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

January 2015

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Amendment to Application for Consolidated Cert. of Corridor Compatibility & Rt. Permit
Basin Electric Power Cooperative
Cris Miller

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Basin Electric Power Cooperative

January 2015

prepared by

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

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1.0 INTRODUCTION

On April 23, 2014, the North Dakota Public Service Commission (Commission) adopted the Findings of Fact, Conclusions of Law and Order granting a waiver of procedures and time schedules in issuing Corridor Certificate No. 152 and Route Permit No. 164 to Basin Electric Power Cooperative (Basin Electric). This Corridor Certificate and Route Permit authorize the construction of approximately 197 miles of 345-kV and 230-kV electric transmission line and associated facilities (Project) by Basin Electric. The Project extends from the Antelope Valley Station (AVS) near Beulah, North Dakota to the Neset Substation near Tioga, North Dakota. Since the December 2014 Amendment and Corridor/Route revisions, changes have been made to the Project. An additional facility is being proposed as part of the Project and includes:

- Construction of a new 345/115-kV load-serving substation near Killdeer, North Dakota (Roundup Substation) to serve the system of Basin Electric's member, McKenzie Electric Cooperative.

The addition of the proposed Roundup Substation does not significantly alter the information presented in the original application. Only siting criteria information that has changed because of the addition of the substation to the Project is presented in this amendment. All other sections of the original application and the March 2013, July 2014, and December 2014 Amendments remain in effect. The general location and reason for the Corridor/Route change are summarized in the following table, and the change is illustrated on the Corridor/Route change map following Table 1.0-1.

Table 1.0-1: Summary of Corridor/Route Change

Township	Range	Section	Reason	Route Change Map Sheet #
145N	95W	3	New 345/115-kV load-serving substation (Roundup Substation)	Sheet 1

Unless otherwise specified in this amendment, all other text sections and Project descriptions in the original application remain unchanged. The general structure of this amendment remains the same, with similar chapters and sections. Section 1.4 was added in the July 2014 amendment to address additional future associated facilities related to the AVS to Neset 345-kV Transmission Project. The map sheets included with this amendment in Volume II have been updated to indicate the above change. Only the one sheet on which changes occurred is included in this amendment. This updated sheet replaces the same numbered sheet in the original application, July 2013, July 2014, and December 2014 amendments.

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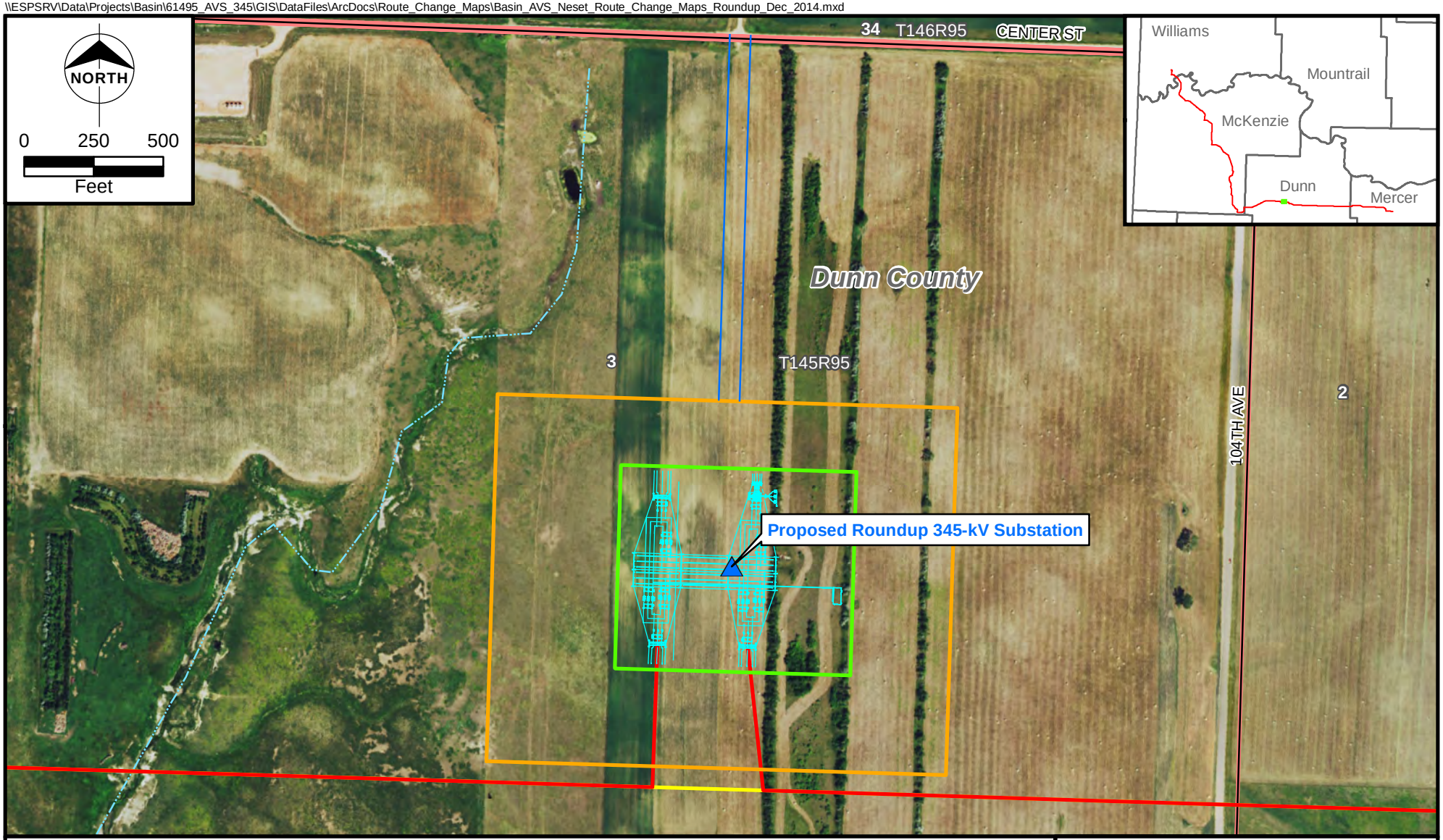

Existing Substation
Proposed Substation
Roundup Substation Outline
Roundup Substation Fence
Substation Equipment
Access Road
County Boundary (1)
Revised Route - November 2014
Revised Route - July 2014
Public Land Survey System Sections
Public Land Survey System Townships

Updated for replacement mapbook from July 2014

Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Route Change Maps
Sheet 1 of 1

Source: USDA NAIP 2014 Aerials; North Dakota GIS; Burns & McDonnell.

Revised January 05, 2015

1.1 Compliance with the Energy Conversion and Transmission Facility Siting Act

No changes from addition of proposed Roundup Substation.

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

The Rural Utilities Service (RUS), along with Western Area Power Administration (Western) and U.S. Forest Service (USFS) as cooperating agencies, issued the Final Environmental Impact Statement (FEIS) for the Project in May 2014. USFS and RUS issued their individual Records of Decision (RODs) in September 2014, and Western issued its ROD in November 2014.

1.1.2 Letter of Intent

No changes from addition of proposed Roundup Substation.

1.1.3 Certificate of Corridor Compatibility

No changes from addition of proposed Roundup Substation. Table 1.1-1 is included for convenience.

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

State Authority	Description	Section
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 of original application
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 of original application
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

State Authority	Description	Section
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 of original application
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 of original application
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 amendment 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

State Authority	Description	Section
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
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 changes from addition of proposed Roundup Substation. Table 1.1-2 included for convenience.

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

State Authority	Description	Section
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 of original application
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
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

State Authority	Description	Section
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
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 of original application
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

State Authority	Description	Section
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 of original application
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 amendment 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 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.	Figures. GIS-based maps are included with this amendment.

1.2 Project Summary

No changes to this section other than the addition of the proposed Roundup Substation.

The Project includes the addition of one 345/115-kV load-serving substation (Roundup Substation) to tie McKenzie Electric Cooperative's 115-kV system to the new AVS to Neset 345-kV line. The proposed Roundup Substation would be located along the AVS to Neset line, north of the City of Killdeer in Section 3, Township 145N, Range 95W, Dunn County, North Dakota. Basin Electric owns the entire 50-acre parcel on which the substation site would be located. The proposed substation would occupy approximately 14.2 acres within the fenced area of the site, and an approximately 0.25-mile access road would occupy an additional approximately 1.8 acres on the property. No opposition to this Project revision is expected.

1.2.1 Study Area, Project Corridor, and Route Development Summary

No changes from addition of proposed Roundup Substation. Figure 1.2-1 updated to include the proposed Roundup Substation.

1.2.2 Product

No changes from addition of proposed Roundup Substation.

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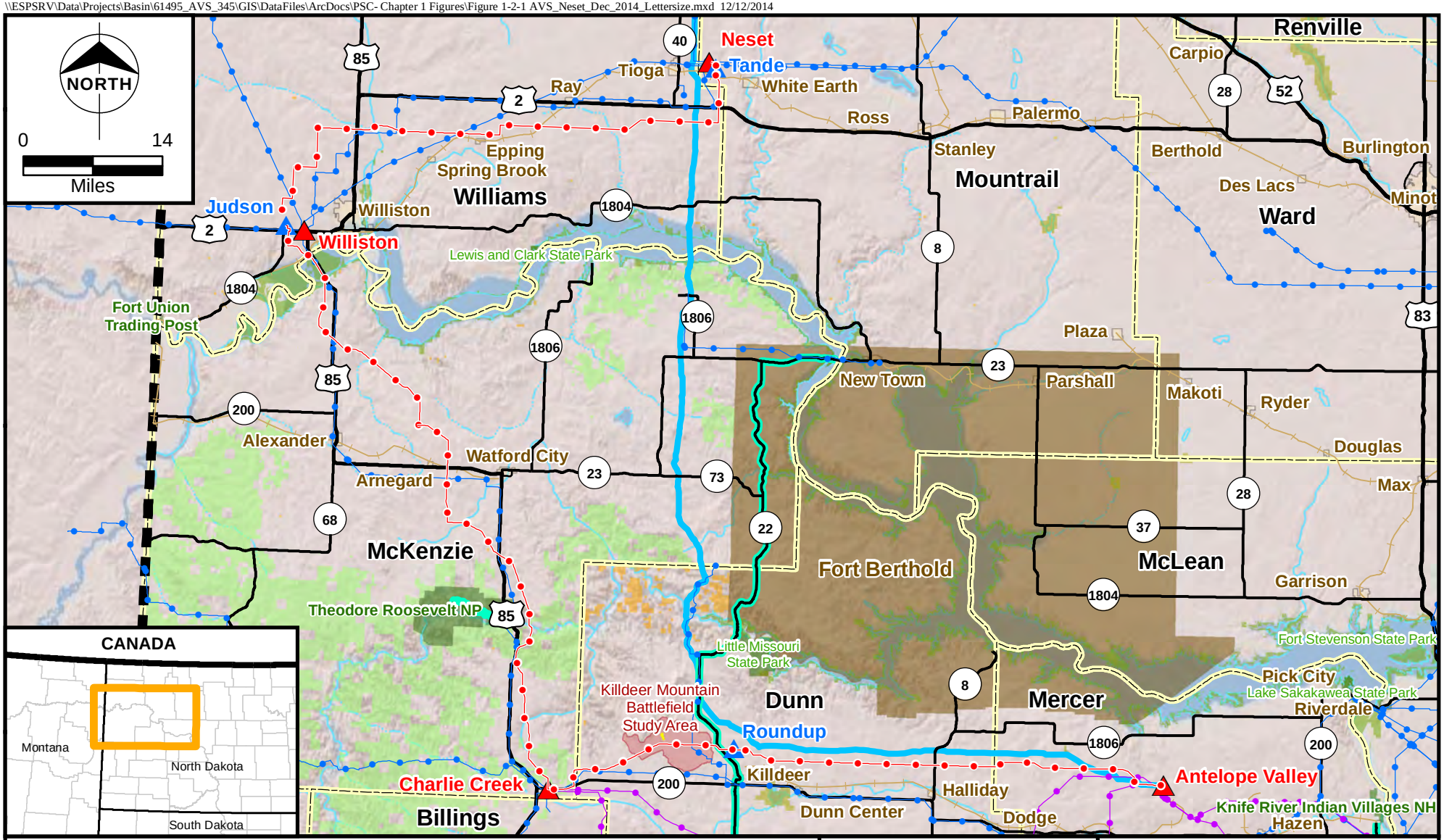

LEGEND

- Project Route November 2014
- 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
- Killdeer Mountain Battlefield State Historic Site
- Killdeer Mountain Battlefield Study Area

Existing Transmission Lines

- 345-kV
- 230-kV and Below

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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

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

Revised December 12, 2014

1.3 Project Schedule

No changes from addition of proposed Roundup Substation.

The overall AVS to Neset Project began construction in September 2014. A 2-year construction phase is anticipated with in-service expected in 2016. Permitting efforts, including the corridor and route selection processes, are underway. The Project requires various state, Federal, and local permits prior to initiating construction. An overview of the overall Project schedule is provided in Table 1.3-1.

Table 1.3-1: Project Schedule

Corridor Certificate/Route Permit issued	April 2014
Corridor Certificate/Route Permit Amendment Application for Roundup Substation	January 2015
Corridor Certificate/Route Permit Amendment for Roundup Substation approved	Anticipated March 2015
Right-of-way acquisition complete	2014
Overall Project construction start date	September 2014
Roundup Substation construction start date	April 2015
Construction complete	October 2016
Test operations	November 2016
In-service date	December 2016

1.4 Future Associated Facilities

No changes from addition of proposed Roundup Substation. The future facilities identified in the July 2014 Amendment, including the North Killdeer Loop 345-kV transmission line (Phase I) and Patent Gate and Kummer Ridge 345/115-kV substations are addressed in a separate Application, Docket # PU-14-831. Figure 1.4.1 has been updated to include the Roundup Substation.

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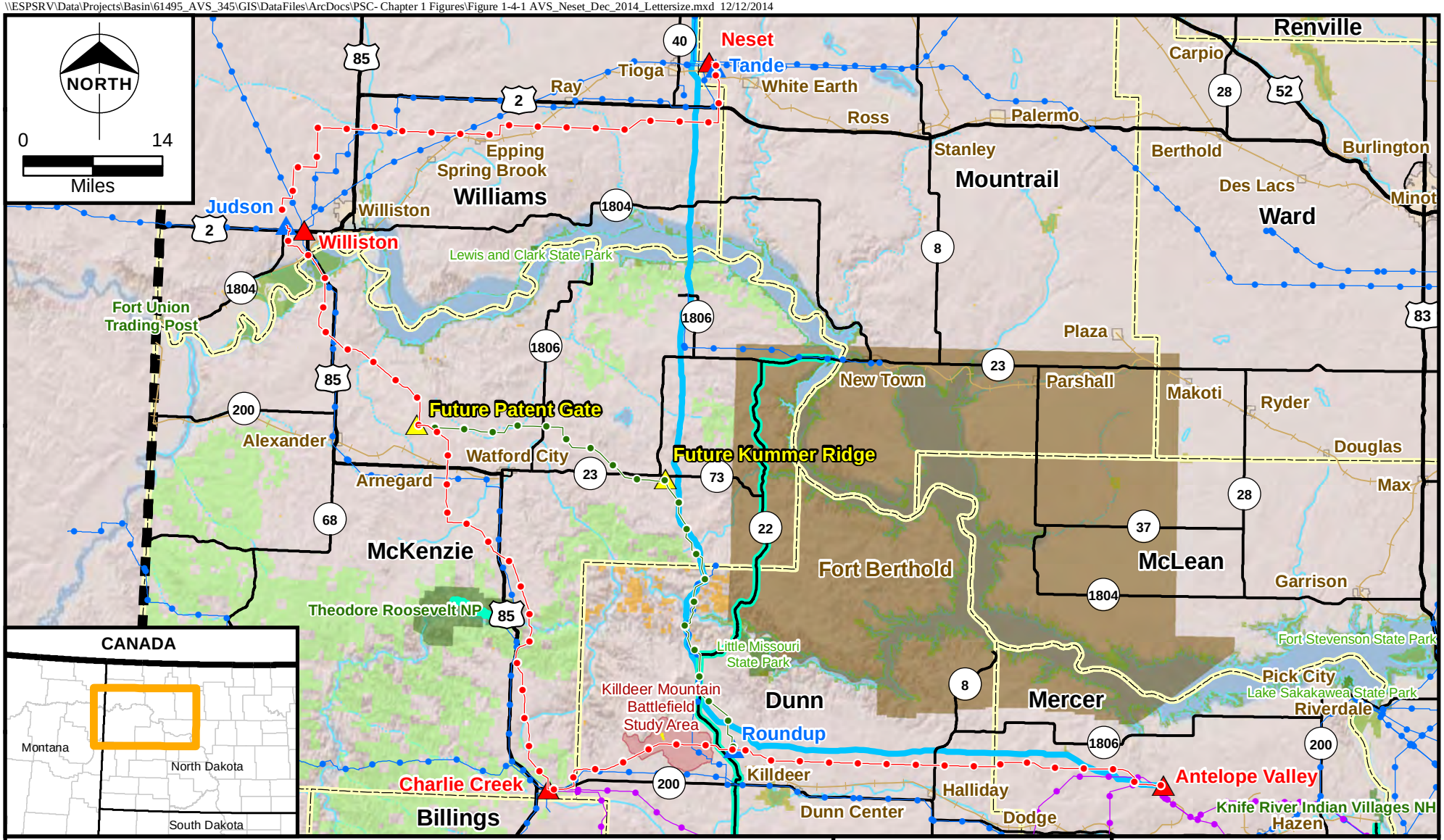

LEGEND

- Project Route November 2014
- Future North Killdeer Loop Route
- Proposed Substation
- Existing Substation
- Future Substation
- Army Corps of Engineers
- National Wildlife Refuge
- National or State Park
- National Grassland
- Tribal Lands
- BLM Lands
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- DGC Pipeline
- Scenic Byway
- Killdeer Mountain Battlefield State Historic Site
- Killdeer Mountain Battlefield Study Area

Existing Transmission Lines

- 345-kV
- 230-kV and Below

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Figure 1.4-1
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Future Associated Facilities

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

Revised December 12, 2014

2.0 NEED FOR FACILITY

2.1 Needs Analysis

No changes from addition of proposed Roundup Substation.

2.2 Alternatives

An additional facility has been added to the Project, as indicated in Table 1.0-1. The need for this new substation is to tie McKenzie Electric Cooperative's 115-kV system to the AVS to Neset 345-kV line. The addition of the substation is a minor change in the overall Project Corridor/Route. The previous alternative corridors evaluated for the Project remain unchanged.

2.2.1 System Upgrades

No changes from addition of proposed Roundup Substation.

2.2.2 Additional 115-kV Lines

No changes from addition of proposed Roundup Substation.

2.2.3 Additional 345-kV Lines

No changes from addition of proposed Roundup Substation.

2.2.4 No Action Alternative

No changes from addition of proposed Roundup Substation.

2.2.5 Recommended System Alternatives

No changes from addition of proposed Roundup Substation.

2.3 New Generation

No changes from addition of proposed Roundup Substation.

2.4 Ten-Year Plan

No changes from addition of proposed Roundup Substation.

3.0 TRANSMISSION FACILITY CORRIDOR AND ROUTE CRITERIA

No changes from addition of proposed Roundup Substation.

3.1 Exclusion Areas

Per Section 69-06-08-02(1), the geographical areas listed in Table 3.1-1 shall be excluded in the consideration of a Corridor/Route for a transmission facility, and shall include a buffer zone of reasonable width to protect the integrity of the area. Exclusion areas are mapped for the Project Corridor/Route and revisions in Volume II of the original application, the July 2013 amendment, the July 2014 amendment, and the December 2014 amendment, and in Volume II of this amendment.

Table 3.1-1: Exclusion Areas

Geographic Area	Present within Additional Substation Site	Proposed Buffer	Section Addressed
Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas	Not present within additional substation site	No impacts are anticipated and no buffer is proposed	5.2, 5.8, 5.9
Designated or registered state: parks; historic sites; monuments; historical markers; archaeological sites; and nature preserves	Not present within additional substation site	No impacts are anticipated and no buffer is proposed	5.2, 5.8, 5.9
County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions	Not present within additional substation site	No impacts are anticipated and no buffer is proposed	5.2, 5.9
Areas critical to the life stages of threatened or endangered animal or plant species	Not present within additional substation site	No impacts are anticipated and no buffer is proposed.	5.13
Areas where animal or plant species that are unique or rare to this state will be irreversibly damaged	Not present within additional substation site	No impacts are anticipated and no buffer is proposed.	5.13

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 and revisions in Volume II of the original application, the July 2013 amendment, the July 2014 amendment, and the December 2014 amendment, and in Volume II of this amendment. Table 3.2-1 presents the changes to avoidance areas resulting from the addition of the Roundup Substation.

Table 3.2-1: Avoidance Areas

Avoidance Area	Change in Avoidance Areas within Project Corridor/Route due to Addition of Roundup Substation	Proposed Buffer	Section Addressed
Designated or registered national: historic districts; wildlife areas; wild, scenic or recreational rivers; wildlife refuges; and grasslands	No changes from addition of substation.	No changes from addition of substation.	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	No changes from addition of substation.	No changes from addition of substation.	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.	Section 106 consultation has been completed with the implementation of a Programmatic Agreement (PA) for the Project.	5.8
Areas which are geologically unstable	No changes from addition of substation.	No changes from addition of substation.	5.11

Avoidance Area	Change in Avoidance Areas within Project Corridor/Route due to Addition of Roundup Substation	Proposed Buffer	Section Addressed
Within 500 feet of a residence, school, or place of business	No changes from addition of substation.	No changes from addition of substation.	5.1
Reservoirs and municipal water supplies	No changes from addition of substation.	No changes from addition of substation.	5.12
Water sources for organized rural water districts	No changes from addition of substation.	No changes from addition of substation.	5.12
Irrigated land	No changes from addition of substation.	No changes from addition of substation.	5.2, 5.10
Areas of recreational significance which are not designated as exclusion areas	No changes from addition of substation.	No changes from addition of substation.	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 and revisions in Volume II of the original application, the July 2013 amendment, the July 2014 amendment, and the December 2014 amendment, and in Volume II of this amendment. Table 3.3-1 presents changes to the selection criteria resulting from the addition of the Roundup Substation.

Table 3.3-1: Selection Criteria

Selection Criteria	Change in Potential Adverse Effects Due to Addition of Roundup Substation	Section Addressed
Agricultural production	At the proposed Roundup Substation site, the 16 acres of agricultural land within the substation site and access road area would be permanently converted to utility use.	5.2, 5.10
Family farms and ranches	No changes from addition of substation.	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 changes from addition of substation.	5.2, 5.10
Surface drainage patterns and ground water flow patterns	No impacts to surface drainage patterns or groundwater flow patterns are anticipated. Best Management Practices (BMPs) would be utilized to prevent soil erosion and sedimentation.	5.12
Noise-sensitive land uses	The proposed Roundup Substation would not be located within 500 feet of sensitive noise receptors.	5.6
The visual effect on the adjacent area	The proposed Roundup Substation would be a new manmade feature in the viewshed of the surrounding area. Project would not adversely affect the scenic integrity of resources because existing transmission lines, roadways, communications towers, and oil and gas development facilities are already present in the visual landscape.	5.7
Extractive and storage resources	No changes from addition of substation.	5.11
Wetlands, woodlands, and wooded areas	No wetlands or woodlands are located within the substation site. Minimal clearing of wooded shelterbelts would be required.	5.13
Radio and television reception, and other communication or electronic control facilities	No changes from addition of substation.	5.4 and 5.3

Selection Criteria	Change in Potential Adverse Effects Due to Addition of Roundup Substation	Section Addressed
Human health and safety	No changes from addition of substation.	5.4
Plant life	An additional 16 acres of vegetation would be permanently removed within the fenced area of the proposed Roundup Substation and access road area.	5.13

3.4 Policy Criteria

No changes from addition of proposed Roundup Substation.

3.5 Design and Construction Limitations

No changes from addition of proposed Roundup Substation.

3.6 Economic Considerations

No changes from addition of proposed Roundup Substation.

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

The general Corridor/Route description remains essentially the same as presented in the original application and subsequent amendments. The only change includes the addition of the Roundup Substation addressed in this amendment, as described below. A figure of the Roundup Substation area follows Table 1.0-1.

The proposed Roundup Substation is located in Dunn County, approximately 2 miles north of Killdeer, in Section 3, Township 145N, Range 95W. The new substation would be located along the AVS to Neset 345-kV transmission line and would provide the capability of servicing McKenzie Electric Cooperative's electricity demand using the new AVS to Neset line.

4.2 Description of Proposed Facilities

No changes from addition of proposed Roundup Substation.

4.2.1 Transmission Line Characteristics

No changes from addition of proposed Roundup Substation.

4.2.2 Associated Facilities and Project Components

The proposed overall Project would require the addition of the following associated facility and Project components:

- **Roundup 345-kV Substation.** The proposed Roundup 345/115-kV Substation near Killdeer would be approximately 14.2 acres in size, and the access road would occupy an additional 1.8 acres on the 50-acre parcel Basin Electric owns. The substation would require the installation of a 345-kV/115-kV transformer, and the necessary bus, circuit breakers, disconnect switches, grounding switches, and protection and control equipment to support the 345-kV interconnection.

4.2.3 Construction Techniques

No changes from addition of proposed Roundup Substation.

4.2.3.1 Pre-Construction Activities

No changes from addition of proposed Roundup Substation. Figure 4.2-5 updated to include the Roundup Substation.

4.2.3.2 Transmission Structure Site Preparation

No changes from addition of proposed Roundup Substation.

4.2.3.3 Structure Assembly and Erection

No changes from addition of proposed Roundup Substation.

4.2.3.4 Stringing and Tensioning of Conductors

No changes from addition of proposed Roundup Substation.

4.2.3.5 Structure Site Access and Traffic

No changes from addition of proposed Roundup Substation.

4.2.3.6 Substation Construction Procedures

No changes from addition of proposed Roundup Substation.

4.2.3.7 Transmission Line Maintenance and Operation

No changes from addition of proposed Roundup Substation.

4.2.3.8 Substation Maintenance

No changes from addition of proposed Roundup Substation.

4.2.3.9 Construction Schedule and Projected Workforce

The construction of the Roundup Substation would occur within the overall two-year AVS to Neset construction timeline. However, construction of the Roundup Substation would take approximately 18 months or less to complete. Pending obtaining all necessary approvals, substation construction would start in April 2015, or as soon as all permits have been acquired, with completion in December 2016, if not sooner. Unlike line construction, which would occur in phases, substation construction would proceed continuously from beginning to completion. The Roundup Substation workforce is anticipated to range from one crew of 20 to 50 employees, depending on the stage of construction, with workers rotating on and off-sight based on specific activities and specialty requirements for different construction activities.

4.2.3.10 Procedures for Minimizing Environmental Impact during Construction

No changes from addition of proposed Roundup Substation. Procedures listed for construction of other project-related substations would be employed for the Roundup Substation as well.

4.2.3.11 ROW and Property Issues

Basin Electric has acquired ownership of the 50-acre Roundup Substation property.

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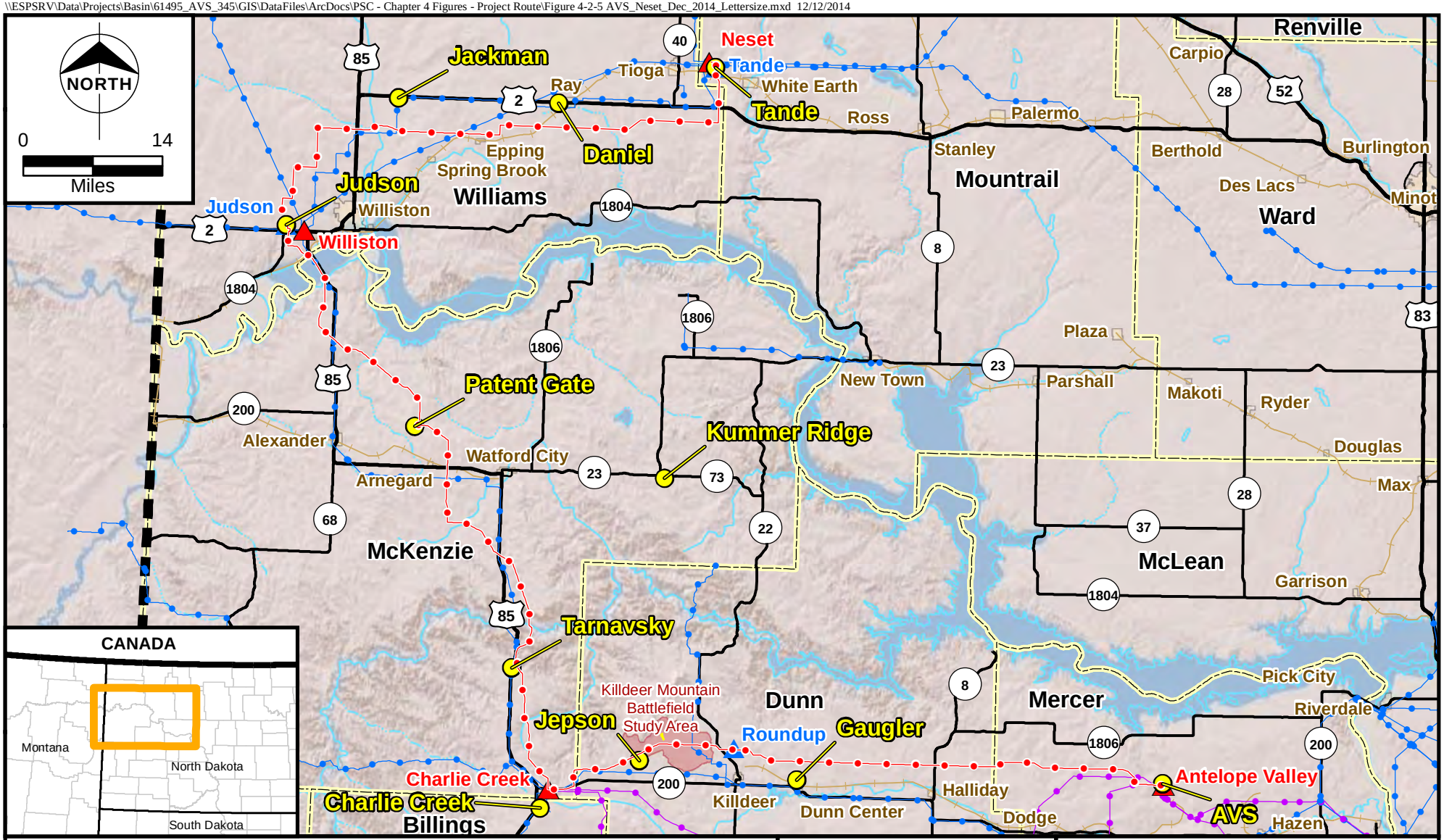

LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- Material Laydown Yard (Approximately 5 acres)
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- Killdeer Mountain Battlefield State Historic Site
- Killdeer Mountain Battlefield Study Area

Existing Transmission Lines

- 345-kV
- 230-kV and Below

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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

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

Revised December 12, 2014

5.0 ENVIRONMENTAL ANALYSIS

This amendment addresses only the addition of the proposed Roundup Substation to the Project. As previously discussed, no other changes to the Project are proposed at this time. As a result, the type of resources affected and the amount of each resource affected are similar to those presented in the original application and the July 2013, July 2014, and December 2014 amendments. This section presents information on only those resources for which a material change resulted in the type or quantity of an affected resource as a result of the addition of the proposed Roundup Substation. For each of these resources, a general description is provided, followed by a discussion of potential impacts and potential mitigation measures. However, sections have only been updated if there would be a material change resulting from the addition of the substation. The description of resources subsections describe the resources and environmental settings found in the vicinity of the Project. The overall Corridor/Route extends through Mercer, Dunn, McKenzie, Williams, and Mountrail Counties in North Dakota. However, the proposed substation is confined to a small area within Dunn County.

The impact discussion subsections describe the potential effects on each resource from the Project. For many of the resources discussed, such as vegetation and soils, impacts will be limited to the 14.2-acre footprint of the substation and 1.8-acre footprint of the access road. For other resources such as wildlife, recreation, and visibility, impacts may extend outside this footprint.

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 use of silt fencing and other erosion-control measures. These standard mitigation measures are included in Appendix I, Standard Mitigation Measures.

5.1 Demographics

No changes from addition of proposed Roundup Substation.

5.1.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.1.2 Impacts

No changes from addition of proposed Roundup Substation.

5.1.2.1 Regional Economy

No changes from addition of proposed Roundup Substation.

5.1.2.2 Population

No changes from addition of proposed Roundup Substation.

5.1.2.3 Housing

No changes from addition of proposed Roundup Substation.

5.1.2.4 Employment and Income

No changes from addition of proposed Roundup Substation.

5.1.2.5 Property Values

No changes from addition of proposed Roundup Substation.

5.1.2.6 Property Taxes

Construction of the Roundup Substation would result in additional property taxes collected in Dunn County.

5.1.2.7 Impacts to Residences

No changes from addition of proposed Roundup Substation.

5.1.3 Mitigation

No changes from addition of proposed Roundup Substation.

5.2 Land Use

5.2.1 Description of Resources

5.2.1.1 Regional Setting

No changes from addition of proposed Roundup Substation.

5.2.1.2 Existing Land Use

No changes from addition of proposed Roundup Substation.

5.2.1.3 Zoning

A Conditional Use Permit for the Roundup Substation is not required from Dunn County.

5.2.1.4 Comprehensive Plans

No changes from addition of proposed Roundup Substation.

5.2.1.5 State and Federal Properties

No changes from addition of proposed Roundup Substation. Figure 5.2-1 updated to include the Roundup Substation.

5.2.2 Impacts

No changes from addition of proposed Roundup Substation.

5.2.2.1 Agricultural Land Use Impacts

Construction of the Roundup Substation and access road would result in the permanent conversion of approximately 16 additional acres from agricultural land, including approximately 12.1 acres of cropland, 2.4 acres of pasture/grassland, and 1.5 acres of wooded shelterbelt, to utility land use.

5.2.2.2 Zoning and Land Use Plans

No changes from addition of proposed Roundup Substation.

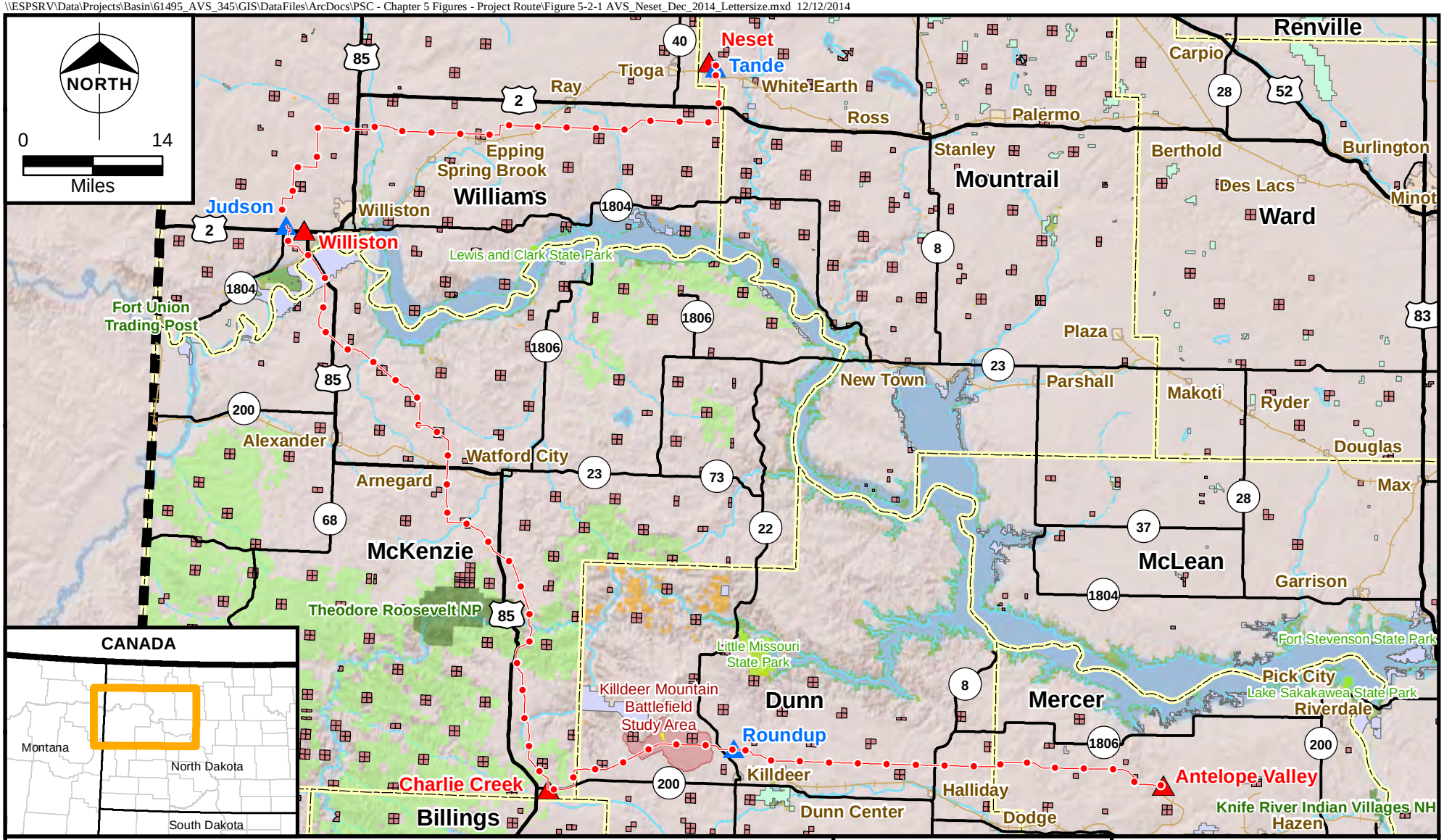
5.2.2.3 State and Federal Properties

No changes from addition of proposed Roundup Substation.

5.2.3 Mitigation

No changes from addition of proposed Roundup Substation.

\\ESPSRV\Data\Projects\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-2-1 AVS_Neset_Dec_2014_Lettersize.mxd 12/12/2014



LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- Army Corps of Engineers
- National Park
- National Wildlife Refuge
- National Grassland
- BLM Lands
- State School Trust Lands
- Wildlife Management Areas
- Waterfowl Production Area
- State Park
- Killdeer Mountain Battlefield State Historic Site
- Killdeer Mountain Battlefield Study Area
- State Boundary
- County Boundary
- Municipal Areas
- Railroad

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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

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

Revised December 12, 2014

5.3 Infrastructure/Transportation

5.3.1 Description of Resources

5.3.1.1 Regional Setting

No changes from addition of proposed Roundup Substation. Figure 5.3-1 updated to include the Roundup Substation.

5.3.1.2 Utility Infrastructure

No changes from addition of proposed Roundup Substation.

5.3.1.3 Transportation Infrastructure

No changes from addition of proposed Roundup Substation.

5.3.2 Impacts

No changes from addition of proposed Roundup Substation.

5.4 Public Health and Safety

No changes from addition of proposed Roundup Substation.

5.5 Air Quality

No changes from addition of proposed Roundup Substation.

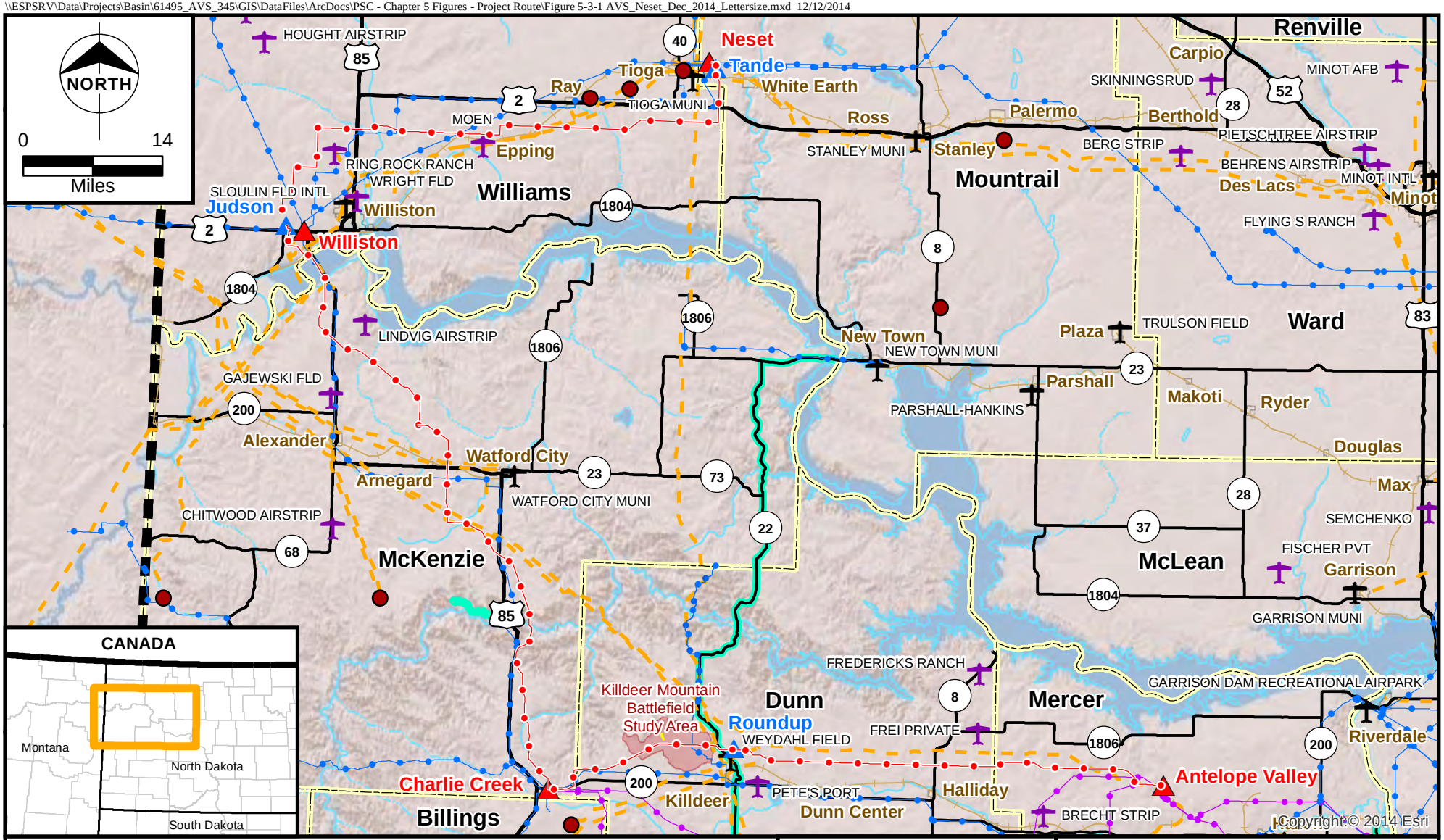
5.5.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.5.2 Impacts

As a result of the addition of the Roundup Substation to the Project, additional air emissions would be emitted from construction vehicles and equipment used in the substation construction process. These vehicles and equipment would emit additional hydrocarbons, particulate matter, and carbon dioxide (CO_2). Air emissions from construction are expected to be minimal, as these activities are temporary and would involve limited equipment. Estimated additional emissions from construction of the substation are listed in Table 5.5-1. As shown in the table, expected emissions would be below applicable thresholds. Therefore, emissions stemming from the construction of the Project would not substantially reduce air quality in the Project area, would not exceed EPA de minimis thresholds, and would not affect the current attainment status of North Dakota. The Project would only result in minimal, short-term impacts.

\\ESPSRV\Data\Projects\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-3-1 AVS_Neset_Dec_2014_Lettersize.mxd 12/12/2014



LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- Pipeline
- Public Airport
- Private Airport
- Gas Plants
- U.S. Highway
- State Highway
- Scenic Byway

Existing Transmission Lines

- 345-kV
- 230-kV and Below
- Killdeer Mountain Battlefield State Historic Site
- Killdeer Mountain Battlefield Study Area

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BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

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

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

Revised December 12, 2014

Table 5.5-1: Estimated Emissions Due to Addition of Roundup Substation and General Conformity *De Minimis* Thresholds

Pollutant	Maximum Emissions Due to Addition of Roundup Substation – Year 1 (tons/year)	Maximum Emissions Due to Addition of Roundup Substation – Year 2 (tons/year)	General Conformity *De Minimis* Threshold (tons/year)
NO_x	6.81	3.97	100
Volatile organic compounds	6.81	3.97	100
$PM_{2.5}$	1.60	0.00	100
PM_{10}	15.97	0.24	100
SO_2	13.65	10.24	100
CO	6.18	3.17	100

Source: EPA's AP-42 emission factors and New Source Performance Standards (40 CFR Part 60) for Mobile Engines.

5.5.3 Mitigation

No changes from addition of proposed Roundup Substation.

5.6 Noise

No changes from addition of proposed Roundup Substation.

5.6.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.6.2 Impacts

Additional noise impacts during substation construction would include temporary increases in noise levels from construction vehicles and equipment onsite and on the surrounding roads. The potential increases in sound due to construction would be temporary in nature and these sources of noise would be removed after construction is complete.

Future sound levels in areas directly adjacent to the proposed Roundup Substation would potentially be impacted by operation of new substation facilities, particularly noise generated by transformers. In addition, the transformers would have cooling fans that would create noise at various times. Predictive modeling was conducted to determine potential noise levels generated by substation operations.

The CadnaA noise model was used to analyze the sound levels from the proposed substation. Due to the absence of local noise regulations, the overriding design goal for noise generated by the proposed substation would be an L_{dn} of 55 dBA, per the EPA Noise Guidelines.

Table 5.6-1 shows the primary noise-generating equipment that would be installed at the Roundup Substation.

Table 5.6-1: Substation Equipment

Proposed Substation	Substation Type
Roundup	One 333 MVA transformer, one 25 MVAR reactor

The sound profile for the transformer was calculated using the National Electric Manufacturers Association (NEMA) rating system for an unquieted 333 MVA transformer. Vendor data for a reactor similar to those at the proposed substation was used. The expected sound-power profiles for the transformer and reactor are shown below in Table 5.6-2.

Table 5.6-2: Expected Transformer Sound Profiles

Equipment	Transformer Sound Power Level (Lw) at Octave Band Frequency (Hz) (dBA)									Normalized Value (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
Transformer	103	109	111	106	106	100	95	90	83	115
Reactor	26	66	86	60	17	17	17	17	17	86

The modeled sound-pressure levels for the substation did not exceed an L_{dn} of 55 dBA at any current residences in the area (Figure 5.6-1). Therefore, it is not expected that operation of the Roundup Substation would cause sound levels that exceed the EPA Guidelines at any current residences, provided Basin Electric installs a transformer rated at the modeled noise level of 90 dBA or lower for IEEE distances. This noise level would be well within the range of noise levels for such equipment. Once specific equipment for the substation has been identified, further assessment of noise levels could be conducted to determine if EPA guidelines would actually be exceeded at these residences (Appendix L).

Figure 5.6-1: Typical Substation Leq Contours: Roundup Substation

5.6.3 Mitigation

In addition to the mitigation measures identified in the original application and subsequent amendments, Basin Electric would implement the following measures:

- Basin Electric would purchase transformers with a noise rating of 90 dBA or less, based on IEEE distance specifications.
- Basin Electric would investigate any complaints of substation noise from nearby residences and work to determine if EPA guidelines are exceeded. If exceedances are determined, Basin Electric would work to reduce noise exposure at these residences.

5.7 Visual Impacts

No changes from addition of proposed Roundup Substation.

5.7.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.7.2 Impacts

The new substation would be an added visual element in the existing landscape. The proposed Roundup Substation would be constructed approximately 2.4 miles north of the City of Killdeer. No residences would be located within 500 feet of the proposed substation site, but several would likely be within sight of the substation. The land cover on the site is a mix of cultivated crops and grassland. The Roundup Substation would be considered a compatible component of the visual landscape due to its location along the AVS to Neset line and utility and oil development in the area.

5.7.3 Mitigation

No changes from addition of proposed Roundup Substation.

5.8 Cultural Resources

No changes from addition of proposed Roundup Substation.

5.8.1 Description of Resources

In 2013, Metcalf Archaeological Consultants, Inc. (MAC) conducted Class III cultural resource inventory of the Roundup Substation site. During the inventory, MAC encountered seven cultural resources, four prehistoric isolated finds and three prehistoric lithic scatters. The North Dakota State Historic Preservation Office (NDSHPO) concurred with the finding of No Historic Properties Affected for the

Roundup Substation, provided that any potentially significant resources found within the substation site be avoided (NDSHPO March 13, 2014; Appendix N). Basin Electric subsequently determined the cultural resources within the Roundup Substation could not be avoided, and further archaeological investigations were necessary. In the summer of 2014, Basin Electric requested that MAC conduct evaluative testing of the three sites located within the footprint areas of the proposed Roundup Substation. The sites and isolated finds were recommended as *not eligible* for the National Register of Historic Places (NRHP) and no further work was determined necessary. MAC recommended a finding of *No Historic Properties Affected* for the Roundup Substation location. The NDSHPO concurred with this recommendation by letter dated December 23, 2014 (Appendix N).

5.8.2 Impacts

No changes from addition of proposed Roundup Substation.

5.8.3 Mitigation

In addition to the mitigation measures identified in the original application and subsequent amendments, Basin Electric would implement the following measure:

- Basin Electric and its contractors would comply with the conditions of the Programmatic Agreement (Appendix Z).

5.9 Recreational Resources

No changes from addition of proposed Roundup Substation.

5.9.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.9.1.1 Regional Setting

No changes from addition of proposed Roundup Substation.

5.9.1.2 Facilities

No changes from addition of proposed Roundup Substation. Figure 5.9-1 updated to include the Roundup Substation.

5.9.1.3 Hunting and Fishing

No changes from addition of proposed Roundup Substation.

5.9.2 Impacts

Construction and operation of the proposed Roundup Substation would potentially result in minor impacts to recreation. Construction of the substation would convert land from agricultural to industrial use, limiting future recreational use of the area. However, as the proposed substation is located in privately owned agricultural land, recreation at this location is likely limited. During construction, noise, ground disturbance, access restrictions, and human activity may impede hunting activities around the substation site. However, following completion of construction, these disturbances would cease and game species would likely return to the area, which would allow hunting opportunities on these adjacent lands to return. Only the approximately 16 acres developed for the substation and access road would be lost for future recreational activity.

5.9.3 Mitigation

No changes from addition of proposed Roundup Substation.

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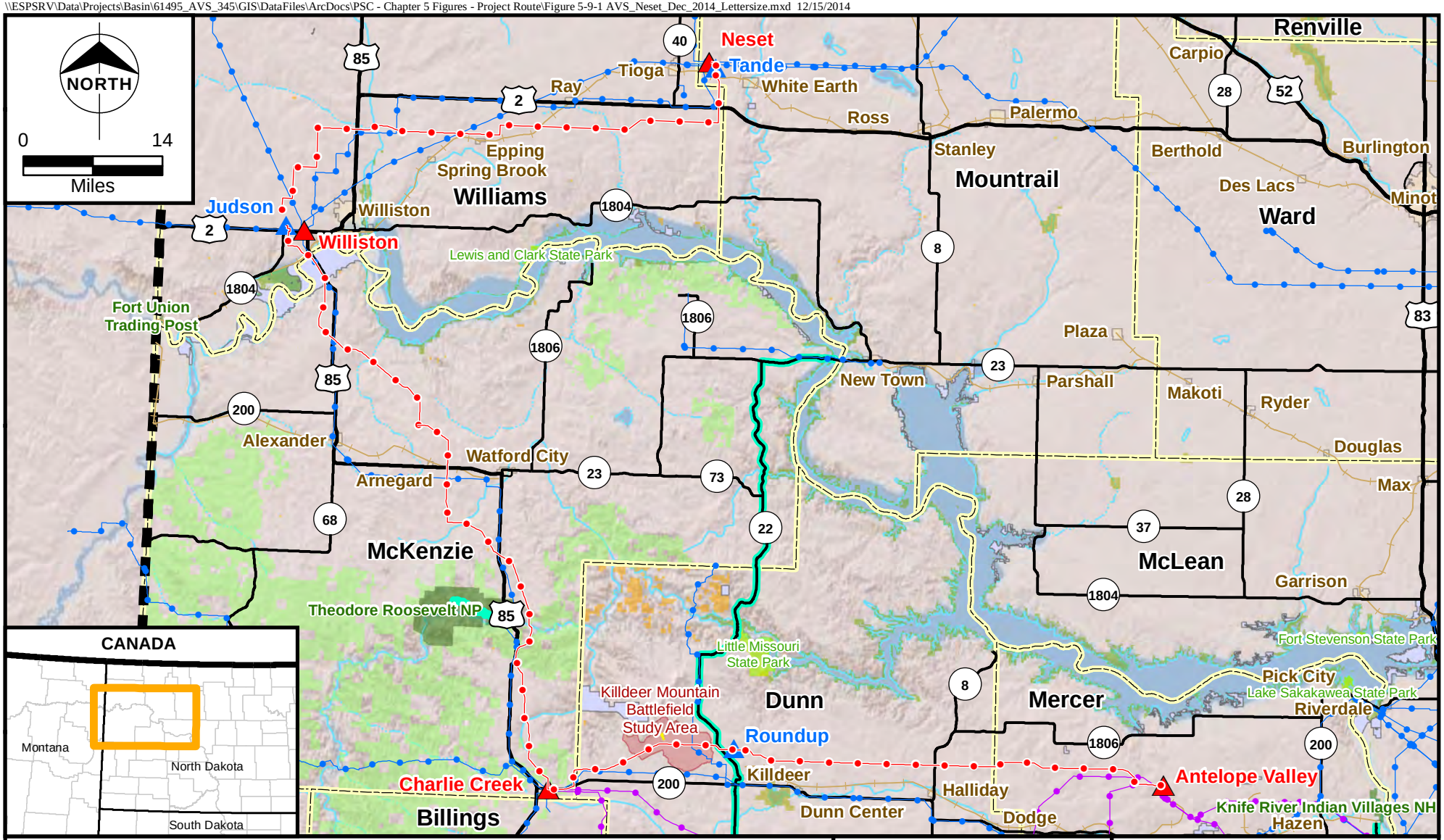

LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- Army Corps of Engineers
- National Park
- National Wildlife Refuge
- National Grassland
- BLM Lands
- State Park
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- Scenic Byway
- Killdeer Mountain Battlefield State Historic Site
- Killdeer Mountain Battlefield Study Area

Existing Transmission Lines

- 345-kV
- 230-kV and Below

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

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

Revised December 15, 2014

5.10 Soils and Farmlands

No changes from addition of proposed Roundup Substation.

5.10.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.10.1.1 Soils

No changes from addition of proposed Roundup Substation.

5.10.1.2 Farmland

No changes from addition of proposed Roundup Substation.

5.10.1.3 Prime Farmland

No changes from addition of proposed Roundup Substation. Figure 5.10-1 updated to include the Roundup Substation.

5.10.2 Impacts

No changes from addition of proposed Roundup Substation.

5.10.2.1 Soils

Approximately 16 additional acres of surface soil will be disturbed for construction of the Roundup Substation and access road. Potential impacts include soil erosion, soil compaction and rutting, and the introduction of noxious weeds on the soil surface. Construction activities such as vegetation clearing, excavating, grading, topsoil segregation, and back-filling may also increase erosion potential by destabilizing the soil surface. Soil compaction and rutting can result from the movement of heavy construction vehicles. The degree of compaction and rutting would depend on the moisture content and texture of the soil. These impacts would be short-term in nature and minimized as much as possible.

Stormwater runoff and erosion control BMPs would be developed for the proposed Project under National Pollutant Discharge Elimination System (NPDES) stormwater pollution prevention plan (SWPPP) permit requirements for construction activities. Typical BMPs that would be part of a SWPPP include, but are not limited to, silt fencing, dust control measures, check dams, erosion control blankets, and seeding of exposed soil surfaces to minimize the potential for wind and water erosion.

5.10.2.2 Farmland

Approximately 16 additional acres of agricultural land, including approximately 12.1 acres of cropland, 2.4 acres of pasture/grassland, and 1.5 acres of wooded shelterbelt, would be converted to utility use in the long-term at the Roundup Substation site and access road location.

5.10.2.3 Prime Farmland

For construction at the proposed Roundup Substation, no prime farmland occurs within the substation or access road areas. No prime farmland would be permanently taken out of production.

5.10.3 Mitigation

No changes from addition of proposed Roundup Substation.

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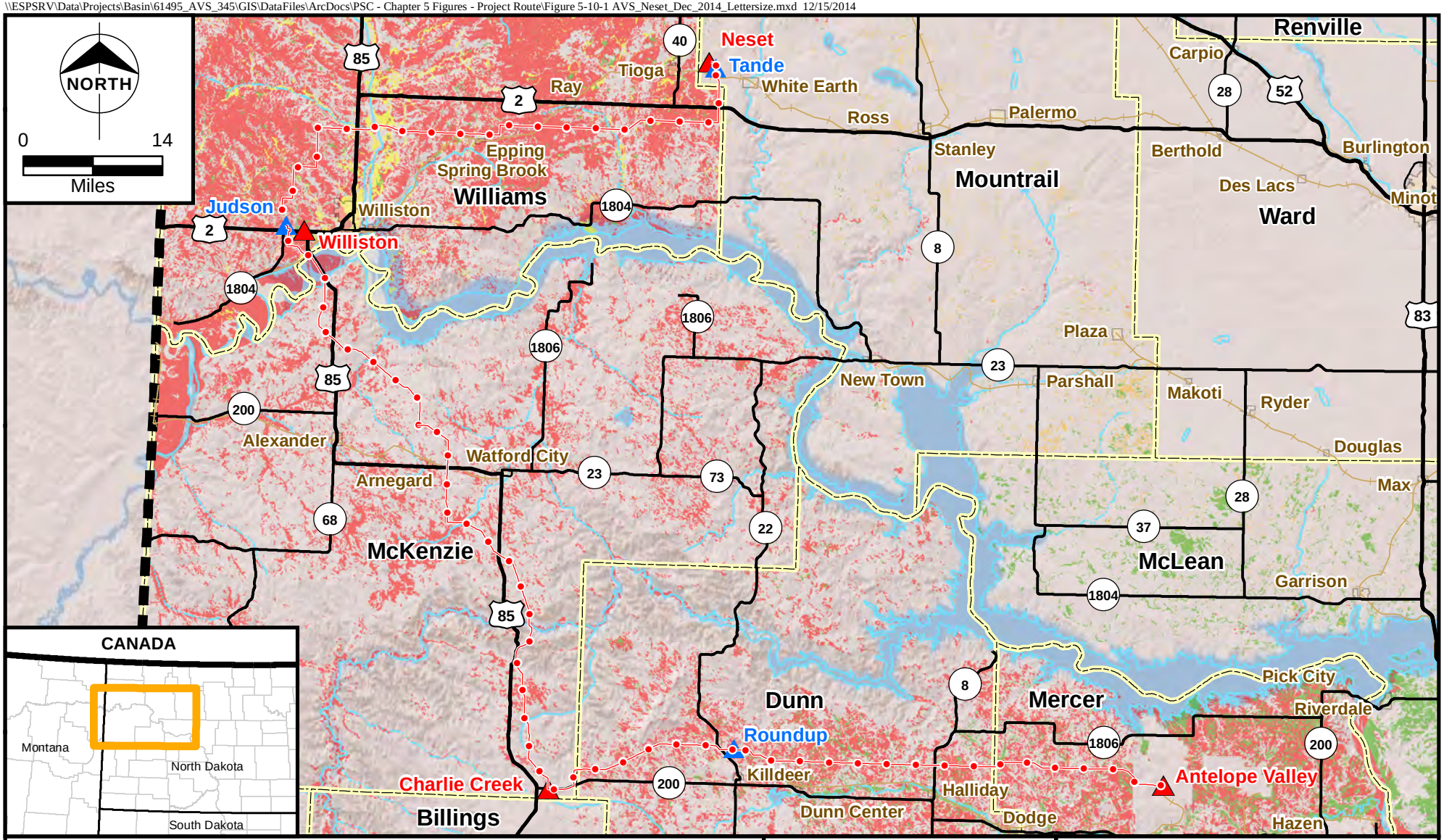

LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- 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

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

Revised December 15, 2014

5.11 Geology and Landforms

No changes from addition of proposed Roundup Substation.

5.11.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.11.1.1 Regional Setting

No changes from addition of proposed Roundup Substation.

5.11.1.2 Terrain

No changes from addition of proposed Roundup Substation.

5.11.1.3 General Geology

No changes from addition of proposed Roundup Substation. Figure 5.11-1 updated to include the Roundup Substation.

5.11.1.4 Oil Shale

No changes from addition of proposed Roundup Substation.

5.11.1.5 Mineral Resources

No changes from addition of proposed Roundup Substation. Figure 5.11-4 updated to include the Roundup Substation.

5.11.1.6 Landslides

No changes from addition of proposed Roundup Substation.Figure 5.11-5 updated to include the Roundup Substation.

5.11.2 Impacts

Impacts to geologic features, resources, or surface landforms resulting from the construction and operation of the proposed Roundup Substation are anticipated to be negligible. The substation site is located on terrain with little slope, and impacts to geological resources related to construction and operation of the substation are not anticipated. Some surface grading and subsurface excavation and trenching would be necessary but would be relatively shallow and not expected to encounter significant bedrock.

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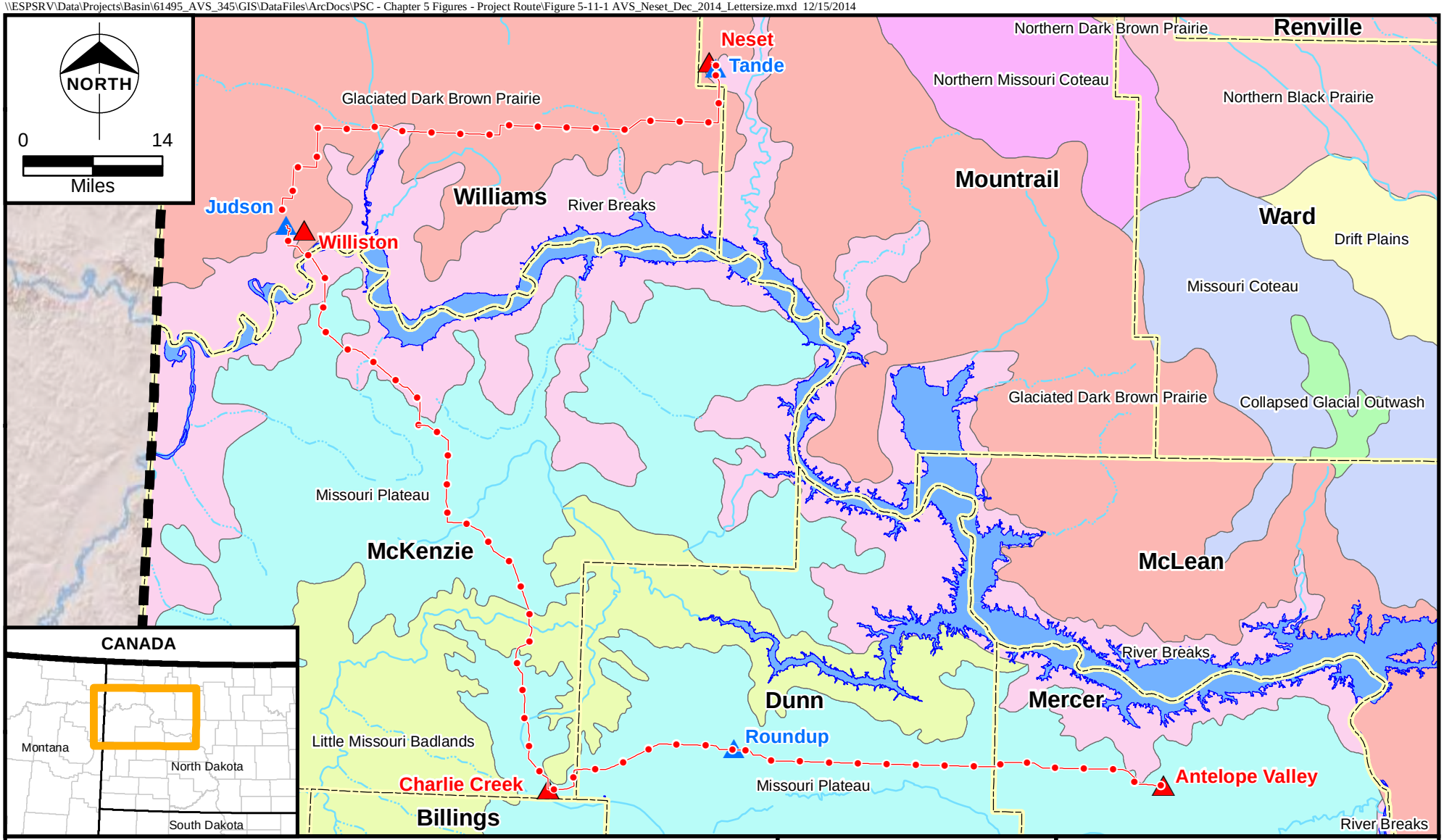

LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- MissouriRiver/Lake Sakakawea

Ecoregions

- Missouri Coteau
- Collapsed Glacial Outwash
- Northern Missouri Coteau
- Glaciated Dark Brown Prairie
- Missouri Plateau
- Little Missouri Badlands
- River Breaks
- Northern Black Prairie
- Northern Dark Brown Prairie
- Drift Plains

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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 December 15, 2014

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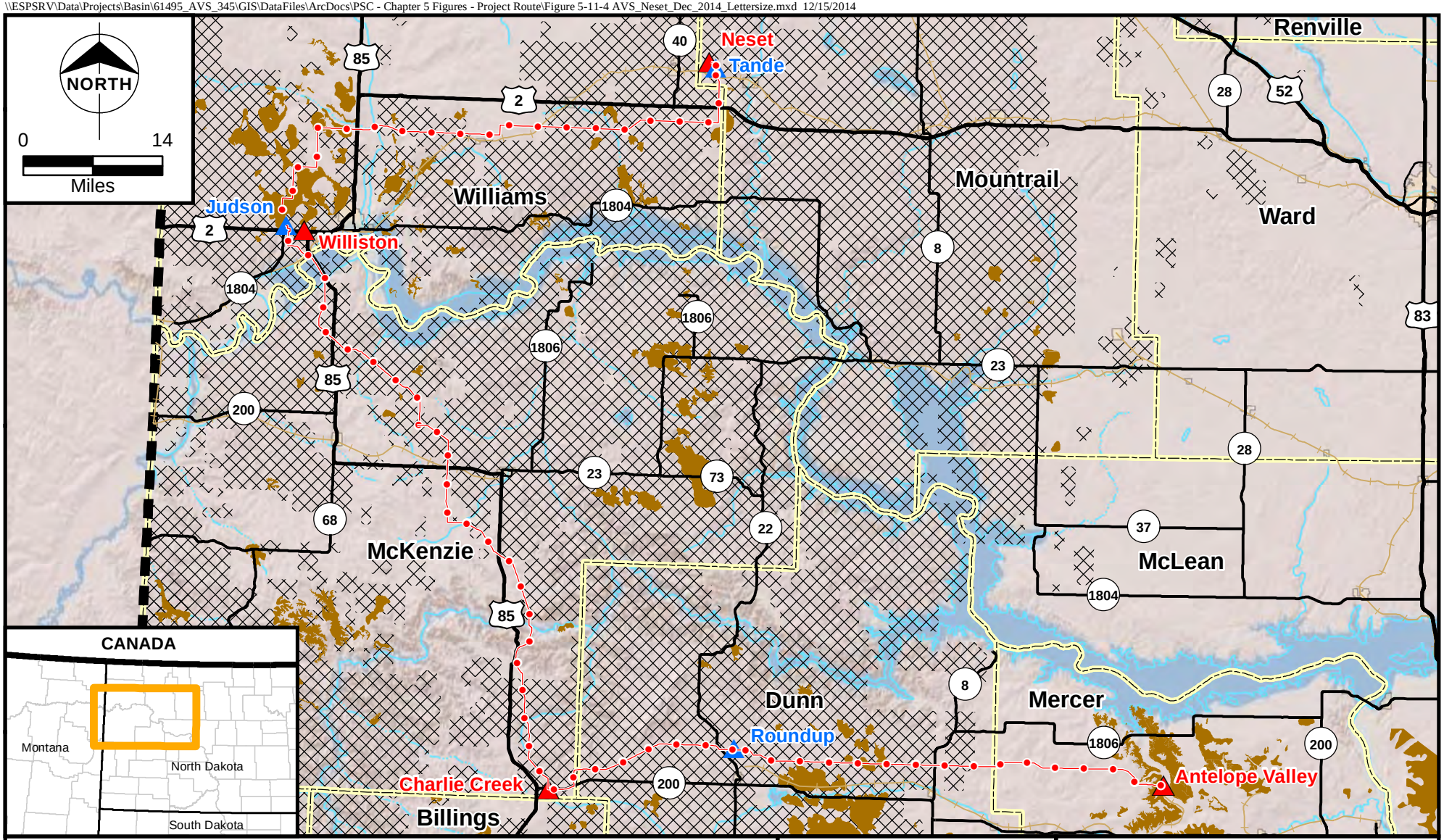

LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- Coal Fields
- Oil Fields

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

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

Revised December 15, 2014

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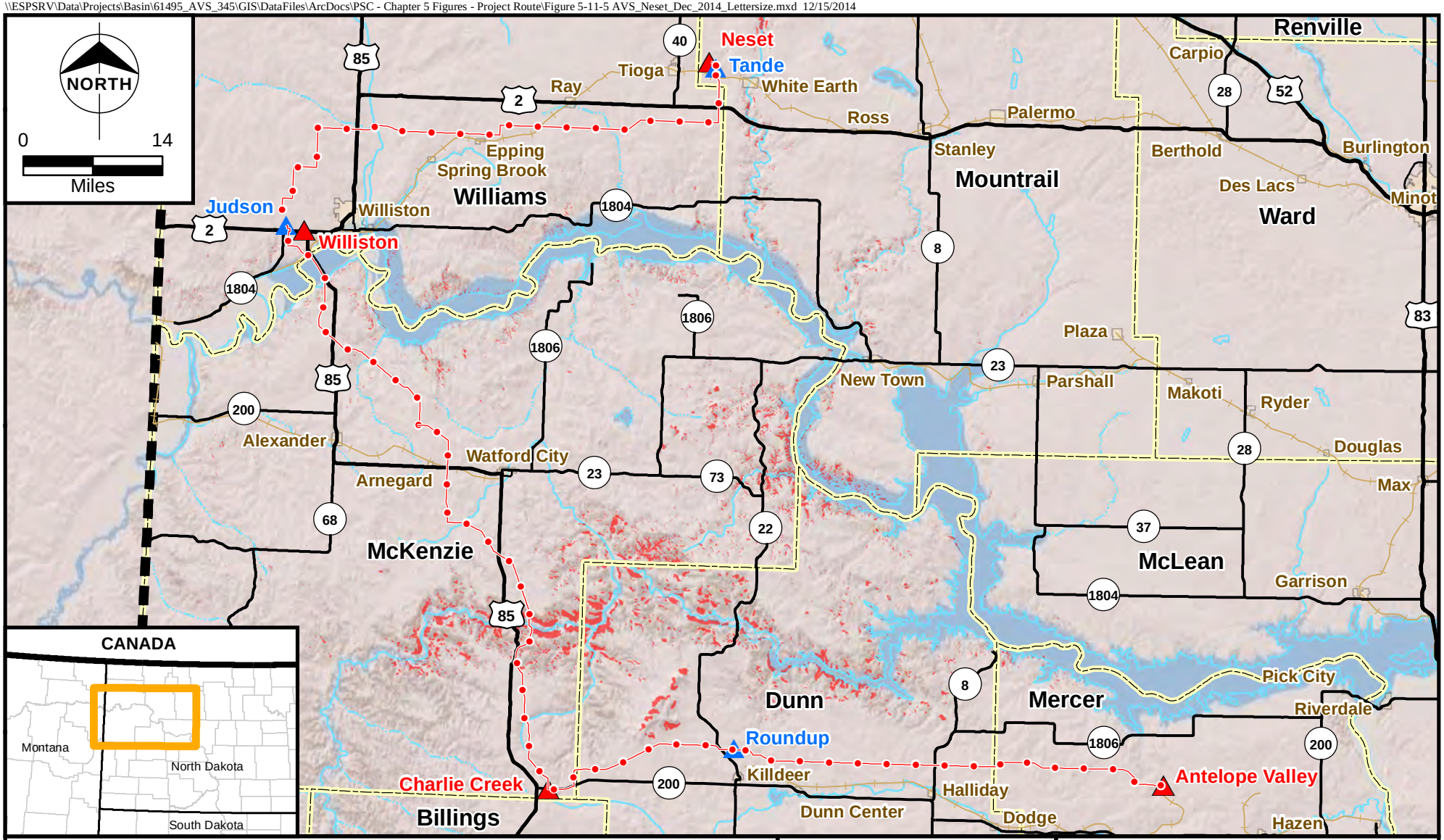

LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- Landslide Deposits

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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

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

Revised December 15, 2014

5.11.3 Mitigation

No changes from addition of proposed Roundup Substation.

5.12 Water Resources

No changes from addition of proposed Roundup Substation.

5.12.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.12.2 Impacts

No impacts to water resources resulting from the construction and operation of the proposed Roundup Substation are expected, because BMPs would be used to prevent soil erosion and sedimentation. No streams or other water bodies are present within the substation site, and the substation would not be located within a FEMA-designated floodplain.

5.12.3 Mitigation

No changes from addition of proposed Roundup Substation.

5.13 Biological Resources

No changes from addition of proposed Roundup Substation.

5.13.1 Description of Resources

No changes from addition of proposed Roundup Substation.

5.13.1.1 Regional Setting

No changes from addition of proposed Roundup Substation.

5.13.1.2 Vegetation

No changes from addition of proposed Roundup Substation.

5.13.1.3 Wildlife

No changes from addition of proposed Roundup Substation.

5.13.1.3.1 Big Game

No changes from addition of proposed Roundup Substation.

5.13.1.3.2 Mammals

No changes from addition of proposed Roundup Substation.

5.13.1.3.3 Migratory and Resident Birds

No changes from addition of proposed Roundup Substation.

5.13.1.3.4 Raptors

No changes from addition of proposed Roundup Substation.

5.13.1.3.5 Gamebirds, Waterfowl, and Shorebirds

No changes from addition of proposed Roundup Substation.

5.13.1.3.6 Reptiles and Amphibians

No changes from addition of proposed Roundup Substation.

5.13.1.3.7 Native and Introduced Gamefish Species

No changes from addition of proposed Roundup Substation.

5.13.1.4 Wetlands

No changes from addition of proposed Roundup Substation. Figure 5.13-5 updated to include the Roundup Substation.

5.13.1.5 Special Status Species

5.13.1.5.1 Endangered Species Act Species and Critical Habitat

No changes from addition of proposed Roundup Substation. Figure 5.13-6 updated to include the Roundup Substation.

5.13.1.5.2 USFS Sensitive and Management Indicator Species

No changes from addition of proposed Roundup Substation.

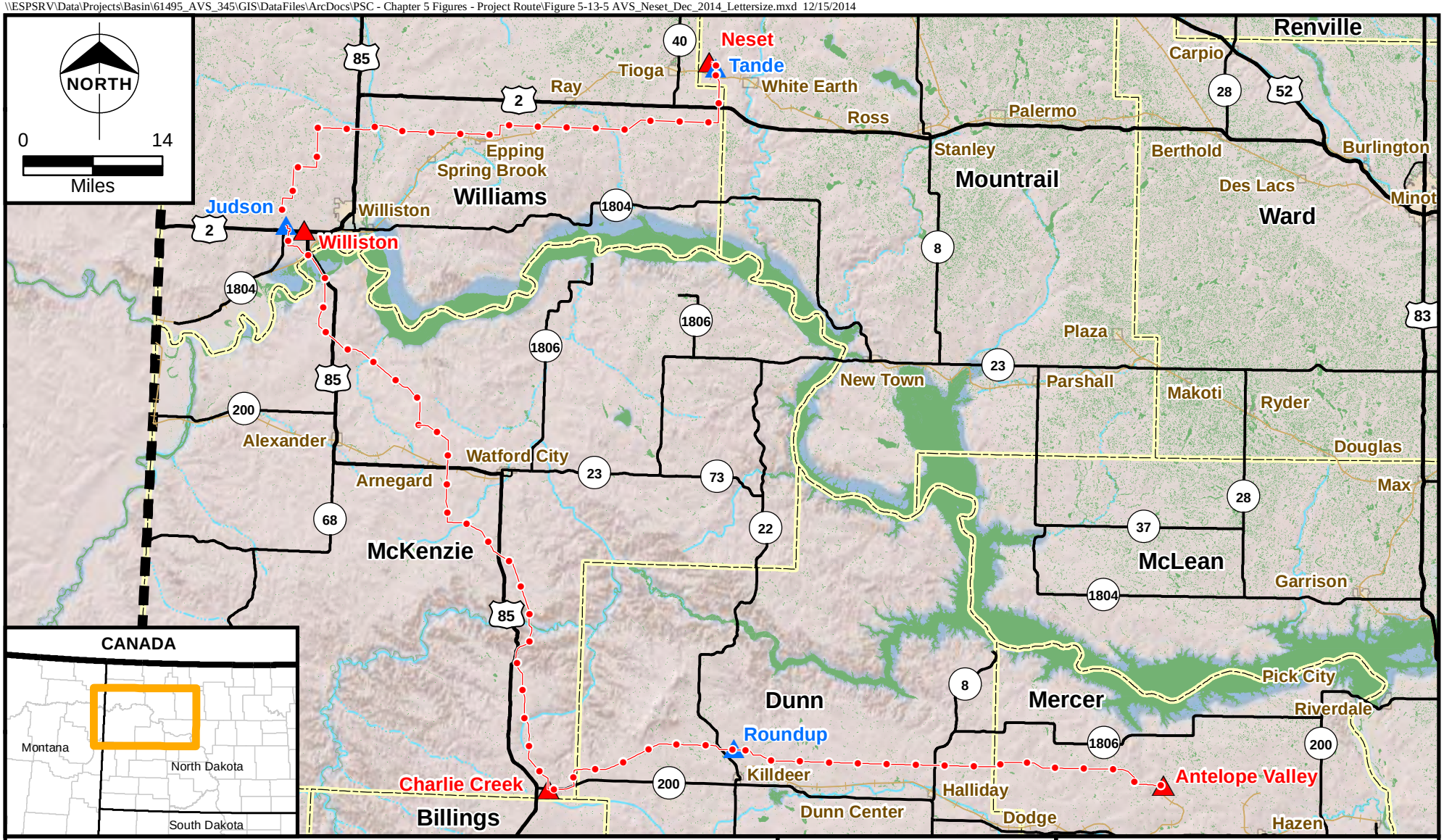
5.13.1.5.3 North Dakota Species of Conservation Priority

No changes from addition of proposed Roundup Substation.

5.13.2 Impacts

No changes from addition of proposed Roundup Substation.

\\ESPSRV\Data\Projects\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-13-5 AVS_Neset_Dec_2014_Lettersize.mxd 12/15/2014



LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- NWI Wetlands

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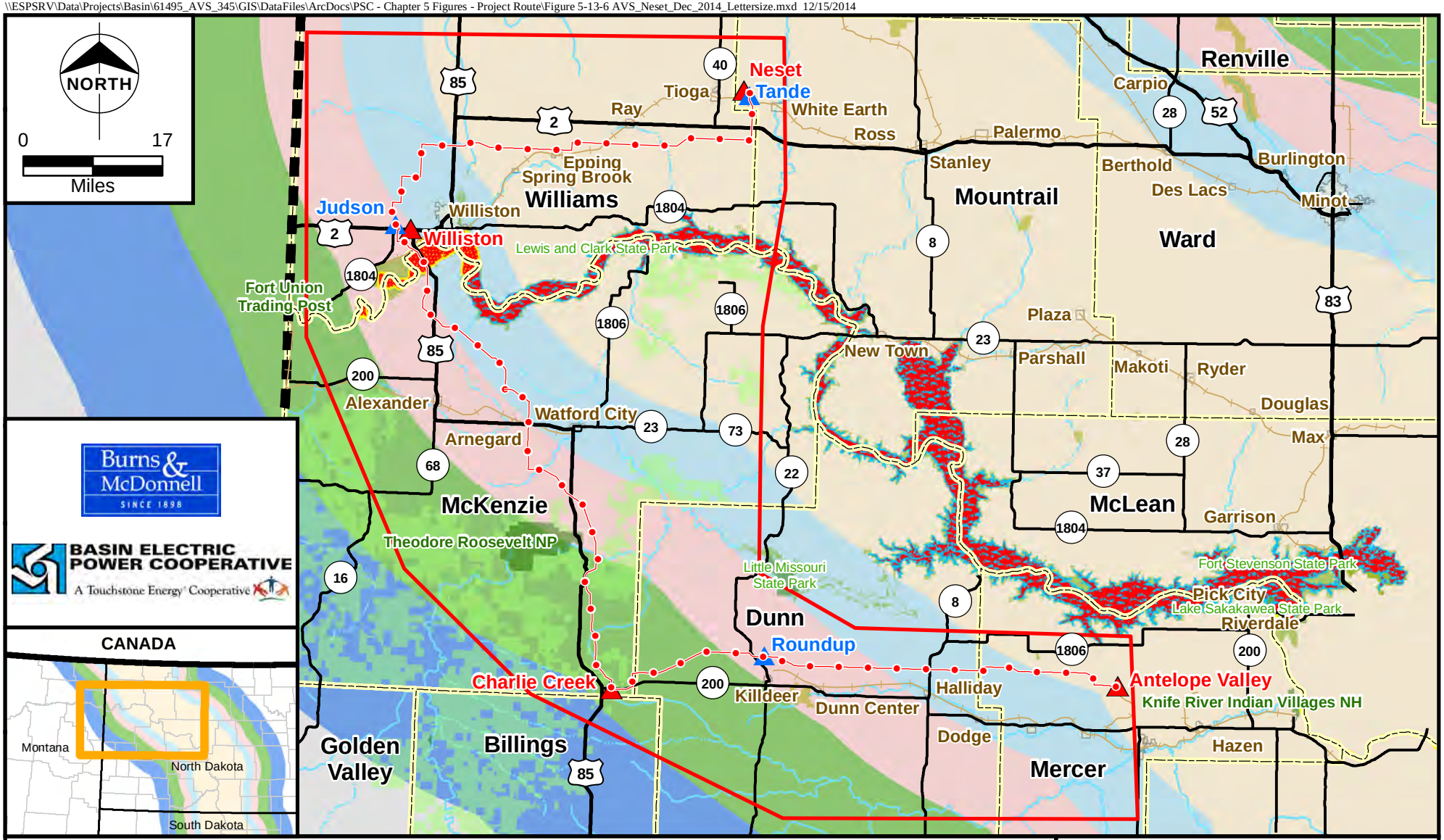
Figure 5.13-5
Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
NWI Wetlands

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

Revised December 15, 2014

\\ESPSRV\Data\Projects\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Figure 5-13-6 AVS_Neset_Dec_2014_Lettersize.mxd 12/15/2014



LEGEND

- Project Route November 2014
- Proposed Substation
- Existing Substation
- Study Area
- Army Corps of Engineers
- National or State Park
- National Wildlife Refuge
- National Grassland
- State Boundary
- County Boundary
- Municipal Areas
- Railroad
- 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)

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; Esri; Basin Electric; Burns & McDonnell.

Revised December 15, 2014

5.13.2.1 Vegetation

The proposed Roundup Substation would require the removal of all vegetation within the fenced area of the site (approximately 14.2 acres) and the 0.25-mile access road (approximately 1.8 acres) for a total of 16 acres, as the site would be converted to utility use. Vegetation within the substation site includes approximately 12.1 acres of cropland, 2.4 acres of pasture/grassland, and 1.5 acres of wooded shelterbelt. Removal of vegetation within the substation boundaries would be long-term, for the life of the substation.

5.13.2.2 Wetlands

No impacts to wetlands are expected from construction of the proposed Roundup Substation. No NWI wetlands are located within the boundaries of the substation site, and no wetlands would need to be crossed for access to the site for construction. BMPs would be used to minimize soil erosion and runoff during construction to prevent sedimentation into any nearby wetlands.

5.13.2.3 Wildlife

No changes from addition of proposed Roundup Substation.

5.13.2.3.1 Big Game

No changes from addition of proposed Roundup Substation.

5.13.2.3.2 Nongame Species

Potential impacts to nongame species, such as small mammals, reptiles, and amphibians, resulting from construction of the proposed Roundup Substation would include long-term loss of wildlife habitat within the 14.2-acre substation footprint and 1.8-acre access road footprint. Additionally, some mortality of less-mobile or burrowing species may occur from construction vehicles or equipment within the site during construction.

5.13.2.3.3 Birds

Habitat disturbance within the substation site and human disturbance from construction activities may result in impacts to migratory bird species. Substation site clearing would occur outside of nesting season or, if during nesting season, additional nesting surveys would be completed. If nests are identified during the nesting survey work, an appropriate buffer for clearing and construction activities would be set in accordance with the protection measures identified in the Biological Assessment (Appendix S) and the Biological Opinion (Appendix X).

5.13.2.3.4 Aquatic Species

No changes from addition of proposed Roundup Substation.

5.13.2.3.5 Proposed Substations

Construction of the proposed Roundup Substation would require the removal of all vegetation within the fenced boundary of the site. Impacts to wildlife during construction would be similar to those incurred during construction of the transmission line. Loss of vegetation in these fenced areas would be permanent, and any available wildlife habitat would be converted to utility use. The proposed substation site and access road would occupy approximately 16 acres and consist of approximately 12.1 acres of cropland, 2.4 acres of pasture/grassland, and 1.5 acres of wooded shelterbelt. Wildlife species using any available habitat on the proposed substation site would be displaced to available habitat adjacent to the site.

5.13.2.4 Special Status Species

No changes from addition of proposed Roundup Substation.

5.13.2.4.1 Proposed Substations

No special status species, or habitat for these species, are known to occur within the site boundary for the proposed Roundup Substation. Impacts on special status species resulting from construction and operation of the substation would not occur.

5.13.3 Mitigation

No changes from addition of proposed Roundup Substation.

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 changes resulting from the addition of the Roundup Substation is provided 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	No change.	No change.	Additional property tax revenue to Dunn County.	No change.	No change.
Land Use	No change.	No change.	An additional 16 acres of agricultural land would be converted to utility use, including 12.1 acres of cropland, 2.4 acres of pasture/grassland, and 1.5 acres of wooded shelterbelt.	No change.	No change.
Infrastructure-Transportation	No change.	No change.	No change.	No change.	No change.
Public Health and Safety	No change.	No change.	No change.	No change.	No change.
Air Quality	No change.	No change.	No change.	Additional air emissions from construction vehicles and equipment at the substation site.	No change.
Noise	No change.	No change.	Future sound levels in areas directly adjacent to the proposed Roundup Substation would be impacted by operation of the new	Temporary increases in noise levels from construction vehicles and equipment onsite and on surrounding roads	Basin Electric would purchase transformers with a noise rating of 90 dBA or less, based on IEEE distance specifications.

Resource	Corridor/Route		Substations		Mitigation
	Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts	
			substation facilities. Sound levels would not exceed EPA Guidelines with installation of a transformer rated at 90 dBA or lower.		Basin Electric would investigate any complaints of substation noise from nearby residences and work to determine if EPA guidelines are exceeded. If exceedances are determined, Basin Electric would work to reduce noise exposure at these residences.
Visual	No change.	No change.	The new substation would be an added visual element in the existing landscape.	No change.	No change.
Cultural	No change.	No change.	No change.	No change.	Basin Electric and its contractors would comply with the conditions of the Programmatic Agreement
Recreation	No change.	No change.	An additional 16 acres of land developed for the substation would be lost for future recreational activity.	No change.	No change.
Soils and Farmland	No change.	No change.	An additional 16 acres of soil would be permanently converted to utility use. No prime	No change.	No change.

Resource	Corridor/Route		Substations		Mitigation
	Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts	
			farmland would be affected.		
Geology and Landforms	No change.	No change.	No change.	Negligible impacts from surface grading and subsurface excavation and trenching at the substation site.	No change.
Water	No change.	No change.	No impacts to water resources are expected.	No change.	No change.
Biological Resources	No change.	No change.	Vegetation: An additional 16 acres of vegetation would be permanently removed within the fenced area of the substation site. Wetlands: No impacts to wetlands are expected. Wildlife: An additional 16 acres of available wildlife habitat would be converted to utility use. Special Status Species: No impacts to special status species or their habitat is expected.	No change.	No change.

6.0 PUBLIC AND AGENCY COORDINATION

No changes from addition of proposed Roundup Substation.

7.0 IDENTIFICATION OF ADDITIONAL REQUIRED PERMITS/APPROVALS

No changes from addition of proposed Roundup Substation.

8.0 FACTORS CONSIDERED

North Dakota Century Code (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 revisions.

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 changes from addition of proposed Roundup Substation.

8.2 The Effects of New Energy Conversion and Transmission Technologies and Systems Designed to Minimize Adverse Environmental Effects

No changes from addition of proposed Roundup Substation.

8.3 The Potential for Beneficial Uses of Waste Energy From a Proposed Energy Conversion Facility

No changes from addition of proposed Roundup Substation.

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 would occur after implementation of mitigation measures. In summary, construction and operation of the proposed Project would convert an additional 16 acres of land from agricultural uses to utility uses. No other changes to this section where identified.

8.5 Alternatives to the Proposed Site, Corridor, or Route Which are Developed During the Hearing Process and Which Minimize Adverse Effects

No changes from addition of proposed Roundup Substation.

8.6 Irreversible and Irretrievable Commitments of Natural Resources Should the Proposed Site, Corridor, or Route Be Designated

Irreversible resource commitments include damage to a resource that is not recoverable for use by future generations. The small size of the substation and access road footprint, approximately 16 acres total, means that there would be minimal irreversible damage to regional natural resources. This would

primarily involve the soil and agricultural property used for the substation; restoration after the life of the transmission line would reduce these potential irreversible impacts. No other changes to this section where identified.

8.7 The Direct and Indirect Economic Impacts of the Proposed Facility

No changes from addition of proposed Roundup Substation.

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 changes from addition of proposed Roundup Substation.

8.9 The Effect of the Proposed Site or Route on Existing Scenic Areas, Historic Sites and Structures, and Paleontological or Archaeological Sites

No changes from addition of proposed Roundup Substation.

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. The additional substation would have no effect on wetlands or special status species. No other changes identified to this section.

8.11 Problems Raised by Federal Agencies, Other State Agencies, and Local Entities

No changes from addition of proposed Roundup Substation.

9.0 QUALIFICATIONS OF CONTRIBUTORS

No changes from addition of proposed Roundup Substation.

10.0 REFERENCES

No changes from addition of proposed Roundup Substation.

11.0 LAND ACQUISITION STATUS

No changes from addition of proposed Roundup Substation.

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Applications to the North Dakota Public Service Commission for Waiver of Procedures and Time Schedules and a Consolidated Certificate of Corridor Compatibility and Route Permit

Volume II

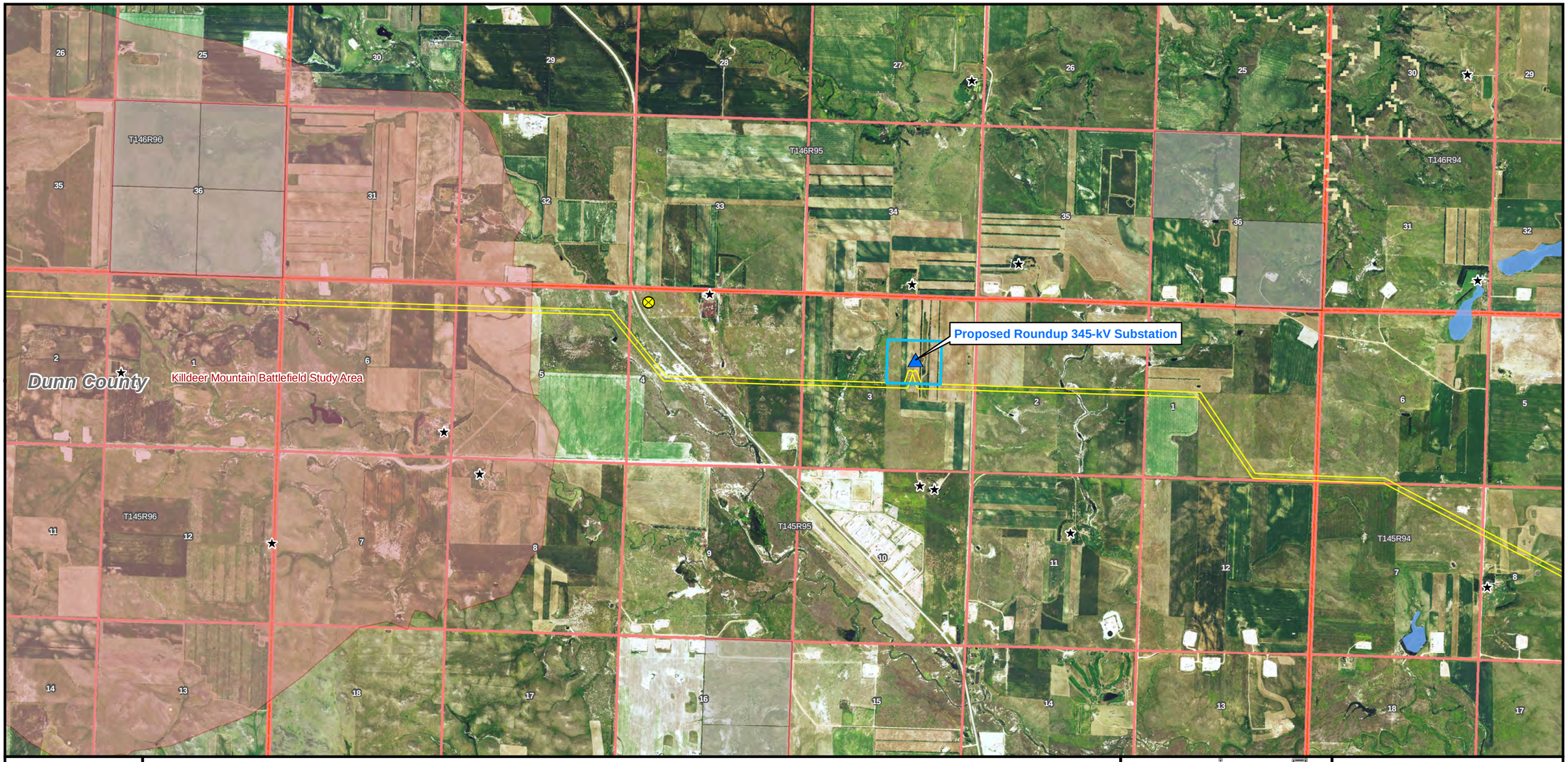
Case No: PU-11-696

for the

AVS-Neset 345-kV Transmission Project

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

January 2015



NORTH

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Feet

- Corridor/Route 150'
- Corridor/Route 100'
- Tande Substation Outline
- Judson Substation Outline
- Patent Gate Substation Outline
- Roundup Substation Outline
- Mobile Home
- Man Camp
- Residence
- Residence within 500 Feet
- New Oil/Gas Pad Site
- County Boundary
- Municipal Boundary
- Civil Townships
- Public Land Survey Sections
- Killdeer Mountain Battlefield State Historic Site
- Killdeer Mountain Battlefield Study Area

Exclusion Areas

- State Sensitive Species Habitat/Occurrence
- NRHP Structure
- Piping Plover Critical Habitat
- State Park
- National Park

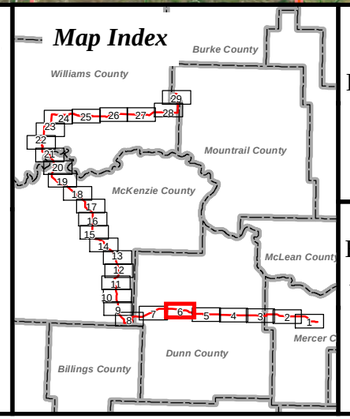
Avoidance Areas

- Center Pivot Irrigation
- State Historical Site
- Scenic River
- Scenic River
- Landslide Deposit
- Waterbody
- National Grassland
- USACE Land
- State-Owned School Lands
- State Wildlife Management Area
- National Wildlife Refuge

Slope Greater than 10%

- 10% - 20%
- 20% - 30%
- 30% - 44.5%

Map Index



Exclusion and Avoidance Criteria

Updated for replacement mapbook sheet 6 from July 2014

Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Detailed Project Route Maps
Sheet 6 of 29

Source: USDA NAIP 2014 Aerial Photography; NDNHI, North Dakota GIS; National Park Service; State Historical Society; Burns & McDonnell.

December 15, 2014

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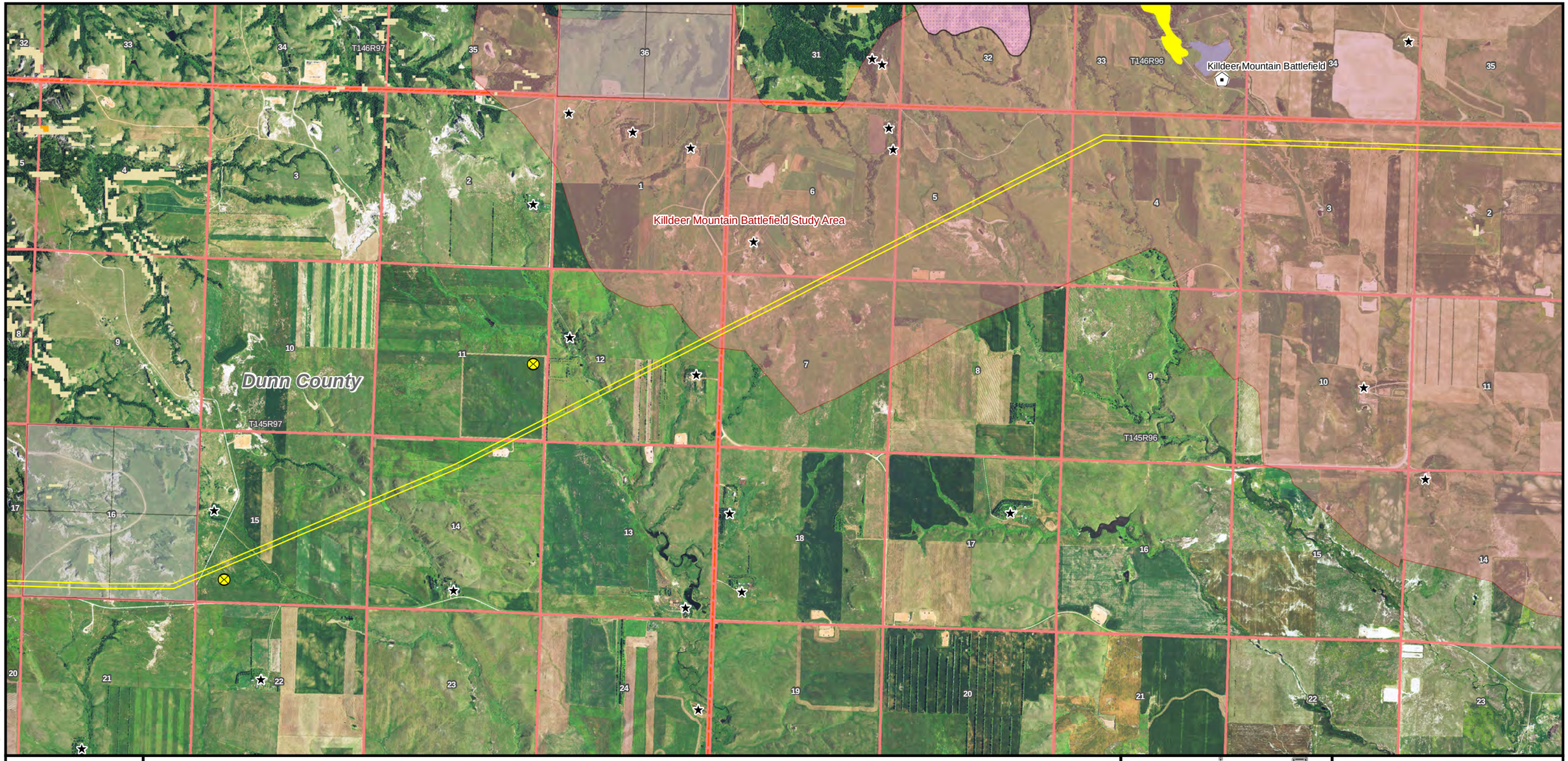

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- Killdeer Mountain Battlefield Study Area

Exclusion Areas

- State Sensitive Species Habitat/Occurrence
- NRHP Structure
- Piping Plover Critical Habitat
- State Park
- National Park

Avoidance Areas

- Center Pivot Irrigation
- State Historical Site
- Scenic River
- Scenic River
- Landslide Deposit
- Waterbody
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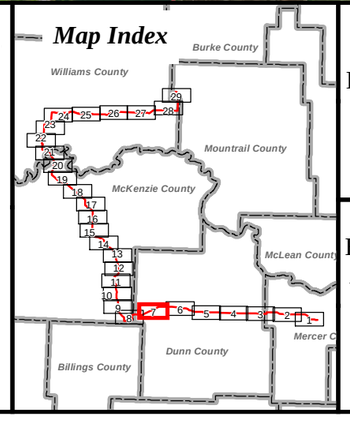
- State Wildlife Management Area
- National Wildlife Refuge

Slope Greater than 10%

- 10% - 20%
- 20% - 30%
- 30% - 44.5%

Map Index



Exclusion and Avoidance Criteria

Updated for replacement mapbook sheet 7 from July 2014

Basin Electric Power Cooperative
Antelope Valley Station to Neset
345-kV Transmission Project
Detailed Project Route Maps
Sheet 7 of 29

Source: USDA NAIP 2014 Aerial Photography; NDNHI, North Dakota GIS; National Park Service; State Historical Society; Burns & McDonnell.

December 15, 2014

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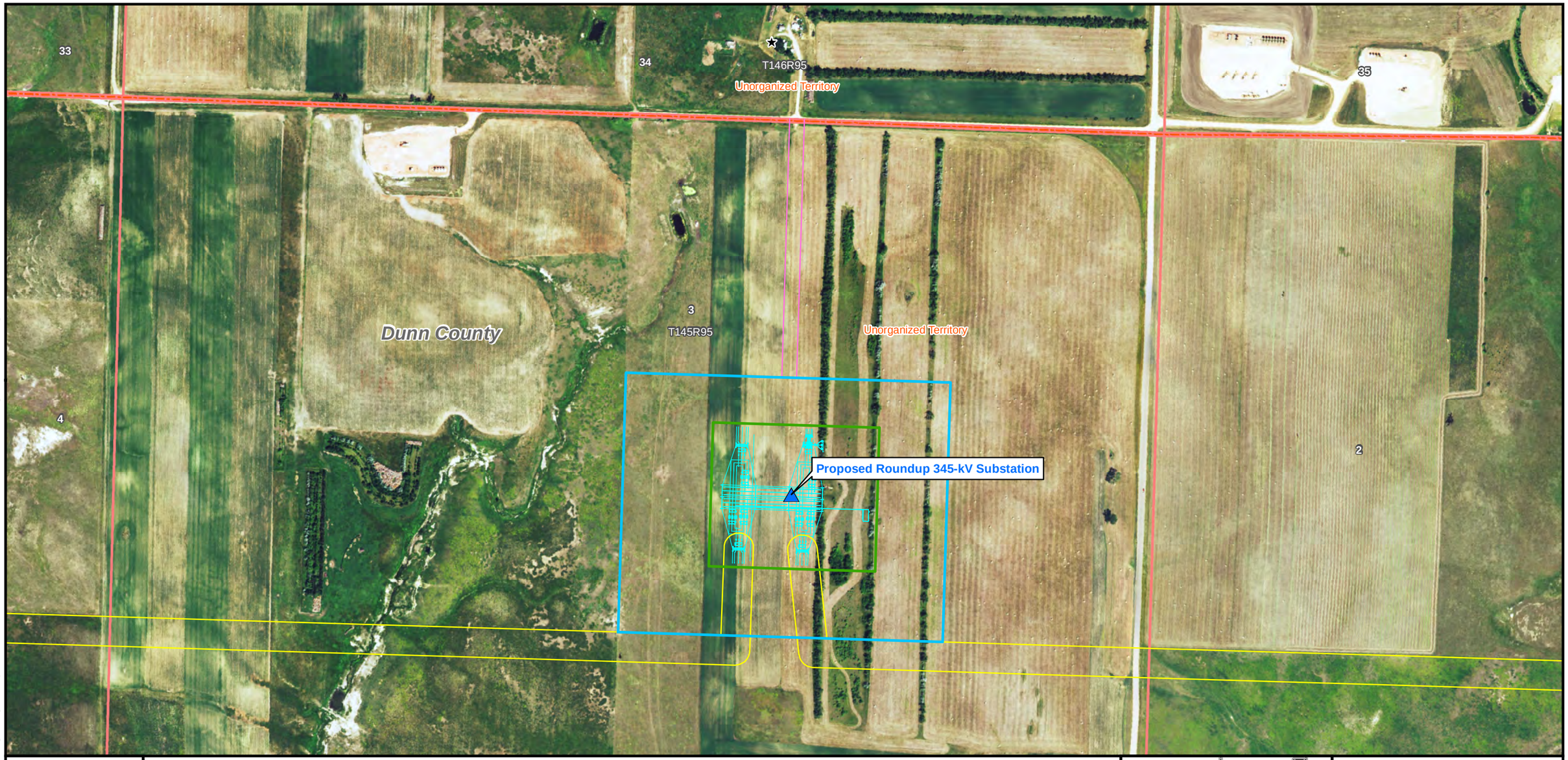

NORTH

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- Corridor/Route 150'
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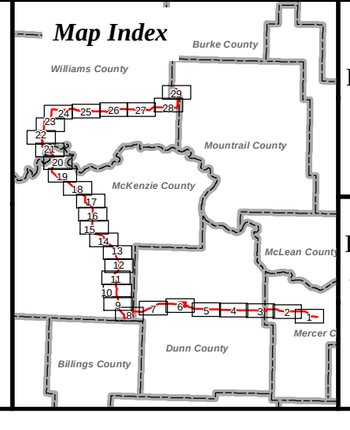

Exclusion and Avoidance Criteria

Updated for replacement mapbook from July 2014

Basin Electric Power Cooperative
Antelope Valley Station to Neset
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Detailed Project Route Maps
Sheet 1 of 1

Source: USDA NAIP 2014 Aerial Photography; NDNHI, North Dakota GIS; National Park Service; State Historical Society; Burns & McDonnell.

January 05, 2015

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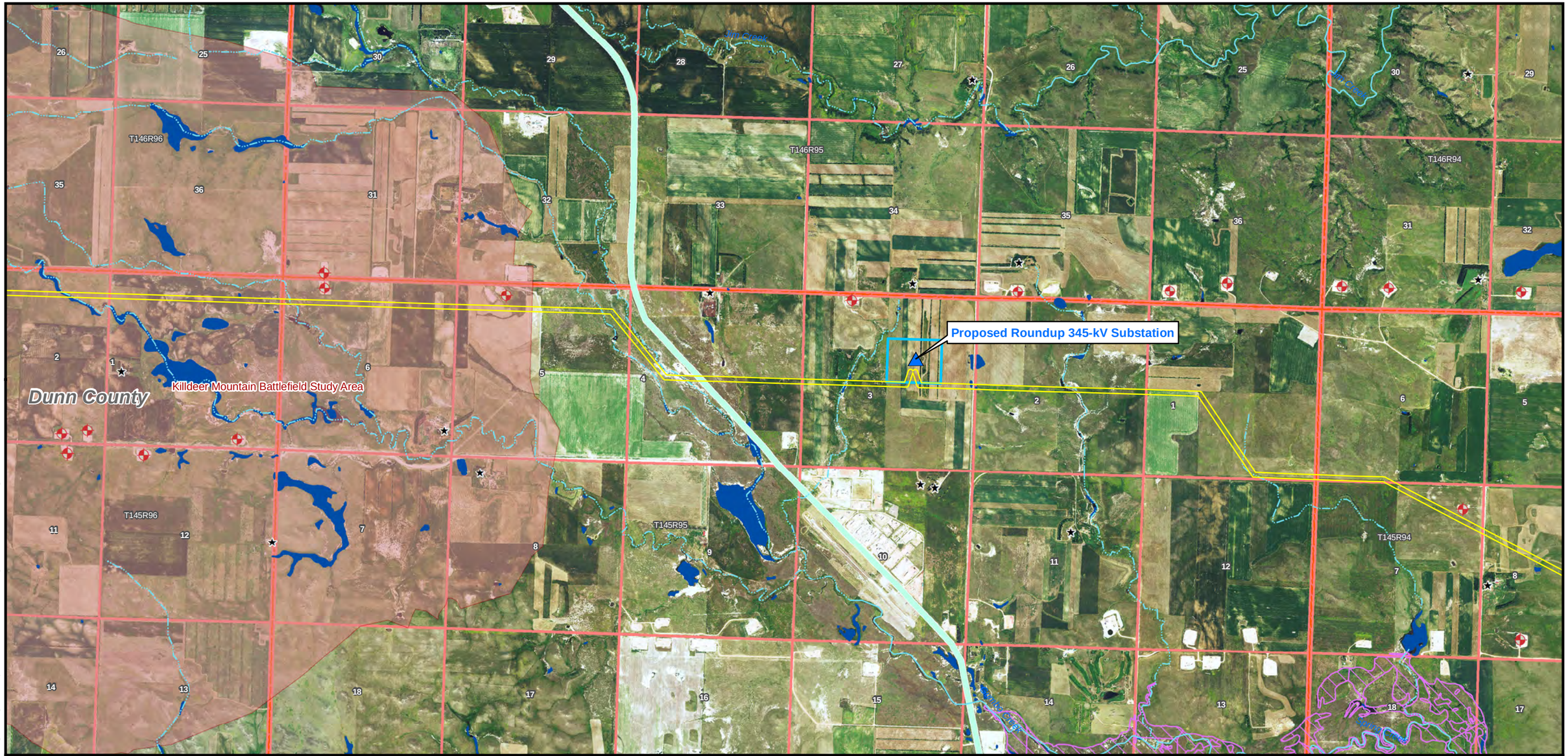

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Selection Criteria

- Residence within 500 Feet
- Mobile Home
- Man Camp
- Residence
- Oil Well
- AM/FM Radio Tower
- Scenic Byway
- Perennial Stream
- Intermittent Stream
- National Grassland
- National Park
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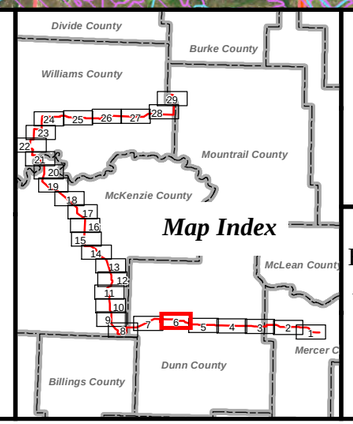
- FEMA Floodplains



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Basin Electric Power Cooperative
Antelope Valley Station to Neset
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Detailed Project Route Maps
Sheet 6 of 29

Source: USDA NAIP 2012 & 2014 Aerial Photography; Federal Communications Commission; North Dakota GIS; National Park Service; State Historical Society; FEMA; Burns & McDonnell.

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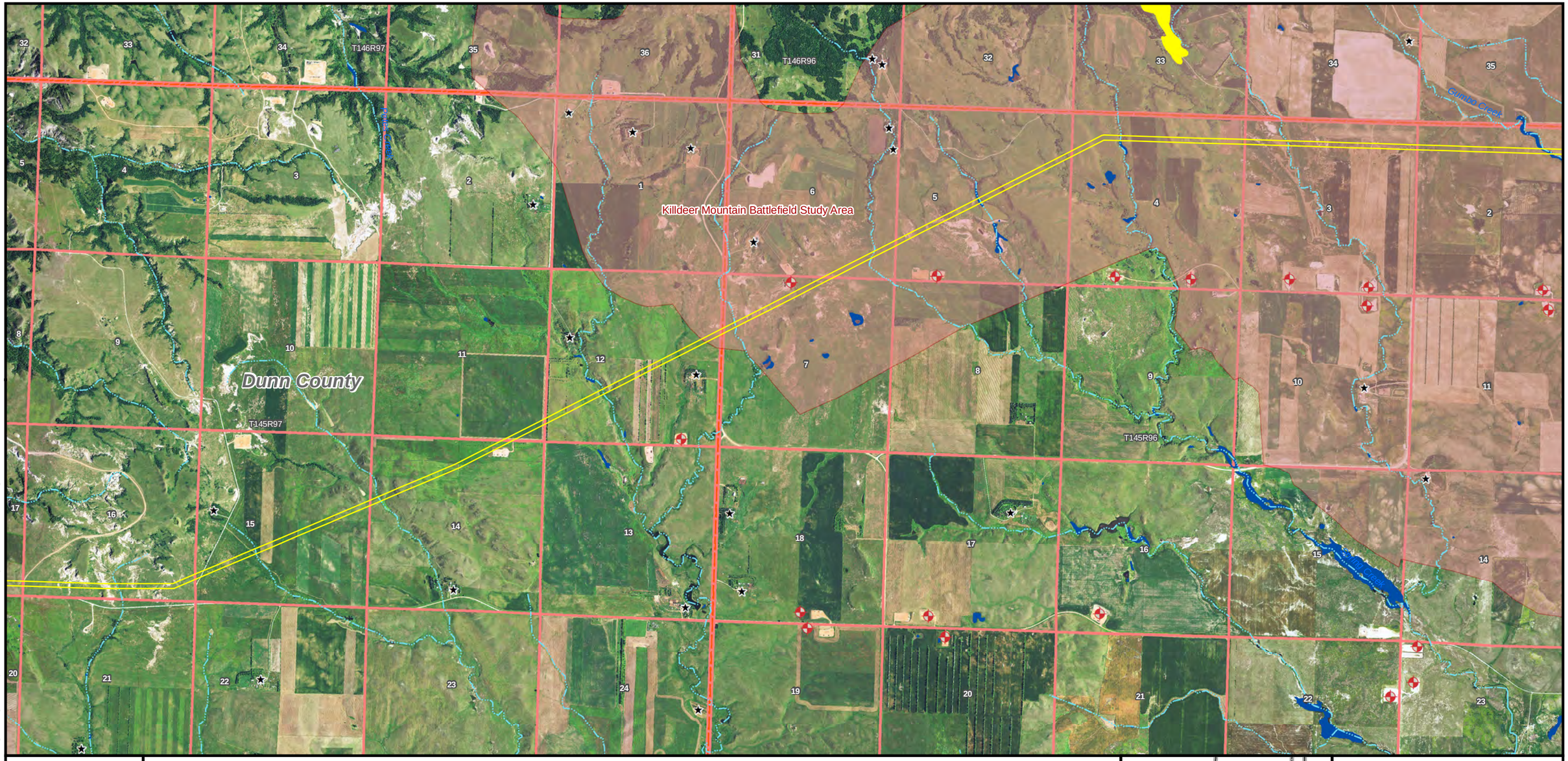

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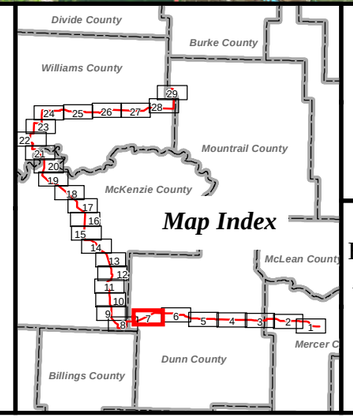

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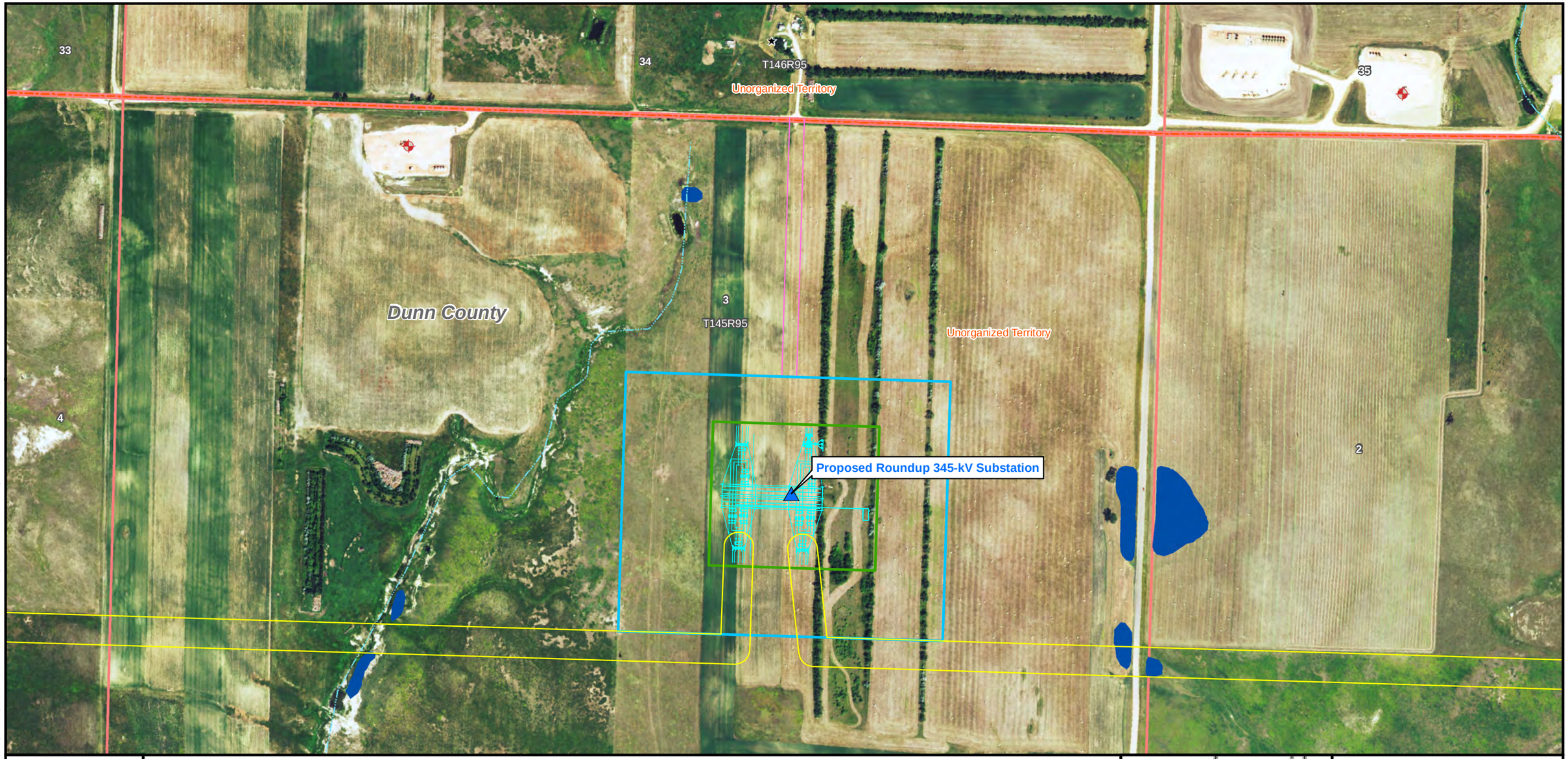

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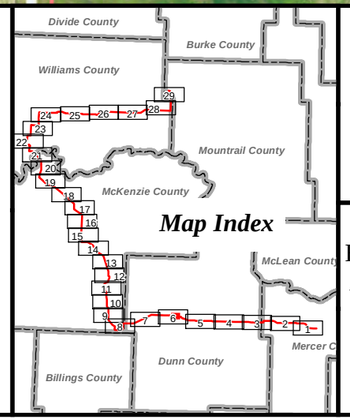

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345-kV Transmission Project
Detailed Project Route Maps
Sheet 1 of 1

Source: USDA NAIP 2012 & 2014 Aerial Photography; Federal Communications Commission; North Dakota GIS; National Park Service; State Historical Society; FEMA; Burns & McDonnell.

January 05, 2015

\\ESPSRV\Data\Projects\Basin\61495_AVS_345\GIS\DataFiles\ArcDocs\PSC - Chapter 5 Figures - Project Route\Selection Criteria Figure\Selection Criteria Maps_AVS_Neset_Roundup_Dec_2014.mxd

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
Phone: 816-333-9400
Fax: 816-333-3690
www.burnsmcd.com

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

Volume III

Case No: PU-11-696

for the

AVS-Neset 345-kV Transmission Project

BASIN ELECTRIC POWER COOPERATIVE

A Touchstone Energy® Cooperative

January 2015

(No change to appendix other than the addition of December 23, 2014 NDSHPO correspondence to Appendix N)

APPENDIX N - CLASS I SURVEY RECORDED CULTURAL RESOURCES AND INVENTORIES

COPY

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

December 23, 2014

Mr. Cris Miller
Basin Electric Power Cooperative
1717 East Interstate Avenue
Bismarck, ND 58503

ND SHPO Ref.: 15-0555 RUS "Basin Electric Power Cooperative's Roundup Substation: A Class III Cultural Resource Inventory and Testing in Dunn County, North Dakota" in portions of [T145N R95W Section 3] Dunn County, North Dakota

Dear Mr. Miller,

We reviewed ND SHPO Ref.: 15-0555 RUS "Basin Electric Power Cooperative's Roundup Substation: A Class III Cultural Resource Inventory and Testing in Dunn County, North Dakota". We concur with a "No Historic Properties Affected" determination, provided the project remains as described and mapped in the report dated November, 2014, and received in this office on December 18, 2014.

Thank you for the opportunity to review this project. If you have any questions please contact Susan Quinnell, Review and Compliance Coordinator at (701) 328-3576, e-mail squinnell@nd.gov

Sincerely,

Claudia J. Berg
State Historic Preservation Officer (North Dakota)

C: Ms. Damita Engel, MAC, Bismarck

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