



Tree Inventory Report

Big Stone South to Ellendale

345kV Transmission Line Project

Case No PU-13-840

North Dakota

August 18, 2015

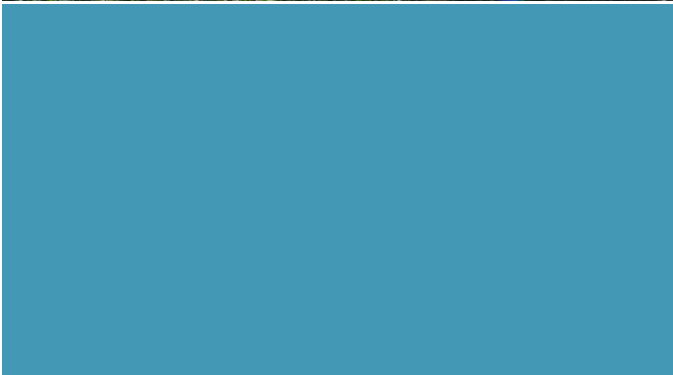


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Scope of Work

HDR Engineering, Inc. (HDR) inventoried trees and shrubs along the North Dakota section of the Otter Tail Power Company's and Montana-Dakota Utilities Co.'s Big Stone South to Ellendale 345kV Transmission Line Project (Project). The Tree inventory was conducted in accordance with the North Dakota Public Service Commission's (Commission) Tree and Shrub Mitigation Specifications (Appendix A). At the April 1, 2014 public hearing for Case No PU-13-840, the Applicants presented evidence that they would need to clear trees to the edge of the 150-foot-wide right-of-way (ROW) to comply with the North American Electric Reliability Corporation's (NERC) Vegetation Management Standards (please see #29 of the Findings of Fact of the July 10, 2014 Findings of Fact, Conclusions of Law, and Order). Therefore, the Order allows for tree clearing to the edge of the 150-foot-wide ROW (Please see #6 of the July 10, 2014 Order). The Project is approximately 163 miles in length in total with about 9 miles occurring in North Dakota. The Project extends from the proposed Ellendale 345kV Substation in North Dakota to the Big Stone South Substation in South Dakota. The inventoried North Dakota section of the Project is located within Sections 9, 10, 15, 22, 23, and 24 Township 129N, Range 63W and Sections 19, 20, 29, and 32 Township 129N Range 62W in Dickey County North Dakota (Figure 1).

Procedures

The inventory was conducted along the entire proposed 150-foot-wide ROW (dated July 7, 2015) from the Ellendale 345kV Substation to the North Dakota – South Dakota Boarder. HDR conducted the inventory on July 28 and 29, 2015. Tree and shrub sites were classified into two habitat types; (1) windbreaks, shelterbelts and other planted areas, known as planted areas, and (2) native growth areas. Planted areas are defined as plantings of single or multiple rows of trees or shrubs that are established for environmental purposes (i.e. wind breaks). Native growth areas are defined as naturally occurring non planted areas. Within planted areas, all trees and shrubs were inventoried within the ROW. Within native growth areas, a tree must have a greater than 1 inch diameter at breast height (DBH) to be inventoried. All shrubs were inventoried within native growth areas. Data forms were completed for each inventoried tree/shrub site. Each site was defined based on the presence of trees or shrubs or multiple trees and shrubs in an area and assigned a Site ID. Data collected at each site included; observer, date, Site ID, habitat type, tree/shrub species, invasive species, tally, and total number. Data sheets for each site can be found in Appendix B. The locations of each site are shown in Figure 1.

Results

Eight sites were identified within the ROW. Four different tree species for a total of 25 individual trees were inventoried. No shrubs were identified within the ROW. A summary of the species and total count of trees inventoried is included in Table 1. All of these trees inventoried occurred within planted habitats.

Species of trees that were inventoried included cottonwood (*Populus deltoides*), Russian olive (*Elaeagnus angustifolia*), black willow (*Salix nigra*), and green ash (*Fraxinus pennsylvanica*). Both cottonwood and green ash are considered native species to North Dakota (USDA 2015). Black willow is not considered a native species to North Dakota. Russian olive is an introduced invasive species in North Dakota (USDA 2015). Several dead trees were observed in the ROW that would need to be removed for construction. Dead trees were not included in the inventory.

Table 1: Summary of Tree and Shrub Inventory

Growth Form	Common Name	Species	Invasive	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Total
Trees – Planted	Cottonwood	<i>Populus deltoides</i>	No	3	0	4	1	1	2	0	0	11
	Black Willow	<i>Salix nigra</i>	No	0	0	0	1	0	0	4	3	8
	Green Ash	<i>Fraxinus pennsylvanica</i>	No	0	0	0	0	0	0	0	5	5
	Russian Olive	<i>Elaeagnus angustifolia</i>	Yes	0	1	0	0	0	0	0	0	1
TOTAL	TREES		3	1	4	2	1	2	4	8	25	
TOTAL	SHRUBS		0	0	0	0	0	0	0	0	0	
GRAND TOTAL			3	1	4	2	1	2	4	8	25	

Recommendations

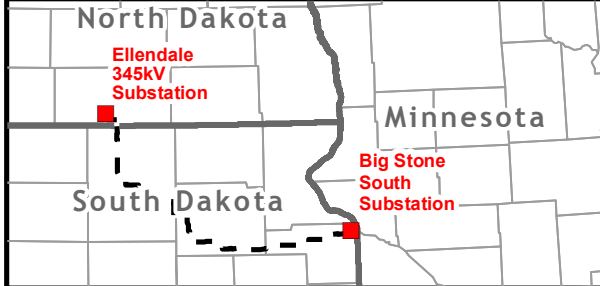
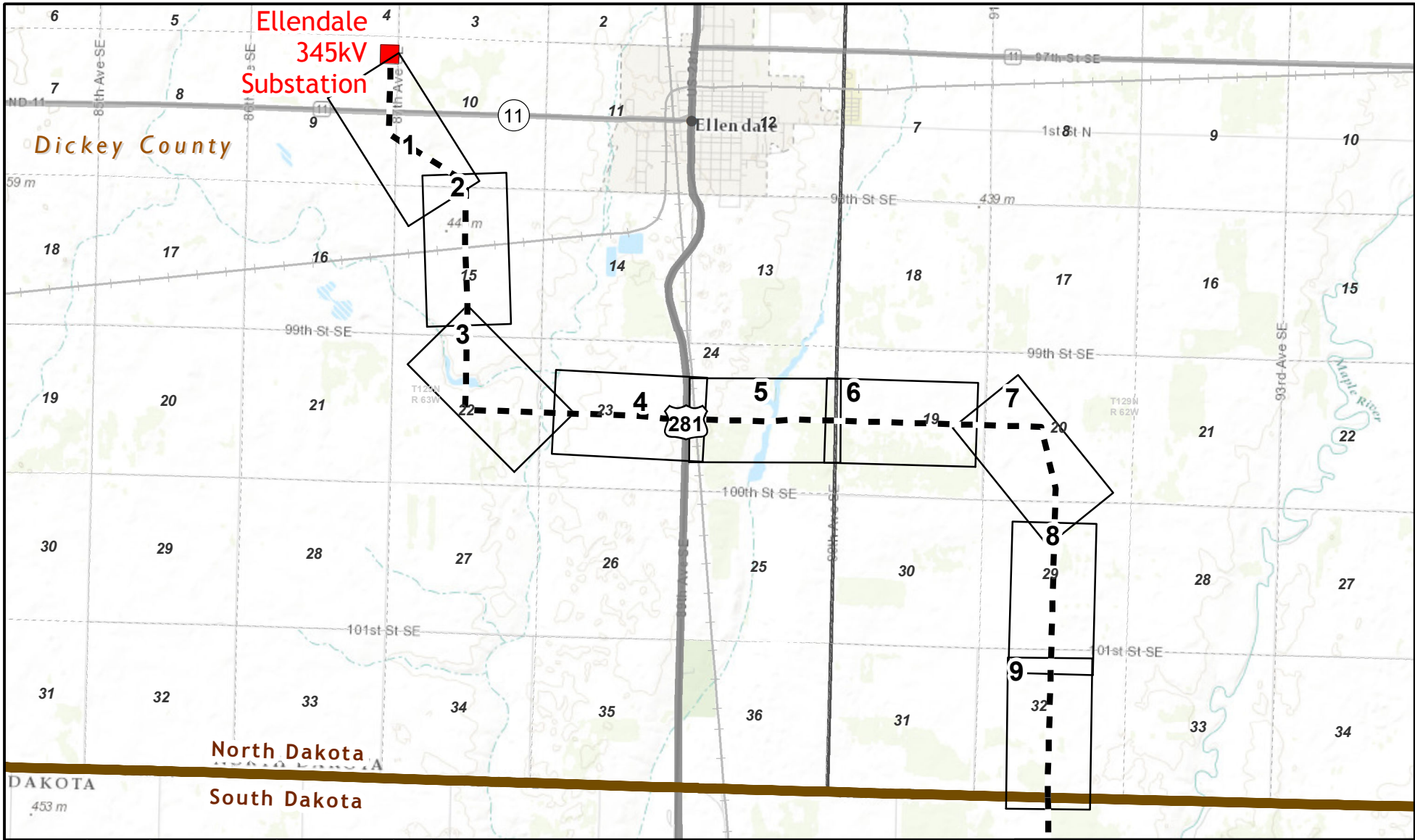
Otter Tail Power Company and Montana-Dakota Utilities Co. will follow the Commission's *Tree and Shrub Mitigation Specifications* (Appendix A) for replacement. A tree/shrub replacement plan will be implemented based on the actual trees and shrubs removal required for construction. HDR makes the following recommendations regarding replacement:

- **Invasive Species.** Invasive species are to be cleared and should be replaced with non-invasive tree/shrub species of similar height and canopy suitable for North Dakota growing conditions.
- **Native Species.** Native species should be replaced with the same or similar native tree species suitable for North Dakota growing conditions at a planting ratio of 2:1. Two 2-year-old saplings must be planted for every one tree removed.

References

United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) 2015. Plants database. <http://plants.usda.gov/java/>. Accessed August 2015.

Figure 1: Tree Inventory Field Map Book



<ul style="list-style-type: none"> Approved Project Route as of 7/7/2015 Project End Point 	<ul style="list-style-type: none"> Railroad Abandoned Railroad 	<ul style="list-style-type: none"> City County Boundary State Boundary Section
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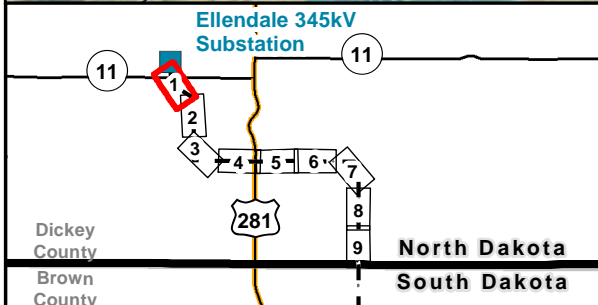
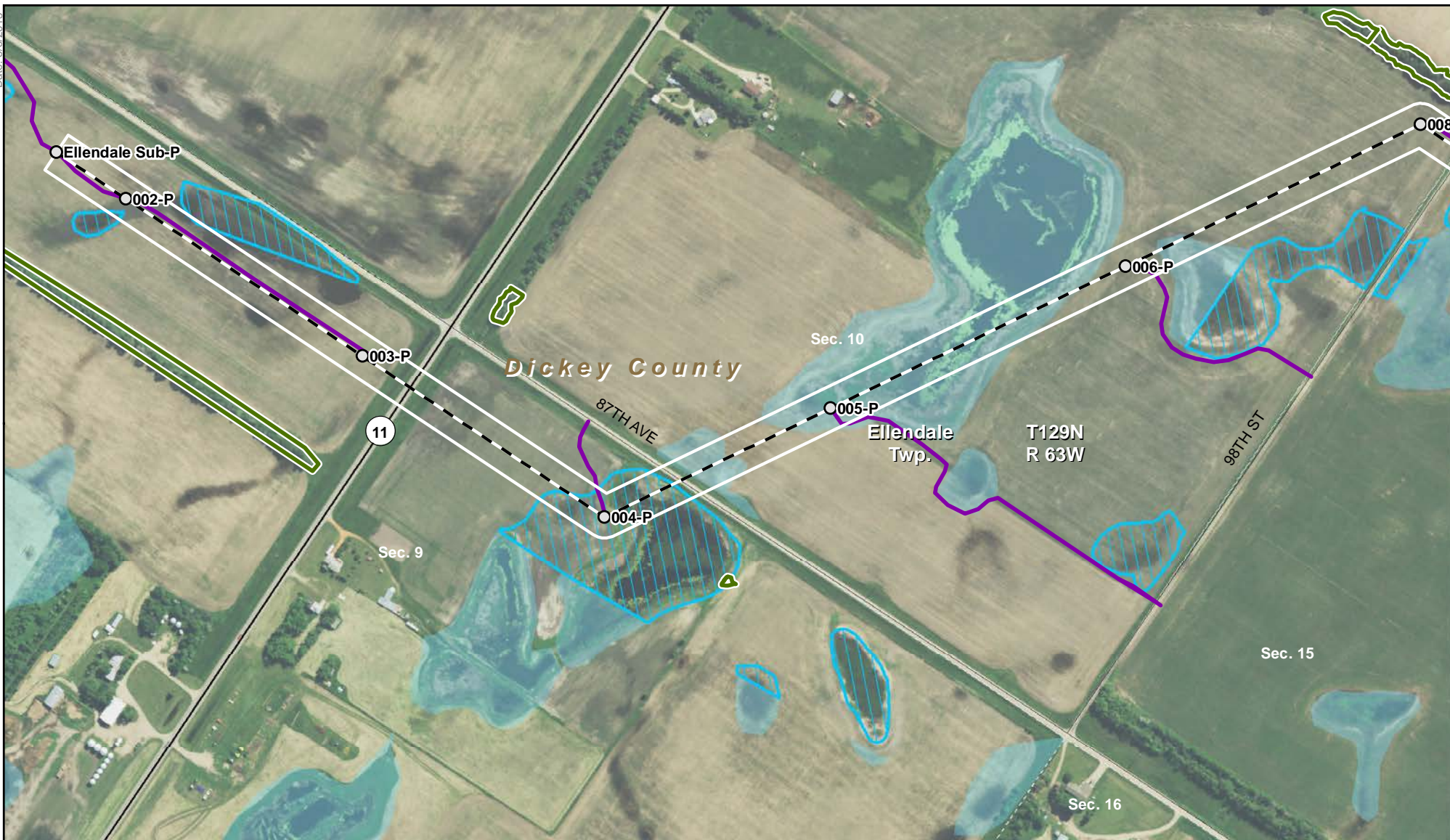


Tree Inventory Overview



Big Stone South to Ellendale 345kV Transmission Line Project North Dakota

Date: 8/5/2015



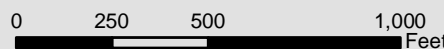
2013 treed area within ROW	Onsite Reviewed Wetlands	ND Interstate Highway
2013 treed areas within route	Jurisdictional Wetland	ND State Highway
Approved Project Route as of 7/7/2015	Offsite Reviewed Wetlands	ND US Highway
Structures as of 7/7/2015		ND Bypass
Access Roads Received 20150626		ND Local Roads
ROW as of 7/7/2015		Condemnation



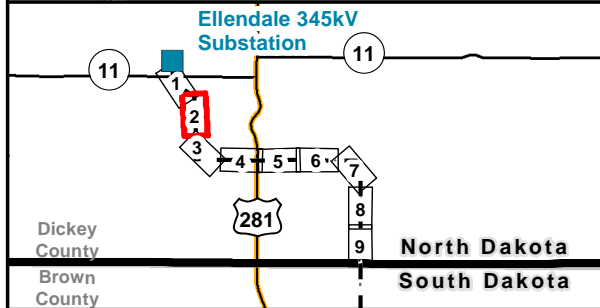
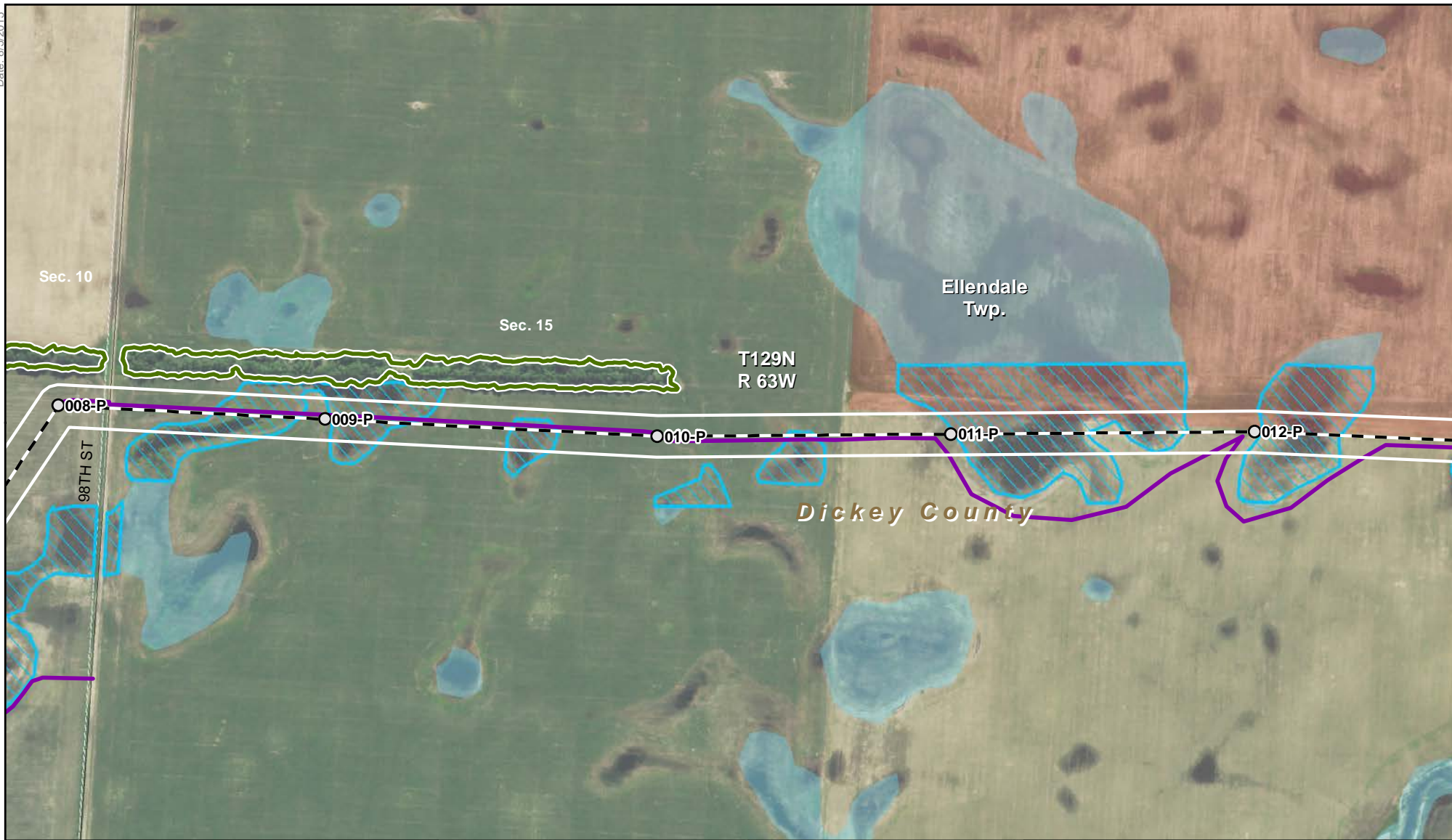
Tree Inventory
Field Map Book - Page 1 of 9

Scale 1:6,000

Big Stone South to Ellendale 345kV Transmission Line Project
North Dakota



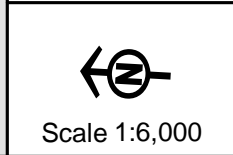
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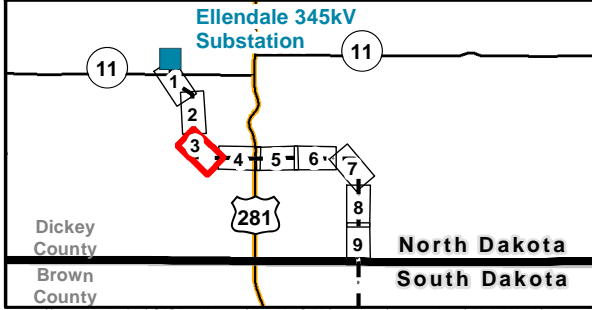


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North Dakota

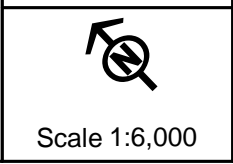
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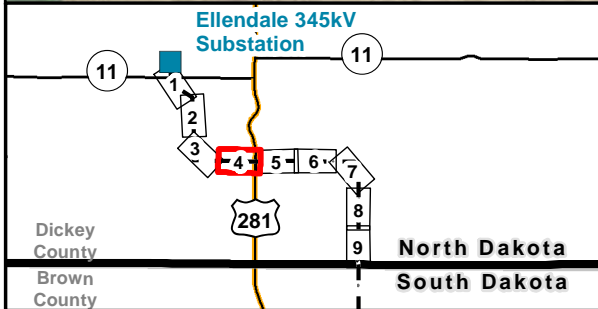


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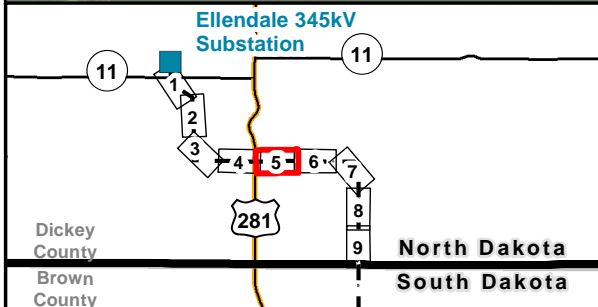
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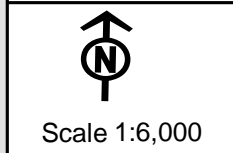
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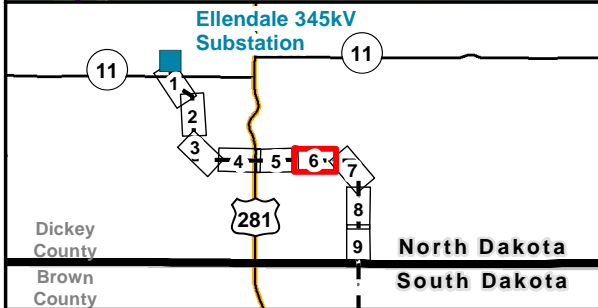
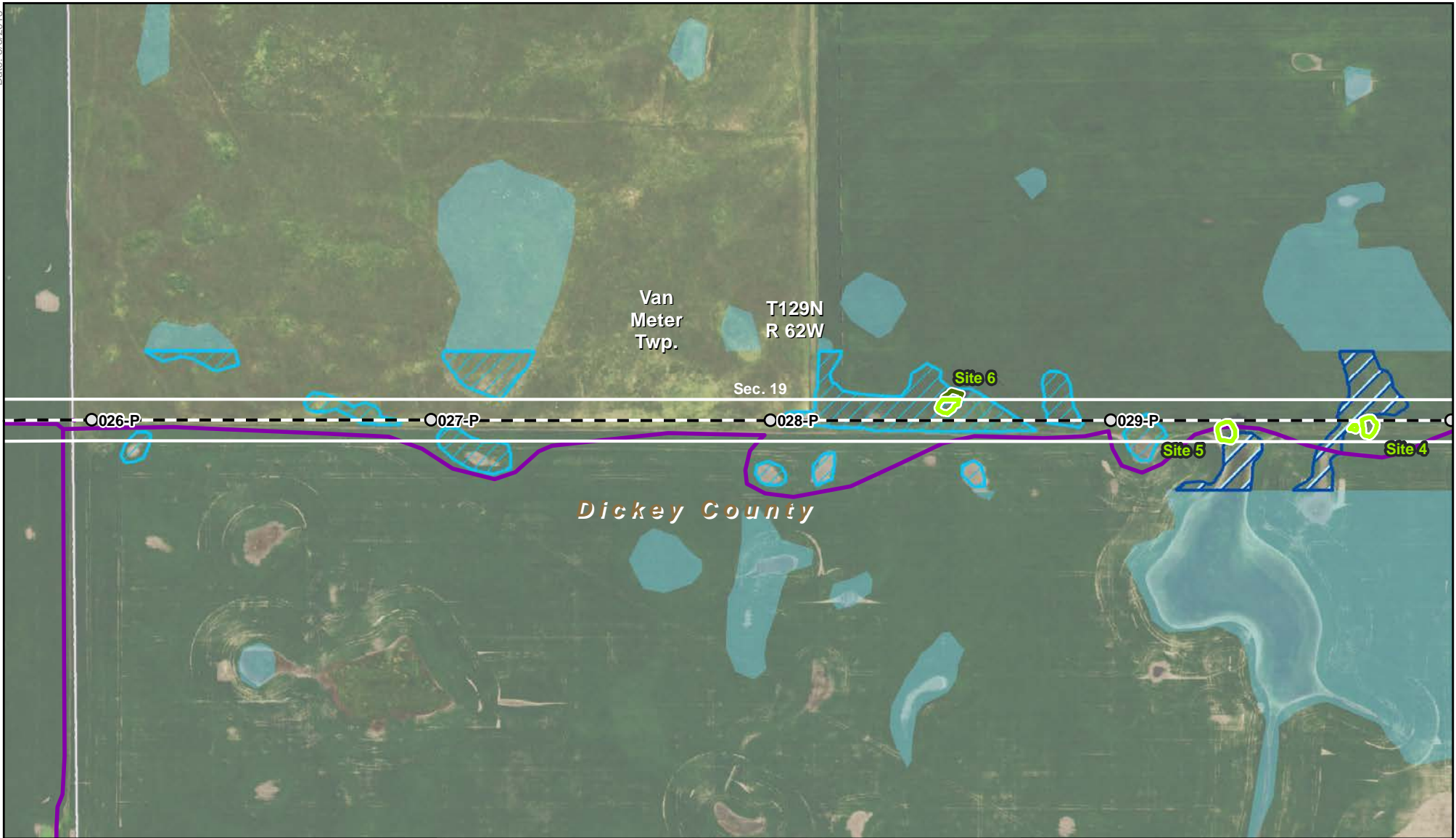


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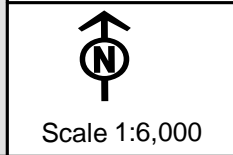
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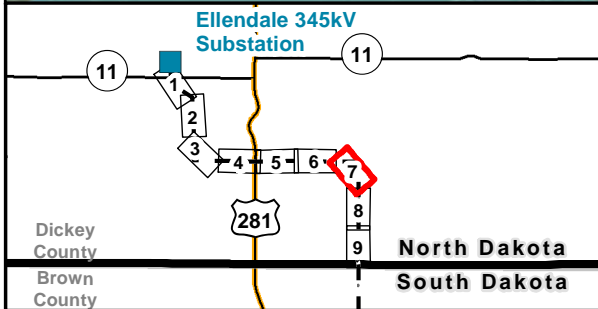


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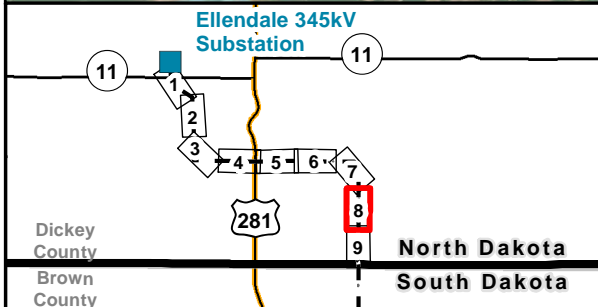
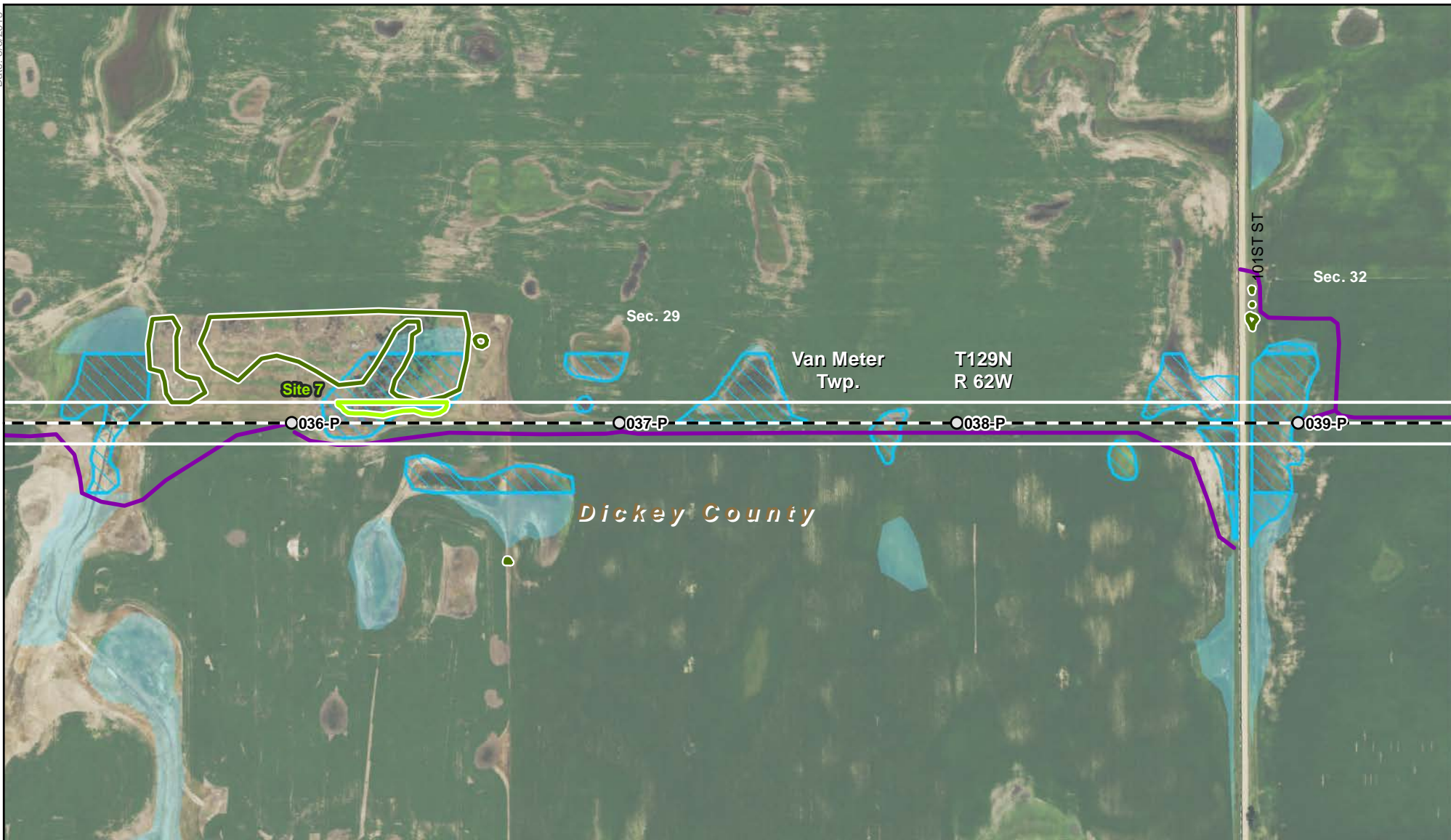
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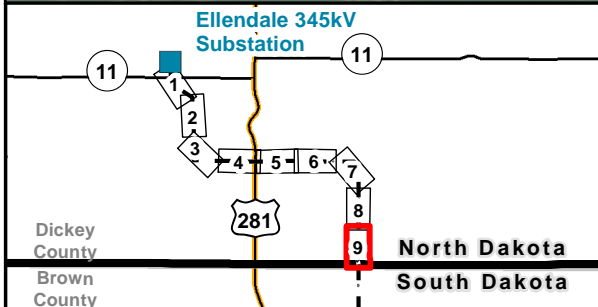
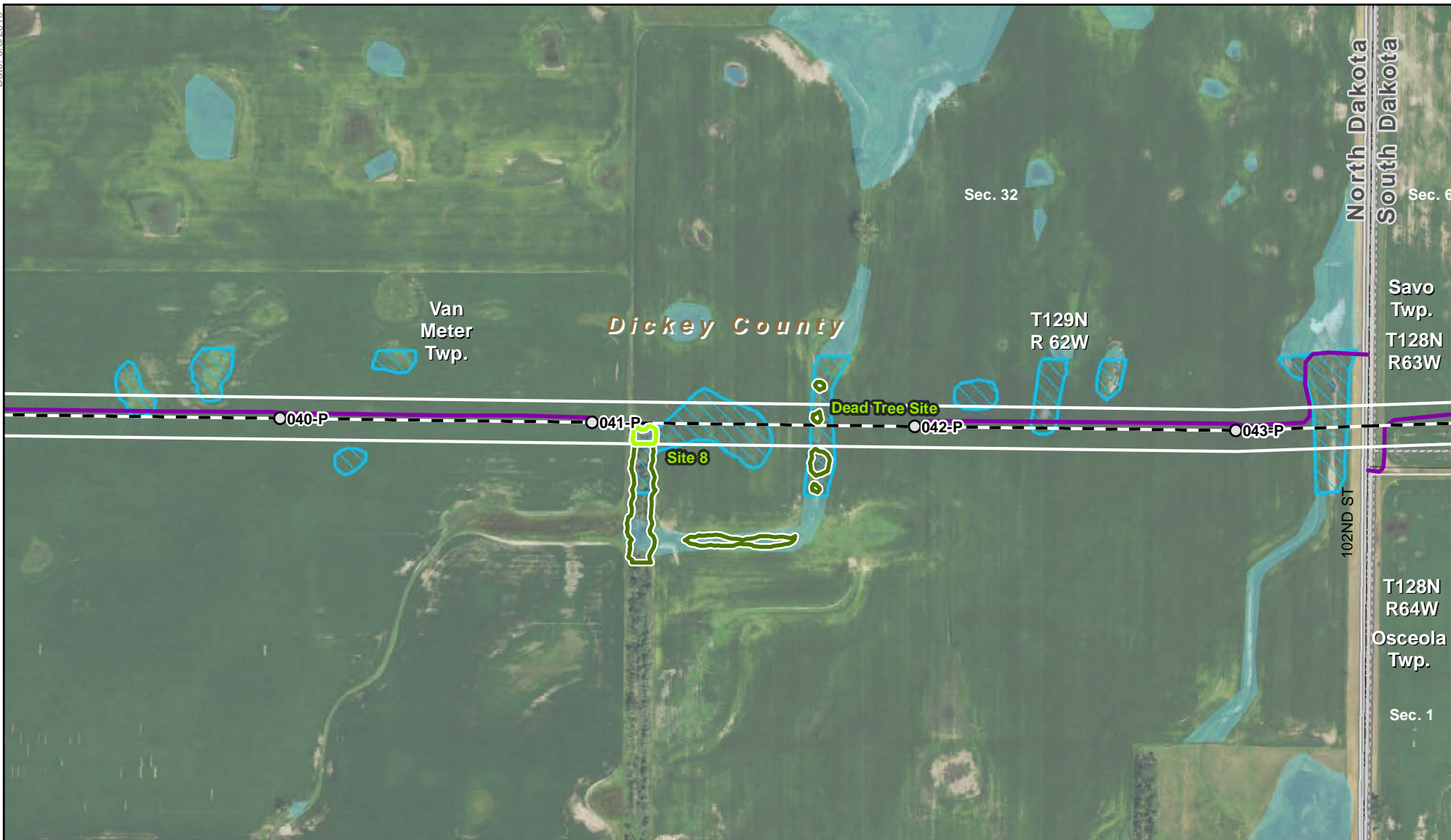
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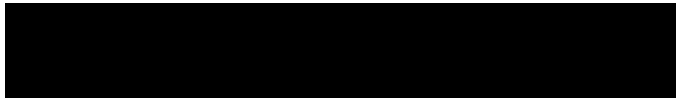
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Big Stone South to Ellendale 345kV Transmission Line Project
North Dakota



A

Tree and Shrub Mitigation Specifications



STATE OF NORTH DAKOTA

PUBLIC SERVICE COMMISSION

**Montana-Dakota Utilities Co., a Division of
MDU Resources Group, Inc.**

Case No. PU-13-272

**345 kV Transmission Line – Ellendale to SD Border
Siting Application**

Otter Tail Power Company

Case No. PU-13-273

**345 kV Transmission Line – Ellendale to SD Border
Siting Application**

Tree and Shrub Mitigation Specifications

Inventory

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (*e.g.*, *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), must be inventoried before cutting. The inventory must record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, must be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1 inch diameter at breast height (dbh) or greater must be inventoried for replacement.

4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way must be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs must be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil must be preserved and replaced after construction. Shrubs must be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared must be inventoried for replacement.
6. In native growth areas, trees and shrubs may be inventoried by actual count or by a sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction must define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots must be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

Clearing for Construction

7. Trees and shrubs must be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The maximum width of clear cuts through windbreaks, shelterbelts and all other wooded areas is 50 feet, unless otherwise approved by the Commission.
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced must be noted on the inventory.

Replacement

10. Prior to tree and shrub replacement, documentation identifying the number and variety of trees and shrubs removed, as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings, must be filed with the Commission for approval.

11. Two 2-year-old saplings must be planted for every one tree removed. Two shrubs (stem cuttings) must be planted for every one shrub removed.
12. Except in the case of invasive or noxious species, trees and shrubs must be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service. Invasive or noxious species must be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.
13. Landowners must be given the option of having replacement trees and shrubs planted on the landowner's property, either on or off the right-of-way. The landowner must also be given the opportunity to waive those options in writing in order to have replacement trees and shrubs planted off the landowner's property.
14. At the conclusion of the project, documentation identifying the actual number, variety, type, location and date of the replacement plantings must be filed with the Commission.
15. Tree and shrub replacements must be inspected annually, in September, for three years. The first annual inspection must be at least one year from the anniversary date of the original plantings. A report of each annual inspection must be submitted to the Commission by October 1 of each year, documenting the condition of plantings and any woodlands work completed as of September of each year. If after the third annual report the survival rate is less than 75%, the Commission may order additional planting(s).



B

Tree and Shrub Inventory Data Sheets

