Amendment to the Application to the North Dakota Public Service Commission for Consolidated Certificate of Corridor Compatibility and Route Permit

Volume I

Case No: PU-11-696

for the

AVS-Neset 345-kV Transmission Project

BASIN ELECTRIC POWER COOPERATIVE

A Touchstone Energy® Cooperative

July 2013

Amendment to the Application to the North Dakota Public Service Commission for Consolidated Certificate of Corridor Compatibility and Route Permit

Case No: PU-11-696

for the

AVS-Neset 345-kV Transmission Project

Basin Electric Power Cooperative

July 2013

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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1.0 INTRODUCTION

Basin Electric Power Cooperative (Basin Electric) filed an application for a Consolidated Certificate of Corridor Compatibility and Route Permit for the AVS to Neset 345-kilovolt (kV) Transmission Project (Project) (PU-11-696) on March 15, 2013. Unless indicated otherwise in this amendment, all other text sections and project descriptions in the original application remain accurate. The structure of the amendment remains the same, with the same chapters and sections.

This amendment identifies route changes made since the application was filed. These changes are a result of:

- Landowner requests
- Federal and state agencies
- Coteau mine plan Avoidance of environmental features
- Refining the route for construction suitability

The route changes do not significantly alter the information presented in the original application. The route changes are minor and typical of the progression of linear projects of this size. Only siting criteria information that has changed as a result of the reroutes is presented in this amendment; all other sections of the original application remain in effect.

The general location and reasons for the route changes are summarized in the following table and illustrated on the route change maps following Table 1.0-1.

Table 1.0-1: Summary of Corridor/Route Changes

Township	Range	Sections	Reason	Route Change Map Sheet #
145N	88W	14,15,16,21,22,23	To accommodate the Coteau mine plan including future double-circuit with the existing AVS to Charlie Creek 345-kV line	Sheet 1
145N 145N	90W 91W	7 12	To accommodate a landowner request	Sheet 2
145N	95W	1	To accommodate a landowner request	Sheet 3

Township	Range	Sections	Reason	Route Change Map Sheet #
145N	95W	3	To accommodate a landowner request	Sheet 3
146N 145N	95W 95W	31 6	Addition of the Gumbo Creek Substation	Sheet 4
145N 146N	98W 98W	5,6,7,8,17 19,30,31,32	To avoid planned future residence and to accommodate a landowner request	Sheet 5
147N	99W	25,36	To accommodate a landowner request and to adjust the route based on terrain issues	Sheet 6
152N	101W	17,18,20,21	To accommodate a landowner request	Sheet 7
152N 153N	102W 101W	1,2,11,12,13 33	To avoid a planned commercial development	Sheet 8
153N	101W	16,21	To accommodate a landowner request and to adjust the route based on terrain issues	Sheet 9
153N	101W	6	To accommodate a landowner request and to adjust the route based on terrain issues	Sheet 10
154N	102W	35,36	To accommodate a landowner request and to avoid a planned development	Sheet 10
154N	102W	2,10,11	To accommodate a landowner request and to avoid a planned commercial development	Sheet 11
155N	102W	23,26,35	To avoid a planned truck bypass route	Sheet 11
155N 156N	101W 101W	4,5,8,9,16,17 32,33	To accommodate a landowner request	Sheet 12
156N	101W	33,34,35,36	To avoid a planned development	Sheet 12
157N	94W	29	To adjust the route based on substation layout changes	Sheet 13
157N	94W	20	To accommodate a landowner request	Sheet 13

Existing Neset 230-kV Substation

Proposed Tande 345-kV Substation

Renville County

Williams County

Existing Williston 230-kV Substation

Proposed Judson 345-kV Substation

Mountrail County

Ward County

McKenzie County

McLean County

Dunn County

Proposed Gumbo Creek 345-kV Substation

Mercer County

Existing Antelope Valley Station
345-kV Substation

Existing Charlie Creek 345-kV Substation

Golden Valley County

Billings County

13 12 11 10 9 8 7 6 5 4 3 2 1

0 5 10
Miles

NORTH

LEGEND

- Existing Substation
- Proposed Substation
- Original Route - March 2013
- Revised Route - July 2013
- County Boundary
- Map Sheet Index

Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Route Change Map Index

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Source: Burns & McDonnell.

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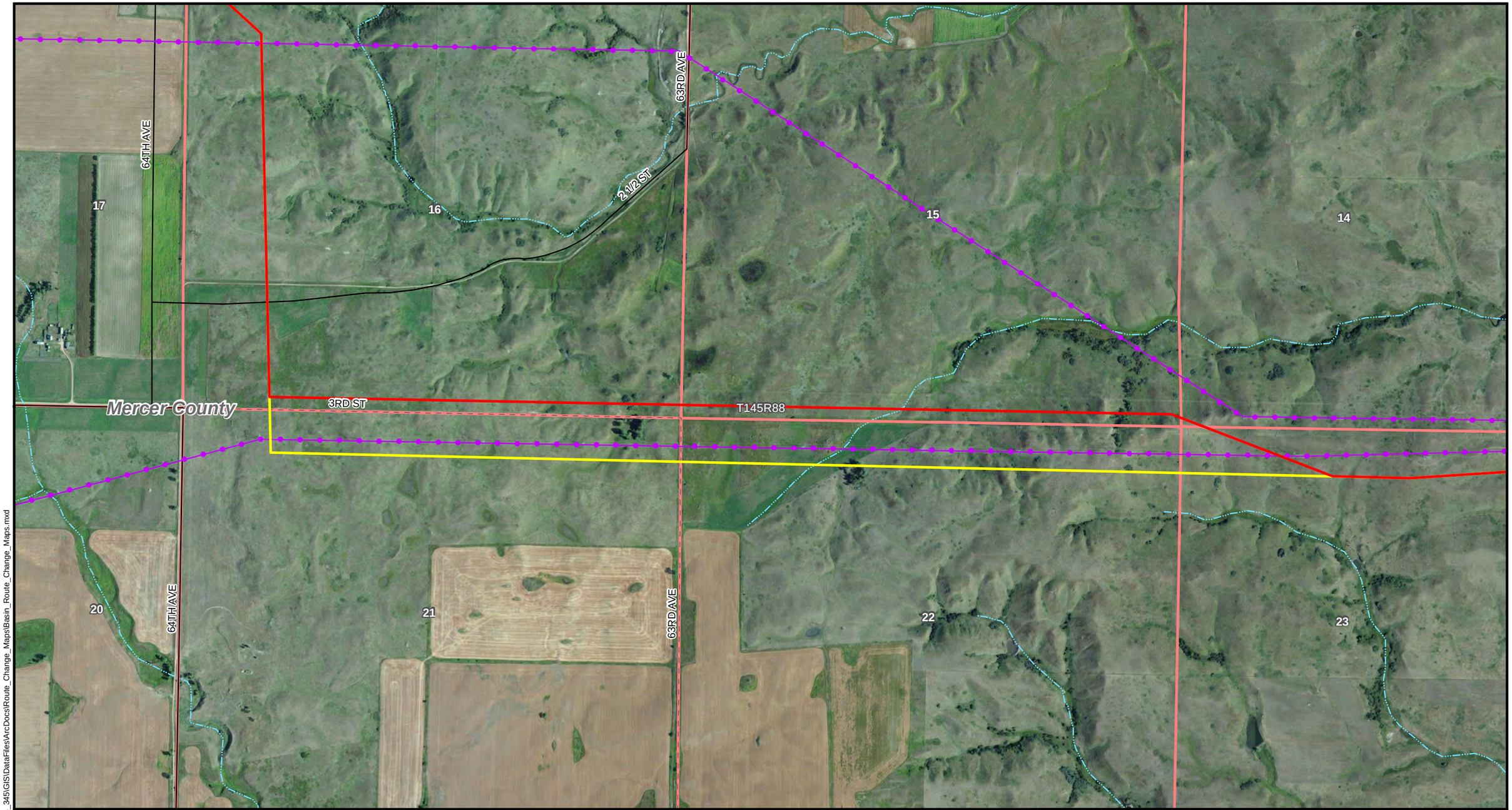

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NORTH

LEGEND

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- Proposed Substation
- Additional Proposed Substation
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- Public Land Survey System Townships
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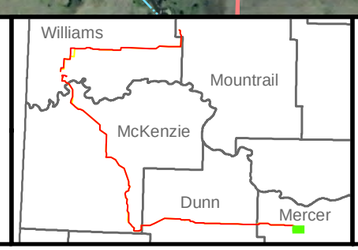

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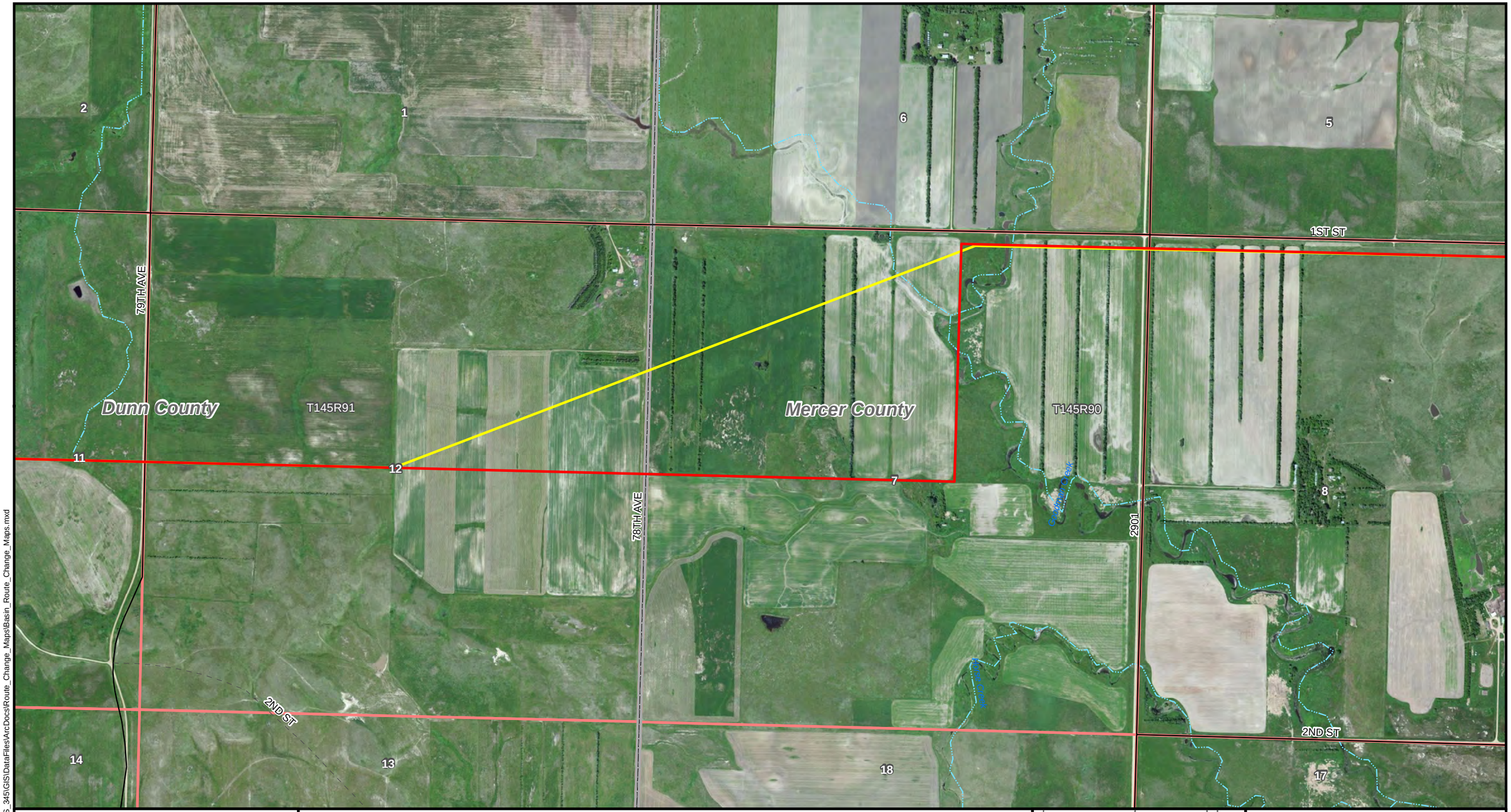

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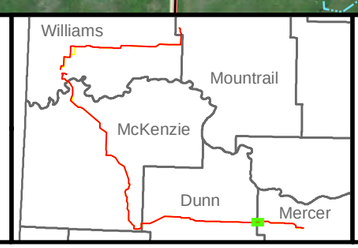

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Source: Bing Aerial Maps; North Dakota GIS; Burns & McDonnell.

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33
34
35
T146R95
36
CENTER ST
105TH AVE
104TH AVE
103RD AVE
4
3
2
1
Dunn County
T145R95
1ST ST
1330
22
9
10
11
12

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NORTH

LEGEND

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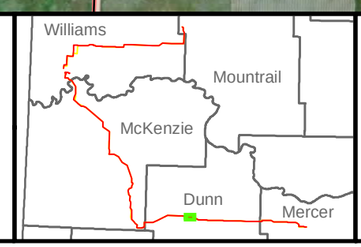

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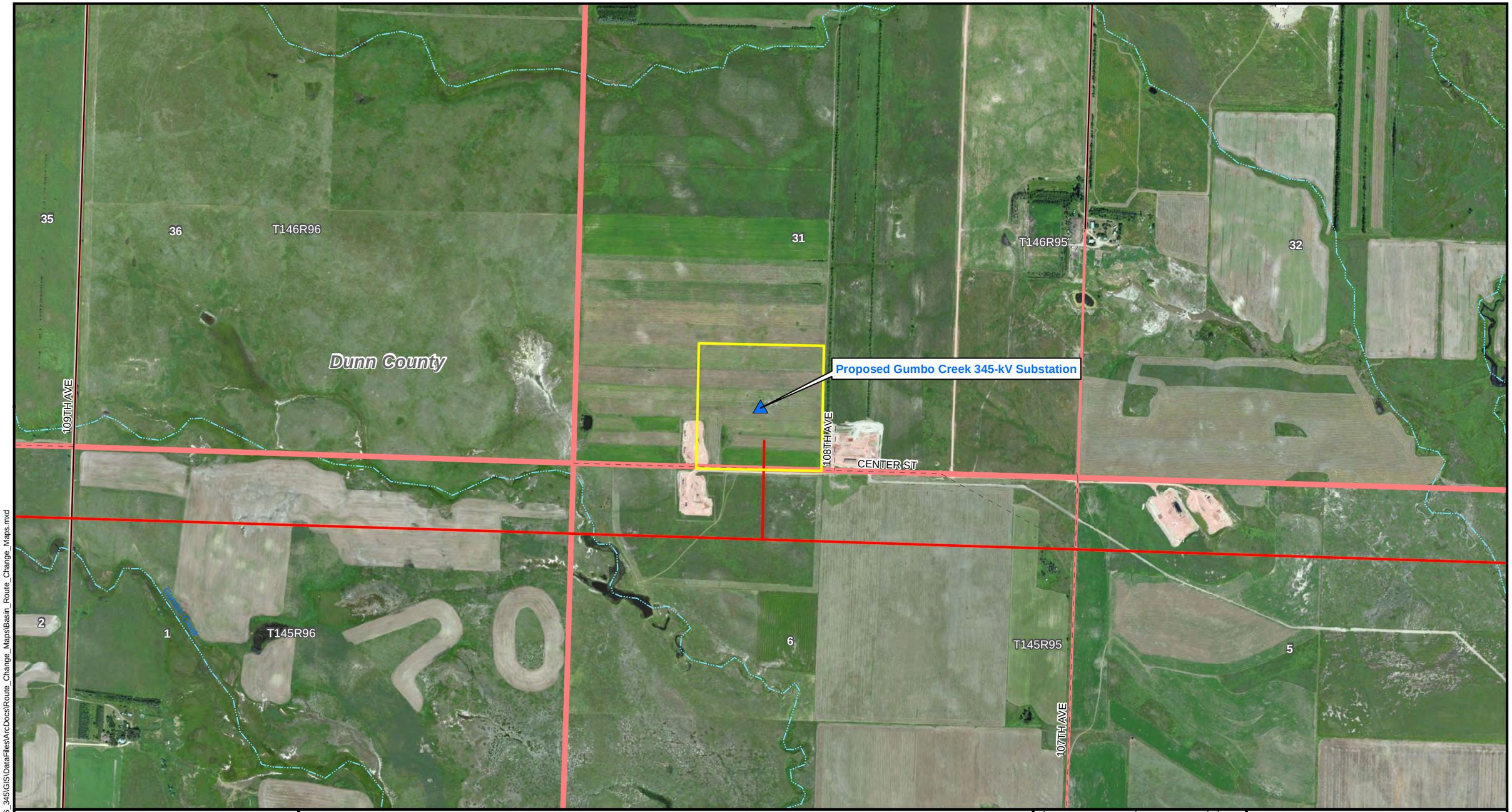

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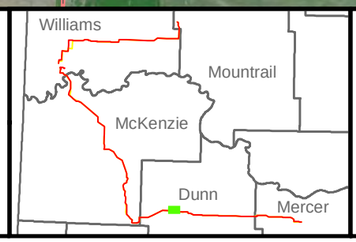

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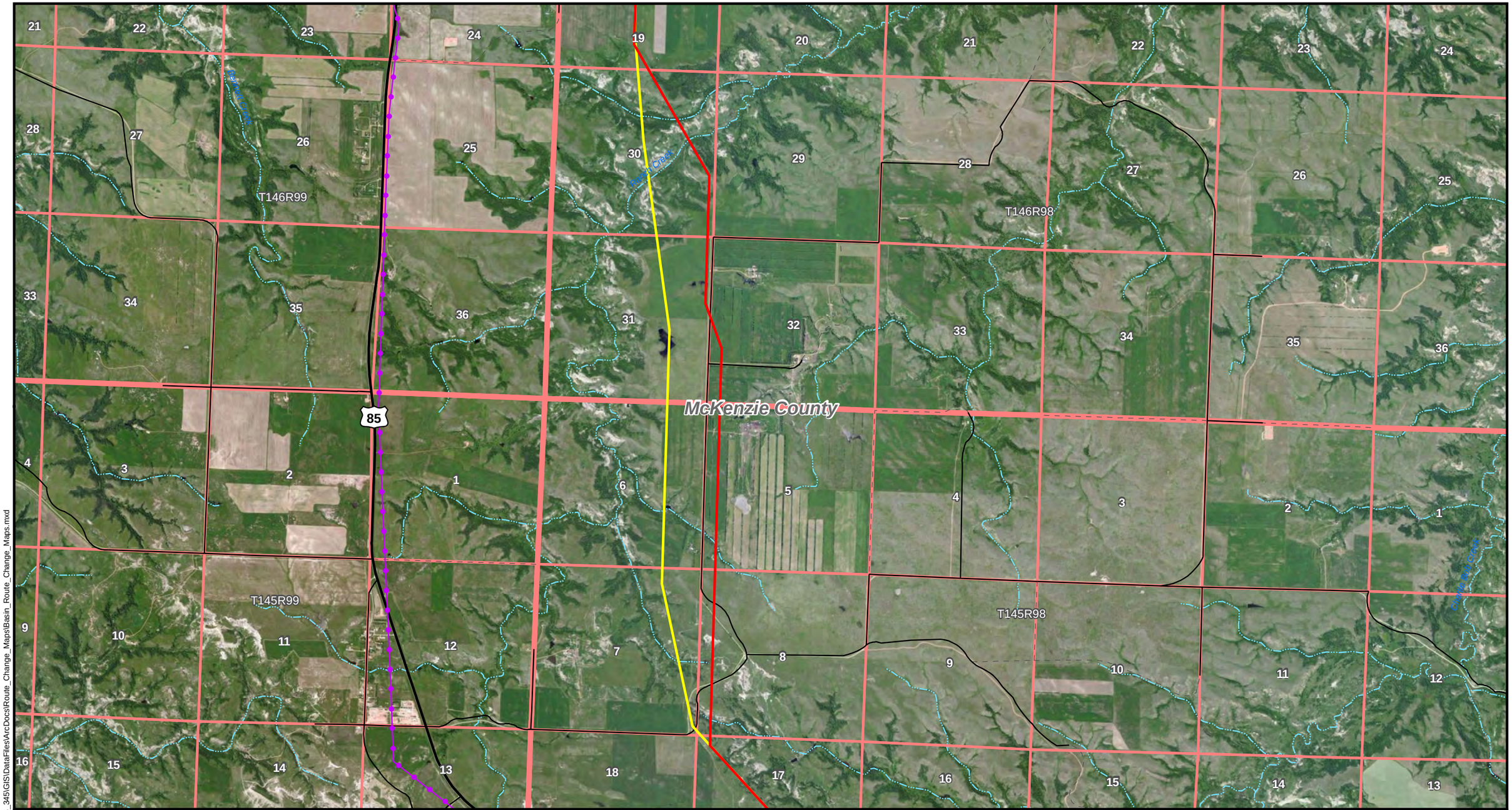

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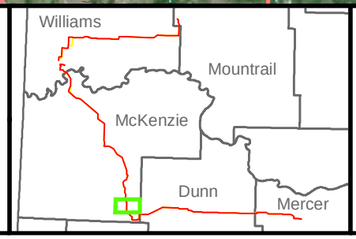

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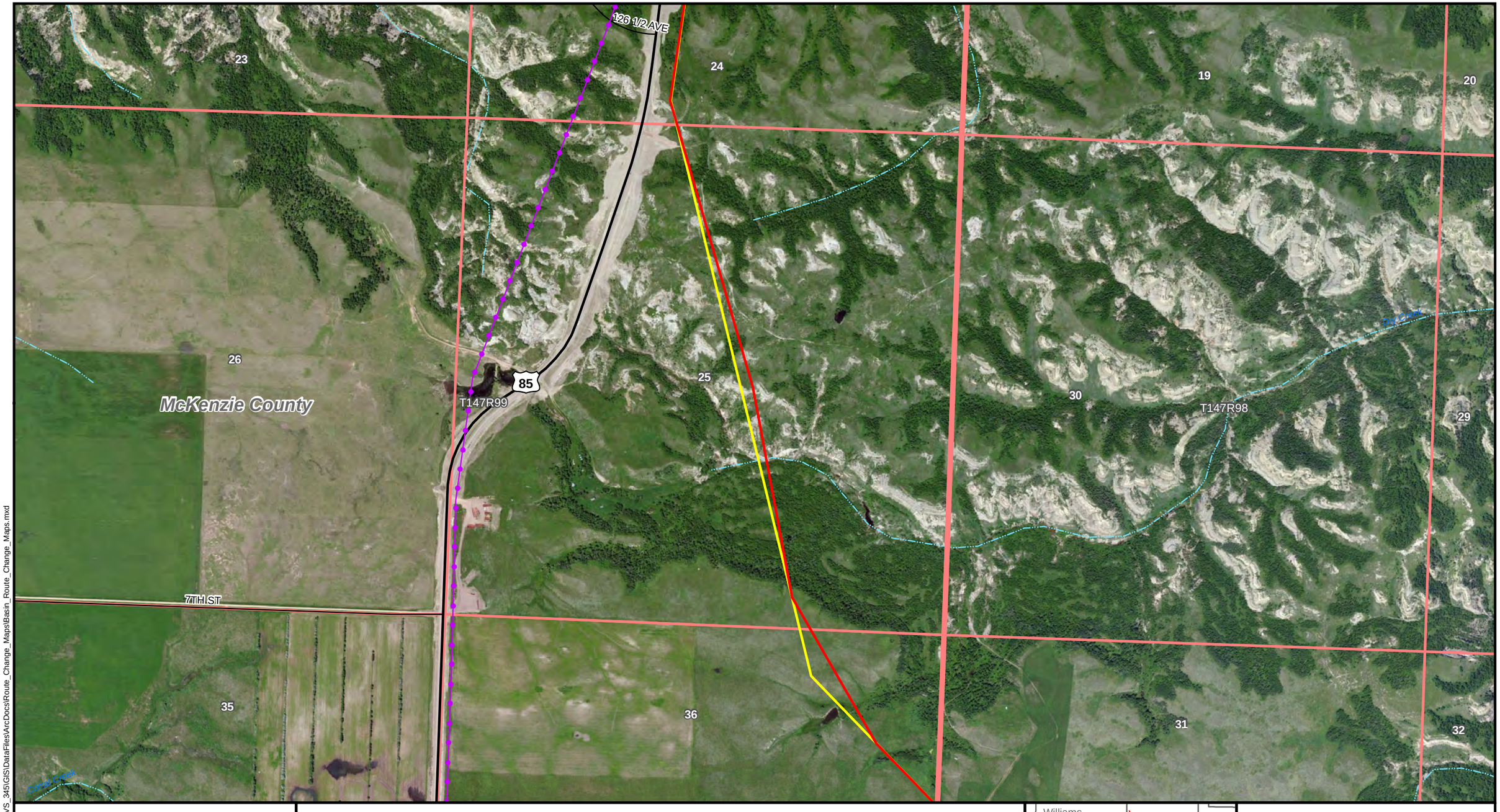

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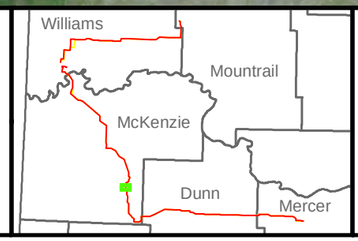

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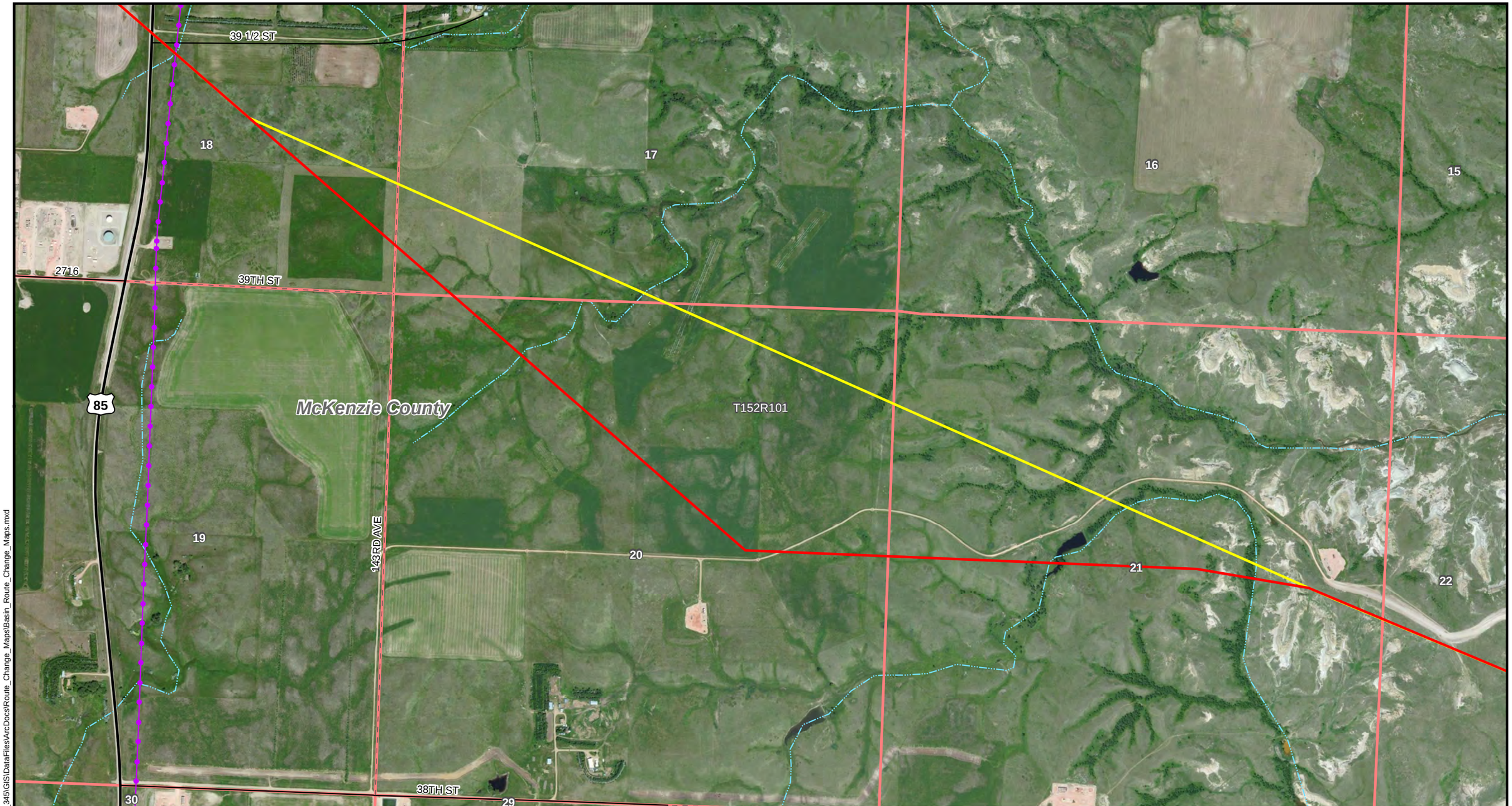

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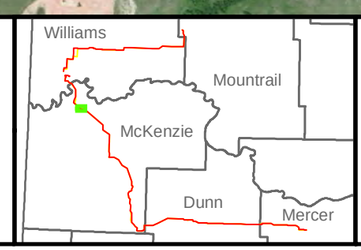

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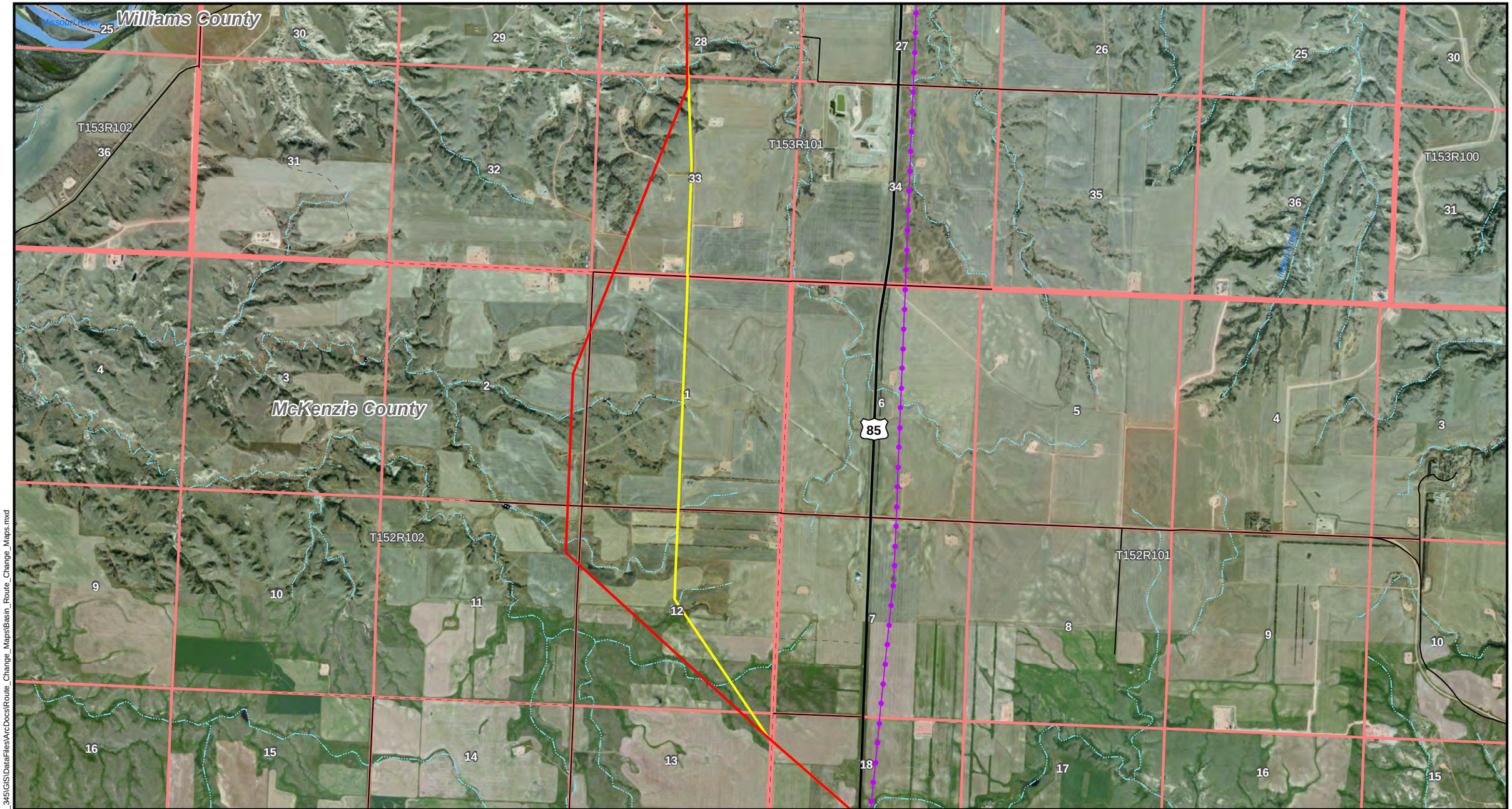

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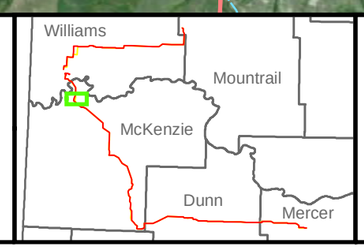

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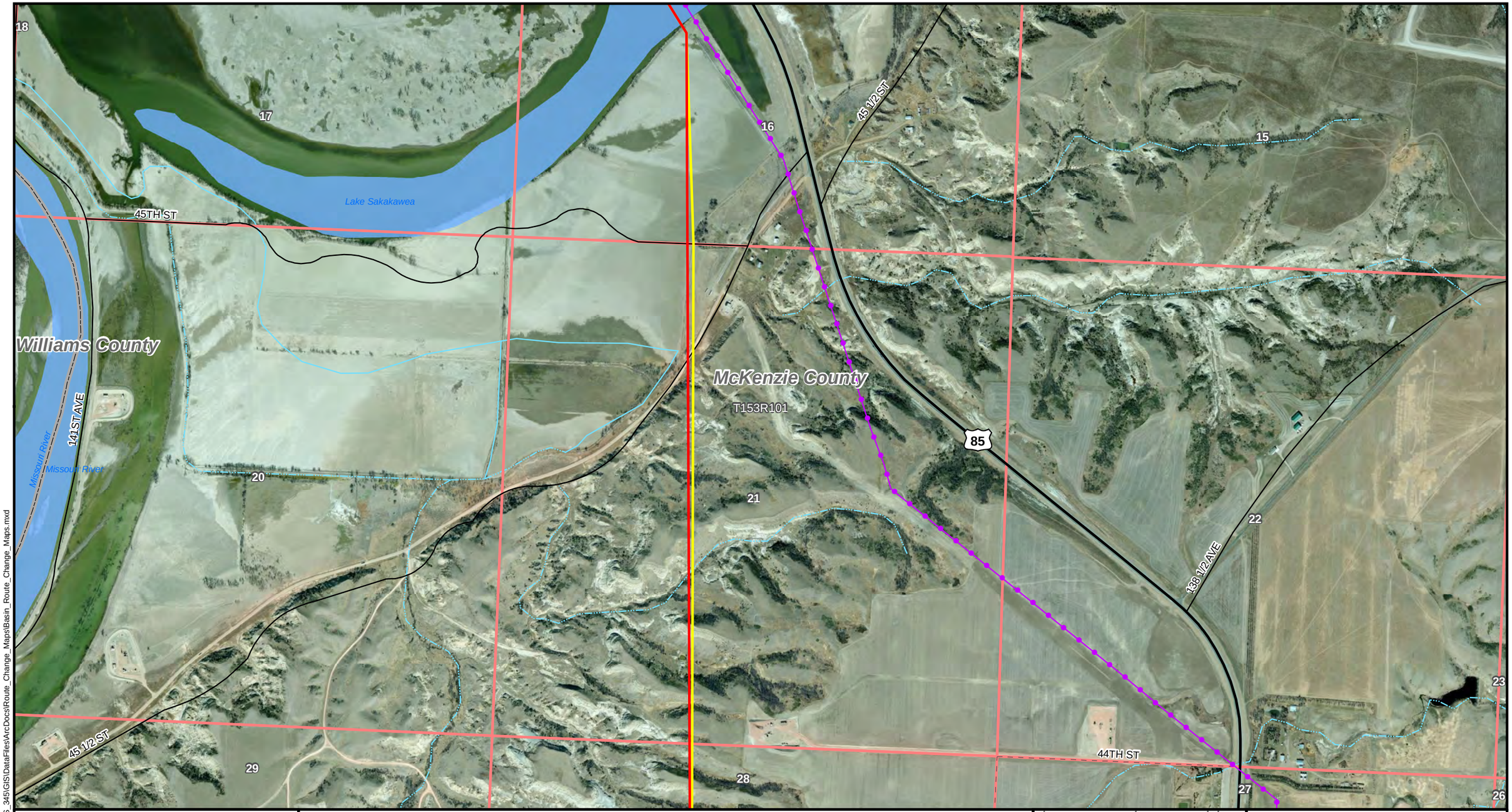

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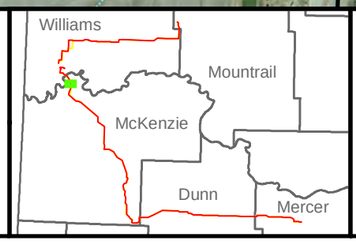

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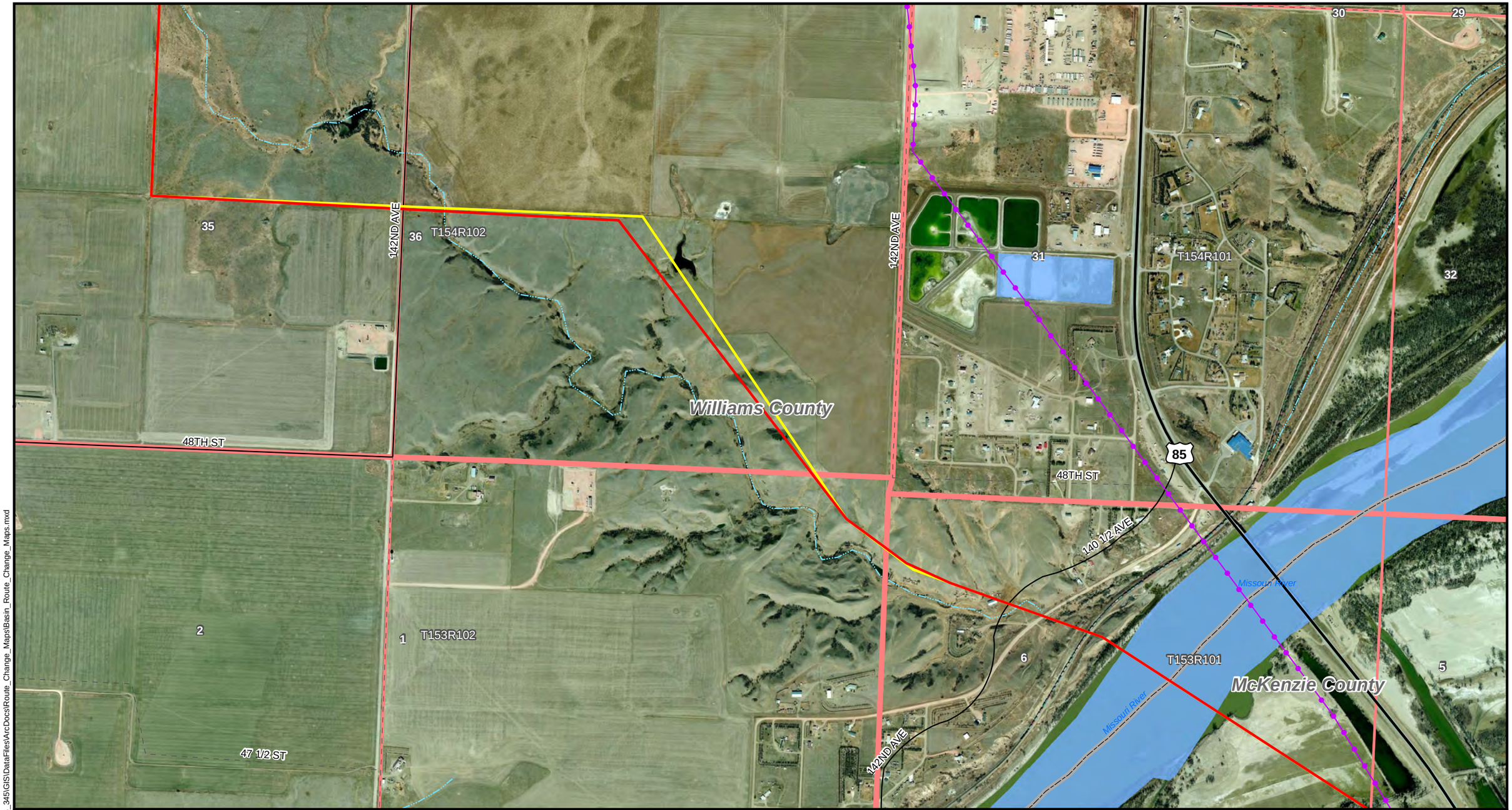

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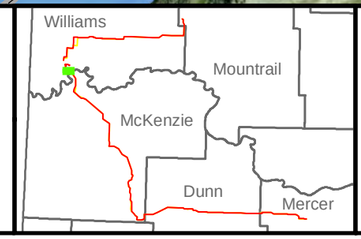

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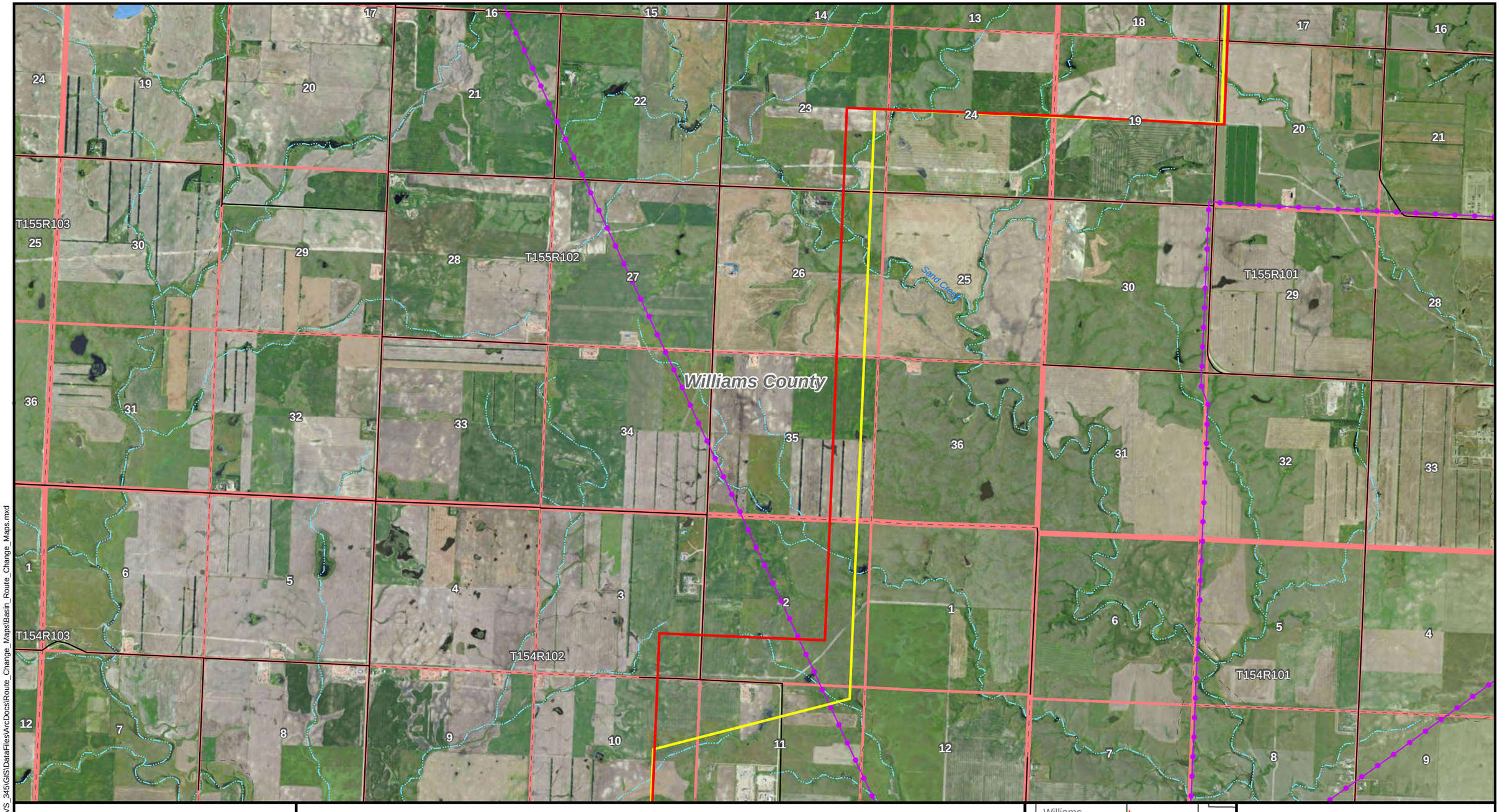

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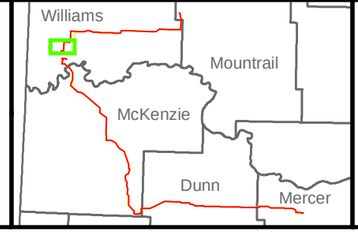

Basin Electric Power Cooperative
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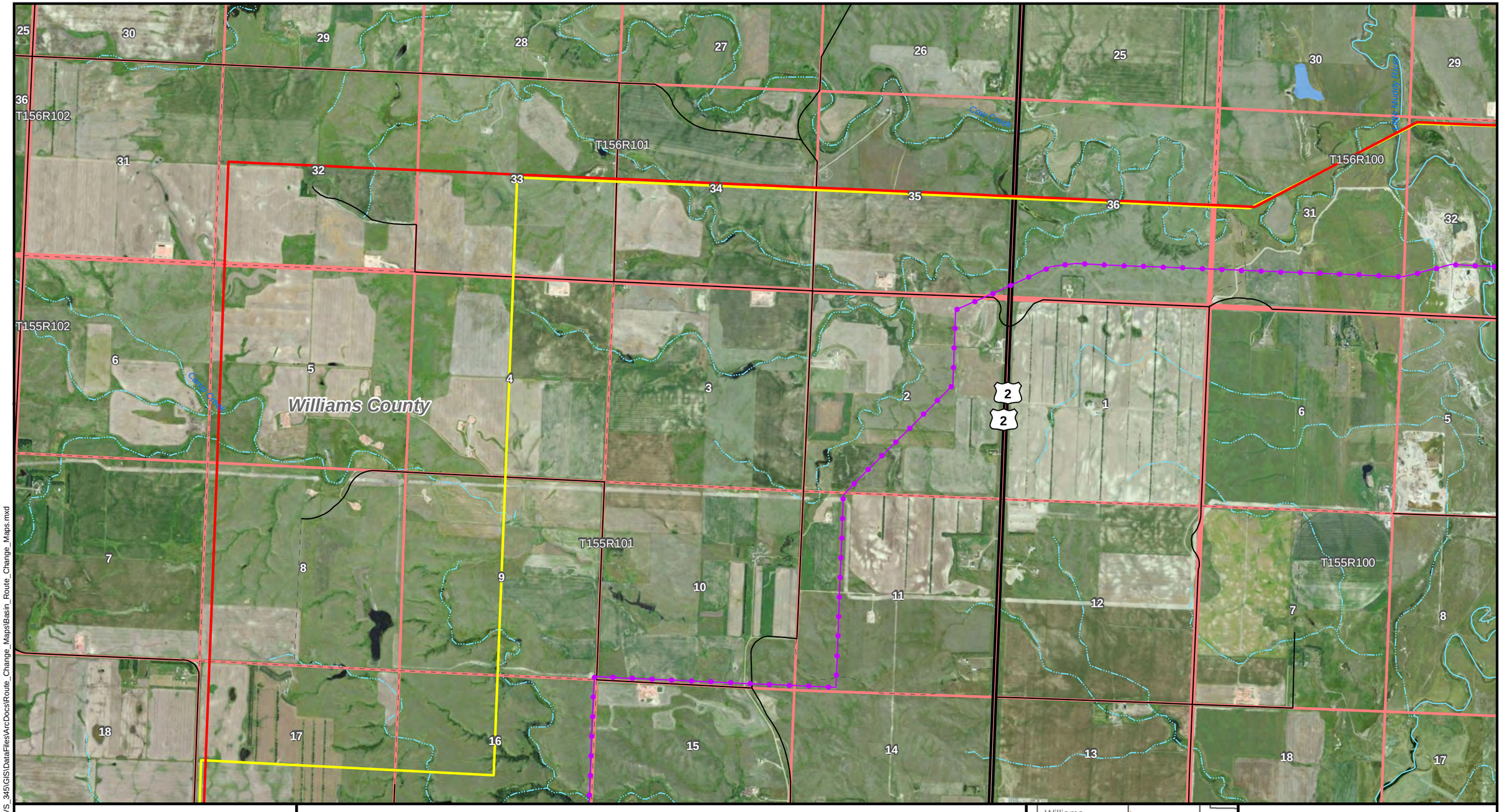

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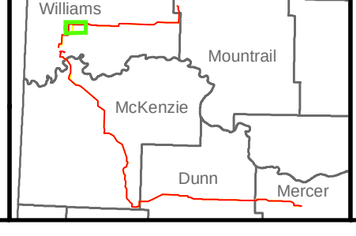

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Source: Bing Aerial Maps; North Dakota GIS; Burns & McDonnell.

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Existing Neset 230-kV Substation

Proposed Tande 345-kV Substation

19 20 21 22

68TH ST

67 1/2 ST

Mountrail County

T157R94

101ST AVE

30 29 28 27

311O

Painted Canyon

0 500 1,000
Feet

NORTH

LEGEND

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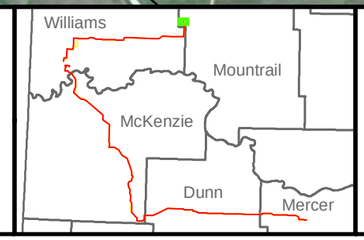

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Source: Bing Aerial Maps; North Dakota GIS; Burns & McDonnell.

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In addition to route changes, the new Gumbo Creek Substation is proposed for Dunn County. The 12-acre Gumbo Creek Substation, located in Section 31 of T146N R95W, would connect to the proposed 345-kV line.

Finally, a 2.5-mile segment of the line in Mercer County would be constructed to accommodate a future double-circuit with the existing AVS to Charlie Creek 345-kV line to accommodate the Coteau mine plan. This segment is located in Sections 15 and 16 of T145N R88W.

The maps included with this amendment have been updated to indicate the above changes.

Basin Electric is a regional wholesale electric generation and transmission cooperative owned and controlled by the member cooperatives it serves. It was created in May 1961 as a result of regional efforts by electric distribution cooperatives and the Rural Electrification Administration, now the Rural Utilities Service (RUS). Basin Electric serves approximately 2.8 million customers in 540,000 square miles covering portions of nine states: Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming.

Within the Basin Electric service area, northwestern North Dakota is experiencing a rapid increase in development as a result of the activities associated with the extraction of oil from the Bakken shale. In North Dakota, development of Bakken oil shale extraction activities is currently concentrated in Dunn, McKenzie, Mountrail and Williams Counties. The level of development that has occurred and is planned for the future will require numerous increases in infrastructure throughout the region, including an increase in electrical transmission capacity and reliability. Through studies of power supply for the region and the upper Midwest (IS, 2011), it was determined that a new 345-kilovolt (kV) transmission line and associated substation upgrades are needed by 2016 in order to serve the needs of northwestern North Dakota.

Basin Electric proposes to construct, operate, and maintain approximately 199 miles of new 345-kV transmission line, three new 345-kV substations (Judson Substation west of Williston, Tande Substation southeast of Tioga, and Gumbo Creek Substation northwest of Killdeer), and 1 mile of additional 230-kV transmission line to connect the 345-kV line into the existing system. Starting from the AVS electric generation facility located near Beulah, North Dakota, the new 345-kV transmission line will extend west and connect with Basin Electric's existing Charlie Creek Substation near Grassy Butte, turn north and connect with Basin Electric's proposed Judson Substation west of Williston, and terminate at Basin Electric's proposed Tande Substation. An additional 230-kV line is required between the new Tande

Substation and Basin Electric's existing Neset 230-kV Substation near Tioga. The new 345-kV and 230-kV transmission lines will include new construction in new right-of-way (ROW). Basin Electric's member system Mountrail-Williams Electric Cooperative's (MWEC) 115-kV Stateline Project was incorporated into approximately 31 miles of the Project in order to share common right-of way to minimize impacts to the existing environment. The overall Project area encompasses parts of Mercer, Dunn, McKenzie, Williams, and Mountrail Counties in North Dakota.

The Project will require upgrades to Basin Electric's existing facilities at the AVS 345-kV Substation, Charlie Creek 345-kV Substation, and Neset 230-kV Substation. These upgrades are all within the existing substations' fence lines. No expansion of physical area is required.

1.1 COMPLIANCE WITH THE ENERGY CONVERSION AND TRANSMISSION FACILITY SITING ACT

No change to section.

1.1.1 Rural Utilities Service and Western Area Power Administration and U.S. Forest Service Planning Documents

Due to revised load forecasts in the region, Basin Electric has modified the proposed Project to include an additional segment of 345-kV line from near Killdeer to south of Williston, which previously was an alternative in the Draft Environmental Impact Statement. As a result of this change, a Supplemental Draft Environmental Impact Statement is being prepared and will be issued in September 2013. A Record of Decision for the revised Project is anticipated in early 2014.

1.1.2 Letter of Intent

No change to section.

1.1.3 Certificate of Corridor Compatibility

No change to section.

Table 1.1-1: Certificate of Corridor Compatibility Completion Checklist

State Authority	Description	Section
Chapter 49-22	**Commission Guidelines: Energy Conversion and Transmission Facility Siting**	**1.1**
Section A	**Description**	**1.2, 4.2**
1.	Type: Describe the type of transmission facility addressed in this application. The description shall include the purpose of the facility and the technology to be employed.	1.0, 1.2, 2.1, 4.2.1
2.	Product: Describe the type, source, and final destination of the product to be transmitted by the proposed facility.	1.2.2
3.	Size and Design:	4.0
3.a.	Provide a description of the size and design of the Electrical facility including, but not limited to, the following:	4.2.1, 4.2.2, 4.2.3
3.a.1.	Width of right of way;	4.2.1
3.a.2.	Estimated span lengths;	4.2.1
3.a.3.	Anticipated type of structure;	4.2.1
3.a.4.	Approximate length of facility	1.0, 1.2, 4.1
3.a.5.	Voltage; and	4.2.1
3.a.6.	The requirement for a general location of any new associated facilities.	4.2.2
3.b.	Provide a description of the size and design of the pipeline facility including, but not limited to, the following:	N/A
4.	Time Schedule: Provide the anticipated time schedule for the accomplishment of the following events:	1.3
4.a.	Certificate of Corridor Compatibility;	1.3
4.b.	Route Application;	1.3
4.c.	Route Permit;	1.3
4.d.	Construction start date;	1.3
4.e.	Construction complete; and	1.3
4.f.	In-service date.	1.3
Section B	**Studies**	
	Provide a copy of any evaluative studies or assessments of the environmental impact of the proposed facility submitted to any federal, regional, state or local agency.	Appendices

State Authority	Description	Section
Section C	**Need for Facility**	**2.0**
1.	An analysis of the need for the proposed facility based on present and projected demand for the product to be transmitted by the facility, including the most recent system studies supporting the analysis of the need.	2.1
2.	A description of any feasible alternative methods of serving the need.	2.2
3.	A statement justifying any deviations from the most recent Ten-Year Plan which the proposed facility may present.	2.3
Section D	**Location**	**Figures, 4.1**
1.	Select a study area, which includes the proposed corridor, of sufficient width to enable the Commission to evaluate the factors addressed in Section 49-22-09, NDCC	1.2.1
2.	Identify and map the criteria that led to the proposed corridor location within the study area.	Figures, 1.2.1, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 Volume II
3.	Discuss the relative value of each criteria and how the proposed corridor location was selected giving consideration to all criteria.	1.2.1, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6
4.	The criteria to be evaluated shall include at a minimum all of the following which are within the study area:	3.0
4.a.	Exclusion areas;	3.1
4.b.	Avoidance areas;	3.2
4.c.	Selection criteria;	3.3
4.d.	Policy criteria;	3.4
4.e.	Design and construction limitations; and	3.5
4.f.	Economic considerations.	3.6
5.	Discuss the general mitigative measures that will be taken to minimize adverse impacts which result from a route location in the proposed corridor.	5.1.3, 5.2.3, 5.3.3, 5.4.3, 5.5.3, 5.6.3, 5.7.3, 5.8.3, 5.9.3, 5.10.3, 5.11.3, 5.12.3, 5.13.3
6.	List the qualifications of the people in the various disciplines that contributed to the corridor location study	9.0
7.	Maps	Figures and Volume II

State Authority	Description	Section
7.a.	Map the criteria within the study area showing the proposed corridor. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	Volume II
7.b.	Furnish one set of Mylar maps, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the study area, but not the proposed facility location.	Figures. GIS-based maps are included with this Application in lieu of Mylar maps.
Chapter 49-22-09	**Factors to be considered in evaluating applications and designation of sites, corridors, and routes.**	**8.0**
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	8.1
2.	The effects of new energy conversion and transmission technologies and systems designated to minimize adverse environmental effects.	8.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility.	8.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	8.4
5.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	8.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
7.	The direct and indirect economic impacts of the proposed facility.	8.7
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	8.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9

State Authority	Description	Section
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species.	8.10
11.	Problems raised by federal agencies, other state agencies, and local entities.	8.11

1.1.4 Route Permit

No change to section.

Table 1.1-2: Route Permit Completion Checklist

State Authority	Description	Section
Chapter 49-22	**Commission Guidelines: Energy Conversion and Transmission Facility Siting**	**1.1**
Section A	**Description**	**1.2, 4.2**
1.	Type: Describe the type of transmission facility proposed.	1.0, 1.2, 4.2
2.	Product: Describe the product or products to be transmitted.	1.2.2
3.	Size and Design: Provide a general description of the proposed size and design, and any alternate size or design, which was considered. Provide one (1) copy of the design data report, separate from the application, for the proposed facility and any associated facilities.	4.0, Appendix E
4.	Time Schedule: Provide the anticipated time schedule for the accomplishment of major events including, at a minimum, the following:	1.3
4.a.	Route Permit;	1.3
4.b.	Right-of-way acquisition complete;	1.3
4.c.	Construction start date;	1.3
4.d.	Construction complete;	1.3
4.e.	Test operations; and	1.3
4.f.	In-service date.	1.3

State Authority	Description	Section
Section B	**Location**	Figures, 4.0
1.	Discuss the utility's policies and commitments to limit the environmental impacts of its facilities, including copies of board resolutions and management directives.	3.4
2.	Discuss the factors listed in Section 49-22-09, NDCC to aid the Commission's evaluation of the proposed route.	8.0
2.a.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	8.1
2.b.	The effects of new energy conversion and transmission technologies and systems designated to minimize adverse environmental effects.	8.2
2.c.	The potential for beneficial uses of waste energy from a proposed energy conversion facility.	8.3
2.d.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	8.4
2.e.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	8.5
2.f.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
2.g.	The direct and indirect economic impacts of the proposed facility.	8.7
2.h.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	8.8
2.i.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9
2.j.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species.	8.10
2.k.	Problems raised by federal agencies, other state agencies, and local entities.	8.11

State Authority	Description	Section
3.	Identify and map the criteria that led to the proposed route location within the designated corridor.	Figures, 1.2.1, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, Volume II
4.	Discuss in detail the relative value of each criteria and how the location, construction, and operation of the facility will affect each criteria.	1.2.1, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6
5.	The criteria to be evaluated shall include at a minimum all of the following which are within the designated corridor:	3.0
5.a.	Exclusion areas;	3.1
5.b.	Avoidance areas;	3.2
5.c.	Selection criteria;	3.3
5.d.	Policy criteria;	3.4
5.e.	Design and construction limitations; and	3.5
5.f.	Economic considerations.	3.6
6.	Discuss the mitigation measures that will be taken to minimize adverse impacts which result from the location, construction, and operation of the facility.	5.1.3, 5.2.3, 5.3.3, 5.4.3, 5.5.3, 5.6.3, 5.7.3, 5.8.3, 5.9.3, 5.10.3, 5.11.3, 5.12.3, 5.13.3
7.	List the qualifications of the people in the various disciplines that contributed to the facility route location study	9.0
8.	Maps	Figures
8.a.	Map the criteria within the designated corridor showing the proposed route and location of any new associated facilities. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	Volume II
8.b.	Furnish one (1) set of Mylar maps, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the designated corridor, but not the proposed route or location of any new associated facilities.	Figures. GIS-based maps are included with this Application in lieu of Mylar maps
8.c.	Furnish one (1) set of uncontrolled 9x9 inch stereo-pair aerial photographs, separate from the application, with acceptable resolution showing the designated corridor, proposed route and location of any new associated facilities, and Section, Township and Range numbers, at a scale	Figures. GIS-based maps are included with this Application.

State Authority	Description	Section
	of 1 inch = 2000 feet, together with a flight map at a scale of ½ inch = 1 mile showing each flight line and the beginning and ending photo number of each flight line. Photo mosaic strip maps will also be acceptable. If the applicant can demonstrate that because of the limited size and scope of the project, aerial photographs will not be practical, this requirement may be waived.	

1.2 PROJECT SUMMARY

The revised Project consists of 199 miles of new 345-kV electric transmission line connecting the existing AVS 345-kV Substation to the proposed Tande 345-kV Substation, with a connection to the existing Charlie Creek 345-kV Substation, proposed Gumbo Creek 345-kV Substation, and proposed Judson 345-kV Substation along the route (Figure 1.2-1). The Project also includes a 0.9-mile 230-kV transmission line connection from the proposed Tande Substation to the existing 230-kV Neset Substation. A 0.2 mile double circuit 345/345-kV line will interconnect the AVS to Charlie Creek segment with the Gumbo Creek Substation. An approximately 31-mile portion of the 345-kV line between the proposed Judson and Tande Substations will be double-circuited with a Mountrail Williams Electric Cooperative (MWEC) 115-kV line associated with other regional improvement projects. A 2.5-mile section of the proposed line west of AVS in Mercer County would eventually be double-circuited when a nearby 345-kV line will be required to be relocated due to mining activity.. The remaining portions of the 345-kV line will be single-circuit. New ROW will be required for the 199 miles of new 345-kV line from the AVS to Tande Substations and the 0.9 mile of new 230-kV line from the Tande to Neset Substations.

The proposed 345-kV, single-circuit transmission line will be constructed using single-pole or H-frame self-supporting structures. The 345/115-kV and 345/345-kV double-circuit transmission line segments will be constructed using single-pole self-supporting structures. All 345-kV segments will be constructed within a 150-foot-wide ROW. The single-circuit 230-kV line will be constructed using single-pole, self-supporting structures within a 100-foot ROW. The Project will require construction of three new substations (Gumbo Creek, Judson, and Tande) and upgrades to the existing substations (AVS, Charlie Creek, and Neset).

1.2.1 Study Area, Project Corridor, and Route Development Summary

No changes to section. Figure 1.2-1 has been updated to include the revised route.

NORTH

0 11.5
Miles

Neset
Tande
Judson
Williston
Williams
Mountrail
Renville
McHenry
Ward
McKenzie
Fort Berthold
McLean
Dunn
Gumbo Creek
Charlie Creek
Antelope Valley
Mercer
Oliver
Golden Valley
Billings

CANADA
Montana
North Dakota
South Dakota

LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- Army Corps of Engineers
- National or State Park
- National Wildlife Refuge
- National Grassland
- Tribal Lands
- BLM Lands
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- DGC Pipeline
- Scenic Byway

Existing Transmission Lines

- 345-kV
- 230-kV and Below

Burns & McDonnell SINCE 1898

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Figure 1.2-1
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Overall Proposed Project Area and
Proposed Corridor/Route

R:\Basin 61495_AVS_345\GIS\DataFiles\ArcDocs\PSC- Chapter 1 Figures\Figure 1-2-1 Revised July 2013.mxd 7/18/2013

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 18, 2013

1.2.2 Product

No change to section.

1.3 PROJECT SCHEDULE

No change to the AVS Substation to Judson Substation schedule. The Judson Substation to Tande Substation will be constructed when the load forecasts indicate the need, but no later than an in-service date of the end of 2017.

* * * * *

2.0 NEED FOR FACILITY

2.1 NEEDS ANALYSIS

No change to section.

2.2 ALTERNATIVES

Route adjustments have been developed as discussed in Table 1.0-1. These adjustments are a result of efforts to accommodate requests from landowners, avoid environmental features or improve construction suitability. The original alternative corridors remain unchanged.

2.2.1 System Upgrades

No change to section.

2.2.2 Additional 115-kV Lines

No change to section.

2.2.3 Additional 345-kV Lines

No change to section.

2.2.4 No Action Alternative

No change to section.

2.2.5 Recommended System Alternatives

Based on the IS study, construction of new 345-kV transmission line facilities will be required to meet the projected load for the eastern Montana and western/central North Dakota areas, including the identified Williston Load Pocket. Construction of a 345-kV line from AVS to Charlie Creek, Williston and Tioga areas is the only alternative identified capable of meeting the long-term system load capacity and reliability criteria. There was initial discussion of delivering power to the Judson/Williston/Neset Substations without a Charlie Creek 345-kV Substation connection. Future conditions evaluated with and without a Charlie Creek 345-kV Substation connection were found to maintain system reliability requirements and serve projected load forecasted through 2020. However, the future condition including the Charlie Creek 345-kV Substation connection provided a more robust support of the Western IS system and better supports future planning for growth in western North Dakota. Similarly, the Gumbo Creek Substation near Killdeer will add additional support of the IS system for load delivery to member systems and has been recommended in this amendment. In addition, a 2.5 mile 345/345-kV double-

circuit transmission line segment is recommended in Mercer County to accommodate Coteau's mining plan. With these amendments, it is determined that the construction and operation of the AVS-to-Gumbo Creek-to-Charlie Creek-to-Judson-to-Tande-to-Neset by a 345-kV transmission line, with associated substation interconnections, will better satisfy the Project's Purpose and Need .

2.3 NEW GENERATION

In order to meet the need for voltage support to areas in northwestern North Dakota, Basin Electric is currently constructing two simple-cycle combustion turbine projects. The need for these projects was identified as areas for concern with the current load demands and the existing transmission infrastructure. The two projects are the Pioneer Generating Station (PGS) and the Lonesome Creek Station (LCS).

PGS Phase I is a single LM 6000 PC SPRINT simple-cycle combustion turbine with a nominal output rating of 45 MW with a clutch attached to isolate the combustion turbine from the generator set. With the clutch engaged, the generator acts similar to a synchronous condenser, thus providing much needed voltage support to the local transmission system during times that generation is not required. Construction on the PGS Phase I began on June 4, 2012. PGS's electrical interconnection with the transmission grid is through a short 115-kV line to MWEC's Stateline I Substation. Commercial operation of PGS Phase I is scheduled for August 2014.

LCS Phase I is also a single LM 6000 PC SPRINT simple-cycle combustion turbine with a nominal output rating of 45 MW with a clutch attached to isolate the combustion turbine from the generator set. With the clutch engaged, the generator acts similar to a synchronous condenser, thus providing much needed voltage support to the local transmission system during times that generation is not required. Construction on the LCS Phase I began on July 3, 2012. LCS's electrical interconnection with the transmission grid is through a short 115-kV line to McKenzie Electric Cooperative's (MEC) Hay Butte Substation. Commercial operation of LCS Phase I is scheduled for August 2013.

Both PGS and LCS will undergo a Phase II project where two additional 45-MW simple-cycle combustion turbines will be installed at each facility. PGS Phase II Project received PSC Siting Certificate in March 2013 and is currently under construction. LCS Phase II siting application is anticipated to be submitted to the ND PSC in the 3rd quarter 2013. Commercial operation of PGS Phase II is expected in end of 2013. A Letter of Intent was filed with the Commission in December 2012 for LCS Phase II. Commercial operation of LCS Phase II is expected by the end of 2014.

2.4 TEN-YEAR PLAN

No change to section

* * * * *

3.0 TRANSMISSION FACILITY CORRIDOR AND ROUTE CRITERIA

No change to section.

3.1 EXCLUSION AREAS

No change to section.

3.2 AVOIDANCE AREAS

Per Section 69-06-08-02(2), the geographical areas listed in Table 3.2-1 shall not be considered in the routing of a transmission facility unless the applicant shows that under the circumstances there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the Commission may consider, among other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative routes. Avoidance areas are mapped for the Project Corridor/Route in Volume II.

Table 3.2-1 Avoidance Areas

Avoidance Area	Present within Project Corridor/Route	Proposed Buffer	Section Addressed
Designated or registered national: historic districts; wildlife areas; wild, scenic or recreational rivers; wildlife refuges; and grasslands	Approximately 152.9 acres of the LMNG within the Corridor/Route	The Corridor/Route does not cross any designated Roadless Areas within the Grassland; the Corridor/Route will be located in a utility corridor along U.S. Highway 85 that is compatible with the USFS land management plan for the area; Basin Electric has submitted a Special Use Permit Application to USFS for the Project	5.2, 5.8, 5.9

Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands	Approximately 57.9 acres of the Lewis and Clark Wildlife Management Area within the Corridor/Route Corridor/Route crosses the Little Missouri River, a designated State Scenic River	Direct impacts to the WMA include acquisition of the ROW and potential clearing of 6.0 acres of woodland; An easement or permit to cross public land will be acquired from USACE for the Project; vegetation removal and replacement will be conducted according to requirements in the Public Service Commission's Woody Species Replacement Plan (Appendix V)	5.2, 5.9
Historical resources which are not specifically designated as exclusion or avoidance areas	Based on the Class I cultural resources investigation conducted for the Project, known sites have been avoided; a portion of the Corridor/Route has been surveyed at the Class III level. The rest of the Corridor/Route will be surveyed prior to construction and any cultural resource sites will be avoided.	Section 106 consultation has been initiated for the Project and will address the need for Class II and/or Class III cultural resource inventories Known archaeological sites within the Corridor/Route will be spanned and protected from disturbance during construction	5.8
Areas which are geologically unstable	Corridor/Route crosses approximately 5,597 feet of terrain (19.4 acres within the Corridor/Route) where landslides have occurred previously Corridor/Route crosses approximately 5,070 feet of terrain with a slope greater than 10 percent (16.9 acres within the Corridor/Route)	A majority of the identified landslide areas will be spanned by the transmission line, with no structures being placed within susceptible landslide areas; geotechnical assessments will be conducted at structure locations to minimize the potential development of landslides in susceptible areas during construction	5.11

Within 500 feet of a residence, school, or place of business	3 residences within 500 feet of the Corridor/Route No schools or business within 500 feet of the Corridor/Route	The transmission line was routed to minimize impacts to residences, and the Project will not result in any displacement of residences Basin Electric has obtained waivers of the 500-foot setback requirement for the 3 residences	5.1
Reservoirs and municipal water supplies	Not present within Corridor/Route	No impacts are anticipated and no buffer is proposed	5.12
Water sources for organized rural water districts	Not present within Corridor/Route	No impacts are anticipated and no buffer is proposed	5.12
Irrigated land.	Not present within the Corridor/Route	No impacts are anticipated and no buffer is proposed	5.2, 5.10
Areas of recreational significance which are not designated as exclusion areas	Corridor/Route crosses the Lewis and Clark National Historic Trail at the Missouri River Corridor/Route crosses approximately 19 North Dakota School Trust Land parcels, for a total of approximately 118.9 acres within the Corridor/Route	The crossing of the Trail at the Missouri River will occur adjacent to an existing transmission line and U.S. Highway 85; access to the Trail will be maintained and recreational activity may continue Basin Electric will obtain an easement from the North Dakota Department of Trust Lands to cross these parcels and is coordinating with the Department to ensure that the Project does not impact the ability to continue to develop the Trust Lands per their planning.	5.2, 5.7, 5.9

3.3 SELECTION CRITERIA

Per Section 69-06-08-02(3), a corridor or route shall be designated only when it is demonstrated to the Commission by the applicant that any significant adverse effects resulting from the location, construction, and maintenance of the facility as they relate to the following, will be at an acceptable minimum, or that those effects will be managed and maintained at an acceptable minimum (Table 3.3-1). Selection criteria are mapped for the Project Corridor/Route in Volume II.

Table 3.3-1 Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
Agricultural production	1,389 acres of cultivated cropland and 153.6 acres of pasture/hay land within the Corridor/Route; Current agricultural production will be maintained for most of the Corridor/Route; The only land unavailable for agriculture will be the area occupied by structures for a total of 1.03 acres (0.0009-acre per structure); There will be approximately 1,167 structures for the Corridor/Route. Landowners will be compensated for crop and forage loss that occurs as a result of construction and maintenance activities, and any damage to soils will be redressed. At the proposed Gumbo Creek, Judson and Tande substation sites, the agricultural land within the approximately 12 acres at each site will be permanently converted to utility use.	5.2, 5.10
Family farms and ranches	No family farms will be displaced due to construction of the Corridor/Route. Basin Electric will work with landowners to minimize impacts to their land and agricultural operations.	5.2, 5.10
Land which the owner can demonstrate has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation	No irrigated land was identified within or adjacent to the Corridor/Route. No owner has expressed concerns related to economically suitable irrigation on their land.	5.2, 5.10

Surface drainage patterns and ground water flow patterns	No impacts to surface drainage patterns or groundwater flow patterns are anticipated. The Corridor/Route will cross 12 perennial waterways (including the Little Missouri River and Missouri River) and numerous intermittent streams. All stream crossings will be spanned by the Project, and no transmission structures will be placed in the streambed. All FEMA-designated floodplain areas within the Corridor/Route including the Missouri River floodplain will be spanned, and no impacts to these areas are expected during construction or operation of the Project. Considerable area at the Missouri River crossing is subject to regular flooding. However, very little is designated as floodplain on the FEMA Federal Insurance Rate Maps (FIRM) which designate floodways and 100 and 500 year flood areas. BMPs will be utilized to prevent soil erosion and sedimentation.	5.12
Noise-sensitive land uses	3 sensitive noise receptors (all residences) will be located within 500 feet of the Corridor/Route. These receptors will potentially be exposed to temporary construction-related noise impacts. Noise generated from the operation of the transmission line (corona effect) is expected to be negligible. None of the residences are located close enough to the Corridor/Route to experience any changes in noise levels during operation of the Project. 1 residence is located within 800 feet of the proposed Tande Substation that could experience an increase in sound levels during operation of the Project; however, HUD site acceptability noise standards will not be exceeded	5.6
The visual effect on the adjacent area	Project will introduce a new man-made feature into the viewsheds of TRNP, LMNG, Lewis and Clark National Historic Trail, and Killdeer Mountain Four Bears Scenic Byway (ND State Highway 22). Project will not adversely affect the scenic integrity of these resources because existing transmission lines, roadways, communications towers, and oil and gas development facilities are already present in the visual landscape where the Corridor/Route crosses these resources. Majority of LMNG tracts in Project area have a scenic integrity level (SIL) of low.	5.7

	Change in the visual characteristics and viewshed within Project area and for residents located near the transmission line (3 residences within 500 feet)	
Extractive and storage resources	8 oil and gas wells identified within 500 feet of the Corridor/Route; Project will not directly affect any wells or drill rigs since the Corridor/Route has been designed to avoid these areas, span collector systems, and provide sufficient clearance for well maintenance and operation	5.11
Wetlands, woodlands, and wooded areas	No effect. All 26.2 acres of wetland within the Corridor/Route will be spanned. No structures will be placed in wetlands and no wetland vegetation will be cleared. Approximately 114.8 acres of woodland potentially removed within the Corridor/Route, depending on slope.	5.13
Radio and television reception, and other communication or electronic control facilities	No impacts to radio and television reception, and other communication or electronic control facilities are expected 6 AM and FM towers located within 6 miles of Corridor/Route (nearest tower is located approximately 275 feet from Corridor/Route), none within Corridor/Route.	5.4 5.3
Human health and safety	During construction, Project may add an additional temporary burden on public health and safety services such as police, fire, ambulance, and hospital services. Basin Electric conducted an electric and magnetic field (EMF) analysis for the Project. Results of the analysis indicate that the maximum predicted EMF value at the edge of the Corridor/Route will be far less than recommended levels identified for protection of the general public. Therefore, no adverse effects from Project-induced electric fields will occur. Accidents involving direct contact with energized transmission line will be avoided by transmission line design features.	5.4

Plant life	Approximately 114.8 acres of woodland potentially removed within the Corridor/Route, depending on slope. One acre of vegetation permanently removed within Corridor/Route at structure locations. Potential introduction of noxious weeds within Corridor/Route to be avoided by weed mitigation measures. Removal of all vegetation within the fenced area of the proposed Judson and Tande substations (approx. 12 acres per substation)	5.13

3.4 POLICY CRITERIA

No change to section.

3.5 DESIGN AND CONSTRUCTION LIMITATIONS

No change to section.

3.6 ECONOMIC CONSIDERATIONS

No change to section.

* * * * *

4.0 ENGINEERING AND OPERATIONAL DESIGN

Engineering design data is presented in Appendix E, and the plan and profiles are provided in Appendix G. A legal description for the Project Corridor/Route is provided in Appendix H.

4.1 GENERAL CORRIDOR/ROUTE DESCRIPTION

AVS to Proposed Gumbo Creek Substation

The route proceeds west out of the AVS Substation in Mercer County paralleling an existing Basin Electric 345-kV transmission line for 2.8 miles before turning north and extending for approximately 0.8 mile. The route then crosses another Basin Electric 345-kV transmission line before heading in a northwest direction for approximately 1.5 miles. From here, the route travels approximately 8 miles due west, primarily along a quarter-section line. The route then heads in a northwest direction for approximately 1 mile, and then turns due west for approximately 3.4 miles along a section line, paralleling the south side of County Road 2. The route then heads south for 0.5 mile, then turns west and travels 0.6 mile, entering Dunn County. The route continues due west for 6 miles before crossing ND State Highway 8.

The route continues west along the quarter-section line for another 16.5 miles before turning to the northwest and extending for approximately 1.2 miles, then heading due west for 0.8 mile, and then northwest for 0.6 mile to another quarter-section line. The route then generally proceeds west along the quarter-section line for 3.1 miles and crosses ND State Highway 22 before angling to the northwest for approximately 0.5 mile parallel to ND State Highway 22. The route then continues to the west for approximately 1.5 miles, where a 0.2-mile double circuit 345/345-kV line segment interconnects in and out of the proposed Gumbo Creek Substation, located approximately 5 miles northwest of the town of Killdeer**.**

Proposed Gumbo Creek Substation to Charlie Creek Substation

Leaving the Gumbo Creek Substation southwardly for 0.2 miles, the route heads west for approximately 4.1 miles and then turns southwest for approximately 6 miles before turning back to the west. The route continues west and parallels a section line for 2.3 miles and then shifts slightly to the southwest for approximately one mile as it crosses into McKenzie County. Once

entering McKenzie County, the route proceeds south for 1.6 miles while crossing an existing Western 115-kV transmission line and ND State Highway 200. The route proceeds southwest for 0.8 mile and west for 1.8 miles along a section line, while generally paralleling the south side of ND State Highway 200 and an existing Basin Electric 345-kV transmission line as the route enters Basin Electric's Charlie Creek Substation.

Charlie Creek Substation to Proposed Judson Substation

Upon exiting the Charlie Creek Substation, the route crosses ND State Highway 200 and extends to the north for approximately one mile before proceeding generally in a northwest direction for approximately 3 miles. The route then extends generally to the north and proceeds for approximately 2.4 miles, then heads northwest for approximately 0.3 mile. The route continues to the north for 0.8 mile before continuing to the northwest for 0.9 mile. The route then travels to the north for 2 miles and turns to the northwest for an additional 1 mile. The route then proceeds to the north for 1.5 miles before turning to the northwest for approximately 1.8 miles. The route then parallels the east side of U.S. Highway 85 for approximately 1.1 miles. The route then extends to the east-northeast for 1.1 miles before turning and traveling northeast for 1.2 miles. The route continues north for approximately 0.4 mile, then northwest for approximately 0.4 mile. The route then extends north for approximately 1.5 miles, crossing the Little Missouri River. The route then generally extends to the northwest for approximately 6.7 miles before crossing U.S. Highway 85 and a Western 230-kV transmission line. The route continues in a general northwest direction for another 4.7 miles before turning west. The route continues west for approximately 1.8 miles along a quarter-section line before turning north. The route extends to the north generally along a quarter-section line for 8.3 miles, crossing a Western 230-kV transmission line and U.S. Highway 85 approximately five miles west of Watford City. The route proceeds to the northwest for 3 miles and then to the north for 1.8 miles. The route then extends to the northwest for approximately 8.9 miles, extending west another 1 mile, and then extending northwest again for approximately 1.6 miles before crossing U.S. Highway 85 and a Western 230-kV transmission line. From here, the route continues in a northwesterly direction for approximately 1.9 miles and then extends north for another 0.9 mile. The route then proceeds northeast for approximately 1.5 miles and then extends north for 2.5 miles. The route then parallels a Western 230-kV transmission line located next to U.S. Highway 85 to the

northwest for approximately 2.4 miles. The route then crosses the Missouri River and enters Williams County shortly after leaving the Western 230-kV transmission corridor and proceeds for approximately 2 miles in a northwesterly direction. The route then turns west, extending for approximately 1 mile along a quarter-section line, then turns north and extends along another quarter-section line for approximately 1.4 miles. The route angles to the northeast for approximately 0.2 mile, then turns and crosses U.S. Highway 2 as it extends north for 0.3 mile. The route turns west for 0.3 mile before turning north for another 0.3 mile. The route then extends to the west for approximately 0.1 mile before turning north and terminating at the site of the proposed Judson Substation, located approximately 5.5 miles west of Williston.

Proposed Judson Substation to Proposed Tande Substation to Neset Substation

Upon exiting the proposed Judson Substation, the route extends approximately 0.4 mile to the northwest and then 0.2 mile due west before extending north for approximately 2.2 miles. The route proceeds east approximately 1 mile and then turns to the north for 3.2 miles. The route then extends to the east for approximately 2.3 miles before heading north for an additional 4 miles. The route extends to the east for 5.1 miles along a quarter-section line, crossing U.S. Highway 2. The route then extends to the northeast for approximately 1 mile, then to the east for 1 mile, and then to the southeast for 1.4 miles, crossing a Basin Electric 230-kV transmission line. The route then turns due east, traveling approximately 10 miles while following a quarter-section line and crossing a MDU 115-kV transmission line. The route then proceeds due north for one mile using a quarter-section line, then extends 12.9 miles to the east utilizing a quarter-section line. After proceeding approximately 1.5 miles to the northeast, the route travels another 7.8 miles to the east along a quarter-section line. The route then turns north and extends for 1.5 miles along a quarter-section line before crossing U.S. Highway 2. The route continues north for another 2.1 miles and crosses into Mountrail County. From here, the route continues north approximately 0.5 mile, then extends to the northwest for approximately 0.8 mile. The route then turns north and extends 0.5 mile to the site of the proposed Tande 345-kV Substation. After leaving the substation, the route extends north for 0.4 mile, then turns back to the west-northwest for approximately 0.5 mile before terminating at the existing Neset Substation.

4.2 DESCRIPTION OF PROPOSED FACILITIES

No change to section.

4.2.1 Transmission Line Characteristics

The proposed Project includes:

- A 345-kV transmission line connection from AVS Substation to proposed Gumbo Creek Substation, continuing to Charlie Creek Substation and proposed Judson Substation
- A 345-kV transmission line connection from proposed Judson Substation to the proposed Tande 345-kV Substation, approximately 31 miles of which will be double-circuited with a MWEC 115-kV line associated with other regional improvement projects
- A 230-kV transmission line connection from the proposed Tande 345-kV Substation to the Neset Substation

An additional structure type has been added to the project for the segment of the line that will be constructed to accommodate a future double circuit line with the existing AVS to Charlie Creek line to accommodate the Coteau mine plan and for the line interconnecting to the Gumbo Creek Substation. The proposed double-circuit 345/345-kV line will be constructed using single-pole, self-supporting structures within a 150-foot-wide ROW. This proposed structure is shown in Figure 4.2-1a, and a summary of the proposed structure characteristics is provided in Table 4.2-1.

Project construction and design will meet the requirements of the National Electrical Safety Code-Heavy Loading District, RUS design criteria (USDA, 2009a), and other applicable local or national building codes (Institute of Electrical and Electronics Engineers Standards Association, 2012). The Heavy Loading District refers to those areas (including North Dakota) that are subject to severe ice and wind loading. Minimum conductor clearance is measured at the point where conductor sag is in closest proximity to the ground. The proposed transmission line will be constructed with clearances that exceed standards set by the National Electrical Safety Code.

**Table 4.2-1: AVS-Neset 345-kV Transmission Project
Typical Structure Design Characteristics**

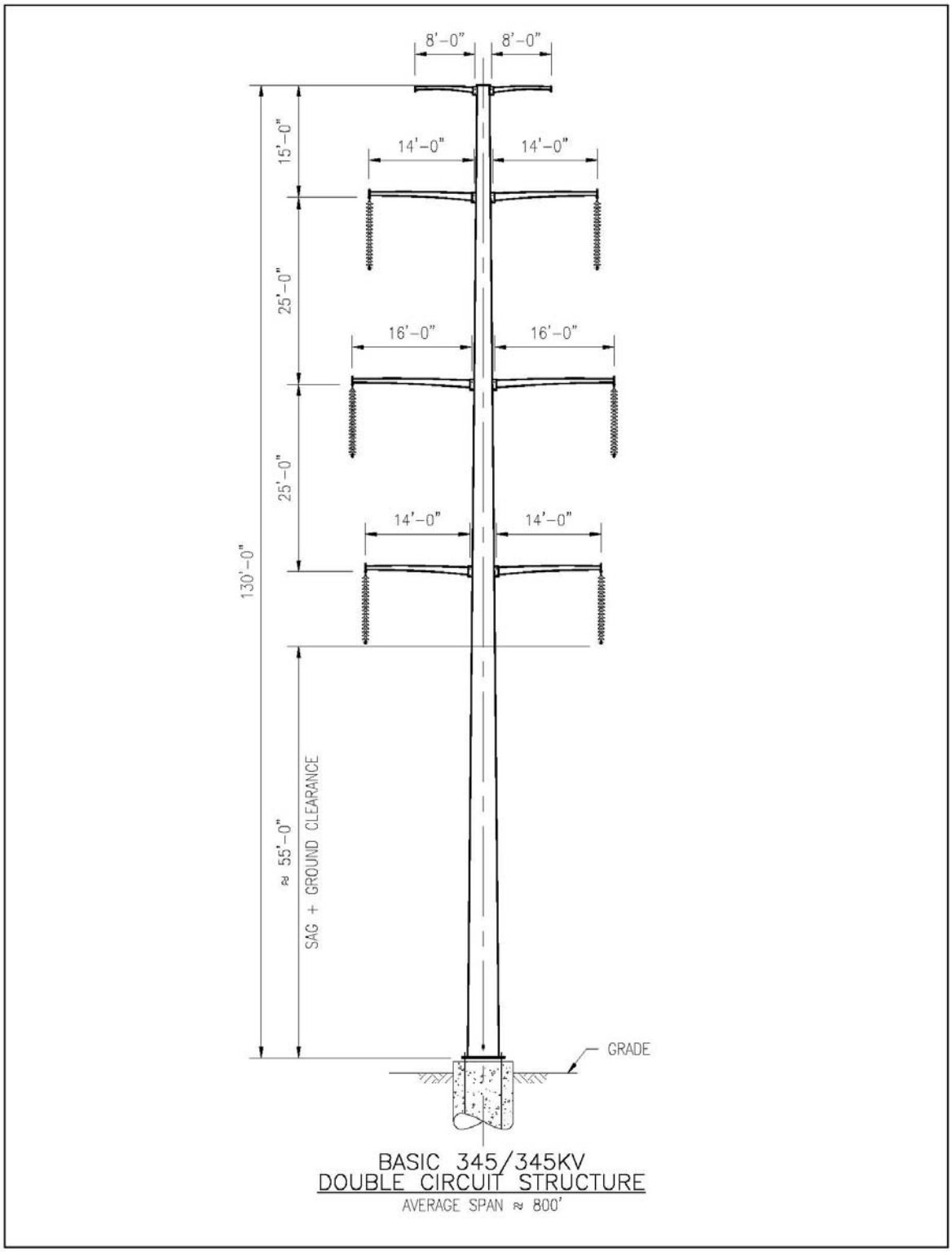
Description of Design Component	345/345-kV (Fig 4.2-5)
Conductor Size(inches)	1.8
ROW Width (feet)	150
Typical minimum and maximum Span Distance between Structures (feet) *	650-1000
Average Span (feet)	900
Minimum and Maximum Structure Height (feet)	65-155
Average Height of Structures (feet)	130
Average Number of Structures per mile	6
Temporary disturbance per Structure (acre) **	0.0003
Minimum Conductor-to-Ground Clearance to agricultural lands, rural roads and paved highways @ 100 deg C (feet)	30
Minimum Conductor-to-Ground Clearance to Railroads @ 100 deg C (feet)	As required by specific Railroad
Circuit Configuration***	See Figure

* Actual span distance will vary depending on topography.

** Angle and dead-end structures (for longitudinal stability) will be constructed with concrete foundations. Guy wires will not typically be required.

*** Single pole tangent structures will be freestanding on concrete foundations or directly embedded. H-frame tangent structures will likely be directly embedded into the ground.

Figure 4.2-1a: 345/345-kV Double Circuit Structure



4.2.2 Associated Facilities and Project Components

The project will require upgrades to Basin Electric's existing facilities at the Antelope Valley Station 345-kV Substation, Charlie Creek 345-kV Substation, and Neset 230-kV Substation. These upgrades are all within the existing Substation's fence line. No expansion of physical area is required. Furthermore no additional power generation capacity will be required for this project. The proposed overall project will require the following associated facilities and project components:

- **AVS 345-kV Substation.** The existing AVS Substation's 345-kV switchyard will require the installation of one 345-kV power circuit breaker and associated transmission bay bus expansion, including disconnect switches, grounding switches, potential transformers, and protection and control equipment. No new land or grading is required at this Substation.

- **Gumbo Creek 345-kV Substation.** The 345-kV Substation will be approximately 12 acres in size and will require the installation of the necessary bus, circuit breakers, disconnect switches, grounding switches, and protection and control equipment to support the a 345/115-kV load delivery substation.

- **Charlie Creek 345-kV Substation.** Upgrades to the existing Charlie Creek 345-kV Substation will require the installation of the necessary bus, circuit breakers, disconnect switches, grounding switches, and protection and control equipment to support the addition of a 345-kV interconnection. No expansion of the substation fence is anticipated.

- **Judson 345-kV Substation.** The proposed Judson 345-kV Substation near Williston will be approximately 12 acres in size and will require the installation of a 345-kV/230-kV transformer, and the necessary bus, circuit breakers, disconnect switches, grounding switches, and protection and control equipment to support the 345-kV interconnection and the addition of the 230-kV interconnect to Western's nearby Williston 230-kV Substation.

- **Tande 345-kV Substation.** The proposed 12-acre Tande 345-kV Substation will require the installation of a 345-kV/230-kV transformer, and the necessary bus, disconnect switches, circuit breakers, grounding switches, and protection and control equipment to support the 345-kV connection and the connection to the nearby existing Neset 230-kV Substation.

- **Neset 230-kV Substation.** The existing Neset 230-kV Substation will require the expansion of transmission bus bay and the necessary circuit breakers, disconnect switches, grounding switches,

and protection and control equipment to support the addition of the 230-kV connection. No expansion of the substation fence is anticipated.

4.2.3 Construction Techniques

The proposed 345-kV, single-circuit transmission line will be constructed using single-pole or H-frame self-supporting structures within a 150-foot-wide ROW. Double-circuit 345/115-kV and 345/345-kV lines will be constructed using single-pole, self-supporting structures. The proposed 230-kV, single-circuit transmission line will be constructed using single-pole, self-supporting structures within a 100-foot ROW. Detailed construction access considerations and construction techniques are described further in the following sections.

4.2.3.1 Pre-Construction Activities

No change to section. Figure 4.2-5 has been updated to include the new route.

4.2.3.2 Transmission Structure Site Preparation

Transmission structure site clearing is expected to be minimal over a large portion of the Project, due to much of the Corridor/Route being located across rangeland, grasslands, or agricultural areas. In these areas, site leveling is expected to be minimal. In areas of difficult terrain, structure location sites may require more extensive leveling using bulldozers or front-end loaders to ensure the safe operation of equipment. In areas where access is extremely difficult, structure placement will be performed through the use of helicopters. All blading and leveling will occur within the boundary of the ROW throughout the length of the Project. Soil removed during leveling of structure sites will be stockpiled nearby and replaced following construction. Disturbed ground will be re-graded to as close to pre-construction condition as appropriate for stabilization and revegetated or approved for tillage depending on pre-construction land use.

Structure holes will be drilled by truck-mounted auger or power auger at appropriate locations along the length of the Corridor/Route. Total land disturbance at each structure location will vary depending on location (i.e. level terrain versus steep, rugged terrain) and structure type. All disturbances related to the boring of structure holes will be confined to the ROW.

Structures used for the Project will be either directly imbedded into the ground or will be bolted on reinforced poured concrete foundations. Determinations on whether a structure will be directly imbedded into the hole or will require a foundation will be based on available access due to terrain and soil conditions. Screw anchors may be used in certain locations based on terrain and soil conditions. The

NORTH

0 11.5

Miles

Jackman Material Laydown Yard

Daniel Material Laydown Yard

Lonesome Creek Material Laydown Yard

Tarnavsky Material Laydown Yard

Jepson Material Laydown Yard

Keller Material Laydown Yard

Dukart Material Laydown Yard

Neset

Tande

Judson

Williston

Charlie Creek

Gumbo Creek

Antelope Valley

Tioga

White Earth

Ray

Epping

Spring Brook

Ross

Stanley

Palermo

Donnybrook

Carpio

Renville

Berthold

Burlington

Des Lacs

Minot

Mountrail

Williams

Ward

McH

Plaza

New Town

Parshall

Makoti

Ryder

Douglas

Max

Alexander

Arnegard

Watford City

McKenzie

Dunn

McLean

Garrison

Killdeer

Golden Valley

Zap

Beulah

Hazen

Stanton

Mercer

Oliver

Pick City

Riverdale

Golden Valley

Billings

CANADA

Montana

North Dakota

South Dakota

LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- Material Laydown Yard (Approximately 5 acres)
- State Boundary
- County Boundary

Existing Transmission Lines

- 345-kV
- 230-kV and Below

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BASIN ELECTRIC POWER COOPERATIVE
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Figure 4.2-5
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Temporary Construction Material
and Equipment Laydown Areas

R:\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 4 Figures - Project Route\Figure 4-2-5 Revised July 2013.mxd 7/19/2013

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

helix on the anchor cuts through the soil, resulting in minimal soil disturbance. An estimated 1,167 structures will be used for the proposed Project, with an average of approximately six structures per mile.

4.2.3.3 Structure Assembly and Erection

No change to section.

4.2.3.4 Stringing and Tensioning of Conductors

No change to section.

4.2.3.5 Structure Site Access and Traffic

No change to section.

4.2.3.6 Substation Construction Procedures

Construction procedures for the Gumbo Creek, Judson and Tande 345-kV Substations will be essentially the same, except for the specific equipment installed. Each site will be approximately 12 acres, although additional area around the substation will be acquired for buffer with adjacent lands and to provide space for transmission line connections. Following survey and staking of the site, erosion control best management practices (BMPs) will be followed. Site access will be prepared, including installation of culverts in adjacent road drainage to install a gravel driveway. No clearing of forested areas is anticipated for any of the substation locations. The sites will be graded and fenced. Concrete pads and footing for equipment will be installed. Aggregate will be spread throughout the fenced area. Equipment will be delivered to the sites and generally stored inside the fenced area, although some materials may need to be stored on the property outside the fence due to size or safety considerations. Equipment such as circuit breakers, bus work, capacitors, and dead-ends will be assembled and installed. Transformers will be delivered to the sites and installed. Substation control house and supervisory control and data acquisition equipment will be installed. Upon completion of construction activities, disturbed areas outside the fence will be restored and erosion control measures removed.

4.2.3.7 Transmission Line Maintenance and Operation

No change to section.

4.2.3.8 Substation Maintenance

No change to section.

4.2.3.9 Construction Schedule and Projected Workforce

No change to section.

4.2.3.10 Procedures for Minimizing Environmental Impact during Construction

No change to section.

4.2.3.11 ROW and Property Issues

Basin Electric Property and Right-of-Way Division will be responsible for acquiring easements for the project. Initially landowners will be contacted to request their permission for property boundary, biological, terrain mapping and archeological surveys. The survey permit form is not an easement and not all properties will require all types of surveys. When a final route is approved, land values will be determined and landowners will be contacted to start the easement process. Basin Electric staff will give the landowners ample time to review and comment on the easement location. Landowners will be compensated for the easement and any damages to existing crops or other property features and for potential future years of agricultural impacts from the transmission ROW and transmission structures on the property. Section 11 contains the status of the land acquisition process for the Project as of July 18, 2013.

* * * * *

5.0 ENVIRONMENTAL ANALYSIS

This section describes the environmental setting as it relates to the Project Corridor and Route and discusses potential impacts associated with the construction and operation of the proposed Project. For this application, the Corridor/Route consist of the same ROW of 150 feet for 199 miles of the Project from AVS to the proposed Tande Substation and ROW of 100 feet for the 0.9-mile connection from Tande to Neset. The analysis has been conducted on this ROW and, where appropriate to the resources and criteria, areas adjacent to the ROW. North Dakota Century Code 49-22-09 lists factors to be considered in evaluating the application and designation of sites, corridors, and routes. The North Dakota Public Service Commission shall be guided by, but is not limited to, the following considerations, where applicable, to aid in the evaluation and designation of sites, corridors and routes:

1. Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.

2. The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.

3. The potential for beneficial uses of waste energy from a proposed energy conversion facility.

4. Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.

5. Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.

6. Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.

7. The direct and indirect economic impacts of the proposed facility.

8. Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.

9. The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.

10. The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species.

11. Problems raised by federal agencies, other state agencies, and local entities.

For each resource, a general description on each resource is provided, followed by a discussion of potential impacts and potential mitigation measures. The description of resources subsections describe the resources and environmental settings found in the vicinity of the Project. The Corridor/Route extends through Mercer, Dunn, McKenzie, Williams, and Mountrail Counties in North Dakota.

The impact discussion subsections describe the potential effects on each resource from the Project. Based on a centerline alignment, a 150-foot ROW was established to quantify the nature and extent of the impacts that could be expected for the Corridor/Route. For many of the resources discussed, such as vegetation and soils, impacts will be limited to this 150-foot ROW. For other resources such as wildlife, recreation, and visibility, impacts may extend outside the ROW.

In addition to impacts associated with construction and operation of the proposed Project within a 150-foot ROW, other potential impacts will result from construction-related facilities and activities. These will occur from establishment of laydown and staging yards and the development of access roads to structure locations. As some of these details will not be known until later in the process as field survey and final design are completed and coordination with landowners progresses, impacts from these activities are discussed in general terms.

The mitigation discussion subsections provide potential measures to reduce or eliminate anticipated adverse impacts identified.

Standard mitigation measures have been incorporated into the development and construction of the proposed Project. These mitigation measures are designed to reduce or eliminate anticipated impacts resulting from the construction or operation of the proposed Project. They include Best Management Practices (BMPs) such as the spanning of wetlands, use of silt fencing and other erosion-control measures, and using existing corridors where feasible for locating and constructing the transmission line. These standard mitigation measures are included in Appendix I, Standard Mitigation Measures.

5.1 DEMOGRAPHICS

5.1.1 Description of Resources

5.1.1.1 Regional Setting

No change to section.

5.1.1.2 Population

No change to section.

5.1.1.3 Housing

No change to section.

5.1.1.4 Income

No change to section.

5.1.1.5 Employment

No change to section.

5.1.1.6 Racial and Ethnic Characteristics

No change to section.

5.1.1.7 Property Valuation and Taxation

No change to section.

5.1.2 Impacts

No change to section.

5.1.2.1 Regional Economy

No change to section.

5.1.2.2 Population

No change to section.

5.1.2.3 Housing

No change to section.

5.1.2.4 Employment and Income

No change to section.

5.1.2.5 Property Values

No change to section.

5.1.2.6 Property Taxes

The construction, operation, and maintenance of the transmission line will generate additional property taxes to counties where the line will be located. Table 5.1-10 summarizes these tax receipts to local governments associated with the 198.9 miles of transmission line. Additionally, there will be property taxes collected from the substation properties.

Table 5.1-10: Property Tax Revenues to Project Area Counties Associated with the Corridor/Route

	Corridor/Route (miles)	Year 2	Year 3	Year 4	Years 5-45
Dunn	43.1	$3,233	$6,465	$9,698	$12,930
McKenzie	72.3	$5,423	$10,845	$16,268	$21,690
Mercer	18.5	$1,388	$2,775	$4,163	$5,550
Mountrail	2.8	$210	$420	$630	$840
Williams	62.1	$4,658	$9,315	$13,973	$18,630
Project Area Total	198.9	$14,910	$29,820	$44,730	$59,640

Source: Staff calculations based on North Dakota Title 57, Taxation, n.d.

5.1.2.7 Impacts to Residences

No changes to section

5.1.3 Mitigation

No changes to section

5.2 LAND USE

5.2.1 Description of Resources

5.2.1.1 Regional Setting

No changes to section.

5.2.1.2 Existing Land Use

No changes to section

5.2.1.3 Zoning

The Project requires Conditional Use Permits (CUP) for the transmission line from Mercer, McKenzie and Williams Counties. Gumbo Creek and Tande Substations require zoning changes from agricultural use to industrial use. The Judson Substation received zoning change approval to industrial use from Williams County in 2011 to support the Williston-Tie Project. CUP applications have been submitted to the three required counties and approvals are expected by the end of 2013.

5.2.1.4 Comprehensive Plans

The McKenzie County Comprehensive Plan, approved in 2013, provides goals, objectives, and implementation strategies for the county, as it confronts growth and development issues in the agriculture and energy sectors.

5.2.1.5 State and Federal Properties

No changes to section. Figure 5.2-1 has been updated to include the revised route.

5.2.2 Impacts

No changes to section.

5.2.2.1 Agricultural Land Use Impacts

The majority of the land crossed by the proposed project is used for agricultural purposes. Long-term land use impacts to grassland, cropland, and pasture will be primarily the result of structure placement, ROW maintenance, and access roads. Current agricultural practices will be maintained for most of the ROW. Areas of cropland within the ROW will continue to be farmed. The only land that will be unavailable for agriculture will be the area occupied by structures located within tillable areas. This area is estimated to be about 7 feet in diameter, which is equivalent to 38.5 square feet or 0.0009 acres per structure, or approximately 1.03 acres overall. There will be approximately 1,167 structures for the

NORTH

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Miles

Neset

Tande

Judson

Williston

Gumbo Creek

Charlie Creek

Antelope Valley

Williams

Mountrail

Renville

McHenry

Ward

McKenzie

Dunn

McLean

Golden Valley

Billings

Mercer

Oliver

LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Municipal Areas
- Wildlife Management Areas
- State Park
- Army Corps of Engineers
- National Grassland
- National Park
- National Wildlife Refuge
- BLM Lands
- State School Trust Lands
- Waterfowl Production Area

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BASIN ELECTRIC POWER COOPERATIVE
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Figure 5.2-1
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Federal and State-Owned Lands

R:\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5.2-1 Revised July 2013.mxd 7/19/2013

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

Corridor/Route. This land will be removed from production and structures will present obstacles that will need to be avoided. Impacts on pasture land will also be negligible, because grazing could continue within the ROW. Structures will remove small areas of land from forage production and structures will present obstacles to haying equipment. Overall, however the line will result in minimal reduction in agricultural production or land available for agricultural activities.

In total, approximately 3,610.3 acres of ROW will be required for the Project. These lands will be restricted from various types of future development but could continue to be used for agricultural uses. Table 5.2-1 shows the acreages of each land use type within the Corridor/Route. The majority of the Corridor/Route consists of grassland and cultivated cropland, with a small percentage consisting of pasture/hay land and woodland. Impacts to all land use types will include the temporary loss of use for landowners within the Corridor/Route to allow for line construction. Temporary disturbance from heavy equipment within the ROW may result in the loss of some crops during construction.

Three new substations, including the proposed Gumbo Creek 345-kV Substation, Judson 345-kV Substation and the proposed Tande 345-kV Substation, will also be constructed as part of the Project. Construction will take place on approximately 12 acres of land per substation and will result in the permanent conversion of this area from agricultural land to utility land use.

Table 5.2-1: Acres of Land Affected within Corridor/Route

Land Use	Project Corridor/Route
Grassland (acres)	1,659.4
Cultivated cropland (acres)	1,389.0
Pasture/hay (acres)	153.6
Developed lands (acres)	118.6
Other lands(acres)*	289.6
Total (acres)	**3,610.3**

*includes woodland, shrub/scrub, wetlands, barren lands, open water
Acres were calculated using available National Land Cover Dataset (NLCD) information

5.2.2.2 Zoning and Land Use Plans

No change to section.

5.2.2.3 State and Federal Properties

The proposed Corridor/Route crosses lands owned by Federal and state agencies. The following summarizes the lands crossed by the Corridor/Route under Federal or state ownership and the potential concerns or conflicts between agency management and the proposed Project.

USFS – The Project will incorporate into utility ROW approximately 152.9 acres of the LMNG unit of the Dakota Prairie National Grasslands. The LMNG, at more than a million acres, is the largest national grassland in the nation. This mixed-grass prairie found in badlands topography is located in McKenzie, Billings, Slope, and Golden Valley Counties in western North Dakota. The LMNG through which the Corridor/Route is located is administered by the McKenzie Ranger District, Watford City, North Dakota.

The LMNG is home to a great variety of wildlife, including bighorn sheep, eagles and falcons, prairie dogs, and pronghorn antelope. Oil and gas production and livestock grazing are important on this unit, as are opportunities for remote roadless experience. These 152.9 ROW acres consist of 100.9 acres of grassland, 18.6 acres of woodland, 12.2 acres of shrub/scrub, 16.9 developed acres, 3.0 acres of pasture/hay land, 0.5 acre of cultivated crops, and 0.8 acre of barren land. Direct impacts will include the acquisition of ROW and potential clearing of 18.6 acres of woodland area. A Special Use Permit to cross public land will be obtained from the USFS for the Corridor/Route.

USACE and NDGFD - The Corridor/Route will cross approximately 57.9 acres of USACE-owned property, which is within the Lewis and Clark WMA managed by the NDGFD. ROW acres impacted include 18.4 acres of cultivated crops, 15.6 acres of wetland, 11.8 acres of grassland, 6.0 acres of woodland, 4.1 acres of pasture/hay, 1.5 acres of open water, and 0.5 acre of shrub/scrub. Direct impacts will include the acquisition of the ROW and potential clearing of 6.0 acres of woodland that may result in loss of wildlife habitat. Some wildlife habitat may be removed or altered within the Corridor/Route as a result of the proposed Project. An easement or permit to cross public land will be acquired from the USACE for the Project. Based on coordination with USACE, the Corridor/Route was sited along U.S. Highway 85 adjacent to an existing transmission line through the Lewis and Clark WMA. This segment of the route was originally sited further west, but based on the input provide by USACE and their management plans for the land to the west of U.S. Highway 85, they preferred to have the Corridor/Route aligned closer to the existing highway and transmission line infrastructure.

During construction, public use of lands within and adjacent to the proposed ROW will be restricted for security and safety for the line, workers and public. Following construction, these lands will again be available for public use.

North Dakota School Trust Lands – Within the proposed Project area, School Trust Land parcels consist of approximately 1,363 acres. These lands are used to generate revenue for schools from grazing and agricultural uses and the extraction of mineral resources such as aggregate and oil and gas production. The Corridor/Route will cross 19 School Trust Land parcels, for a total of approximately 118.9 acres within the ROW. Of the 118.9 ROW acres, 101.1 acres are grassland, 9.1 acres are in cultivated crops, 3.9 acres are wetlands, 2.4 acres are woodland, 0.9 acres are shrub/scrub, 1.0 acres are developed, and 0.4 acre is barren land. Woodland will be permanently converted to cleared ROW suitable for agricultural activities. No permanent changes in land use, inconsistent with the current school land requirements within these parcels are anticipated as a result of the proposed Project. Temporary impacts will be expected during construction, with permanent impacts to grasslands and cultivated cropland occurring only at structure locations. An easement to cross these public lands will be needed from the North Dakota Department of Trust Lands for these portions of this route. Basin Electric has been engaged with the Department to ensure that the Project does not impact the Department of Trust Lands' ability to continue to develop the Trust Lands per their planning.

5.2.3 Mitigation

No change to section

5.3 INFRASTRUCTURE/TRANSPORTATION

5.3.1 Description of Resources

5.3.1.1 Regional Setting

No change to section. Figure 5.3-1 has been updated to include the revised route.

5.3.1.2 Utility Infrastructure

5.3.1.2.1 Pipelines

No change to section.

5.3.1.2.2 Electrical Transmission Lines

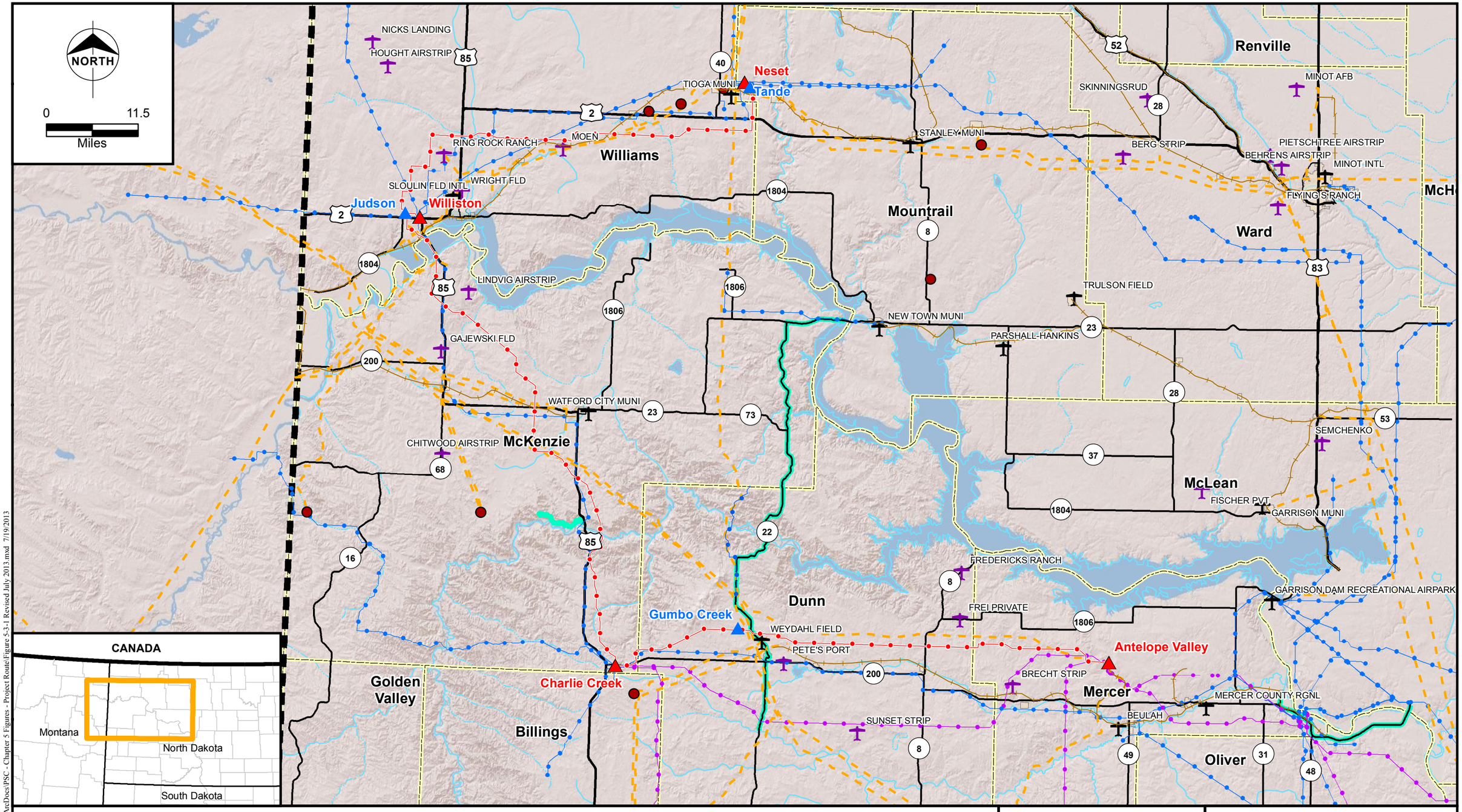
No change to section.

5.3.1.2.3 Electrical Substations

No change to section.

5.3.1.2.4 Power Supply/Generation

No change to section.



LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Railroad
- Pipeline
- Public Airport
- Private Airport
- GasPlants
- Scenic Byway

Existing Transmission Lines

- 345-kV
- 230-kV and Below

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BASIN ELECTRIC POWER COOPERATIVE
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Figure 5.3-1
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Transportation and Utilities

R:\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-3-1 Revised July 2013.mxd 7/19/2013

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

5.3.1.2.5 Reliability Issues

No change to section.

5.3.1.2.6 AM and FM Towers

No change to section.

5.3.1.2.7 Water Supply and Treatment

No change to section.

5.3.1.3 Transportation Infrastructure

5.3.1.3.1 Roadways

Primary roadways within the Project area include U.S. Highway 2 and U.S. Highway 85. U.S. Highway 2 runs generally east to west through the northern portion of the Project area, passing through the towns of Williston and Ray. The proposed Judson 345-kV Substation will be constructed adjacent to, or very near, U.S. Highway 2 approximately five miles west of Williston, and the proposed Tande 345-kV Substation is located approximately four miles north of U.S. Highway 2 and four miles east of the community of Tioga, on the eastern edge of the Project area. U.S. Highway 85 extends generally north to south through the western portion of the Project area, passing through the towns of Williston, Alexander, Arnegard, Watford City and Grassy Butte. The proposed Gumbo Creek 345-kV Substation will be constructed within 1.5 miles of North Dakota Highway 22, which is a north-south state highway that extends through Dunn and McKenzie Counties.

5.3.1.3.2 Rail

No change to section.

5.3.1.3.3 Airports/Airstrips

No change to section.

5.3.1.3.4 Proposed Roadway Improvements

No change to section.

5.3.1.3.5 NDDOT District 5

No change to section

5.3.1.3.6 NDDOT District 7

No change to section.

5.3.1.3.7 Scenic Highways

No change to section.

5.3.2 Impacts

As discussed in Section 1.0, Introduction, northwestern North Dakota is experiencing a rapid increase in development as a result of activities associated with the extraction of oil from the Bakken shale. The level of current and future development will require increases in transmission capacity, pipelines, rail, roads, gas refineries, and other infrastructure needs. This section discusses potential impacts to current utility and transportation infrastructure resulting from construction and operation of the proposed Project.

Direct impacts to existing utility and transportation infrastructure resulting from the construction and operation of the proposed Project are anticipated to be minor. Impacts will include:

- Temporary power outages during construction and stringing of conductors across existing lines
- Delays, detours, or temporary road closures during line construction
- Road congestion near construction areas
- Road deterioration from heavy equipment used for construction

Utility Infrastructure

No change to section.

Transportation Infrastructure

Temporary impacts to local roads and highways may also occur during the construction phase of the proposed Project. The Corridor/Route has 106 road crossings and construction at road crossings my result in occasional short-term traffic delays during the stringing of conductors across the roadway. Traffic will likely be detoured or temporarily halted as conductors are pulled across the road.

Transportation concerns will include delays or detours on local roadways when stringing conductors across these roads, and general traffic increases and congestion along roads near the proposed transmission line due to construction-related vehicles and equipment. These effects will be minor and temporary as construction will occur at several locations along the line, reducing the amount and intensity of construction at any particular location. Construction crews will only be at a particular location for several days during the various stages of construction so any construction-related delays or congestion at any specific location along the line will occur for only a short time. Most of the roads that will be crossed by the project have low levels of vehicle traffic and the grid of section line roads in the area provides

numerous opportunities for traffic to detour around construction areas with only minimal delay and inconvenience to motorists.

Temporary lane closures, flag men or pilot vehicles for traffic control will be implemented for traffic control and motorist and construction crew safety. Overall, however, any lane or partial road closures will likely only last a few hours, with any complete stoppage of traffic only anticipated for a few minutes. While such activities will likely create considerable congestion along these highways, they will only occur for a short time during the actual stringing across the road. Once accomplished, traffic flow patterns will be restored to normal. Additionally, stringing across these roads could be conducted during off peak travel hours to reduce the number of motorists exposed. Stringing across these roadways will only be expected to take several hours, minimizing the period of inconvenience to motorists.

Construction equipment will be required to operate over local roadways, contributing to the wear and tear they experience. Overall, construction vehicles will be similar to current vehicle and semi-trailer traffic and will not result in a significant increase in average daily traffic on major thoroughfares or contribute to road wear. On more local roadways, heavy construction vehicles will be similar to agricultural traffic, although the level of vehicle use will likely increase in the areas along the line during construction. Such increases could contribute to road deterioration. Basin Electric will coordinate with the counties and North Dakota Department of Transportation to redress any road damage related to construction of the project.

Following completion of construction, impacts to transportation and infrastructure will largely cease. Infrequent and short-term congestion and road closures may be necessary for maintenance and repair activities. Road crossing permits will be acquired from the affected counties as part of the requirements for construction of the Project.

Railroads

No change to section.

Airports and Airstrips

Several public and private airport and airstrips occur in the vicinity of the Corridor/Route. Under Title 14 Code of Federal Regulations Part 77 (Part 77) the sponsor of a proposed project with the potential to affect navigable airspace is required to notify the Federal Aviation Administration (FAA) 45 days prior to construction. This provides the FAA time to determine if the structure will be a hazard to airport operations. The FAA has established standards to identify proposed or existing structure that will be an

obstruction to the navigable airspace surrounding public airports. These standards are defined in Part 77 by imaginary surfaces that extend above and beyond the physical surface of the runway and are based on the dimensions, composition, and type of approach available or planned for the runway. The imaginary surfaces include a horizontal surface 150 above the runway elevation that extends outward from the runway from 5,000 to 10,000 feet, a conical surface that begins at the outer edge of the horizontal surface and extends outward and upward at a 20:1 slope for an additional 4,000 feet, an approach surfaces that extends outward and upward from the runway end for 5,000 to 50,000 feet at a slope determined by the category of runway, and transition surfaces between the various surfaces.

Public airports and private airstrips within five miles of the Corridor/Route that may be potentially impacted include:

- Weydahl Field in Dunn County (City of Killdeer)
- Two private airstrips in Dunn County
- One private airstrips in McKenzie County
- Sloulin Field International Airport in Williams County (City of Williston)
- Tioga Municipal Airport in Williams County (City of Tioga)
- One private airstrip in Williams County
- One private airstrip in Mercer County

Public airports with published instrument approach procedures (IAP) could potentially be affected by transmission structures that will be within the final approach portion of the IAP. The final approach portion typically begins at point located within 50,000 feet from the IAP runway end and must begin within 10 nautical miles or 60,760 feet of the runway end. Based on this maximum distance, the Corridor/Route will be within 10 nautical miles of three airports with published IAP's, the Tioga Municipal Airport in Williams County; the Sloulin Field International Airport in Williams County; and the Watford City Municipal Airport in McKenzie County. An Obstruction Analysis filing will be submitted to the FAA for the Project once final plan and profile drawings are available to determine specific impacts.

At the nearest point, the Corridor/Route will be approximately 11,000 feet east of the Tioga Municipal Airport, within the conical surface, and across an IAP area. It is possible that this portion of the Corridor/Route will exceed Part 77 obstruction standards and could affect the minimum decent altitude (MDA), published in the IAP, which will result in an impact to the flight operations at for this airport. Another portion of the Corridor/Route will be located approximately 25,000 feet west of the Sloulin Field

International Airport and could affect the MDA published in the IAP. The Corridor/Route will be approximately 34,000 feet west of the Watford City Municipal Airport and possibly within an IAP area. Public airports with no published or planned IAP's could be affected by transmission structures that exceed a Part 77 imaginary surface. Transmission structures that exceed an imaginary surface will require a study by the FAA to determine the effect they will have on air navigation. An Obstruction Analysis was submitted to the FAA in the area of Weydahl Field Airport in Dunn County in November 2012 (Obstruction Analysis 2012-AGL-11085 thru 2012-AGL-11097) to determine any impacts of the Project at the Airport. The FAA in their Obstruction Analysis provided a Determination of No Hazard to Air Navigation for the structures near the Weydahl Field.

Williston is in the planning stages for a new airport and is evaluating three potential sites in the northwest portion of the Williston area. Basin Electric is aware of the airport plans and developed the proposed alignment for the route northwest of Williston knowing that there are three candidate sites and that a final site for a future airport has not yet been determined. An FAA obstruction analysis for Sloulin Field and the proposed potential new airport sites was submitted to the FAA. A Determination of Hazard was determined for structures associated with the Project for the existing airport.

Basin Electric has been in communication with the City of Williston and the airport project engineering team and through this coordination has developed the proposed alignment accordingly. This transmission project segment's construction will not occur until 2017. This will provide the opportunity for the City of Williston to finalize their selection process for a new airport and provide time for further discussions with the City of Williston and the FAA.

When the remainder of the final structure plan and profile is available, further FAA Obstruction Analysis will be submitted for evaluation with the FAA.

Although the FAA does not typically protect airspace associated with private airports, an overhead transmission line can have a permanent impact to their operations. There will be seven private airports within 5,000 feet of the Corridor/Route, two in Dunn County, one in McKenzie County, one in Mercer County, and three in Williams County.

Basin Electric will coordinate with the FAA to determine if the proposed Project will have any impact to local aircraft facilities. Further consultation with the Federal Aviation Administration (FAA) will be required to determine specific impacts and potential mitigation measures to address any impacts to aviation safety and the operation of the airports and airstrips in proximity to the Corridor/Route.

In addition to airports, radars and other navigational aids necessary for safe air navigation are protected by the FAA. Proposed construction of a permanent structure in proximity to a navigational aid requires notice to the FAA to determine any possible effects on the equipment. Northwest of the town of Williston, North Dakota, the Corridor/Route will be within approximately 7,000 feet west of the Williston VORTAC radar, a navigational aid used for both civilian and military air navigation. Further study by the FAA will likely be required for structures in this portion of the Corridor/Route to determine the potential impact to navigational equipment.

Substation Impacts

Impacts to existing utility and transportation infrastructure resulting from the construction and operation of the proposed Gumbo Creek, Judson and Tande substations are anticipated to be minor. Temporary impacts to existing utilities and transportation infrastructure during construction of the substations may include short-term line outages on existing transmission lines for safety reasons during construction and interconnection to the substations, minimal if any service outage to electricity customers, delays or detours on local roadways during construction, and general increases in traffic along roads in construction areas due to construction-related vehicles and equipment. Substation sites are generally located along roadways but are large enough to allow equipment to pull off and park off the roadways, reducing road congestion.

5.3.3 Mitigation

No change to section.

5.4 PUBLIC HEALTH AND SAFETY

5.4.1 Description of Resources

No change to section.

5.4.2 Impacts

No change to section.

5.4.2.1 Construction Impacts

No change to section.

5.4.2.2 Operation Impacts

No change to section.

Radio and Television Interference

No change to section.

Implantable Medical Devices

No change to section.

Stray voltage

No change to section.

Direct Contact with Lines and Structures

No change to section.

Fallen lines

No change to section.

Proposed Substations and Switchyards

Construction of the proposed Gumbo Creek, Judson and Tande substations may cause temporary impacts to public health and safety resources near the construction sites similar to those experienced during construction of the transmission line. Potential health and safety impacts during operation of the substations will be limited to direct contact with energized equipment within the substation or switchyard fence, and with potential EMF issues associated with high-voltage transmission lines connecting to the substations or the switchyard. According to NIEHS[1], EMF levels produced by substation equipment beyond the substation fence are typically indistinguishable from background levels and therefore have not been evaluated for this project.

5.4.3 Mitigation

No change to section.

5.5 AIR QUALITY

5.5.1 Description of Resources

5.5.1.1 Regional Setting

No change to section.

[1] National Institute of Environmental Health Sciences, 2002.

5.5.1.2 NAAQS/Attainment

No change to section.

5.5.1.3 Greenhouse Gases

No change to section.

5.5.1.4 Regional Haze

No change to section.

5.5.2 Impacts

The implementation of the Corridor/Route will require the permanent removal of trees and other vegetation as a result of road construction of ROW clearing. Although permanent tree removal will not immediately emit GHGs, it will reduce the level of solid carbon storage in the area. Tree growth and future carbon sequestration rates are highly variable and dependent on several factors, including, the species of the tree, the age of the tree, climate, forest density, and soil conditions. In the North Central Region, the average carbon storage associated with forest is 160,000 pounds of carbon acre (USFS, 1992). As a result of the Project, a total of approximately 114.8 acres of forested area will be removed.

It is expected that approximately 114.8 forested acres will be removed for the Corridor/Route. Assuming each affected acre contains the average carbon content for the North Central Region, the net carbon footprint associated with the removal of forested area will be an estimated 8,331 metric tons of CO_2e. Given this estimate, the impact of vegetation removal on GHG emissions will be low.

5.5.3 Mitigation

No change to section.

5.6 NOISE

5.6.1 Description of Resources

No change to section.

5.6.2 Impacts

Proposed Substations

Increases in noise levels resulting from the construction of the proposed Gumbo Creek, Judson and Tande substations are anticipated to be similar to impacts associated with the construction of the proposed transmission line with the exception that construction will occur over a more extended period of time in a

specific area. Potential impacts during site construction will include temporary increases in noise levels from construction vehicles and equipment on-site and on the surrounding roads. The potential increases in sound due to construction will be temporary in nature and sound levels will return to the existing ambient levels after construction is complete.

Final siting of the Gumbo Creek Substation is not complete. Once the site acquisition and layout are finalized, a noise analysis will be completed. The site is adjacent to two existing oil well facilities. No residences are located within 500 feet of the proposed substation.

5.6.3 Mitigation

No changes to section.

5.7 VISUAL IMPACTS

5.7.1 Description of Resources

5.7.1.1 Regional Setting

No changes to section.

5.7.1.2 Natural Features

No changes to section.

5.7.1.3 Built Environment

No changes to section.

5.7.2 Impacts

The Project will be constructed through varying types of terrain. Distance from the line, terrain, topographical features in the area, differences in elevation, man-made features and natural features such as forest cover will all influence the level of potential impact at specific locations throughout the Project area. The Corridor/Route will have 106 road crossings along the length of the route. Many, if not most, of these roads are county section-line gravel roads that receive only very light local traffic. However, the Project will introduce a new visual element to the surrounding area for motorists at each road crossing. This addition will likely be more pronounced at road crossings of larger, well-traveled roads or at crossings where there is no existing transmission or distribution lines within view of the road.

Proposed Substations

Visual impacts resulting from the construction and operation of the proposed Gumbo Creek, Judson and Tande substations are anticipated to have similar impacts associated with the construction and operation of the proposed transmission line. Each new substation will be an added visual element in the existing landscape. The proposed Judson Substation will be constructed approximately two miles to the west of the existing Williston Substation. No residences will be located within 500 feet of the proposed substation site, but several will likely be within sight of the substation. This site is currently being used for agricultural purposes but is within and surrounded by rapidly increasing commercial, industrial, and residential development and several roads and highways. The Judson Substation will be considered a compatible component of the visual landscape.

The proposed Gumbo Creek substation will be constructed in a rural area, adjacent to two gas well facilities. No residences are located within 500 feet of the proposed substation.

5.7.3 Mitigation

No change to section.

5.8 CULTURAL RESOURCES

5.8.1 Description of Resources

No change to section.

5.8.1.1 Project Area of Potential Effects

No change to section.

5.8.1.2 Class I File Search

No change to section.

5.8.1.3 Class III Inventory

Metcalf Archaeological Consultants, Inc. (MAC) staff prepared an interim report that documents the results of the 2012 inventory. Western subsequently initiated project-specific tribal consultations.

5.8.1.4 Visual Assessment

5.8.1.5 Traditional Cultural Properties

No change to section.

5.8.1.6 Substation Sites

MAC conducted a field survey at the Gumbo Creek Substation that resulted in no findings.

5.8.2 Impacts

No change to section.

5.8.3 Mitigation

No change to section.

5.9 RECREATIONAL RESOURCES

5.9.1 Description of Resources

5.9.1.1 Regional Setting

No change to section.

5.9.1.2 Facilities

No change to section. Figure 5.9-1 has been updated to include the revised route.

5.9.1.3 Hunting and Fishing

No change to section.

5.9.2 Impacts

Proposed Substations

Construction and operation of the proposed Gumbo Creek, Judson and Tande substations are expected to result in minor impacts to recreation. Conversion of land for substations will convert it from agricultural to industrial use limiting further recreational use of the area. However, as the proposed substations are located in privately owned agricultural areas, recreation at these locations is likely limited. During construction, noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation sites. However, following completion of construction, these disturbances will cease and as game species return to the area, hunting opportunities on these adjacent lands will return. Only the 12 acres developed for the substations will be lost for future recreational activity.

5.9.3 Mitigation

No change to section.

NORTH

0 11.5
Miles

Neset
Tande
Judson
Williston
Williams
Mountrail
Renville
McHenry
Ward
McKenzie
McLean
Dunn
Gumbo Creek
Antelope Valley
Charlie Creek
Golden Valley
Billings
Mercer
Oliver

LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Municipal Areas
- Wildlife Management Areas
- Scenic Byway
- State Park
- Army Corps of Engineers
- National Grassland
- National Park
- National Wildlife Refuge
- BLM Lands

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BASIN ELECTRIC POWER COOPERATIVE
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Figure 5.9-1
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Recreation Areas

R:\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5.9-1 Revised July 2013.mxd 7/19/2013

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

5.10 SOILS AND FARMLANDS

5.10.1 Description of Resources

5.10.1.1 Soils

No change to section.

5.10.1.2 Farmland

No change to section.

5.10.1.3 Prime Farmland

No change to section. Figure 5.10-1 has been updated to include the revised route.

5.10.2 Impacts

No change to section.

5.10.2.1 Soils

Approximately 3,610.3 total acres of surface soil will be incorporated into the Corridor/Route, although the acreage that will actually be disturbed will be far less. Permanent impacts to soils will include the disturbance of approximately 1.03 acres of soil where the approximately 1,167 transmission structures will be placed. Up to as much as approximately 114.8 acres of woodland occur within the Corridor/Route, and the clearing of trees will disturb the soil within these acres and expose it to erosional forces. Some of the Corridor/Route will also likely be located along areas of steeper slopes, and will incorporate approximately 19.4 acres of land that has experienced landslides in the past, making these areas especially susceptible to soil erosion. The development of access roads during construction will potentially disturb areas of soil as well, although these areas are anticipated to be minimal since most access to the ROW will occur at locations where the ROW crosses existing roads and by utilizing the ROW itself for access along the line.

5.10.2.2 Farmland

Approximately 1,389 acres of cultivated cropland will be incorporated into the Corridor/Route. It is likely that impacts will not occur across the entire 1,389 acres, with most impacts being temporary and occurring during construction. Permanent impacts, requiring the removal of cropland from production, will occur only at the structure locations. The remaining acreage within the ROW will be allowed to return to cropland upon completion of construction. Approximately 1,813 combined acres of grassland, pasture, or hay land occur within the Corridor/Route, and construction activities will have a temporary

NORTH

0 11.5
Miles

Neset
Tande
Judson
Williston
Renville
McHenry
Mountrail
Ward
Williams
McKenzie
McLean
Dunn
Gumbo Creek
Antelope Valley
Charlie Creek
Golden Valley
Billings
Mercer
Oliver

CANADA
Montana
North Dakota
South Dakota

LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Prime Farmland
- Farmland of Statewide Importance
- Prime Farmland if Drained
- Prime Farmland if Irrigated

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BASIN ELECTRIC POWER COOPERATIVE
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Figure 5.10-1
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Prime and Important Farmland

R:\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-10-1 Revised July 2013.mxd 7/19/2013

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

impact on cattle grazing activities. Cattle may need to be moved temporarily during construction in areas where the ROW will cross grass, pasture or hay land. Additionally, cattle will need to be restricted from grazing within the ROW upon completion of construction until the re-establishment of grass within the ROW was complete.

At the proposed Gumbo Creek, Judson and Tande substation sites, any agricultural land within the approximately 12 acres at each site will be permanently converted to utility use.

5.10.2.3 Prime Farmland

The Corridor/Route will traverse areas containing prime or other important farmland soils. Approximately 2.3 percent of the Corridor/Route consists of prime farmland, 38.1 percent is farmland of statewide importance, and 1.7 percent is prime farmland if drained or irrigated (Table 5.10-4). However, only a minimal amount of prime farmland will be taken out of production permanently due to transmission line structures being placed within the ROW (approximately 1.03 acres). Alternatively, areas cleared within the ROW on prime farmland could be converted to agricultural use. The reduction in prime farmland availability will represent a small fraction of one percent of the nearly 1.8 million total prime farmland acres within Williams, Mountrail, Mercer, McKenzie, and Dunn counties. Based on this, it is expected that alternatives will not need to be considered under the Farmland Protection Policy Act. However, the Farmland Conversion Impact Rating for Corridor Type Projects documentation (Form NRCS-CPA-106) will be completed and coordinated with the NRCS.

Table 5.10-4: Acres of Prime Farmland within Corridor/Route

Farmland Classification	Corridor/Route
Not prime farmland (acres)	2,089.7
All areas are prime farmland (acres)	81.5
Farmland of statewide importance (acres)	1,377.0
Prime farmland if drained (acres)	4.3
Prime farmland if irrigated (acres)	57.8
Total (acres)	**3,601.3**

For construction of the proposed Gumbo Creek, Judson and Tande substations, approximately 12 acres of prime farmland at each location will be permanently taken out of production.

5.10.3 Mitigation

No changes to section.

5.11 GEOLOGY AND LANDFORMS

5.11.1 Description of Resources

5.11.1.1 Regional Setting

No change to section.

5.11.1.2 Terrain

No change to section.

5.11.1.3 General Geology

No change to section. Figure 5.11-1 has been updated to include the revised route.

5.11.1.4 Oil Shale

No change to section.

5.11.1.5 Mineral Resources

No change to section. Figure 5.11-4 has been updated to include the revised route.

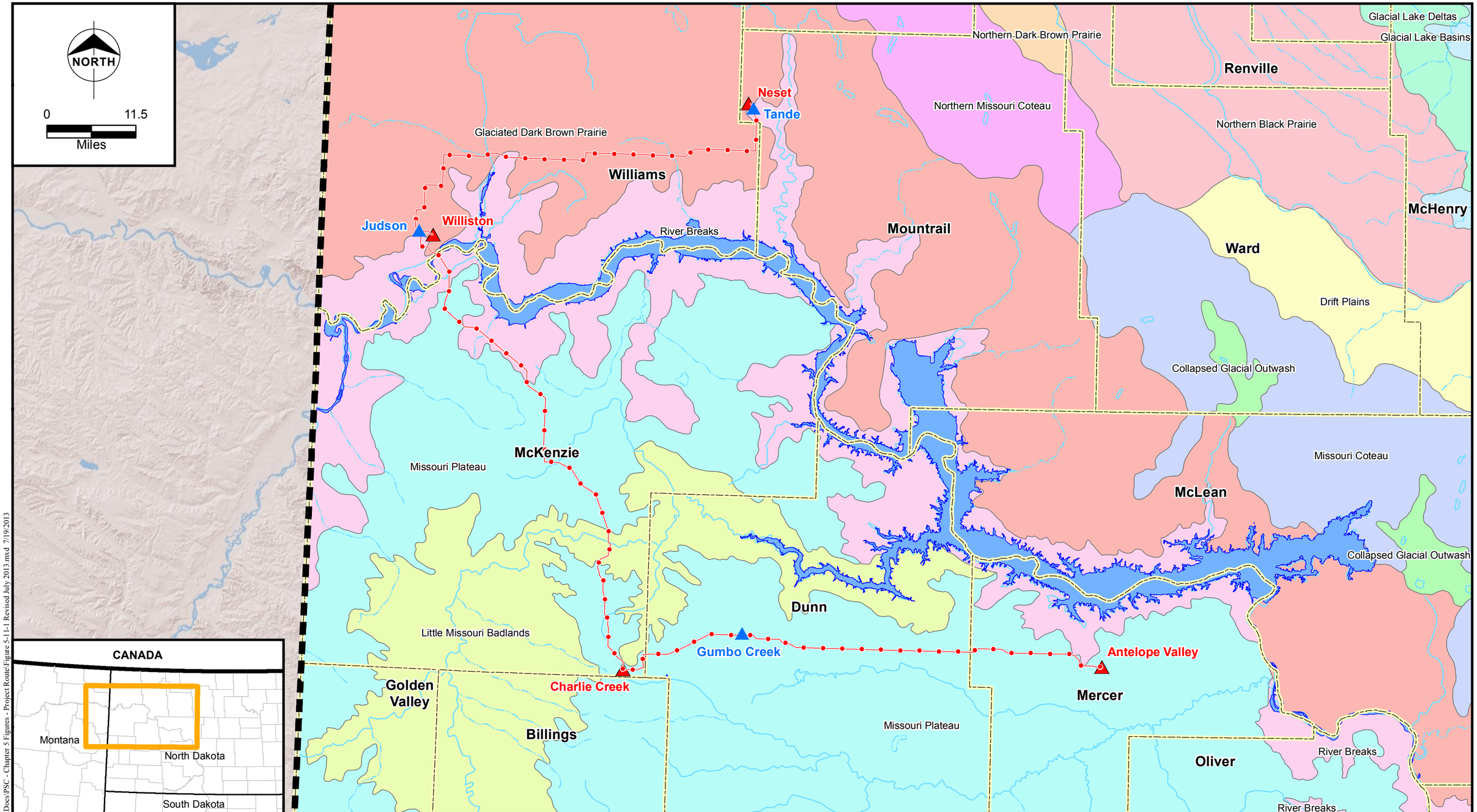
5.11.1.6 Landslides

No change to section. Figure 5.11-5 has been updated to include the revised route.

5.11.2 Impacts

The overall impact of the Project on geology, geologic resources, and surface landforms within the proposed Project area will be minor. The Corridor/Route is located within 500 feet of eight existing oil and gas wells along the length of the route, but it is probable that this number will increase due to the continuing development of oil and gas development activities in the area. However, it is anticipated that the Project will not directly affect any wells or drill rigs since the final design and placement of structures along the Corridor/Route will be designed to avoid these areas, span collector systems, and provide sufficient clearance for well maintenance and operation.

With approximately 1,167 structures used for the construction of the Corridor/Route, a total of approximately 1.75 million cubic feet of displaced soil and/or rock will be anticipated. This displaced soil and rock will be used for backfilling around structure foundations with excess material removed from the site to locations directed by landowner or disposed of at another location.



LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- MissouriRiver/Lake Sakakawea

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BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Figure 5.11-1
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Ecoregions within the Study Area

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

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NORTH

0 11.5
Miles

Neset
Tande
Judson
Williston
Gumbo Creek
Charlie Creek
Antelope Valley

Williams
Mountrail
Renville
Ward
McHenry
McKenzie
Dunn
McLean
Mercer
Oliver
Golden Valley
Billings

CANADA
Montana
North Dakota
South Dakota

LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- Coal Fields
- State Boundary
- OilFields
- County Boundary

Burns & McDonnell SINCE 1898

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Figure 5.11-4
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Oilfields and Coal Deposits

R:\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-11-4 Revised July 2013.mxd 7/19/2013

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

NORTH

0 11.5
Miles

Neset
Tande
Judson
Williston
Williams
Mountrail
Renville
McHenry
Ward
McKenzie
McLean
Dunn
Gumbo Creek
Antelope Valley
Charlie Creek
Golden Valley
Billings
Mercer
Oliver

CANADA
Montana
North Dakota
South Dakota

LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Landslide Deposits

Burns & McDonnell SINCE 1898

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Figure 5.11-5
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Landslide Areas

R:\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-11-5 Revised July 2013.mxd 7/19/2013

Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

Overall, the Project will not affect the geology of the area. However, the various geologic characteristics of the area will need to be considered during construction to provide for a safe and reliable project. Erosion and the potential for landslides will be possible in select areas along the length of the Corridor/Route, primarily during the construction phase of the proposed Project until restoration of disturbed areas can be completed. Badland areas along the Corridor/Route consist of steep, sparsely-vegetated terrain with a greater likelihood of landslide occurrences than other, more gently-sloped areas along the route. The Corridor/Route will cross approximately 5,579.3 feet of terrain (19.4 acres within the Corridor/Route) where landslides have occurred previously (as mapped by the North Dakota Geological Survey). At one location, south of the Little Missouri River, the Corridor/Route was selected to avoid a residence that was not in a landslide area but this placed the route over landslide areas that occurred on either side of the residence. A majority of these areas will be spanned by the transmission line, with no structures being placed within susceptible landslide areas. The exact locations of the structures will be developed to avoid construction in the landslide areas based on additional geotechnical studies. Care will be taken to minimize disturbance in these areas both to reduce landslide potential and protect construction workers and equipment from slides and falls. In some specific areas, Basin Electric may use helicopter construction to minimize ground disturbance in badlands areas, particularly any grading or excavating that could be necessary to develop vehicle access to structure locations. Construction-related impacts along the Corridor/Route may also consist of erosion in badland areas where vegetation is removed within the ROW along steep slopes and rugged terrain. The Corridor/Route will cross approximately 5,070 feet of terrain with a slope greater than 10 percent (16.9 acres within the Corridor/Route). Increased erosion could lead to increased landslide potential in these areas.

Impacts to geologic features, resources, or surface landforms resulting from the construction and operation of the proposed Judson and Tande substations are anticipated to be negligible. Both the Judson and Tande substation sites are located primarily on terrain with little slope, and impacts to geological resources related to construction and operation of these substations is not anticipated. Some surface grading and subsurface excavation and trenching will be necessary but will be relatively shallow and not expected to encounter significant bedrock.

5.11.3 Mitigation

No change to section.

5.12 WATER RESOURCES

5.12.1 Description of Resources

5.12.1.1 Regional Setting

No change to section.

5.12.1.2 Surface Water

No change to section.

5.12.1.3 Floodplains

No change to section.

5.12.1.4 Groundwater

No change to section.

5.12.1.5 Hydrogeology

5.12.1.5.1 Formations - General

No change to section.

5.12.1.6 Missouri River Basin Water Supply and Water Use Information

No change to section.

5.12.1.7 Water Supply Development Initiatives within the Project Area

No change to section.

5.12.2 Impacts

The Corridor/Route contains a total of 16.5 acres of FEMA-designated floodplain along the length of the route. These designated areas consist of many small, narrow floodplains associated with rivers and streams within the proposed Project area. All FEMA-designated floodplain areas within the Corridor/Route including the Missouri River floodplain[2] will be spanned and no impacts to these areas are expected during construction or operation of the proposed Project. The Corridor/Route will cross 12 perennial waterways (including the Little Missouri River and Missouri River) and numerous intermittent streams.

[2] Considerable area at the Missouri River crossing is subject to regular flooding. However, very little is designated as floodplain on the FEMA Federal Insurance Rate Maps (FIRM) which designate floodways and 100 and 500 year flood areas.

No impacts to water resources resulting from the construction and operation of the proposed Gumbo Creek, Judson or Tande substations are expected because of the use of BMPs to prevent soil erosion and sedimentation. No streams or other water bodies are present within either substation site, and the substation sites will not be located within FEMA-designated floodplains. The Tande Substation will be located within a larger parcel of land being acquired by Basin Electric, but the actual site location is yet to be determined. An existing stream is located on the eastern portion of this property, but the substation site will be constructed on the western side of the property and, with the use of BMPs, impacts to this stream will not occur.

5.12.3 Mitigation

No change to section.

5.13 BIOLOGICAL RESOURCES

5.13.1 Description of Resources

5.13.1.1 Regional Setting

No change to section.

5.13.1.2 Vegetation

No change to section.

5.13.1.3 Wildlife

No change to section.

5.13.1.3.1 Big Game

No change to section.

5.13.1.3.2 Mammals

No change to section.

5.13.1.3.3 Migratory and Resident Birds

No change to section.

5.13.1.3.4 Raptors

No change to section.

5.13.1.3.5 Gamebirds, Waterfowl, and Shorebirds

No change to section.

5.13.1.3.6 Reptiles and Amphibians

No change to section.

5.13.1.3.7 Native and Introduced Gamefish Species

No change to section.

5.13.1.4 Wetlands

No change to section. Figure 5.13-5 has been updated to include the revised route.

5.13.1.5 Special Status Species

5.13.1.5.1 Endangered Species Act Species and Critical Habitat

No change to section. Figure 5.13-6 has been updated to include the revised route.

5.13.1.5.2 USFS Sensitive and Management Indicator Species

No change to section.

5.13.1.5.3 North Dakota Species of Conservation Priority

No change to section.

5.13.2 Impacts

No change to section.

5.13.2.1 Vegetation

Table 5.13-3 presents the potential number of acres impacted within the Project Corridor/Route for each vegetation type for the entire route length. A discussion of impacts to vegetation resulting from the construction and operation of the Project is provided below.

Table 5.13-3: Vegetation Types within Corridor/Route

Vegetation Type	Project Corridor/Route Acres
Woodland	114.8
Grassland	1,659.4
Pasture/Harland	153.6
Cultivated Cropland	1,389.0

*Source: National Land Cover Dataset

NORTH

0 11.5

Miles

Neset
Tande
Judson
Williston
Williston

Tioga
White Earth
Ray
Epping
Spring Brook
Williams
Ross
Stanley
Palermo
Donnybrook
Renville
Carpio
Berthold
Burlington
Des Lacs
Minot
McHenry
Mountrail
Ward
Plaza
New Town
Parshall
Makoti
Ryder
Douglas
Max
Alexander
Arnegard
Watford City
McKenzie
McLean
Garrison
Pick City
Riverdale
Dunn
Gumbo Creek
Killdeer
Antelope Valley
Charlie Creek
Halliday
Golden Valley
Billings
Dodge
Golden Valley
Zap
Mercer
Hazen
Beulah
Stanton
Oliver

85 40 2 1804 2 85 1806 1806 200 68 16 85 23 73 22 8 1804 8 1806 200 8 49 31 48 83 52 28 28 53 37 1804 8

LEGEND

- Project Route July 2013
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Municipal Areas
- NWI Wetlands

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BASIN ELECTRIC POWER COOPERATIVE
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Figure 5.13-5
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
NWI Wetlands

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Source: North Dakota GIS; Esri; Basin Electric; Burns & McDonnell.

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NORTH

0 11

Miles

Neset
Tande
Tioga
White Earth
Ray
Epping
Spring Brook
Williams
Ross
Stanley
Palermo
Donnybrook
Renville
Carpio
Berthold
Des Lacs
Burlington
Minot
McHenry
Ward
Judson
Williston
Williston
Lewis and Clark State Park
Mountrail
Fort Union Trading Post
Plaza
New Town
Parshall
Makoti
Ryder
Douglas
Max
Alexander
Arnegard
Watford City
McKenzie
McLean
Garrison
Fort Stevenson State Park
Pick City
Riverdale
Theodore Roosevelt National Park
Little Missouri State Park
Dunn
Gumbo Creek
Killdeer
Dunn Center
Halliday
Antelope Valley
Charlie Creek
Golden Valley
Billings
Dodge
Golden Valley
Zap
Beulah
Mercer
Hazen
Knife River Indian Villages NH
Stanton
Oliver

North Dakota

LEGEND

- Project Route July 2013
- Substation
- Proposed Substation
- State Boundary
- County Boundary
- Municipal Areas
- National or State Park
- National Wildlife Refuge
- National Grassland
- Piping Plover Critical Habitat
- Interior Least Tern Habitat
- Pallid Sturgeon Habitat
- 75% (60 mi Whooping Crane Corridor)
- 80% (80 mi Whooping Crane Corridor)
- 85% (100 mi Whooping Crane Corridor)
- 90% (130 mi Whooping Crane Corridor)
- 95% (170 mi Whooping Crane Corridor)

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BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Figure 5.13-6
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Important Threatened and Endangered Species Habitat

Source: North Dakota GIS; USFWS Map; Esri; Basin Electric; Burns & McDonnell.

Revised July 19, 2013

R:\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-13-6 Revised July 2013.mxd 7/19/2013

Temporary impacts associated with the construction of the Project will include the disturbance of vegetation along temporary access roads, as well as temporary disturbance of vegetation within the ROW boundary for access during construction. Grassland vegetation comprises the largest amount of acreage within the Corridor/Route (1,659.4 acres), although very little of this area will actually be subject to disturbance during construction. Grassland vegetation will be temporarily impacted during construction, but due to its short height, removal of only minimal grassland vegetation is anticipated within the ROW except at structure locations, and grassland vegetation will be expected to recover in full upon the completion of construction and restoration efforts. Vegetation used for pasture or hay land will be temporarily impacted as well, primarily during structure erection and pulling of conductors. In agricultural areas, cropland will be temporarily disturbed within the ROW during construction, but will be re-planted following completion of construction. Permanent vegetative impacts (not including forested areas) associated with the Project will primarily be confined to the removal of vegetation at each structure foundation location, resulting in a permanent loss of vegetation of approximately 1.03 acres over the length of the Corridor/Route.

Approximately 114.8 acres of woodland is located within the Corridor/Route. Typically, trees will be cleared to maintain access to the ROW and appropriate clearance for the safe and reliable operation of the line. For this project, much of the woodland vegetation is associated with deep draws and canyons in badland areas and around drainages. It is likely that many of these areas will be spanned in such a manner that the trees will pose no hazard to the line and clearing will be unnecessary. Thus, while approximately 114.8 acres of woodland occurs within the Corridor/Route, considerably less woodland is likely to actually require clearing. Depending on the type of vegetation adjacent to these wooded areas, cleared woodland areas will likely be converted to grassland or pasture similar to these types of areas throughout the project areas. In addition, though not categorized as woodland, numerous treed windbreaks, shelterbelts, and fencerows will be crossed by the Project. Trees within the ROW at these locations will be cleared and the areas converted to similar vegetative cover that is adjacent to the cleared areas.

The proposed Gumbo Creek, Judson and Tande substations will require the removal of all vegetation within the fenced area of the site (approximately 12 acres per substation), as both sites will be converted to utility use. These substation sites are located in grassland or cropland areas, avoiding the clearing of woodland vegetation. Impacts to vegetation within the substation boundaries will be permanent.

5.13.2.2 Wetlands

Impacts to NWI wetland areas within the proposed Project area are expected to be minimal. Table 5.13-4 displays potential wetland types and acreages within the Corridor/Route. Wetland data was determined using available National Wetland Inventory (NWI) data. Prior to construction, all wetland areas within the Corridor/Route will be delineated to minimize the Project's impacts to the wetland areas. During construction, steps will be taken to avoid wetland areas while accessing the ROW, and measures will be taken to avoid disturbing areas adjacent to wetlands to prevent sedimentation and soil runoff caused by construction disturbance. No permanent impacts, such as placement of transmission structures within wetland boundaries, will occur. Basin Electric will coordinate with the USACE to determine any permitting requirements and conditions necessary for construction involving wetlands within the Corridor/Route. No impacts to wetlands are anticipated during operation of the proposed Project.

Table 5.13-4: NWI Wetland Acres within Corridor/Route

Wetland Type	Wetland Acres in Corridor/Route
PEM	11.3
PSS	0.4
Lake	11.1
Pond	0.7
Riverine	2.5
Total	**26.2**

PEM = palustrine emergent, PSS = palustrine scrub/shrub
Source: NWI Geographic Information System (GIS) data layer

No structures will be placed within any wetlands within the Corridor/Route, and no clearing of wetland vegetation is anticipated within the ROW. BMPs will be employed to minimize impacts to wetlands within the ROW during construction.

No impacts to wetlands are expected from the construction of the proposed Gumbo Creek, Judson or Tande substations. No NWI wetlands are located within the boundaries of the substation sites, and no wetlands will need to be crossed for access to either site for construction. BMPs will be used to minimize soil erosion and runoff during construction to prevent sedimentation into nearby wetlands.

5.13.2.3 Wildlife

Big Game

Specific, sensitive areas used by certain big game species, such as lambing areas for bighorn sheep, are located within areas of the Little Missouri River badlands within the LMNG and adjacent private lands. These areas could potentially be affected if the Corridor/Route, which impacts approximately 152.9 acres of LMNG, was to be constructed through or near these areas during the lambing and calving seasons. Consultation with the North Dakota Game and Fish Department (NDGFD) determined that timing restrictions during construction will need to be adhered to within these areas in order to prevent disturbance to bighorn sheep lambing activities (April 1st thru July 1st). Based on this coordination and development and implementation of appropriate mitigation, it is anticipated that, although habitat within the ROW may be changed or modified from its current condition, big game calving and lambing activities will not be adversely impacted by construction. Following construction, the ROW will provide habitat not dissimilar to that currently present in the area and within existing utility ROW's. No changes in big game use of the area are anticipated.

Proposed Substations

Construction of the proposed Gumbo Creek, Judson and Tande substations will require the removal of all vegetation within the fenced boundary of the sites. Impacts to wildlife during construction will be similar to those incurred during construction of the transmission line. Loss of vegetation in these fenced areas will be permanent, and any available wildlife habitat will be converted to utility use. The proposed substation sites will be 12 acres in size, and currently consist of grassland habitat. Land use in these areas is a mixture of grassland and tillable cropland. Exact impacts to available habitat will be determined upon acquisition of a site, if needed. Wildlife species using any available habitat on the proposed substation sites will be displaced to available habitat adjacent to these sites.

5.13.2.4 Special Status Species

The Corridor/Route contains 64.8 acres of critical habitat[3] for the piping plover. Designated areas of critical habitat include prairie alkali wetlands and surrounding shoreline; river channels and associated sandbars and islands; and reservoirs and inland lakes and their sparsely vegetated shorelines, peninsulas, and islands. Although structures will be placed within the greater boundary of critical habitat for the piping plover, no structures would be placed within the primary constituent elements of piping plover critical habitat. Impacts to the primary constituent elements are not expected. Additionally, the

[3] Piping plover critical habitat and pallid sturgeon habitat information was obtained from USFWS maps. Acreage of piping plover critical habitat was determined by measuring the amount of critical habitat occurring within the proposed Project ROW.

Corridor/Route crosses the Missouri River, known habitat for the pallid sturgeon, while paralleling U.S. Highway 85 near Williston. Habitat for the pallid sturgeon within the proposed Project area includes the upper reaches of the Missouri River itself. Impacts to sturgeon habitat are not anticipated (see Table 5.13-6 for species-specific considerations) as a result of the Project having no impacts to surface water habitats.

Although critical habitat for the whooping crane has not been designated within the Project area, the Project area is within the whooping crane migration corridor. This migration corridor provides the area within which whooping cranes are most likely to occur during spring and fall migration periods. The center of the corridor represents the core of the area followed by the cranes. The wider the corridor, the more likely cranes will occur within the corridor area considered. However, as the corridor widens out, the likelihood of crane occurrence decreases with distance from the migration corridor core. As cranes move east and west along the migration corridor in search of food, water, and roosting areas, they may venture outside the core of the migration corridor, potentially occurring in these fringe areas of the corridor. While crane occurrence at any particular location within the corridor will vary from year to year based on weather conditions and associated availability of water and wetlands and crop stages, over time, the greatest crane occurrence and use will trend toward the core of the migration corridor. Table 5.13-5 displays the length in miles that the Corridor/Route will occur within each whooping crane percent occurrence migration corridor. Although migration can be highly variable, this data provides an indication of the probability of whooping crane occurrence along the Corridor/Route.

Table 5.13-5: Whooping Crane Percent Migration Corridor

	Length Through Whooping Crane Percent Migration Corridors (miles)					
	75%	**80%**	**85%**	**90%**	**95%**	**Total**
Project Corridor/Route	54.4	53.3	57.1	34.1	0	**198.9**

Source: USFWS Whooping Crane Percent Migration Corridor, as depicted in Figure 5.13-6

Whooping cranes are highly dependent on wetlands during migration for roosting, resting, and feeding and have been known to use wetland areas within the proposed Project area. Wetland acres within one mile of the Corridor/Route may also provide an indication of the likelihood of whooping cranes utilizing the area of the proposed project. The Corridor/Route will be located within one mile of 3,996.5 acres of NWI wetlands for the length of the route. Further analysis of potential whooping crane habitat is being conducted through a Resource Selection Function (RSF) analysis. This analysis will depict the

probability of stopover likelihood to help identify areas of greatest risk or concern for the crane during migration.

Table 5.13-6 presents the project considerations for all identified special status species. North Dakota Species of Conservation Priority and USFS sensitive/watch plant species are not specifically addressed here as the effects discussion for federally listed species and USFS sensitive species should encompass habitats utilized by North Dakota Species of Conservation Concern and USFS sensitive/watch plant species. Project-specific mitigation measures will be developed as part of detailed species-specific evaluation in the Biological Assessment (BA) for the Project (Appendix S), in consultation with USFWS and for lands within the LMNG in the Biological Evaluation (BE) (Appendix T), in consultation with the USFS[4]. Project-specific mitigation measures will also be developed in consultation with USFS and will be included as conditions in the USFS-issued SUP.

Table 5.13-6: Potential Project Considerations for Federally-Listed Special Status Species

Species	Corridor/Route	Comment
Endangered		
Whooping crane	Approximately 198.9 miles (entire length of Corridor/Route) of new line within migration corridor (Table 4-5)	Collisions with transmission lines pose highest potential risk, especially where line is located between wetland roosting areas and agricultural areas used for foraging. Habitat locations will be identified in the Project areas a result of surveys to be completed for suitable habitat locations. Project-specific mitigation measures will be developed as part of detailed species-specific evaluation in the Biological Assessment, in consultation with USFWS.
Interior least tern	None	Interior least terms may utilize sandbars in the vicinity of the Missouri River crossing. Project-specific mitigation measures will be developed as part of detailed species-specific evaluation in the Biological Assessment, in consultation with USFWS.
Pallid sturgeon	None	There will be no in-water work within the Missouri River and no work within its inundated floodplain; BMPs will be used to prevent impacts on water resources.

[4] The BA and BE are currently under development and will be included in Appendix S and Appendix T upon completion.

Species	Corridor/Route	Comment
Black-footed ferret	None	No populations known to exist in North Dakota (USFWS, 2011a); surveys for prairie dog towns will be conducted prior to construction to identify habitat for black-footed ferret.
Gray wolf	None	No populations known to exist within the Project area
Threatened		
Piping plover	Approximately 64.8 acres of designated critical habitat within Corridor/Route, however structures will not be placed in the primary constituent elements of piping plover habitat.	A habitat survey will be on both sides of the centerline of the Corridor/Route and findings included in the Biological Assessment. Project-specific mitigation measures will be developed as part of detailed species-specific evaluation in the Biological Assessment, in consultation with USFWS.
Candidate		
Sprague's pipit (also a USFS sensitive species)	Approximately 1,659.4 acres of potential grassland habitat within Corridor/Route	Potential temporary disturbance to grassland habitat within ROW; grassland habitat re-established upon completion of construction Project-specific mitigation measures will be developed as part of detailed species-specific evaluation in the Biological Assessment, in consultation with USFWS.
Dakota skipper (also a USFS sensitive species)	Approximately 1,180.2 acres of potential grassland habitat within Corridor/Route in Dunn and McKenzie Counties	Potential temporary disturbance to native grassland habitat within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed as part of detailed species-specific evaluation in the Biological Assessment, in consultation with USFWS.
USFS Sensitive Species		
Baird's sparrow	Approximately 1,659.4 acres of grassland habitat potentially containing areas of suitable native grassland within Corridor/Route	Potential temporary disturbance to native grassland habitat within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.

Species	Corridor/Route	Comment
Bald eagle/Golden eagle	No known nests within 1 mile of centerline of Corridor/Route	Nest surveys for raptors will be conducted in an area 1 mile on both sides of the centerline of the Corridor/Route during spring 2013. As part of project implementation, USFWS, USFS and NDGFD will be consulted to develop and implement a plan to protect any identified nests from adverse effects during construction. Basin Electric will develop an Avian Protection Plan for operation of the line and associated facilities.
Burrowing owl	Approximately 1,659.4 acres of grassland within Corridor/Route	Potential temporary disturbance to native and nonnative grassland habitat within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP
Greater prairie chicken	None	No populations known to exist within the Project area
Greater sage-grouse	Approximately 0.6 acre of sage brush habitat within the Corridor/Route	Sage grouse not reported from the Project area, but are reported from adjacent counties. Potential disturbance to sage brush habitat within ROW; sage brush habitat to be reestablished upon completion of construction; Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.
Loggerhead shrike	Approximately 1,659.4 acres of grassland within Corridor/Route Approximately 0.6 acre of sage brush habitat within the Corridor/Route	Potential disturbance to sage brush and grassland habitat within ROW; sage brush and grassland habitat to be reestablished upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.
Long-billed curlew	Approximately 1,659.4 acres of grassland within Corridor/Route Approximately 1,389.0 acres of cropland within Corridor/Route	Potential temporary disturbance to grassland habitat and cropland within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.

Species	Corridor/Route	Comment
Black-tailed prairie dog (also a MIS for the LMNG)	No prairie dog towns are known to occur within the Corridor/Route	Potential temporary disturbance to native and nonnative grassland habitat within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.
Bighorn sheep	Approximately 1,659.4 acres of grassland within Corridor/Route Approximately 114.8 acres of woodland habitat within Corridor/Route	Potential impacts to foraging, wintering, and lambing habitat; Basin Electric will coordinate with NDFGD and USFS to avoid construction in lambing areas during the lambing season; Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.
Arogos skipper	Approximately 1,659.4 acres of grassland habitat potentially containing areas of suitable native grassland within Corridor/Route	Potential temporary disturbance to native grassland habitat within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.
Broad-winged skipper	None	No populations known to exist in the Project area. Species only reported from eastern North Dakota.
Dion skipper	None	No populations known to exist in the Project area. Species only reported from eastern North Dakota.
Mulberry wing	None	No populations known to exist in the Project area. Species only reported from eastern North Dakota.
Ottoe skipper	Approximately 1,659.4 acres of grassland habitat potentially containing areas of suitable native grassland within Corridor/Route	Populations known to exist in western North Dakota. Potential temporary disturbance to native grassland habitat within ROW; grassland habitat to be re-established upon completion of construction (USFWS, 2011d). Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.
Powesheik skipper	None	No populations known to exist in the Project area. Species only reported from eastern North Dakota.

Species	Corridor/Route	Comment
Regal fritillary	Approximately 1,659.4 acres of grassland habitat potentially containing areas of suitable native grassland within Corridor/Route	Populations known to exist in western North Dakota. Potential temporary disturbance to native grassland habitat within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.
Tawny crescent	Approximately 1,659.4 acres of grassland habitat potentially containing areas of suitable native grassland within Corridor/Route Forested wetlands not known to occur within Corridor/Route	Populations known to exist in western North Dakota. Potential temporary disturbance to native grassland habitat within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS and will be included as conditions in the SUP.
USFS Management Indicator Species		
Plains sharp-tailed grouse	Approximately 1,659.4 acres of grassland habitat potentially containing areas of suitable native grassland within Corridor/Route	Potential temporary disturbance to native grassland habitat within ROW; grassland habitat to be re-established upon completion of construction. Project-specific mitigation measures will be developed in consultation with USFS/NDGF and will be included as conditions in the SUP.

Surveys for Species under U.S. Fish and Wildlife Service Jurisdiction

5.13.3 Mitigation

No change to sections.

5.14 SUMMARY OF CORRIDOR/ROUTE IMPACTS

The construction and operation of Basin Electric's proposed Project could have a potential impact on environmental and human resources located in northwestern North Dakota. A summary of potential impacts and mitigation by resource is located in Table 5.14-1.

Table 5.14-1: Summary of Project Impacts and Mitigation

Resource	Corridor/Route		Substations		Mitigation
	Permanent Impacts	**Temporary Impacts**	**Permanent Impacts**	**Temporary Impacts**	
Socioeconomics	Economic benefit to businesses and surrounding communities from increased electrical capacity and reliability. Potential changes in property values. Property tax revenues of $59,640 annually to Project counties.	Economic benefit to local communities during construction as a result of construction crews generating local revenue.	Economic benefit to businesses and surrounding communities from increased electrical capacity and reliability. Potential changes in property values	Minor economic benefit to local communities during construction as a result of construction crews generating local revenue.	• The construction contractor, after assessing utilization of existing housing availability, should plan to establish its own housing in the form of man-camps and/or recreational vehicles (RVs) brought in from outside of the region to a number of locations secured by the contractor. • Work with agricultural producers to minimize disruptions during the harvest season and to limit the impact on the farmers' ability to maneuver equipment in the vicinity of the immediately affected area. • Work with individual landowners to try to coordinate the timing of construction to minimize short-term impacts on agriculture. • Initiate discussions with local fire and police districts prior to construction and work with the districts and other appropriate emergency response providers to develop fire and emergency response plans.
Land Use	3,610.3 acres of ROW will be required and will be restricted from some types of future development. Approximately 1 acre of soil (0.0009-acre per structure) will be permanently removed. 36 acres of land will be required for construction of new substations and require permanent conversion from agricultural uses to a utility use. Corridor/Route will include state and federal properties. Corridor/Route will include approximately 152.9 acres of LMNG, 57.9 acres of USACE property, and approximately 118.9 acres of school trust lands.	Loss of use for landowners within ROW on private lands during construction. Access restrictions and/or loss of use within ROW during construction on state or federal properties. Disturbance from heavy equipment may result in some crop loss during construction	12 acres will be permanently converted from agriculture use to utility use for each substation.	Construction-related impacts such as increased noise and dust on surrounding agricultural lands.	• Provide a schedule of construction activities to all landowners who could be affected by construction. • Coordinate with landowners for potential measures to minimize project impacts on uses on specific properties. • Coordinate with appropriate federal and state land management agencies to obtain appropriate permits and easements for portions of the Corridor/Route traversing public lands. • Obtain the appropriate permits as necessary to comply with county and township zoning ordinances. • Plan and conduct construction activities to minimize temporary disturbance, displacement of crops, and interference with agricultural activities. • Restore compacted cropland soils as close as possible to pre-construction conditions using tillage. • Compensate landowners for any new land rights required for ROW or access road easements. • Compensate landowners at market value for any new land rights required for ROW easements or acquired for new temporary or permanent access roads on private lands. This should include compensation for agricultural production and market values lost during the construction period.
Infrastructure-Transportation	No long-term effects on utility infrastructure are anticipated.	Existing utility infrastructure will be traversed during construction activities and may	No effect	Short-term interruption of existing transmission lines during construction activities	• Time conductor stringing across U.S. Highway 85, U.S. Highway 2, ND State Highway 8, ND State Highway 22, and ND State Highway 23 to avoid peak traffic, in consultation

	No long-term effects on transportation are anticipated. Potential impacts on airports within 10 nautical miles will be avoided through coordination with FAA. Basin Electric will coordinate with BNSF to minimize or avoid potential impacts on railroads in areas where the route will traverse railroads at a vertical elevation.	be temporarily taken out of service. Some temporary road closures are likely during construction activities and may result in short-term adverse impacts. Basin Electric will also coordinate with BNSF in order to string the transmission line over existing railroad tracks.		may result minor temporary impacts. The introduction of material haul trucks and road closures during construction activities may result in short-term adverse impacts.	with North Dakota Department of Transportation. • Mark a detour route, if required by North Dakota Department of Transportation, and provide traffic information to motorists in advance of the detour, consistent with the Manual on Uniform Traffic Control Devices (Federal Highway Administration, 2012). • Coordinate with townships, counties, and North Dakota Department of Transportation to redress any road damage related to construction of the project. • Coordinate with FAA to avoid or minimize impacts on local aircraft facilities. • Identify existing utilities and coordinate with the owners to implement appropriate measures to protect both facilities and construction workers during crossings. Railroads (BNSF, 2011): • Locate poles 50 feet out from the centerline of railroad main, branch and running tracks, CTC sidings, and heavy tonnage spurs. • Provide at least 10-foot clearance from the centerline of track for poles located adjacent to industry tracks. If located adjacent to curved track, then said clearance must be increased at a rate of 1.5 inches per degree of curved track. • Locate unguyed poles (regardless of the voltage) at a minimum distance from the centerline of any track, equal to the height of the pole above the ground-line plus 10 feet. If guying is required, place the guys in such a manner as to keep the pole from leaning/falling in the direction of the tracks. • Locate poles (including steel poles) at a minimum distance from the railroad signal and communication line equal to the height of the pole above the ground-line or else be guyed at right angles to the lines. High voltage towers (345 kV and higher) must be located off railroad ROW. • Perform (if requested by BNSF) an inductive coordination study for electrical lines paralleling the tracks. • Construct utilities that cross railroad property, to the extent feasible and practical, perpendicular to the railroad alignment and preferably at not less than 45 degrees to the centerline of the track. • Do not place utilities within culverts or under railroad bridges, buildings, or other important structures. • Do not install crossings under or within 500 feet of the end of any railroad bridge, or 300 feet from the centerline of any culvert or switch area. • Span property completely with supportive structures and appurtenances located outside railroad property. For electric supply lines, normally the crossing span shall not exceed 150 feet with adjacent span not exceeding 1.5 times the crossing span length. • Encourage joint-use construction at locations where more than one utility or type of facility is involved. However, electricity and petroleum, natural gas, or flammable materials shall not be combined. Review and approve pipe truss design and layout with BNSF Engineering. • Construct electric lines with a minimum clearance of 26.5 feet or greater above top of rail when required by the National Electric Safety Code or state and local regulations.

					Electric lines must have a florescent ball marker on low wire over centerline of track. • Label the posts closest to the crossing with the owner's name and telephone number for emergency contact.
Public Health and Safety	Long-term adverse effects expected to be negligible to minor. EMFs will be well below identified thresholds to protect the public. The operation of farm equipment near proposed structures could result in unnecessary contact and/or damage to machinery and/or operators. Standard operating and safety procedures will be employed to ensure the safe delivery of services.	Hazardous and/or potentially hazardous materials may be encountered during construction, or exposure to energized transmission lines. These impacts are likely to be minor with the implementation of construction plans that ensure worker safety, proper handling of hazardous materials, and spill cleanup.	Long-term adverse effects are expected to be negligible to minor.	Hazardous and/or potentially hazardous materials may be encountered during construction. Impacts on public health and safety are likely to be minor with the implementation of construction plans that ensure worker and public safety, proper handling of hazardous materials, and spill cleanup.	• Prepare a construction plan in accordance with the National Electrical Safety Code and the Occupational Safety and Health Administration's regulations, as required by federal law, to ensure the safety of construction workers. This will also identify procedures should a spill occur or hazardous materials be discovered. • Construct the proposed project with materials designed to contain electric currents and meet the highest safety standards. • Employ standardized agency procedures should the transmission line need maintenance or repairs. The use of such can help ensure the safety of both workers and those in the surrounding area. • Additional measures such as those identified in Appendix I are designed to ensure that Basin Electric's operational procedures are adhered to the highest standard to ensure the safety of workers and others close to the construction and operation of the proposed project.
Air Quality	Potential increase in GHG levels as a result of the operation of the transmission line	Increases in fugitive dust caused by construction activity, vehicles, and equipment. Increased emissions from construction vehicles and equipment	Potential increase in GHG levels as a result of the operation of the substations.	Increases in fugitive dust caused by construction activity, vehicles, and equipment. Increased emissions from construction vehicles and equipment	• Use water on roads and disturbed areas to minimize dust. • Re-seed vegetation in disturbed areas outside of the substation/switchyard to prevent wind-blown dust from areas void of vegetation. • Implement vehicle idling and equipment emissions measures, such as establishing operating policies that limit idling time and mechanical modifications to the vehicles that restrict the amount of idle time. • Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions. • Locate staging areas as close to construction sites as practicable to minimize driving distances. • Locate, where possible, staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable. • Encourage the use of the proper size of equipment for the job to maximize energy efficiency. • Use alternative fuels, if possible, for generators at construction sites, such as propane or solar, or use electrical power where practicable. • Recycle or salvage non-hazardous construction and demolition debris where practicable. • Dispose of wood debris (burning) in the local area where practicable. • Use local rock sources for road construction where practicable.
Noise	No effect	Increases in noise levels along the Corridor/Route from construction vehicles and equipment	No effect	Increases in noise levels for nearby residences during construction of the substations.	• Use equipment with sound-control devices no less effective than those provided on the original equipment. • Do not use equipment with an unmuffled exhaust. • Do not conduct noise-generating construction activity within 1,000 feet of a residential

					structure between the hours of 10:00 p.m. and 7:00 a.m. • Notify landowners directly impacted along the Corridor/Route prior to construction activities. • During operation, if the proposed transmission line is found to be the source of radio or television interference in areas with reasonably good previous reception, measures will be taken to restore the reception to a quality as good as or better than before the interference.
Visual	Change in the visual characteristics and viewshed within project area and for residents located near the transmission line (3 residences within 500 feet)	Visibility of construction vehicles and equipment along Corridor/Route	Additional visual element added to the landscape.	No effect	• Use weathering single pole steel structures where steel towers are utilized, to reduce visual impacts. • Work with the agencies to choose a structure type (weathering steel or galvanized) that will reduce visual impacts in highly visible or scenic areas, such as the Missouri and Little Missouri River crossings, the National Grasslands, and badland areas. • Leave (where possible) plants smaller than 8 feet in height within the 150-foot-wide ROW to help reduce the effect of the Corridor/Route on visual and aesthetic resources. • Keep the ROW free of construction debris and other litter during construction to further minimize visual intrusion to the surrounding landscape.
Cultural	No adverse effects on NRHP-eligible cultural resources. Based on the Class I cultural resources investigation conducted for the Project, known sites have been avoided; a portion of the Corridor/Route has been surveyed at the Class III level. The rest of the Corridor/Route will be surveyed and any cultural resource sites will be avoided. Surveys have been conducted on over 95% of the 80% of the proposed line where survey access has been granted. There are two sites that are being investigated further.	No adverse effects on NRHP-eligible cultural resources.	No adverse effects on NRHP-eligible cultural resources.	No adverse effects on NRHP-eligible cultural resources.	• If necessary, develop a Memorandum of Agreement that will establish procedures to guide the identification and evaluation of historic properties, the assessment of adverse effects on them, and the development of appropriate mitigation of any adverse effects for cultural resources within the Corridor/Route. • Conduct a Class III cultural survey within the Corridor/Route and the site boundaries of all proposed substations and switchyards prior to construction and develop mitigation measures where required. • Span and protect known archaeological sites within the Corridor/Route from disturbance during construction. • Prevent construction workers from collecting or disturbing discovered cultural resources. • Develop a Project's Unanticipated Discovery Plan to provide guidance on how to proceed if a previously unknown archaeological or historic resource is encountered during construction or operation of the proposed transmission line, including contact of the SHPO and RUS-designated Federal Preservation Officer for further evaluation.
Recreation	Approximately 330 acres of state or federal land potentially open to dispersed recreational activities such as hunting will be located within the Corridor/Route.	Increased noise, dust, and traffic congestion in recreational areas. Temporary access restrictions during construction on public use areas	Conversion of land for substations will remove it from further land use, including recreational use. Each substation will occupy 12 acres.	Increased noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation sites.	• Impacts on recreation will largely be associated with changes in viewsheds and general recreational experiences from the presence of the proposed transmission line. Mitigation measures for viewsheds are described under Aesthetics and Visual Resources. • Recreation will also be impacted in the short term by noise and dust from construction activities, equipment, and vehicles; construction-related traffic; and the presence of construction crews. Mitigation measures for these impacts are described under Geology and Soils; Infrastructure and Transportation; and Noise.
Soils and Farmland	Approximately 1 acre of soil (0.0009-acre per structure) will be permanently removed. Farmland for crop production	338 acres (0.29-acre per structure) of temporary soil disturbance during construction within Corridor/Route, with	Any farmland within the 12-acre substation sites will be permanently converted to utility	No effect	Soils: • Confine construction activities to the ROW and around structure locations for placement of the transmission structures.

	permanently impacted only at structure locations	temporary loss of crop production	use		• Stockpile any topsoil removed during any required leveling of structure sites nearby and replace it following construction. • Re-grade disturbed ground to as close to pre-construction condition as appropriate for stabilization and revegetated or approved for tillage depending on pre- construction land use. • Locate the construction laydown areas required for the proposed Project at previously-disturbed or developed locations, such as vacant lots or agricultural lands, where feasible. • Place construction materials on pallets or cribbing within the designated laydown areas. • Return laydown areas to pre-construction condition upon completion of the project. Farmland: • Compensate landowners for any crop damage that may occur as a result of construction and operation of the proposed project. • Redress any compaction or other construction-related issues that could affect soil productivity and agricultural operations.
Geology and Landforms	Displacement of 1.75 million cubic feet of soil and rock during structure foundation borings and construction	Potential for erosion on steeper slopes during construction	No effect	No effect	• Conduct geotechnical assessments at structure locations to develop a process or approach to minimize the potential development of landslides in susceptible areas during construction. • Span identified landslide areas with no structures being placed within susceptible landslide areas. • Prepare a stormwater pollution prevention plan for construction activities prior to construction.
Water	No effects anticipated. 12 perennial waterways and 16.5 acres of FEMA floodplain crossed, but all will be spanned. Natural floodplain will be crossed with structure placement.	Potential sedimentation and runoff caused by construction	No effect	No effect	• Clean up any spills or equipment leaks promptly to prevent materials entering surface water. • Contain and store appropriately any materials such as fuel, lubricants, and solvents. • Schedule construction in the area of the Missouri River crossing in low water periods or during winter to minimize impacts to the geographical floodplain. Coordinate construction timing with USACE. • Span floodplains to the extent possible to avoid potential impacts. • Plant or seed non-agricultural areas that were disturbed during construction. Use native seed mixes from the indigenous plants and plant indigenous species located in the immediate disturbed soil area; ensure seeding and/or plantings are done in a time congruent with seeding and growth of the area, not during a time that will preclude germination or rooting. • Remove excavated material and other debris from flood prone areas to maintain storage volumes and prevent introduction of debris that may lead to clogged culverts or bridges, resulting in changes to water flow and flood patterns. • Locate structures and disturbed areas away from rivers and lakes, where practicable. • Install sediment control measures prior to construction in accordance with plans and permits including: mulch produced through the chipping of removed trees; soil berms; and partially burying logs along the ROW.

					• Use wastewater and stormwater control measures to meet the effluent limits prior to discharging from construction sites to surface waters. • Avoid the use of fertilizers, pesticides, or herbicides in or near surface waterbodies. • Fuel construction vehicles away from surface waterbodies and use appropriate spill prevention and containment procedures.
Biological Resources	Vegetation: Approximately 114.8 acres of woodland potentially removed within Corridor/Route, depending on slope. One acre of vegetation permanently removed within Corridor/Route at structure locations. Potential introduction of noxious weeds within Corridor/Route to be avoided by weed mitigation measures. Wildlife: Loss of forested habitat due to removal of 114.8 acres of woodland within the Corridor/Route. Some mortality of small, less-mobile species. Potential avian species collisions with power lines. Aquatic Resources: Change in local aquatic habitats in areas where vegetation is cleared along shoreline. Special Status Species: No adverse effect on listed species pending outcome of consultation with USFWS and USFS. Wetlands: No effect. All 26.2 acres of wetland (NWI) within Corridor/Route will be spanned. No structures placed in wetlands and no wetland vegetation will be cleared.	Vegetation: Disturbance of vegetation within the Corridor/Route and along access roads during construction. Natural Heritage Inventory sensitive ecological community potentially impacted. Wildlife: Disturbance within and near the Corridor/Route during construction due to human intrusion, noise, and construction activity. Temporary loss of habitat due to vegetation clearing within ROW during construction. Aquatic Resources: Potential for sedimentation, runoff, and spills during construction; to be avoided by use of BMPs. Special Status Species: Potential impacts to grassland habitat within Corridor/Route during construction. Wetlands: Potential sedimentation and runoff caused by construction near wetlands.	Vegetation: All vegetation removed from 12 acre sites and converted to utility use. Wildlife: Loss of habitat within the 12 acre sites as these are converted to utility use. Aquatic Resources: No effect. Special Status Species: No effect. Wetlands: No effect.	Vegetation: No effect. Wildlife: Disturbance to nearby species due to construction activities Aquatic Resources: No effect. Special Status Species: No effect. Wetlands: Potential sedimentation and runoff caused by construction near wetlands located near substation sites.	• Restore any new temporary access roads created during construction of the transmission line to the natural condition of the surrounding area after construction is completed. • Revegetate disturbed areas outside of the substation/switchyard and within the ROW using native vegetation and certified weed-free seed and mulch to protect native vegetation and wildlife habitat. • Inspect equipment for seeds and other vegetative material and power-wash prior to transport to new areas to prevent the spread of undesirable plants from one area to another. • Coordinate with the North Dakota Public Service Commission to determine appropriate mitigation for the vegetation removed. Typically for these types of projects, the tree and shrub vegetation is replaced at a ratio of 2:1, reducing the overall loss of these vegetation types over time. • Avoid the Natural Heritage Inventory-listed significant ecological community (western little bluestem prairie) in Dunn County. If the significant ecological community cannot be avoided, Basin Electric will coordinate with North Dakota Game and Fish Department (NDGFD) to minimize impacts and implement mitigation measures. • Coordinate with USACE and the state of North Dakota to obtain the necessary permits if impacts on wetlands, streams, or other waterbodies are unavoidable. • Avoid wetland areas while accessing the ROW during construction. Design and install temporary low-water crossings or culverts, if needed, so as not to inhibit fish passage, or create upstream or downstream habitat changes. • Coordinate with NDGFD and USFS to avoid construction during bighorn sheep lambing season (April 1st thru July 1st; and other important times for game species) in the Little Missouri Badlands area and LMNG. • Conduct raptor and migratory bird surveys along and adjacent to the proposed transmission line route prior to construction. Coordinate with USFWS, USFS, and NDGFD to develop and implement a plan to protect any identified nests from adverse effects during construction. Coordinate with USFWS to develop an Avian Protection Plan for operation of the transmission line. • Design the proposed project to meet the requirements for the protection of avian species from electrocution and line strikes according to the guidelines in the Avian Power Line Interaction Committee's "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2012" (APLIC, 2012). • Coordinate with UFWS, USFS, and NDGFD regarding greater prairie chicken, greater sage-grouse, and Plain's sharp-tailed grouse habitat. Structures will not be placed within 0.25 mile of active lek sites. In addition, consult with USFWS, USFS, and NDGFD prior to construction within a 2-mile radius of an active lek during the period of March 1st through June 15th.

					• Coordinate with USFWS to avoid construction in designated critical habitat during the piping plover nesting season (mid-April to mid-August) and in interior least tern nesting habitat during the nesting season. • Comply with all conditions issued by USFS in conjunction with the SUP. • Include the results of the ESA Section 7 consultation in the Final EIS and implement any measures required.

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6.0 PUBLIC AND AGENCY COORDINATION

No change to section.

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7.0 IDENTIFICATION OF ADDITIONAL REQUIRED PERMITS/APPROVALS

7.1 PERMITS/APPROVALS

A zoning change from agricultural to industrial land use will need to be approved by Dunn County for the Gumbo Creek Substation.

* * * * *

8.0 FACTORS CONSIDERED

NDCC Section 49-22-09 of the North Dakota Energy Conversion and Transmission Facility Siting Act lists 11 factors to guide the Commission in evaluation of sites, corridors, and routes. The following sections address these factors where applicable to the Project Corridor/Route.

8.1 AVAILABLE RESEARCH AND INVESTIGATIONS RELATING TO THE EFFECTS OF THE LOCATION, CONSTRUCTION, AND OPERATION OF THE PROPOSED FACILITY ON PUBLIC HEALTH AND WELFARE, NATURAL RESOURCES, AND THE ENVIRONMENT

No change to section.

8.2 THE EFFECTS OF NEW ENERGY CONVERSION AND TRANSMISSION TECHNOLOGIES AND SYSTEMS DESIGNED TO MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS

No change to section.

8.3 THE POTENTIAL FOR BENEFICIAL USES OF WASTE ENERGY FROM A PROPOSED ENERGY CONVERSION FACILITY

No change to section.

8.4 ADVERSE DIRECT AND INDIRECT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSED SITE OR ROUTE BE DESIGNATED

Unavoidable impacts are those that will occur after implementation of mitigation measures. In summary, construction and operation of the proposed Project will convert approximately 37 acres of land from agricultural uses to utility uses. This permanently converted acreage will represent a negligible portion (much less than 1 percent) of the cropland in the Project area. The introduction of new transmission lines will permanently change the visual landscape of the Project area. Oil and gas development in the area has already introduced visual contrast to the natural landscape, and the introduction of a transmission line will likely be less noticeable because of the existing visual intrusions. Other unavoidable impacts will occur due to increased traffic from construction personnel. As indicated in the air emission and transportation analyses, these temporary impacts will be minor and will not significantly affect the environmental quality of the area. Other environmental impacts of the proposed project, such as construction traffic to access

tower facilities, will produce impacts that are temporary in nature, and restoration of the natural landscape will occur following these temporary impacts. These relatively minor impacts to environmental resources will be offset to some degree by the societal benefit of better electrical service to western North Dakota. It is not possible to quantify this benefit, as individuals will weigh the tradeoffs differently, and assign widely variable values to each resource.

8.5 ALTERNATIVES TO THE PROPOSED SITE, CORRIDOR, OR ROUTE WHICH ARE DEVELOPED DURING THE HEARING PROCESS AND WHICH MINIMIZE ADVERSE EFFECTS

No change to section.

8.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF NATURAL RESOURCES SHOULD THE PROPOSED SITE, CORRIDOR, OR ROUTE BE DESIGNATED

Irreversible resource commitments involve damage to a resource that is not recoverable for use by future generations. The small size of the permanent footprint, approximately 37 acres, means that there will be minimal irreversible damage to regional natural resources. This will primarily involve the soil and agricultural property taken for the towers and substations, and restoration after the life of the transmission line will reduce these potential irreversible impacts. Irretrievable resource commitments are permanent losses of nonrenewable resources such as fossil fuels. Natural gas, energy, and non-recyclable materials used in construction and operation will represent irretrievable commitments of non-renewable resources that will not be available for use in other projects.

8.7 THE DIRECT AND INDIRECT ECONOMIC IMPACTS OF THE PROPOSED FACILITY

No change to section.

8.8 EXISTING PLANS OF THE STATE, LOCAL GOVERNMENT, AND PRIVATE ENTITIES FOR OTHER DEVELOPMENTS AT OR IN THE VICINITY OF THE PROPOSED SITE, CORRIDOR, OR ROUTE

No change to section.

8.9 THE EFFECT OF THE PROPOSED SITE OR ROUTE ON EXISTING SCENIC AREAS, HISTORIC SITES AND STRUCTURES, AND PALEONTOLOGICAL OR ARCHAEOLOGICAL SITES

Section 5.8.2 discusses the potential effects of the Project on cultural resources. One hundred percent coverage Class III surveys will occur on the Corridor/Route. A Class III survey of the proposed Judson, Tande, and Gumbo Creek substation sites did not identify any cultural resources present. Additional coordination with SHPO will be conducted regarding adverse effects to NRHP-eligible cultural resources within the Corridor/Route and the need for additional cultural resources surveys for the Project prior to construction.

8.10 THE EFFECT OF THE PROPOSED SITE OR ROUTE ON AREAS WHICH ARE UNIQUE BECAUSE OF BIOLOGICAL WEALTH OR BECAUSE THEY ARE HABITATS FOR RARE AND ENDANGERED SPECIES

Section 5.13.2 discusses the effects of the Project on biological resources, including wetlands, vegetation, wildlife, and special status species. Approximately 114.8 acres of woodland will potentially be removed within the Corridor/Route, resulting in a loss of forested habitat for some wildlife. Approximately one acre of vegetation will be permanently removed as a result of structure placement with the Corridor/Route. The Project will have no effect on wetlands, as all 26.2 acres of wetlands within the Corridor/Route will be spanned, and no structures will be placed in wetlands. Coordination with USFWS and NDGFD will continue regarding adverse effects of the Project on special status species. Section 7 Consultation on Endangered Species will be conducted as part of the EIS process, and any Reasonable and Prudent measures will be implemented.

8.11 PROBLEMS RAISED BY FEDERAL AGENCIES, OTHER STATE AGENCIES, AND LOCAL ENTITIES

Additional coordination with the City of Williston and the FAA is occurring to resolve potential airspace obstruction issues with the current alignment of the Project near Sloulin Field.

There are two cultural resources sites in the proposed Project alignment on U.S. Forest Service sites that are being investigated. Additional coordination is occurring with the U. S. Forest Service cultural resources staff, the State Historical Preservation Officer staff and the Tribes.

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9.0 QUALIFICATIONS OF CONTRIBUTORS

No change to section.

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10.0 REFERENCES

No change to section.

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11.0 LAND ACQUISITION STATUS

Basin Electric is progressing with its land acquisition efforts and has successfully obtained the necessary easements or purchased land from 75% of the land owners for a total of 72% of the route miles as of July 2013. See Table 11.0-1 below.

Table 11.0-1: Land Acquisition Status by County

County	Total Landowners	Landowners Acquired	Percentage	Total Miles	Miles Acquired	Percentage
Mercer	33	24	73%	19.0	13.3	73%
Dunn	58	47	81%	43.0	39.0	91%
McKenzie	84	57	68%	71.0	39.6	57%
Williams	123	95	78%	63.1	47.7	76%
Mountrail	4	2	50%	2.7	1.8	67%
Totals	302	225	75%	198.80	141.4	72%

Entities included in "Total Landowners" include County/Township Roads (0.10 miles); ND Department of Transportation (1.56 miles); ND Department of Trust Lands (5.98 miles); BNSF Railway (0.12 miles); US Corps of Engineers (3.46 miles); US Forest Service (7.40 miles)

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