 miles of 16-inch-diameter natural gas pipeline in Duchesne County Utah: Project Team Member

responsible for coordinating paleontological surveys, researching and writing Geology and Paleontology sections of project documents, and running and interpreting soils analysis for the project.

- Dominion Virginia Power, Chickahominy to Skiffes Creek 500 kV and Skiffes Creek to Whealton 230 kV Transmission Line Project Environmental Route Review, 2011 to 2012, Approximately 72 miles of 230 kV and 500 kV new and existing electric transmission line in multiple counties in Virginia: Section Lead responsible for preparation of Land Use, Recreation, Geology, and Soils sections of Routing Study, State Corporation Commission (SCC) Application, and Department of Environmental Quality (DEQ) supplement documents.

- Dominion Virginia Power, Lexington to Dooms 500 kV Transmission Line Project, September 2012 to October 2012, Approximately 39 miles of 500 kV lines in Virginia: Project Team member responsible for preparation of Land Use, Geology, Recreation, and Soils sections of project documents.

- Williams Gas Pipeline, Piceance Anomaly Digs, January 2012 to August 2012, EA for anomaly digs along existing 48-mile Piceance Lateral in Rio Blanco County Colorado: Project Team Member responsible for researching and writing Soils, Surface and Ground Water, Floodplains, Hydrology, Water Rights, and Paleontology sections of the EA.

- Kinder Morgan, Port Westward Coal Export Terminal Project, March 2012 to April 2012, Coal export terminal in St. Helens, Oregon: Project Team Member responsible for researching federal, state, and local permits applicable to this type of project and assisting with preparing a written permit process report for client.

- Dominion Virginia Power, Cloverhill to Liberty, 230 kV Transmission Line Project, January 2012 to April 2012, Approximately 8 miles of new 230 kV transmission line: Project Team Member responsible for researching and writing Land Use, Recreation, Geology, and Soils section of related project documents.

- Spectra Energy, New Jersey-New York Expansion Project, 2011 to 2012, 20 miles of multi-diameter natural gas pipeline and compressor station modifications in New Jersey, New York, and Connecticut: Project Team Member responsible for assisting with alternatives sections of a Federal Energy Regulatory Commission (FERC) third-party EIS.

- Marshal Line 6B Incident Response Public Affairs, August 2010 to September 2010: Managed local call center in Marshall Michigan for Enbridge, responsible for training local hires, reporting oiled wildlife to U.S. Fish and Wildlife Service (FWS), passing landowner requests on to right-of-way agents and claims adjustors, maintaining "Emergency Response Tracking" database, and speaking with distressed/upset landowners. Compiled data and created daily morning reports, met with client on a daily bases to answer questions, and attended nightly meeting to report status of call center.

- Palomar Gas Transmission, LLC, Palomar Gas Transmission Project, 2007 to 2010, 221 miles of 36- and 24-inch-diameter natural gas pipeline in Oregon: Project Team Member responsible for assisting with survey coordination for environmental field survey efforts; assisting biological leads with research, quality control, and data compilation; assisting with

preparing FERC resource reports for Geology and Ground Water; and participating in tribal consultations and cultural survey coordination for the project.

- Guardian Pipeline, L.L.C., Guardian Expansion and Extension Project, 2007 to 2010, 119 miles of 30-, 20-, and 16-inch-diameter natural gas pipeline and two new compressor stations in Illinois and Wisconsin: Project Team Member responsible for construction compliance tracking and task support.

- NV Energy, Fort Churchill to Harry Allen Substation, 2009 to 2010, 484 miles of 345 kV electric transmission line in Nevada: Project Team Member responsible for analyzing soils data and writing Soils, Geology, and Paleontology sections of siting and routing report.

- Sierra Pacific Power Company, Blackhawk to Ft Churchill, and Falcon to Humboldt Projects, September 2008 to December 2008, a 345 kV Electrical transmission line in Nevada: Responsible for supporting soils lead with SSURGO/STATSGO database management and queries for two 345 kV electric transmission line projects in Nevada.

- Sunstone Gas Transmission Project, July 2008 to November 2008, approximately 598-mile-long natural gas pipeline in Wyoming, Idaho and Oregon: responsible for assisting biological leads with fisheries research and compiling a waterbody crossing table.

Education and Training

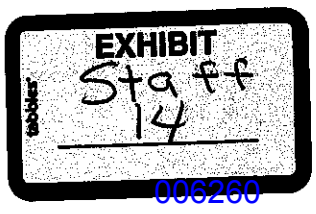
- B.A., Environmental Geology, Northeastern University, Boston, Massachusetts, 2006
- B.A., Environmental Studies, Northeastern University, Boston, Massachusetts, 2006
- National Environmental Policy Act Writing the Perfect EA/FONSI, or EIS Training, 2014
- FERC Environmental Compliance Seminar, Louisiana, 2008
- FERC Regulatory Overview and Guidance Seminar, Louisiana, 2008
- Occupational Safety and Health Administration (OSHA) 24 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training, Massachusetts, 2005

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of DeAnn Thyse
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: Please state your name and business address.

A: DeAnn Thyse, Natural Resource Group, LLC, an ERM Group Company
1000 IDS Center, 80 S 8th St, Minneapolis, MN 55402

Q: Describe your educational background.

A: I have a Bachelor of Arts degree in Anthropology from the University of Wisconsin and a Master of Arts in Anthropology from the University of Minnesota.

Q: By whom are you now employed?

A: Natural Resource Group, LLC, an ERM Group Company

Q: What work experience have you had that is relevant to your involvement on this project?

A: I have worked as a cultural resources specialist for more than 15 years and have experience with cultural resource surveys and permitting, including for natural gas and oil pipelines and electric transmission lines in the United States. I have expertise in cultural resource management and experience in field survey management, federal and state permitting and consultations, and preparation of environmental review documents on behalf of applicants or agencies.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to provide comments on Dakota Access's application to the South Dakota Public Utilities Commission (PUC) for a permit to construct the Dakota Access Pipeline Project under the Energy Conversion and Transmission Facility Act. My testimony includes comments pertaining to cultural resources.

Q: What methodology did you employ?

A: I reviewed the revised application submitted by Dakota Access and their responses to data requests from SD PUC staff.

Q: Did you review section 23.6 of the Revised Application that addresses the impacts on cultural resources?

A: Yes, I did review section 23.6, Forecast of Impact on Cultural Resources, of the revised application.

Q: In your opinion, were the cultural resource surveys completed by Dakota Access consistent with surveys completed for other similarly situated projects?

A: This project is anticipated to be authorized by USACE Nationwide Permit 12 through the submittal of a Pre-Construction Notification (PCN) to the USACE. As lead federal agency, the USACE is required to comply with Section 106 of the National Historic Preservation Act (NHPA) which requires federal agencies to take into account the effects of agency actions on properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP).

Consistent with the terms of the PCN, Dakota Access is complying with Section 106 of the NHPA and the guidelines set forth by the State of South Dakota (South Dakota Codified Law 1-19A-11.1) by conducting field surveys to identify sites within the pipeline construction right-of-way that may be eligible for listing in the State or National Register of Historic Places. Dakota Access submitted a scope of work (SOW) to the South Dakota State Historic Preservation Office (SHPO); the SHPO reviewed the SOW and requested revisions which were incorporated by Dakota Access and implemented during the cultural resources survey. Additionally, Dakota Access submitted a plan outlining the geoarchaeological methods to be used for identifying buried cultural deposits, which was reviewed and accepted by the SHPO.

The cultural resource surveys as proposed complied with federal and state regulations and therefore are consistent with surveys completed on similar projects. Final comments regarding the surveys are pending the SHPO's review of the survey report, which Dakota Access submitted to the SHPO in June, 2015.

Q: Please summarize Dakota Access's findings as to the potential impacts the pipeline may have on South Dakota's cultural resources.

A: The revised application includes results of archaeological survey conducted by Dakota Access between August and November, 2014. As a result of this survey, 17 sites required additional archival research and/or artifact analysis in order to make a recommendation of eligibility for listing in the NRHP. Eight sites eligible for listing in the NRHP were identified within the project footprint. Dakota Access has committed to avoiding eligible sites or mitigating impacts to any eligible sites that cannot be avoided by the project. Three of the eligible sites will be avoided by changes to the project route or by horizontal directional drill (HDD) or boring methods. The remaining five eligible sites could not be avoided and will be impacted by the project; mitigation strategies are described in the following response. A summary of impacts to cultural resources identified during the remaining survey completed in spring 2015 is pending review of the survey report submitted to SHPO.

Q: Does Dakota Access propose any mitigation strategies for preservation of South Dakota's cultural resources? If so, please explain what those strategies are.

A: The five eligible sites that cannot be avoided by the project are historic railroad beds; the rails and ties have been removed from the railroad so only the berms remain. Dakota Access has consulted with the SHPO to determine mitigation measures to minimize impacts to these sites. After construction through the railroad beds, Dakota access will reconstruct the berm to the pre-construction contours and will provide photographic documentation and a brief context of each site.

Q: In your opinion, do you believe that Dakota Access's mitigation strategies will adequately preserve South Dakota's cultural resources?

A: The mitigation strategies were developed in coordination with and approved by SHPO so I believe they will adequately preserve South Dakota's cultural resources.

Q: Do you have any additional recommended mitigation strategies that should be implemented in order to preserve South Dakota's cultural resources?

A: In response to a PUC data request, Dakota Access provided a copy of an Unanticipated Finds Plan (*Unanticipated Discoveries Plan, Cultural Resources, Human Remains, Paleontological Resources, & Contaminated Media*) referenced in its revised application. The plan identifies measures to be implemented in the event that undocumented cultural resources or human remains are discovered during construction. I recommend that the PUC requires that Dakota Access implement this plan during the construction phase of the project, with a provision that the plan be revised to include any changes identified by the SHPO or USACE through the Section 106 process.

Q: Does this conclude your testimony?

A: Yes.

DeAnn Thyse

Email: deann.thyse@NRG-LLC.com

an ERM Group company

DeAnn is a Consultant in Natural Resource Group, LLC's (NRG) Minneapolis office. She specializes in providing oversight of compliance with the requirements of Section 106 of the National Historic Preservation Act (NHPA), and serves as a cultural lead on a variety of projects throughout the United States. DeAnn has been working in the cultural resources field since 1997 and has experience with cultural resource surveys and permitting. She conducts agency consultations, manages cultural resource sub-consultants, and provides quality control of fieldwork and report preparation to ensure compliance with the NHPA.

Selected Project Experience

- Enbridge Energy, L.P., Southern Access Expansion Program, 2012 to Present, 165 miles of 24-inch-diameter crude oil pipeline in Illinois: Task Manager responsible for managing cultural resources surveys, Phase II evaluations, and geomorphological testing for compliance with NHPA with the U.S. Army Corps of Engineers serving as the lead federal agency.

- CenterPoint Energy, Bear Den Gathering Project, Phases I and II, 2012 to Present, 99 miles of 4- to 6-inch-diameter oil pipeline and saltwater transport pipeline in North Dakota: Cultural and Paleontological Task Manager responsible for managing cultural and paleontological survey located on state, federal, and private lands; coordinating agency and tribal consultations; and overseeing sub-consultants' and tribal surveyors fieldwork, report production, and development and implementation of a cultural resources testing plan. Also responsible for writing Unanticipated Finds Plans and the Cultural Resource section of the environmental assessment (EA) and Plans of Development.

- Gulf South Pipeline Company, LP, Southeast Market Expansion Project, 2012 to Present, 70 miles of multi-diameter natural gas pipeline and three new compressor stations in Mississippi and Alabama: Task Manager responsible for reviewing the cultural resource survey and resource reports and associated agency correspondence as a third-party reviewer of an EA for the Federal Energy Regulatory Commission (FERC). Review variance requests submitted during construction to ensure covered by cultural resource surveys.

- New Frontier Midstream, South Heart Pipeline Project, 2012 to 2013, approximately 69 miles of new 6-inch-diameter pipeline in North Dakota and Montana: Field Coordinator and Cultural Task Manager responsible for coordinating cultural and biological surveys on state, federal, and private lands as well as coordinating agency and tribal consultations.

- Questar Pipeline Company, JL 47 Loop Project, 2012 to 2013, 14.7 miles of new, 16-inch-diameter pipeline in Utah: Cultural Task Manager responsible for managing cultural survey located on state and federal lands; coordinating agency and tribal consultations; preparing the cultural resource report for the FERC application; writing an Unanticipated Finds Plan; writing the Cultural Resource section of the EA; and overseeing sub-consultants' cultural resources fieldwork and report production.

- CenterPoint Energy, A-206 Replacement Project, 2012 to 2013, approximately 1 mile of new 24-inch-diameter natural gas pipeline in Illinois: Cultural Task Manager responsible for managing cultural survey and geomorphological testing on private lands, coordinating agency

consultations, and overseeing sub-consultants' cultural resources fieldwork and report production.

- Transcontinental Gas Pipe Line Company, LLC, Rockaway Delivery Lateral Project, 2012 to Present, 3.2 miles of new 26-inch-diameter natural gas pipeline and a new meter and regulating station in New York: Task Manager responsible for reviewing the cultural resource survey and resource reports and associated agency correspondence as a third-party reviewer of an Environmental Impact Statement for the FERC.

- Northern Natural Gas, ongoing, System-wide Operation and Maintenance Projects for FERC regulated pipeline system in Minnesota and Nebraska: Cultural Task Manager responsible for conducting cultural resources records reviews, overseeing sub-consultants conducting cultural resources records reviews, and consultation with the appropriate State Historic Preservations Offices.

- Dominion Virginia Power, Harrisonburg to Endless Caverns Transmission Line, 2012, replacing approximately 20 miles of 230 kilovolt (kV) transmission line: Project team member responsible for coordinating project introduction letters for local, state and federal agencies; overseeing the background cultural literature review; reviewing sub-consultant's report; and ensuring client meets state requirements for assessing impacts to historic resources.

- Kinder Morgan Bakken Crude Oil Project, 2012, conversion of existing pipeline system to accommodate batched deliveries of crude oil and new storage and interconnect facilities located in North Dakota, Minnesota, and Michigan: Cultural Task Manager responsible for overseeing cultural resources records review and reporting for locations in multiple states.

- Dominion Virginia Power, Lexington to Dooms Transmission Line, 2012 to 2013, replacing approximately 39 miles of 500 kV transmission line: Cultural Task Manager responsible for coordinating project introduction letters for local, state, and federal agencies; overseeing the background cultural literature review and pre-application cultural resources analysis; reviewing sub-consultant's report and photo simulations; and ensuring client meets state requirements for assessing impacts to historic resources.

- Michael Baker Jr., Inc., Phoenix, Arizona, 2005 to 2010: Coordinated and consulted with multiple sub-consultants, state and federal agencies, and tribal entities on behalf of clients. Managed completion of cultural resources surveys at 165 separate locations and supported the Department of Homeland Security's agency official with cultural resource compliance. Oversaw sub-consultants' historic property identification fieldwork, evaluation, analysis, and report production, and tracked their progression to verify that they were on schedule. Reviewed sub-consultant reports to ensure they fulfilled federal requirements and worked with sub-consultants to finalize reports after addressing edits. Managed scheduling of environmental monitoring for pre-engineering surveys in multiple states; coordinating with sub-consultant to provide these monitors. Worked with both monitor and engineering sub-consultants to ensure environmental requirements were met. Helped develop a Communication and Coordination Plan for use by Office of Border Control (OBP) and the Tohono O'odham Nation for tactical infrastructure projects on the Nation. Assisted with development of a Cultural and Historical Resources Protection Plan and an Inadvertent Discovery Plan and the associated archaeological awareness training to support the

Programmatic Agreement for the closure and disposal of Camp Bonneville, Washington. Administered all company cultural resources permits and permissions from Arizona's land management agencies and repositories. Provided general support to Project Manager on various environmental and civil engineering projects. Assisted with management of multi-million dollar project budgets, including monitoring sub-consultant billing and verifying timely payment of invoices, tracking receipt of payment and assisting in solving billing and payment issues with the client, and working with sub-consultants and clients to define project scope and budget.

Education and Training

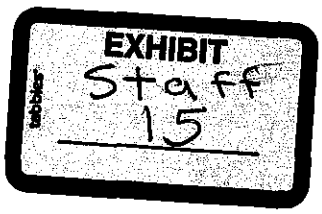
- M.A., Anthropology, University of Minnesota, 2008
- B.A., Anthropology, University of Wisconsin at Madison, 1993

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Cameron Young
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015



Q: Please state your name and business address.

A: Cameron Young, Natural Resource Group, LLC, 1675 Larimer Street, Suite 600, Denver, CO 80202

Q: Describe your educational background.

A: I have a bachelor's degree in Biology from Earlham College. I also have post-baccalaureate/graduate school experience at both the University of South Florida and the University of Georgia were I studied biology and ecology.

Q: By whom are you now employed?

A: Natural Resource Group, LLC, an ERM Group Company.

Q: What work experience have you had that is relevant to your involvement on this project?

A: I have worked the last 16 years as a threatened and endangered species/wildlife biologist for the oil and gas industry helping clients comply with rules and laws such as the Endangered Species act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and National Environmental Policy Act. I have conducted field surveys for threatened and endangered species across the country and written numerous biological assessments as well as other reviews and impact analyses.

Q: What Professional Credentials do you hold?

A: None.

Q: What is the purpose of your testimony?

A: To provide an assessment of the completeness and adequacy of the threatened and endangered species impact analysis contained in the Revised Application. My testimony contains my professional opinion and includes recommendations regarding additional review and assessments that Dakota Access may conduct so that the impact analysis may be considered to be complete.

Q: What methodology did you employ?

A: I reviewed and compared the species lists contained in the Revised Application with the lists publically available from the US Fish and Wildlife Service for the counties crossed by the proposed project. I compared these lists to the habitat types crossed by the project (as provided in the Revised Application and on aerial maps) to determine if the conclusions reported in the Revised Application were correct. I then provided my professional opinion that based on the

evidence provided (please note that no documentation of agency consultations or survey reports were available for review), the Revised Application was not adequate.

Q: Did you review section 17.4 of the Revised Application that discusses sensitive, threatened and endangered species and the potential impacts the project could have on those species?

A: Yes.

Q: In your opinion, do you agree with Dakota Access's conclusion that the project has the potential to impact only one listed species, the Topeka shiner?

A: Not based on the information available at the time of our review. In addition to the Topeka shiner, the data presented and analyses in the Revised Application are not adequate to show that there will be no effect to the following species: northern long-eared bat; Sprague's pipit; whooping crane; pallid sturgeon; Dakota skipper; and western prairie fringed orchid. Each species is discussed further below. The Revised Application and its appendices refer to NatureServe as a source for Dakota Access's determinations. NatureServe recommends that data obtained from their site only be used for planning purposes. Site specific projects and ground disturbing activities should be reviewed by appropriate state and federal agencies. It is recommended that a survey report be provided and reviewed from the baseline studies that were completed for the project as well as copies of all agency correspondence (phone logs, letters, emails, meeting minutes).

Northern long-eared bat – The northern long-eared bat is a federally listed species in every county crossed by the proposed pipeline. Its presence is likely not just limited to the forested areas in Bix Sioux River as reported. These bats can occur in any live or dead tree with crevices within 100 miles of a hibernaculum during their active season (April 15 through October 15). It is unclear when tree clearing for the project will occur or if a right-of-way will be cleared over the HDD sections at the Big Sioux River. The maps provided are not at an adequate scale to review for trees within the construction right-of-way.

Sprague's pipit – The Sprague's pipit is a federally listed species in Campbell and McPherson Counties, South Dakota. Pipit distribution can vary annually and previous surveys or lack of documented occurrences do not necessarily warrant a "no effect" determination. However, pipits require large tracts of grasslands (greater than 71.6 acres) void of trees and shrubs for nesting. In addition, it is unclear if land clearing operations may overlap with pipit nesting season (April 15 through September 15). It is our recommendation that a GIS exercise to identify grassland patches greater than 71.6 acres in area, and preconstruction nest

surveys, be conducted if construction and/or maintenance activities occur within the Sprague's pipit nesting season.

Whooping Crane – The whooping crane is a federally listed species in every county crossed by the proposed pipeline. While this species is mobile and only potentially present during spring and fall migration, no analysis was conducted to locate potential stopover habitat for cranes. In addition, no mitigation is proposed if a crane choses to occupy a wetland or field in the project area during construction or if construction will occur during migration.

Pallid sturgeon – While HDD is appropriate mitigation to avoid impacts during construction to the pallid sturgeon, no analysis was conducted to determine the potential impacts caused by a leak. Mitigation could include block valve location and SCADA leak detection systems.

Dakota skipper – The U.S. Fish and Wildlife Service (USFWS) indicates the Dakota skipper as having potential presence in Edmunds and McPherson Counties, South Dakota. The Dakota skipper is an obligate of high- to medium-quality prairie habitat that is dominated by native species and is untilled. They can be found in isolated or remnant patches of prairie within pastureland. No surveys were conducted to determine if this species or its habitat occurs in the project area.

Western prairie fringed orchid – The USFWS lists the western prairie fringed orchid as having potential presence in Lake, Lincoln, McCook, Miner, Minnehaha, and Turner Counties, South Dakota. No surveys were conducted to determine if this species or its habitat occurs in the project area.

Q: In your opinion, does Dakota Access properly mitigate the potential impacts the project could have on the Topeka shiner?

A: Not based on the information available at the time of our review. According to the Revised Application, there are eight waterbodies that may contain Topeka shiners. Of these, six will be open-cut, thereby directly impacting fish habitat and potentially altering water quality, all of which may directly and indirectly affect Topeka shiners. Implementing HDD technology to cross all waterbodies that may contain Topeka shiners would eliminate direct impacts to fish habitat. In addition, the locations of block valves is unclear in relation to the eight waterbodies that contain Topeka shiners. Block valves on both sides of these waterbodies and a SCADA or similar leak detection system should be used to reduce oil spill quantities in the event of a leak.

Q: Do you have any additional recommended mitigation measures that Dakota Access should implement in order to protect sensitive, threatened, or endangered species?

A: Yes. The following additional measures are recommended to avoid and minimize impacts to habitat and to protect sensitive species:

The construction right-of-way and permanent easement width should be reduced in sensitive areas and listed species habitats;

Seasonal timing restrictions should be implemented as appropriate to protect critical time periods such as migration and breeding for listed species;

A Migratory Bird Assessment, Mitigation, and Compliance Plan should be developed to protect bird nests along or adjacent to the project. This Plan should be developed to promote project compliance with the Migratory Bird Treaty Act as well as the Endangered Species Act;

Environmental inspectors should be trained in the identification and habitat requirements of all listed species that may occur in the project area;

If a whooping crane is observed within one mile of the Project area the USFWS should be immediately contacted and construction within one mile of the sighting should be curtailed until the whooping crane has left the area or additional protection measures could be determined in consultation with the USFWS;

Erosion control structures should be installed to protect the integrity of sensitive resources downstream of the project where listed fish may be located;

Temporary construction bridges should be installed across waterbodies in all construction areas prior to right-of-way grading and should be removed once construction and restoration has been completed;

Waterbodies with the potential for listed species should not be used as sources for hydrostatic test water;

There should be no use of mulch, lime or fertilizers in wetlands;

To avoid excessive disruption of wetland soils and the native seed and rootstock within the wetland soils, stump removal, grading, topsoil segregation (if soils are not saturated), and excavation should be limited to the area immediately over the trenchline;

Construction vehicles should be properly muffled to minimize noise;

Placement of signage should be posted along the construction right-of-way to identify sensitive resource areas and to alert construction personnel of restrictions that apply, and fencing should be used if required to protect specific resources;

Contractor vehicles and equipment should arrive to the project clean and weed-free;

Air compressors should be used to remove seeds and vegetation of noxious weeds at approved cleaning stations where vehicles leave an infested area along the project;

If straw sediment barriers are used they should be certified weed-free to prevent the further spread of invasive non-native vegetation;

A Weed Management Plan should be developed that identifies weed populations and control measures during and after construction that should be implemented to manage noxious plant species, decreasing the potential source for noxious plants in listed species habitat;

Grasslands should be avoided where practicable, and where grasslands will be impacted by the project they should be restored to pre-construction conditions;

Emergency shut-off block valves are placed along the project right-of-way to meet federal regulations (49 CFR 195) to help reduce the amount of crude oil or produced water that could potentially spill into sensitive areas along the Project; and

A remote leak detection and monitoring systems should be installed to monitor pressures and flow rates at a central location 24 hours a day and 7 days a week. The SCADA or similar system should allow abnormal operating conditions to be discussed immediately and addressed promptly, including shutdown of the system in the event of a leak or other appropriate circumstance.

Q: Does this conclude your testimony?

A: Yes.

Cameron Young

Email: cameron.young@NRG-LLC.com

an ERM Group company

Cameron Young is a Consultant 3 in Natural Resource Group, LLC's (NRG) Denver office. Cameron has been working in the industry since 1999 and has extensive experience conducting biological surveys and state and federal protected species consultations, preparing species mitigation plans, and developing and implementing nationwide survey methodologies for Federal Energy Regulatory (FERC)-regulated natural gas pipeline, Bureau of Land Management (BLM) Right-of-way grant applications, U.S. Forest Service special use permits and facility permitting, and natural gas storage facilities projects across the United States. Cameron has worked as a biologist in 16 states including experience in Oregon, North Dakota, Texas, Georgia, Alabama, and Florida and has completed international work in Kenya, St. Lucia, and the Bahamas. Cameron has recently served as a Project Manager working to navigate a variety of energy clients through endangered species and wetland permitting involving the Endangered Species Act, Migratory Bird Treaty Act, National Environmental Policy Act, and Clean Water Act. Cameron is also experienced using Density, Disturbance Calculation Tools for impacts on greater sage-grouse and lesser prairie chickens as well in the collection and management of survey data for wind power projects throughout the United States.

Selected Project Experience

- 2014 to present ONEOK Rockies Midstream; Converse County Gathering System – over 30 miles of crude oil pipelines North Dakota: Deputy Project Manager and Biological Resources Task Manager responsible for providing technical guidance for biological resource surveys, Greater Sage-Grouse impact analyses, conducting agency consultations, and helping to prepare resource reports and biological assessments.
- 2013-2014 Williams Field Services; Bluegrass Segment 3 Project - 60 miles of natural gas liquid pipeline in Louisiana: Deputy Project Manager and Biological Resources Task Manager responsible for providing technical guidance for biological resource surveys, conducting agency consultations, and helping to prepare resource reports and biological assessments.
- 2012-2014 Enable Bakken Crude Services, LLC; Bear Den Project - 58 miles of 3- to 8-inch diameter crude oil pipeline and produced waterline gathering system in North Dakota: Deputy Project Manager and Biological Resources Task Manager responsible for providing technical guidance for biological resource surveys, conducting agency consultations, and helping to prepare resource reports and biological assessments.
- 2011-2012 Dawson Geophysical Company; Niobrara Shale Seismic Exploration Projects – Wildlife surveys and permitting on BLM lands crossed by the seismic survey areas. Studies included BLM sensitive species and greater sage-grouse impact analyses using the DDCT in Wyoming.
- 2010-2012 Marathon Oil Company, Bridges Project – 25 miles of natural gas gathering and produced water pipelines and development of 12 well pads on the Sabine National Forest in Texas: Biological Resources Task Manager responsible for providing technical guidance for biological resource surveys, conducting agency consultations, and helping to prepare environmental assessments and biological assessments.
- 2010-2012 Encana Oil and Gas Company USA; Brent Miller Phase II Project - 13 miles of natural gas gathering pipelines and development of 18 well pads on the Angelina National Forest in Texas: Biological Resources Task Manager responsible for providing technical

guidance for biological resource surveys, conducting agency consultations, and helping to prepare environmental assessments and biological assessments.

- 2007-2010 Palomar Gas Transmission, LLC, Palomar Gas Transmission Project, 221 miles of 36- and 24-inch-diameter natural gas pipeline in Oregon: Biological Resources Task Manager responsible for providing technical guidance for biological resource surveys, conducting agency consultations, and helping to prepare resource reports and biological assessments.
- 2005-2010 Enterprise Products Partners Inc.: Biological Resources quality assurance/quality control specialist responsible for providing technical guidance for biological resource surveys, conducting agency consultations, and helping to prepare resource reports and biological assessments for the Petal Gas Storage Project.
- 2009 CenterPoint Gas Transmission, Alto Compressor Station Project, new compressor station in Louisiana. Biological Task Manager responsible for field surveys and preparation of wetland, wildlife, vegetation, and threatened and endangered species portions of the FERC application.
- 2009-2010 CenterPoint Energy Field Services, Magnolia Project, 25 miles of 8- and 20-inch-diameter natural gas pipeline in Louisiana. Biological Task Manager responsible for wetland and waterbody surveys and ACOE permitting, vegetation surveys, and threatened and endangered species surveys and FWS consultations.
- 2007 ONEOK, Overland Pass Pipeline Project, 760 miles of 16- and 14-inch-diameter natural gas liquids pipeline and two pump stations in Colorado, Kansas, and Wyoming: assisted the Biological Resource Lead for the project on T&E tasks; managed and conducted a Midget-faded Rattlesnake survey.
- 2010 Tri-States Pipeline in Alabama, Mississippi and Louisiana: Biological Resources Task Manager for a 162-mile-long Gopher Tortoise survey.
- 2005-2006 El Paso/Southern Natural Gas, Elba Express Pipeline Project, Georgia: Biologist negotiated mitigation requirements for state and federally protected species including pondspice, pondberry, flatwoods salamander, eastern indigo snake, and gopher tortoise.
- 2002-2004 El Paso/Southern Natural Gas, Cypress Pipeline Project, Florida and Georgia: Biological Resources Task Manager - coordinated and obtained federal, state, and local regulatory permits and approvals including Federal Energy Regulatory Commission approval for protected species along the Cypress Pipeline Project in Georgia and Florida.
- 2002-2004 Williams Partners L.P., Gulfstream Natural Gas System, Florida: Biological Resources Task Manager - negotiated mitigation requirements for state and federally protected species including pygmy fringe tree, sand skink, eastern indigo snake, and gopher tortoise.
- Williams Partners L.P., Gulfstream Natural Gas System, Florida: Biologist conducted protected species and wetland surveys using approved methodologies for natural pipelines and storage facilities.
- Biologist; Norcross, Georgia: conducted protected species and wetland surveys using approved methodologies for natural gas pipelines and storage facilities in Georgia, Alabama, Florida, South Carolina, and Mississippi.
- Biologist/ Field Project Manager; Cheyenne, Wyoming: managed and implemented field operations of a carcass search study at the FPL Meyersdale Wind power Plant in Meyersdale, Pennsylvania.

- Biologist/ Field Project Manager; Cheyenne, Wyoming: conducted Phase 1 surveys including raptor migration studies on potential wind power turbine sites in New York and Pennsylvania.
- Biologist; Tampa, Florida: conducted protected species and wetland surveys using approved methodologies for various developments and phosphate mines.

Education and Training

- Master's Program and Post-Baccalaureate Studies, University of Georgia, Athens (1995-2005)
- B.A., Biology, Earlham College, Richmond, Indiana, 1997
- Natural Gas Pipeline Environmental Compliance Workshop, FERC
- Zweig White Project Manager Training

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Direct Testimony of Ryan Ledin
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015

Q: Please state your name and business address.

A: Ryan Ledin
Natural Resource Group, LLC
IDS Center, 80 S 8th St, Minneapolis, MN 55402

Q: Describe your educational background.

A: I received my Bachelor's degree in 2009 from Winona State University, in Environmental Geology – Environmental Science

Q: By whom are you now employed?

A: I have been employed by Natural Resource Group, LLC, an ERM Group Company since 2012, and was employed at E3 Environmental, LLC from 2010 to 2012. I currently hold a Construction Compliance Specialist position in our Construction Compliance Group.

Q: What work experience have you had that is relevant to your involvement on this project?

A: At NRG my responsibilities have included providing support in the pipeline and transmission line industries with environmental permitting and environmental review services including assisting in the preparation of Environmental Impact Statements and Environmental Assessments under the National Environmental Policy Act and/or applicable state programs. I have environmental consulting experience in the natural gas and petroleum pipeline industries including gathering, interstate and intrastate, as well as operations and maintenance projects.

I have experience with various federal, state, and local agencies, including the Bureau of Land Management (BLM), U.S. National Forrest Service (NFS), Federal Energy Regulatory Commission (FERC), U.S. Army Corps of Engineers (COE), and U.S. Fish and Wildlife Service (USFWS). Stormwater permitting in 20 states (AL, CO, IA, IL, IN, PA, MO, MN, MT, ND, OH, OK, SD, TX, WI, WY).

I have acted as the Environmental Inspector during pipeline construction in 6 states involving more than 1,500 miles of right-of-way, and as a Lead Environmental Inspector on various gathering projects in North Dakota.

I have also served as a construction compliance advisor for several potential pipeline projects, reviewing route and design plans for constructability issues in relation to natural resources impacts and environmental permitting.

Q: What Professional Credentials do you hold?

A: None.

Q: What is the purpose of your testimony?

A: I evaluated the hydrology, hydrostatic test water use, and water quality Project constraints sections (15.0, 15.1, 15.2, 15.3, 15.4, 15.5, and 20.0) of the Dakota Access LLC (Dakota Access) Revised South Dakota Public Utilities Commission Application (PUC) for a permit to construct the Dakota Access Pipeline under the Energy Conservation and Transmission Facility Act. I also evaluated Dakota Access's Agricultural Impact Mitigation Plan and Draft Stormwater Pollution Prevention Plan (SWPPP) to further review the level of detail provided for erosion

control and revegetation mitigation measures to assess that areas affected by construction of the proposed Project would be restored to pre-construction conditions within a reasonable timeframe post construction.

Q: What methodology did you employ?

A: I assessed the information provided in Sections 15.1, 15.2, 15.3, 15.4,15.5 and 20.0 of the Dakota Access's Revised PUC by comparing it to information which is normally provided in comparable industry-standard applications for state and federal permits. I also assessed the information provided in the SWPPP and the Agricultural Impact Mitigation Plan by comparing it to multiple project-specific construction mitigation plans used for projects in a similar geographic region.

Q: Did you review sections 15.1, 15.2, 15.3, 15.4, 15.5, and 20.0 of the Revised Application that address hydrology, hydrostatic test water use, and water quality?

A: Yes, I reviewed sections 15.1, 15.2, 15.3, 15.4, 15.5, and 20.0 of the Revised application as well as the SWPPP, the Agricultural Impact Mitigation Plan, and Dakota Accesses' responses to PUC staff's data requests that were applicable to hydrology, hydrostatic test water use, and water quality.

Q: Does Dakota Access correctly identify the permits required for hydrostatic test water withdrawal and discharge?

A: The Draft PUC Application appears to omit the South Dakota Temporary Discharge Permit that covers Hydrostatic Test and Trench Dewatering. The permit number is SDG070000, and requires authorization. This permit has monitoring, reporting, and recording requirements.

Q: Do you have any additional recommendations for Dakota Access in regards to either hydrostatic test water withdrawal or discharge?

A: At the time of our review, the locations for hydrostatic test water withdrawal and discharge had yet to be identified. I recommend that qualified people with an engineering and environmental background having familiarity with hydrostatic test withdrawals and discharges review all proposed locations prior to the submittal of permit applications or notices. I also recommend identifying and permitting several locations in addition to what may actually be needed as a contingency plan.

Q: Did you review Dakota Access's Stormwater Pollution Prevention Plan (SWPPP), as found in Exhibit D of the Revised Application?

A: Yes.

Q: In your opinion, does the SWPPP follow standard industry practices and comply with applicable regulations?

A: The plan includes many standard industry practices, but fails to quantify the measureable standards by which such industry practices will be implemented on the Project (e.g. slope breaker intervals, use of trench plugs, type and frequency of erosion control devices, application of mulch). Recommendations for these measures are included below.

Q: Do you have any recommended changes for the SWPPP? If so, please explain.

A: Yes, based on a determination that some Project construction activities are likely to take place during frozen conditions. As mentioned in NRG's testimony

regarding soil types and geological features, the Revised Application, SWPPP, and Agricultural Impact Mitigation Plan do not mention winter construction, stabilization procedures, or seeding over winter. If construction is to take place over the winter months, we recommend that the PUC require a Winter Construction Plan be filed prior to issuing Dakota Access a permit. That testimony provided several examples of industry standard documents that include recommendations for the development of project-specific winter construction plans.

In several portions of the SWPPP, erosion and sediment control installation (both timing and frequency) are left to the discretion of the Environmental Inspector. This could create an inconsistency as there are multiple Environmental Inspectors per spread, and multiple spreads across the Project. Specifically installation of Temporary Slope Breakers, Permanent Slope Breakers, and Temporary Trench Plugs should be standardized with the opportunity for changes based on site conditions and in consultation with agency representatives, when indicated. Industry standards call for approximate spacing versus percent slope.

For example:
Industry standards hold that **temporary slope breakers** should be installed to minimize concentrated or sheet-flow runoff in disturbed areas in accordance with the following maximum-allowable spacing.

Slope (%)	Approximate Spacing (ft)
5-15%	300ft
>15-30%	200ft
>30%	100ft

Temporary trench plugs should be installed at the edge of wetlands. Where a waterbody is located within a wetland, install trench breakers at the wetland edge.

Slope (%)	Approximate Spacing (ft)
5-15%	300ft
>15-30%	200ft
>30%	100ft

The Dakota Access SWPPP only calls out temporary trench plugs adjacent to waterbodies or drain tiles. It again leaves the frequency of installation to the EI or CI, which could create inconsistencies.

For example:

Permanent slope breakers should be installed to minimize concentrated or sheet-flow runoff in disturbed areas in accordance with the following maximum-allowable spacing.

Slope (%)	Approximate Spacing (ft)
5-15%	300ft
>15-30%	200ft
>30%	100ft

Although special pipeline construction techniques for wetlands and waterbodies are called out in the Revised Application (sections 17.1, 17.1.1, 17.2, and 17.2.1), they are not mentioned in the SWPPP.

I recommend that a master waterbody and wetland crossing table be included in the SWPPP with milepost or stationing indicating the features' exact locations. The Revised Application mentions this is located in Exhibit C. Because the SWPPP is the living document during construction, I recommend that the table in Application Exhibit C be added to the SWPPP as an appendix.

Although the PUC Draft Application describes the open-cut, flume, and dam and pump special construction techniques at waterbody crossings, it does not specifically call out the locations where these techniques will be used. I recommend that the crossing method be indicated in the master waterbody table with an alternative method also stated. In this way the Environmental Inspector can make recommendations based on the method that is planned.

The Revised Application does not define minor or intermediate waterbody crossings, which are typically defined by their crossing width. Along with these crossing widths come standard timing restrictions for open cut or dry crossing methods. I recommend defining minor, intermediate, and major waterbody crossings by crossing width and assigning a timing restriction. These would not apply to HDD crossings.

	Crossing Length	Timing Restriction
Minor	<10'	< 24 hours
Intermediate	10' – 100'	< 48 hours
Major	>100'	< 72 hours or custom restriction.

Decisions regarding the application of mulch to the right-of-way are delegated to the Environmental Inspector. I recommend specifying a slope, such as 5% and greater, to apply mulch. By leaving this to the Environmental Inspector's discretion, this could result in inconsistency throughout the project.

The SWPPP calls for an inspection at least weekly. This should be clarified to be once every seven calendar days according to Section 3.12 of the South Dakota

General Stormwater Permit. "Weekly" could be misinterpreted as "once per calendar week," which could result in inspections occurring as many as 14 days apart.

Q: Did you review section 16.1 of the Revised Application that discusses expected impacts to vegetation from construction of the pipeline and Dakota Access's plans for mitigating these impacts?

A: Yes

Q: In your opinion, do the construction techniques and mitigation measures identified by Dakota Access adequately minimize the impacts to vegetation?

A: Yes, the Revised Application adequately describes industry standards of topsoil segregation.

Q: Do you have any additional recommendations for mitigation measures in order to minimize impacts to vegetation?

A: The Revised Application has no mention of cleaning stations to avoid the spread of noxious weeds/invasive species. A typical recommendation is for equipment cleaning stations to be staged at the entry and exit of known noxious weed areas. Typical techniques at cleaning stations include compressed air pressure and brushes. Equipment should be thoroughly cleaned prior to entry and exit of noxious weed areas.

Mechanical control (e.g., mowing or disking) can also be an effective control measure for annual weed species. The efficacy of mechanical control measures is dependent upon proper timing to cut the vegetation prior to the maturation of seed and may require multiple treatments during the growing season. The NRCS or local county authorities should be consulted regarding management of noxious weeds.

Q: Did you review sections 17.1 and 17.2 of the Revised Application that discuss expected impacts to waterbodies from construction of the pipeline and Dakota Access's plans for mitigating these impacts?

A: Yes

Q: In your opinion, do the construction techniques and mitigation measures identified by Dakota Access adequately minimize the impacts to waterbodies?

A: Several recommendations for open-cut and dry crossing methods (dam and pump, flume) are included in this testimony.

Q: Do you have any additional recommendations for mitigation measures in order to minimize impacts to waterbodies?

A: Excavated material from the stream should be set back further than the ordinary high water mark. Typically additional temporary workspace may be used for spoil storage. Industry standards typically place the edge of the workspace at 50' back from the ordinary high water mark, as well as in an area with relatively little slope (less than 5%).

The Revised Application does not describe in-stream activities.

- Excavating equipment should operate from one or both banks, without entering the stream. If equipment must encroach into the stream it should operate on clean construction mats. Material removed from the stream should be placed on the banks in spoil containment areas.
- If trench dewatering is necessary, the pump intake should be suspended off the trench bottom and dewatering will take place into a sediment filter bar or a straw bale dewatering structure. The trench should be dewatered in such a manner that no heavily silt-laden water flows into streams and wetlands.
- Backfill material should consist of the spoil material from the trench unless otherwise specified in state and federal permits. In-stream trenches should be returned to pre-construction contours.

Dam and pump

- Stream flow should be pumped across the construction area through a hose and will be discharged onto an energy-dissipation device.
- Pumps should have a capacity greater than the anticipated stream flow.
- A backup pump of equal or greater capacity will be on-site at all times in the event that the primary pump fails.
- Standing water that is isolated in the construction area by the dams or any stream water that leaks around the dams or seeps from the ground into the trench during construction will be pumped into a sediment filter or a straw bale dewatering structure located in an upland area.

Flume

- Flumes should be sufficient diameter to transport maximum seasonal flows.
- The upstream and downstream ends of the flume(s) will be incorporated into dams made of sand bags and plastic sheeting (or equivalent).

I recommend that a master waterbody and wetland crossing table be included in the SWPPP with milepost or stationing calling their exact locations. The PUC Draft Application mentions this is located in Exhibit C. As the SWPPP is the living document in the field, I recommend it be added to the SWPPP as an appendix.

Although the Revised Application describes the open-cut, flume, and dam and pump special construction techniques, it does not specifically call out the locations at which these techniques will be used. I recommend that the crossing method be called out with an alternative method in place. This way the Environmental Inspector can make recommendations based on the method that is planned.

The PUC Draft Application does not define minor or intermediate waterbody crossings, which are typically defined by their crossing width. Along with these crossing widths come standard timing restrictions for open cut or dry crossing methods. I would recommend defining minor, intermediate, and major waterbody

crossings by crossing width and assigning a timing restriction. These would not apply to HDD crossings.

	Crossing Length	Timing Restriction
Minor	<10'	< 24 hours
Intermediate	10' – 100'	< 48 hours
Major	>100'	< 72 hours or custom restriction.

Q: Are Dakota Access's proposed construction techniques for waterbody crossings consistent with industry standard practices?

A: The construction practices stated in the Revised Application are typical.

Q: Do you have any concerns with the proposed waterbody crossing construction techniques proposed by Dakota Access? If so, please explain and provide any recommendations you have for addressing your concerns.

A: See recommendations.

Q: Did you review Dakota Access's Horizontal Directional Drill (HDD) Contingency Plan?

A: Yes.

Q: In your opinion, does the HDD Contingency Plan adequately mitigate the impact to waterbodies should an inadvertent release occur?

A: Yes, however I have some recommendations. See below.

Q: Do you have any recommended modifications for the HDD contingency plan? If so, please explain.

A: I recommend that the construction contractor notify the CI or EI when there is a loss of pressure. This should trigger an inspection by the EI of the HDD path. At this point the bentonite slurry should be thickened. It's possible that the drill will lose pressure and fill a void in the substrate.

The construction contractor should have containment BMPs for inadvertent releases in open water. I recommend that silt curtains remain on site and available. The contractor should plan on having a small boat available in order to deploy a silt curtain around an inadvertent release.

Q: Did you review the Draft Spill Prevention, Control, and Countermeasures Plan (SPCC Plan)?

A: Yes.

Q: Is Dakota Access required by law or regulation to maintain an SPCC Plan for both construction activities and operation of the pipeline? If so, please explain what laws and regulations apply.

A: South Dakota does not have a counterpart to the federal SPCC Plan rules.

Q: In your opinion, does the SPCC plan comply with the applicable laws and regulations?

A: Yes.

Q: Do you have any recommended modifications for Dakota Access's SPCC Plan? If so, please explain.

A: I recommend that each construction spread identify a separate spill coordinator.

Q: Does this conclude your testimony?

A: Yes.

Ryan Ledin

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an ERM Group company

Ryan is an Associate Consultant in Natural Resource Group, LLC's (NRG) Minneapolis office. He has been working in the industry since 2010 and specializes in environmental permitting and reviews, regulatory compliance, and environmental inspection and monitoring. Ryan has experience with National Pollutant Discharge Elimination System (NPDES) permitting throughout the United States; conducting dig site and regulatory analyses; preparing environmental reports, and drafting Public Service Commission (PSC) route and corridor applications; and compliance monitoring on Federal Energy Regulatory Commission (FERC)-regulated projects. Ryan has certifications in Erosion Control Inspection/Installation and the Design of Construction Stormwater Pollution Prevention Plans.

Selected Project Experience

- Alliance Pipeline, L.P., Tioga Lateral Project, 2012 to Present, 80 miles of natural gas pipeline and a new compressor station in North Dakota: Construction Compliance Coordinator responsible for providing project support, preparing variance request to the FERC, and Environmental Inspector's daily reporting.

- Enable Midstream Partners, LP, Bear Den Project (Phase 1 and 2), 2012 to Present, 68 miles of 3- and 6-inch-diameter welded steel pipeline and 3- and 4-inch-diameter composite pipeline, 31 new Lease Automatic Custody Transfer units in North Dakota: Project team member responsible for sections of the environmental assessment (EA) and construction feasibility study. Construction Compliance Coordinator responsible for providing project support, preparing variance request, Environmental Inspector's daily reporting, and periodic environmental inspection.

- ONEOK Sterling III Pipeline LLC, Sterling III Pipeline Project, 2013, 549 miles of 16-inch-diameter natural gas liquids pipeline in Oklahoma and Texas: Project team member responsible for Environmental Training, project orientation for Environmental Inspectors, and Environmental Inspection.

- Enbridge – Line 61 Mainline Enhancement, 2012 to Present, Expansion of facilities and various pump stations along the Line 61 route: Project team member responsible for completing permit applications and conduct environmental reviews.

- Permitting and Environmental Reviews: Project team member responsible for completing permit applications and conducting environmental reviews for multiple clients, including but not limited to Alliance, Enbridge Energy, Kinder Morgan, Koch, Magellan, MidAmerican Energy, and ONEOK.

- NPDES Permitting: Project team member responsible for NPDES permitting for projects in Iowa, Illinois, Indiana, Missouri, Minnesota, Montana, North Dakota, Ohio, Oklahoma, South Dakota, Texas, and Wisconsin.

- Environmental Inspection and Monitoring: Project team member responsible for post-construction inspection for ONEOK – Rockies Midstream gathering line system in North Dakota and Montana, daily reporting to office staff, and desktop review/map interpretation.

- Dig Package Processing: Project team member responsible for conducting preliminary dig site analyses, preparing regulatory checklists, interpreting maps, preparing site-specific environmental reports, and drafting various local, state, and U.S. Army Corps of Engineers (COE) permits and notifications.

Education and Training

- B.S., Geoscience/Environmental Science, Winona State University, Minnesota, 2010
- Erosion Control Installer/Inspector Certification, University of Minnesota
- Design of Construction Stormwater Pollution Prevention Plans Certification, University of Minnesota
- Natural Heritage Inventory Data, Wisconsin Department of Natural Resources
- Montana Department of Environmental Quality – BMP 301 – Conducting Storm Water Compliance Evaluation Inspections for Construction Activities
- Experience with ArcView GIS software, Trimble GPS/PDA, and Microsoft Office

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. HP14-002

IN THE MATTER OF THE REVISED APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

Rebuttal Testimony of Michael E. Timpson, Ph.D.
On Behalf of the Staff of the South Dakota Public Utilities Commission
August 14, 2015

Q: Please state your name and business address.

A: Michael E. Timpson, Ph.D., Natural Resource Group, LLC (an ERM Group Company), 1500 SW 1st Ave, Suite 885, Portland, OR, 97201.

Q: Describe your educational background.

A: I received a Bachelor's degree in 1982 from the University of Rhode Island in Kingston, RI with a major in Natural Resources (soil science concentration). I received a Master's degree in 1985 from North Dakota State University in Fargo, ND, majoring in soil science, with a minor in geology. I received a Doctorate of Philosophy in 1992 from the University of Tennessee-Knoxville in Knoxville Tennessee, with a major in Plant and Soil Science and a minor in Environmental Engineering. I conducted post-doctoral research at Oak Ridge National Laboratory in 1993 and 1994, focusing on remediation of uranium-contaminated soils.

Q: By whom are you now employed?

A: I have been employed by Natural Resource Group, LLC (an ERM Company) since 2001. I currently hold the position of Principal Consultant in our Regulatory Group and serve as the office manager of the Portland, Oregon office.

Q: What work experience have you had that is relevant to your involvement on this project?

A: While pursuing my doctorate I was employed full time by the Department of Plant and Soil Science, part of the agricultural experiment station system of the University of Tennessee. As such, I conducted field work and operated a

laboratory that analyzed soils in support of the agricultural experiment station's research program and also supported the United States Department of Agriculture, Natural Resources Conservation Service soil survey program. Prior to joining Natural Resource Group, I worked for a smaller consulting firm conducting soils and wetlands evaluations in support of natural gas pipeline projects. Since joining Natural Resource Group I have conducted soils and agricultural impact and mitigation assessments for more than 3,000 miles of natural gas and petroleum pipelines across the United States, including three recent natural gas pipelines in North Dakota. As a third-party contractor to the Federal Energy Regulatory Commission, I've assisted in the preparation of soils and agricultural impact assessments related to natural gas pipelines for 13 Environmental Impact Statements and Environmental Assessments under the National Environmental Policy Act and/or applicable state programs.

Q: What Professional Credentials do you hold?

A: I am a Licensed Professional Soil Scientist in the State of Wisconsin (License No. 174-112). My current license expires in July 2016.

Q: What is the purpose of your rebuttal testimony?

A: My rebuttal testimony is being provided to address specific concerns identified in direct testimony provided by intervening landowners. That testimony is specifically related to: the potential for trench excavation to bring dormant weed seeds to the surface from deeper soil layers; the potential for soil compaction related to construction to impact post-construction crop yields; and, the potential

for soil temperature changes that may occur over the pipeline due to pipeline operations to impact post-construction crop yields.

Q: What methodology did you employ?

A: I reviewed the information provided in Sections 14.5 and 16.1 of Dakota Access' Revised Application as well as the information provided in the Agricultural Impact Mitigation Plan (AIMP, Exhibit D of Dakota Access' Revised Application). I also reviewed existing publications and environmental review documents prepared for federal and state permits for similar projects in the upper Midwest. In addition, I applied my knowledge of soil characteristics and limitations as well as my knowledge of the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) to determine if soils were properly classified by their limitations and if the appropriate mitigation measures were proposed for implementation to avoid or minimize potential construction impacts on agricultural soils (as defined in the project AIMP).

Q: In pre-filed direct testimony, intervening landowners raised concerns about the possibility of impacts on crop yields due to heat generated during operation of the pipeline. Based on your experience and research, do you believe that heat-related impacts on crop yields could occur?

A: Yes, heat-related effects on plant growth and crop yields have been identified as a result of pipeline operations for natural gas and oil pipelines. Published reports of impacts on plant growth and crop yields resulting from soil heating caused by pipeline operations are limited, however, a recent assessment of pipeline temperature effects on vegetation was conducted for the Alliance Pipeline, a

natural gas transmission pipeline that crosses portions of North Dakota, Minnesota, Iowa and Illinois (TERA Environmental Consultants, 2004). Measurements of soil temperature, plant available soil moisture, and spring wheat and barley yields were recorded upstream and downstream of a compressor station on the Alliance Pipeline in 2002, 2003, and 2004. Data were collected from four sites downstream of the compressor station (at distances ranging from 0.5 to 52 miles downstream) and compared with a site 0.5 mile upstream of the compressor station. Data collection took place at points directly over the trench, 6 feet way from the pipeline, and 43 feet away from the pipeline, and at different soil depths. Soil temperature was highest directly over the pipeline (as documented in previous studies, e.g., Naeth et al., 1993) and decreased with increasing distance from the pipeline. No significant differences were noted in plant available soil moisture or crop yield at any site with the exception that mean plant available soil moisture was significantly greater over the trench in 2002 than in adjacent areas. Data were collected under the drought conditions that existed in 2002, while precipitation and plant available soil water were normal to above normal in 2003 and 2004, respectively. The authors anticipated that soil temperatures above the pipeline might lead to increased soil drying, however, this effect was not documented. Increased soil temperature above the pipeline did not significantly affect plant available soil moisture or crop yield. Although the operational parameters of the Alliance natural gas pipeline may vary from the proposed Dakota Access oil pipeline, similar temperature

effects on plant growth, soil moisture parameters, and crop yield may be expected from operation of the Dakota Access pipeline project.

References:

Naeth, M.A., D.S. Chanasyk, W.B. McGill and A.W. Bailey. 1993. Soil temperature regime in mixed prairie rangeland after pipeline construction and operation. Can. Agriculture Engineering. 35(2): 89-95.

TERA Environmental Consultants. 2004. Effects of heat from a pipeline on crop growth – interim results. Proceedings of the 8th International Symposium on Environmental Concerns in Rights-of-Way Management, Saratoga Springs, NY.

Q: If reduced crop yields are expected as a result of heat generated during operation of the pipeline, are there any mitigation measures that can be implemented? If so, please explain.

A: Reduced crop yields may result from heat added to soils from pipeline operations; however, the majority of studies published to date have demonstrated a neutral to positive effect on crop yields as a result of the heat effects from pipeline operation. Further, there are no mitigation measures that can be implemented to change the heat effects on soils surrounding an operating pipeline.

Q: If there are ways to mitigate the impacts, what measure(s) do you recommend the PUC should consider in order to mitigate the impacts of crop yield loss due to heat generated during operation of the pipeline?

A: Data regarding crop yields near buried pipelines indicate that most effects of heat added to soils from pipeline operations have neutral to positive effects on crop

yields. As a result, no mitigation measures would be required to address heat effects from pipeline operations.

Q: In pre-filed direct testimony, intervening landowners raised concerns about the possibility of impacts on crop yields due to the increased emergence of noxious weeds resulting from trenching and other soil disturbance during construction of the pipeline. Based on your experience and research, do you believe that impacts from an increased occurrence of noxious weeds could occur?

A: Yes

Q: If reduced crop yields or other impacts are expected as a result of the spread of noxious weeds resulting from construction of the pipeline, are there any mitigation measures that can be implemented? If so, please explain.

A: There are a variety of mitigation measures that can be implemented to minimize the potential for spreading noxious and other weeds during pipeline construction. Section 16.1 of Dakota Access' Revised Application describes the preconstruction survey effort employed to document the presence of noxious weeds along the proposed pipeline route in South Dakota. Section 16.1.1 describes the mitigation measures that may be employed to minimize the potential for spreading noxious weeds along the pipeline route during construction. The AIMP does not include a section describing the potential to spread noxious or other weed species as a result of construction, and includes

no mention of mitigation measures that would be employed to avoid or minimize the spread of weeds of any sort along the right-of-way.

Q: If there are ways to mitigate the impacts, what measure(s) do you recommend the PUC should consider in order to mitigate the impacts resulting from the spread of noxious weeds resulting from pipeline construction?

A: Section 16.1.1 of the Revised Application states that Dakota Access would consult with the South Dakota Department of Agriculture regarding appropriate Best Management Practices (BMPs) to implement to minimize the spread of noxious weeds during construction. The mitigation measures described in that Section, if used in combination, would be sufficient to minimize the potential spread of noxious weeds as a result of construction. However, the success of the mitigation measures should be documented through post-construction weed surveys for at least 2 years following the completion of construction.

Additional mitigation measures should be employed to minimize the potential for propagation of other common agricultural weeds as a result of construction. In areas of rotated cropland, typical weed control measures reduce the growth of weeds, minimizing competition between agricultural crops and weed species for nutrients and water. However, deeper portions of the topsoil in most agricultural lands also act as a seed bank for long-lived weed seeds located below the depth of most common pre-emergent herbicide treatments. Topsoil segregation, performed to preserve topsoil productivity and eliminate the potential for rutting due to construction traffic resulting in mixing of topsoil and subsoil, will result in a

mixing of the soil to the depth of the topsoil segregated from the construction workspace. For example, in areas with 12-inches or more of topsoil, Dakota Access proposes to segregate 12-inches of topsoil from the ditch and spoil storage areas of the construction right-of-way. Moving this volume of topsoil across the construction workspace will mix the soil. This mixing action brings dormant weed seeds to the surface of the stored topsoil piles and can result in significant growth of weeds. To minimize the potential for this new weed growth to result in new weed infestations following construction and restoration of the right-of-way, monitoring and controlling the growth of weeds on topsoil storage piles should be employed. To implement this additional weed control mitigation, the environmental inspector or agricultural inspector should be capable of identifying multiple species of weeds at a number of life stages, and be able to recommend and implement weed control measures early enough in the life cycle of the weed species in question to minimize or prevent the plants from setting seeds.

In pre-filed direct testimony, intervening landowners raised concerns about the possibility of long-term impacts on crop yields due to the compaction of soil occurring during construction of the pipeline. Based on your experience and research, do you believe that soil compaction impacts on crop yields could occur?

A: Yes.

Q: If reduced crop yields are expected as a result of soil compaction during construction of the pipeline, are there any mitigation measures that can be implemented?

A: There are mitigation measures that can be implemented to minimize the potential for compaction of soils to impact post-construction crop yields.

Q: If there are ways to mitigate the impacts of soil compaction, what measure(s) do you recommend the PUC should consider in order to mitigate the impacts of crop yield loss due to soil compaction during construction of the pipeline?

A: Section h of the AIMP describes the mitigation measures that would be implemented to alleviate compaction of soils resulting from construction traffic. Soil compaction is typically greatest on the "working side" or "travel lane" portion of the construction right-of-way, and largely results from the use of rubber-tired trucks used for hauling pipe segments and transporting other heavy items along the right-of-way. Little if any compaction typically occurs on the spoil storage side of the right-of-way, and virtually no compaction occurs over the trench line.

The deep tillage methods described in Section h of the AIMP will likely be adequate to alleviate soil compaction that will result from construction. However, the approach for implementing the deep tillage methods and a means to determine if the proposed 3 passes of the tillage equipment have been sufficient to remediate the compacted soils is insufficient. The industry standard for judging whether decompaction measures are adequate is a comparison of soil density, as measured with a tool called a penetrometer, on the right-of-way with

undisturbed soils in adjacent off-right-of-way areas of the same field. Dakota Access' AIMP contains no provisions for making these comparisons, it simply assumes that 3 passes of the deep tillage equipment will be sufficient to alleviate the level of compaction induced by construction traffic. Natural Resource Group recommends that the PUC include requirements for compaction testing of areas on and off the construction right-of-way, using a penetrometer or other equivalent measuring device, to provide an appropriate means of determining whether deep tillage operations have reduced compaction to levels similar to adjacent sections of cropland undisturbed by construction activities.

Q: Does this conclude your testimony?

A: Yes.

Michael E. Timpson, Ph.D., L.P.S.S.
e-mail: mike.timpson@NRG-LLC.com

Mike Timpson is a Senior Consultant at Natural Resource Group, LLC (NRG) and the Office Manager in NRG's Portland office. Mike has been working in the industry since 1997 and has expertise in soil, geological, and wetland resources for natural gas pipeline and liquefied natural gas (LNG) projects under the jurisdiction of the Federal Energy Regulatory Commission (FERC). He manages projects and coordinates the efforts of natural resource subconsultants. Mike has experience preparing Environmental Report Applications for several FERC 7(c) pipeline projects, as well as preparation of federal, state, and local permits necessary for the construction and operation of natural gas and petroleum pipelines. He also has extensive experience preparing sections for third-party Environmental Impact Statements (EISs) and Environmental Assessments (EAs) for a number of lead federal agencies.

Selected Project Experience

- WBI Energy Transmission – Wind Ridge Pipeline Project, April 2014 –present, 96-miles of 16-inch-diameter pipeline, two meter stations, and associated facilities in North Dakota: Project Manager responsible for overseeing the preparation of the FERC 7(c) environmental report application, including authoring Resource Report 10 (Alternatives), preparation of an applicant-prepared draft Environmental Assessment, biological and cultural resource surveys, federal and state permitting, and public affairs support.
- Texas Gas Transmission, LLC – Texas Gas Abandonment Project, February 2013 to present, 568 miles of 26-inch-diameter pipeline and associated facilities in Kentucky, Tennessee, Mississippi, Arkansas, and Louisiana: Project Manager responsible for overseeing the preparation of the FERC section 7(b) environmental report application, including authoring Resource Report 1 (Project Description), and providing quality assurance for the rest of the environmental application.
- Northwest Pipeline, GP – Kalama Lateral Pipeline Project, November, 2011 – 2012, 3.1 miles of 16-inch-diameter natural gas pipeline, a new meter station, and pig launcher/receiver facilities in Cowlitz County, Washington: Project Manager responsible for overseeing the preparation of the FERC section 7(c) Environmental Report Application, including authoring Resource Reports 1 (Project Description) and 10 (Alternatives), and assisting with Clean Water Act permitting.
- Williams Gas Pipeline, Project Manager – Pipeline Feasibility Study and Cost Estimate, October – December 2011, Environmental Permitting and Cost Estimate for 68- and 98-mile-long, 24-inch-diameter pipeline routes and associated aboveground facilities in southeastern Virginia: The cost estimates included use of the FERC pre-filing process, federal and state permitting, protected species consultations and biological surveys, cultural resource consultations and surveys, preparation of National Environmental Policy Act (NEPA) documents, construction inspection and compliance monitoring, and environmental and cultural resource mitigation.
- Portland General Electric Company, Cascade Crossing Transmission Project, October, 2010 – June 2013, 215 miles of new 500 kilovolt (kV) electric transmission line, upgrade of an existing 230 kV line, and related facilities in Oregon: Deputy Project Manager for the preparation of a third-party EIS for the U.S. Forest Service, preparing the project description and Alternatives section, the Traffic and Transportation section, and portions of the Vegetation and Water Resources sections of the EIS, and providing QA/QC oversight for the document.
- Alliance Pipeline, LP, Tioga Lateral Pipeline Project, 2011 – 2012, about 80 miles of natural gas pipeline and a new compressor station in North Dakota: Project team

member responsible for preparation of Resource Reports 2 (Water Use and Quality) and 6 (Geological Resources), section of the applicant-prepared EA for Water Resources and Geology; for the FERC section 7(c) Environmental Report Application. Managed the subconsultant conducting wetland and waterbody surveys, coordinated with the U.S. Army Corps of Engineers on jurisdictional determinations and prepared the pre-construction notification for Section 404, Nationwide Permit 12 application.

- Spectra Energy Corporation, New Jersey – New York Expansion Project, 2011 – 2012, 20 miles of multi-diameter natural gas pipeline and related aboveground facilities in New Jersey and New York: Project team member responsible for preparing the Wildlife and Aquatic Resources section; assisted with non-pipeline Alternatives section for a FERC third-party EIS.
- Liberty Natural Gas, Liberty Natural Gas Deepwater Port, September 2010 – February 2011, an offshore natural gas receiving terminal, 44 miles of offshore 36-inch-diameter pipeline in the Atlantic Ocean and Raritan Bay, and 9 miles of onshore 36-inch-diameter pipeline in New Jersey: Project team member responsible for preparing the offshore sediments section of a third-party EIS for the U.S. Coast Guard Deepwater Ports Standards Division; U.S. Maritime Administration; and cooperating agencies, including the FERC.
- Sierra Pacific Power Company, Electric Transmission Line Routing and Feasibility Study, 2009, 25 to 50 miles of 345 kV transmission lines (two) in Nevada: Project Manager responsible for preparing a report to identify and rank potential route alternatives.
- ConocoPhillips/BP, Denali – The Alaska Gas Pipeline Project, 2008, 1,700 miles of 48-inch-diameter natural gas pipeline originating on the North Slope of Alaska and terminating near Calgary, Alberta, Canada: Project team member responsible for study planning for soils and geological resources.
- Guardian Pipeline, LLC, Guardian Expansion and Extension Project, 2006 – Present, 119 miles of 30-, 20-, and 16-inch-diameter natural gas pipeline and two new compressor stations in Illinois and Wisconsin: Project Manager responsible for overseeing the preparation of the FERC section 7(c) Environmental Report Application, including authoring Resource Report 1 (Project Description), and federal, state, and local permitting. Also managing construction and monitoring of a compensatory wetland mitigation site in eastern Wisconsin, and post-construction monitoring of wetlands and agricultural impacts along the pipeline.
- Transcontinental Gas Pipe Line Corporation, Leidy to Long Island Expansion Project 2005, 51 miles of natural gas pipeline in Pennsylvania and New Jersey: Project Manager responsible for overseeing the preparation of the FERC section 7(c) Environmental Report Application and applicant-prepared EA, including preparing Resource Report 1 (Project Description) and assisting with Resource Report 10 (Alternatives).
- Transcontinental Gas Pipe Line Corporation, Central New Jersey Expansion Project, 2004, 3.9 miles of natural gas pipeline in New Jersey: Project team member responsible for preparing FERC Resource Reports 6 (Geology) and 7 (Soils), conducting wetland delineations, and assisting with preparing wetland permit applications.
- Questar Pipeline Company, Southern System Expansion Project, 2003 – 2004, about 20 miles of natural gas pipeline in Utah: Project team member responsible for supervising the preparation of Resource Reports 6 and 7 (Geology and Soils) for the FERC section 7(c) Environmental Report Application.
- EnCana Oil & Gas (USA) Inc., Entrega Gas Pipeline Project, 2003 – 2004, 327 miles of 42- and 36-inch-diameter natural gas pipeline in Colorado and Wyoming: Project team member responsible for preparing Resource Report 7 (Soils) for the FERC section 7(c) Environmental Report Application.

- Guardian Pipeline, LLC, Guardian Pipeline Project, 1999 – 2002, 149 miles of 36-inch-diameter natural gas pipeline in Illinois and Wisconsin: Project team member responsible for conducting and supervising wetland delineations and topsoil depth surveys, performing data quality control and electronic data transfer to project engineering firm, and managing surveys for endangered and threatened species.
- Pearl Crossing LNG Terminal LLC and Pearl Crossing Pipeline LLC (ExxonMobil), Pearl Crossing LNG Project, 2004 – 2005, 170 miles (two 53-mile-long offshore pipelines and one 64-mile-long onshore pipeline) of 42-inch-diameter natural gas pipeline and an offshore LNG import terminal in the Gulf of Mexico and Louisiana: Project team member responsible for preparing the Soils and Sediments sections of a FERC and U.S. Coast Guard third-party EIS.
- Creole Trail LNG Terminal and Pipeline Project, 2005 – 2006, an LNG terminal and 123.6 miles of send out pipeline in Louisiana: Prepared the sediments section for the LNG terminal and assisted with the Soils and Wetlands sections.
- ExxonMobil, Vista Del Sol LNG Terminal Project, 2004 – 2005, LNG import terminal and 27-mile pipeline near Corpus Christi, Texas: Project team member responsible for preparing the Sediments and Soils sections of a FERC third-party EIS.
- Gulf LNG Energy, LLC and Gulf LNG Pipeline, LLC, Gulf LNG Clean Energy Project, 2005 – 2006, 5 miles of 36-inch-diameter natural gas pipeline and an LNG import terminal in Mississippi: Project team member responsible for preparing the Dredging and Sediment Analysis section of the EIS; also provided oversight on the Soils section.
- Bradwood Landing, LLC and NorthernStar Energy, LLC, Bradwood Landing LNG Project, 2005 – 2006, 36 miles of 30- and 36-inch-diameter natural gas pipeline and an LNG import terminal in Oregon, Washington: Project team member responsible for preparing the Dredging and Sediment Analysis section of the draft EIS.
- KeySpan LNG, L.P., KeySpan LNG Facility Upgrade Project, 2004 – 2005, an LNG facility expansion in Rhode Island: Project team member responsible for preparing the Soils, Sediments, and Alternatives sections for a FERC third-party EIS.
- Crown Landing, LLC, Crown Landing LNG Terminal, 2005 – 2006, an LNG storage facility and 11 miles of natural gas pipeline in New Jersey, Delaware, and Pennsylvania: Project team member responsible for preparing the Soils and Sediments sections of a FERC third-party EIS.
- Weaver's Cove Energy, LLC, Weaver's Cove LNG Project, 2004 – 2005, an LNG terminal facility and 6 miles of natural gas pipeline in Massachusetts: Project team member responsible for preparing the Soils and Sediments sections of a FERC third-party EIS.
- Cheyenne Plains Gas Pipeline Company, LLC, Cheyenne Plains Pipeline Project, 2003 – 2004, 387 miles of 36-, 30-, 20-, and 8-inch-diameter natural gas pipeline, one new compressor station, and modifications to one existing compressor station in Colorado and Kansas: Project team member responsible for preparing the Groundwater, Soils, and Geology sections of a FERC third-party EIS.
- Hackberry LNG Terminal, LLC, Hackberry LNG Terminal Project, 2002 – 2003, an LNG plant in Louisiana: Project team member responsible for preparing the Soils section of a FERC third-party EIS.
- Williams, Chacahoula Gas Storage Project, 2001 – 2002, natural gas cavern storage and pipeline in Louisiana: Project team member responsible for preparing Resource Report 7 (Soils) for the FERC section 7(c) Environmental Report Application and the Soils section of the applicant-prepared EA.
- Kern River Gas Transmission Company, Kern River 2003 Expansion Project, 2002, 717 miles of natural gas pipeline and three new compressor stations and modifications to six existing compressor stations in Wyoming, Utah, Nevada, and California: Project

team member responsible for conducting third-party compliance monitoring for the FERC, and overseeing pre-construction plant salvage operations on Spreads 8 and 9 in Nevada and eastern California.

- Alaska Gas Pipeline Producers Team, Alaska Gas Pipeline Project, 2001 – 2002, 1,628 miles of natural gas pipeline in Alaska, North Dakota, Minnesota, Iowa, and Illinois: Project team member responsible for preparing Resource Report 7 (Soils) for the FERC section 7(c) Environmental Report Application.
- NRG Energy, Inc. Arthur Kill Pipeline Project, 2002 – 2004, 2.3 miles of natural gas pipeline in New York: Project team member responsible for preparing the Soils and Geology sections of New York State Public Service Commission Article VII application.
- Georgia Strait Crossing Pipeline LP, Georgia Strait Crossing Pipeline Project, 2001 – 2002, 47 miles of 20- and 16-inch-diameter natural gas pipeline and one compressor station in Washington State and the Strait of Georgia: Project team member responsible for preparing Geology, Soils and portions of the Water Resources sections for a FERC third-party EIS.
- Kinder Morgan Inc., Illinois Power Lateral Project, 2001, 49 mile-long natural gas pipeline in south-central Illinois, managed wetland delineations and threatened and endangered species surveys.

Education and Training

- Ph.D., Plant and Soil Science, University of Tennessee, Knoxville, Tennessee, 1992
- M.S., Soil Science, North Dakota State University, Fargo, North Dakota, 1985
- B.S., Natural Resources, University of Rhode Island, Kingston, Rhode Island, 1982
- Licensed Professional Soil Scientist, Wisconsin #174-112
- FERC, Environmental Report Preparation Seminar, 2014
- FERC, Environmental Compliance Seminar, 2014