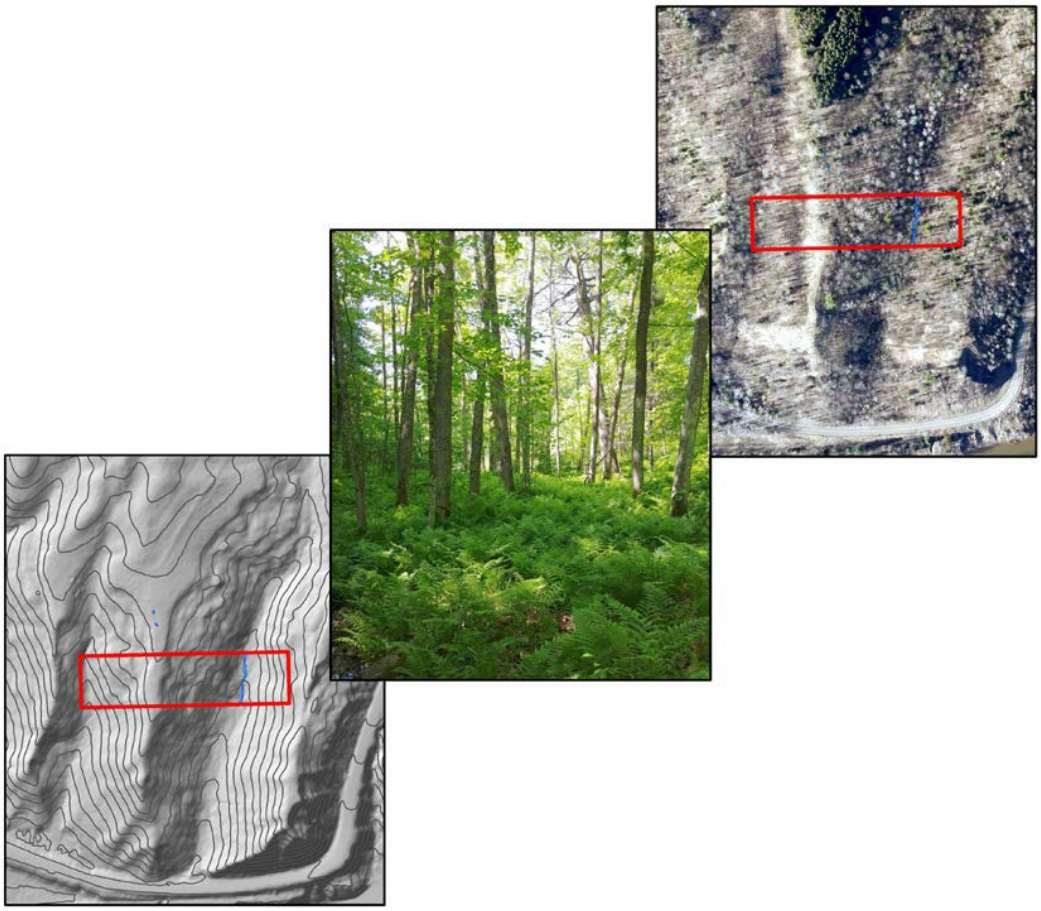
Appendix D: Environmental Survey Report

WETLANDS & VEGETATION REVIEW

Minnesota Power 15 Line Reroute Project

SE¼, Section 1, T. 48N. – R. 16W. Carlton County, Minnesota



MNGeo,

JUNE 2018

LOCATION

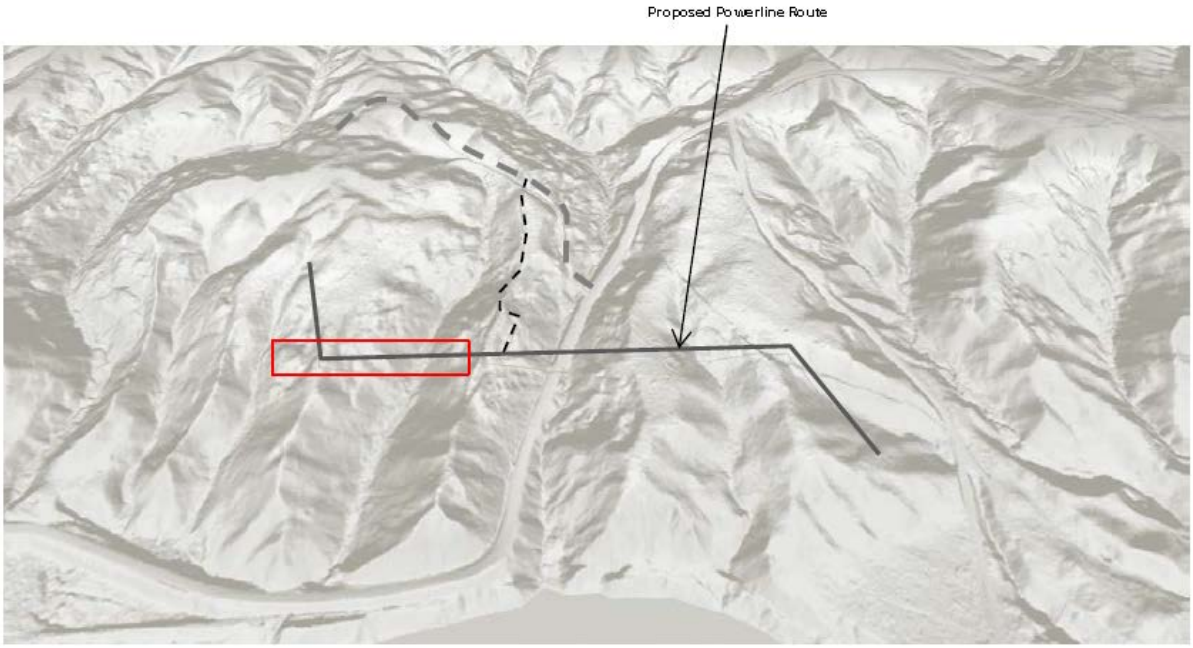
This 2.1-acre wetlands and vegetation review report was part of a 10-acre study along a proposed powerline corridor. The 2.1-acre area of review is in Carlton County; north of the St. Louis River, near Highway 210, within Jay Cooke State Park (Figure 1).

The proposed powerline corridor is located in the northwest quarter of the southwest quarter of Section 6, Township 48 North, Range 15 West, St. Louis County (69), and the northeast quarter of the southeast quarter & the southeast quarter of the northeast quarter Section 1, Township 48 North, Range 16 West, Carlton County (9) (Figure 2).

Historically the area of review has been forestland as historical aerial photographs indicate (Appendix A). Existing powerline corridors are located south near the St. Louis River and Highway 210 and in a north-south alignment along the west side of the review area.

GEOMORPHOLOGY

The area of review is within the Nemadji-Duluth Lacustrine Plain, clayey geomorphic region. There are a series of ridge tops and ravine bottoms. The lowest elevation of 760 feet is at the ravine bottom between proposed Pole No. 7 and Pole No. 6 (Figures 2). Slopes range from relatively flat and concave at the valley bottoms to greater than 40 percent on the ridge side slopes on these dissected lake plain sediments.



SOILS

The terrain is ridge and valley along the proposed powerline corridor. Three soil units mapped by USDA NRCS for the property are described in the table below. Two of the soils are included on the NRCS hydric soil list. Based on the soil units mapped potentially one-half acre of hydric soils may be found in the area of review (Appendix B).

SYMBOL	SOIL UNIT	ACRES	PERCENT HYDRIC	POTENTIAL HYDRIC ACRES
1020	UDORTHENTS	1.5	10	0.15
F155G	UDALFS-EUTRDEPTS complex, 25 to 70 percent slopes	0.1	5	0.005
367C	CAMPIA SILT LOAM, 2 to 12 percent slopes	0.5	0	-
	TOTAL			**0.16**

These soils are primarily very fine sandy loam and silt loam that are well drained with varying rates of vertical permeability. Some soil units are stratified. Saturated soils were found at valley or ravine bottoms on relatively level to concave areas. Here fluvaquents are within cobbled drainageways.

HYDROLOGY

Located 0.1 miles north of St. Louis River the project area is located within the St. Louis River watershed (No. 3). Surface water migrates down relatively steep slopes to valley bottoms where accumulated flow in cobble drainageways discharge south to the St. Louis River (Figure 2). The St. Louis River is within the Lake Superior Basin. Mission Creek and its tributaries are state-listed trout streams within one-mile radius east of the area of review.

Surface water was observed in the valleys and climate conditions were dry during this review. Average annual rainfall is 31-inches. Highway 210 and old access road construction has altered surface hydrology.

VEGETATION

The corridor has remained wooded. The area is located in the Laurentian Mixed Forest province, Southern Superior Uplands section, Glacial Lake Superior Plain subsection. The area of review is primarily a mixed deciduous hardwood forest over ridge and valley topography with three small streams flowing through wooded wetlands. The plant community is northern wet-mesic boreal hardwood-conifer forest (MHn44) which grades to northern mesic (MHn35) and northern rich mesic (MHn47) hardwood forest based on elevation, slope direction, and soil moisture. The uplands are characterized by quaking aspen (Populus tremuloides), black ash (Fraxinus nigra), sugar maple (Acer saccharum), Northern red oak (Quercus rubra), American basswood (Tilia americana), red maple (Acer rubrum), paper birch (Betula papyrifera), with areas of white spruce (Picea glauca) and eastern white pine (Pinus strobus). The shrub layer is dominated by beaked hazelnut (Corylus cornuta) and eastern hop-hornbeam (Ostrya virginiana). The ground layer is dominated by large-leaf wood-aster (Eurybia macrophylla), Pennsylvania sedge (Carex Pensylvanica), and false lily-of-the-valley (Mainthemum canadense) with scattered patches of ramp (Allium ticoccum). The wetlands ground cover is dominated by ferns: subartic lady fern (Athyrium filix-femina), eastern marsh fern (Thelypteris palustris), sensitive fern (Onoclea sensibilis), and Ostrich fern (Matteuccia struthiopteris). Also, present: wild leek (Allium tricoccum) and yellow lady's slipper (Cypripedium parviflorum).

Four of seventy-four plants observed are classified as invasive plants. An overall June 2018 plant list for the area and plant list per powerline segment (A-B) between poles are in Appendix C. Many plants did not have pedicels or were not in flower.

WETLAND SUMMARY

Wetlands are located in this mixed deciduous forest, which is part of the Glacial Lake Superior Plain within the South Superior Uplands ecological section. The forest may be identified as a northern rich mesic hardwood forest (MHn47). Wetlands are associated with valley bottom, surface water stream flow through cobble channels and adjacent floodplains. Northern bracken fern (Pteridium aquilinum) and northern oak fern (Gymnocarpium dryopteris) are associated with the upland – wetland boundaries.

The US Fish and Wildlife Service, National Wetland Inventory map indicates no wetlands in the Project area. Approximately 707 square feet of wetlands were mapped during this 2018 wetland and vegetation review (Figure 2). Wooded swamps Type 7A are the dominate wetlands type (Appendix D).

Wetland Type	Square Feet	Acres
Wooded Swamp, Stream Flow, Cobble Channel / 7A	707	0.016
Total		**0.016**

The wetland is associated with ravine or valley stream flow. The study area is within Bank Service Area 1.

METHODS

Field data was collected and the delineation conducted June 2018. Flags were placed to mark the wetland edge. Slope – slope form, soils, hydrology, and vegetation were observed and descriptions recorded on data forms (Appendix D). A subfoot accurate GPS was used to locate the boundary and generate a wetland edge as shown on the wetland map. The 1987 Corp of Engineers Wetland Delineation Guidance Manual was followed for the delineation. Wetland indicator ratings for plant species are based on the National List – North Central Region 3.

Wetland Delineator:

Kiff J. Samuelson, MNDC# 1172, MNPG #30534
Finite Earth Environmental LLC

Attachments:

Figure 1	Site Location
Figure 2	Powerline Terrain and Profile
Figure 3	Powerline Topography and Aerial Photograph
APPENDIX A	Historic Aerial Photographs
APPENDIX B	USDA NRCS Soils Map & Hydric Soil Ratings
APPENDIX C	Plant List – June 2018
APPENDIX D	Data Form

FIGURES

Proposed Transmission Line Relocation - Carlton County, Jay Cooke State Park

Northeast Quarter of the Southeast Quarter Section 1, Township 48 North, Range 16 West, Carlton County (9)

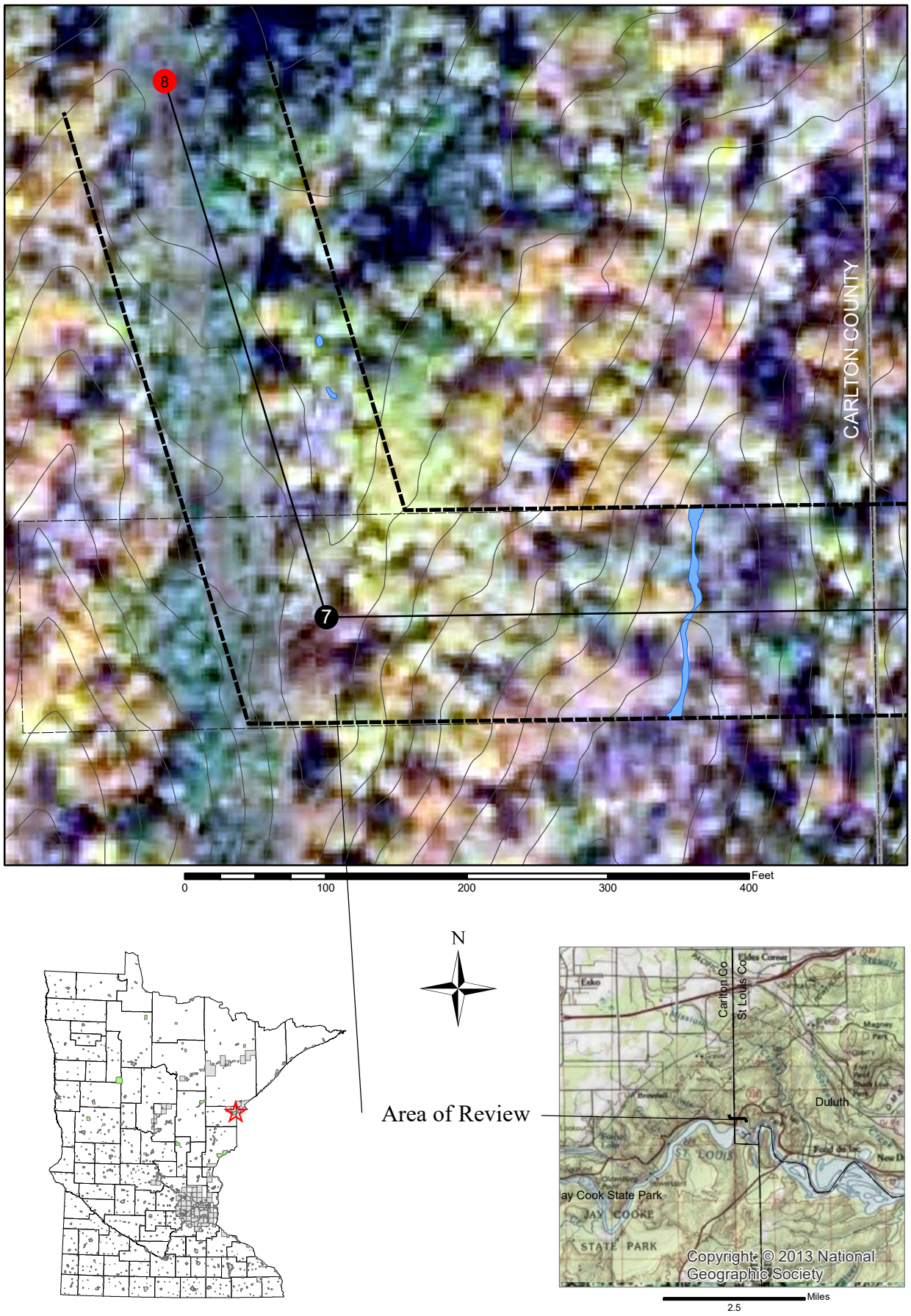
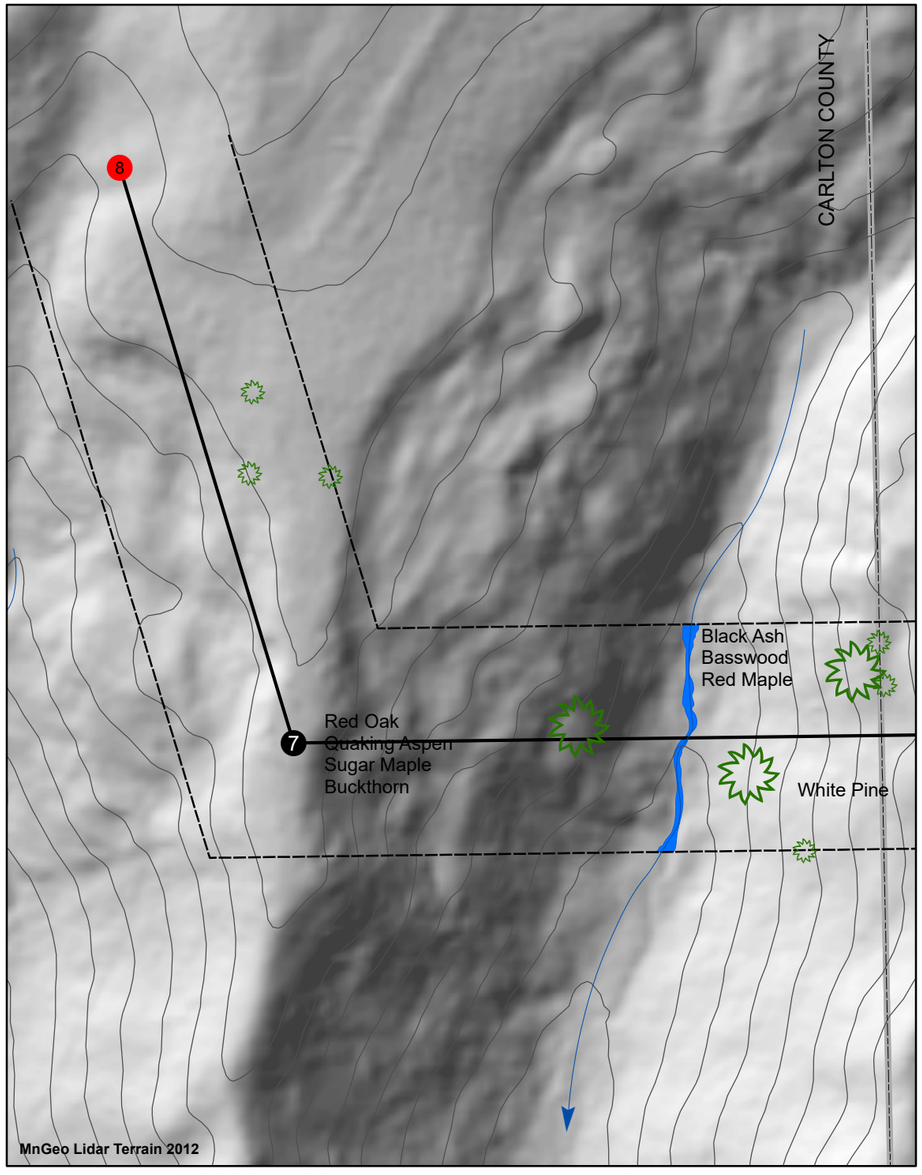


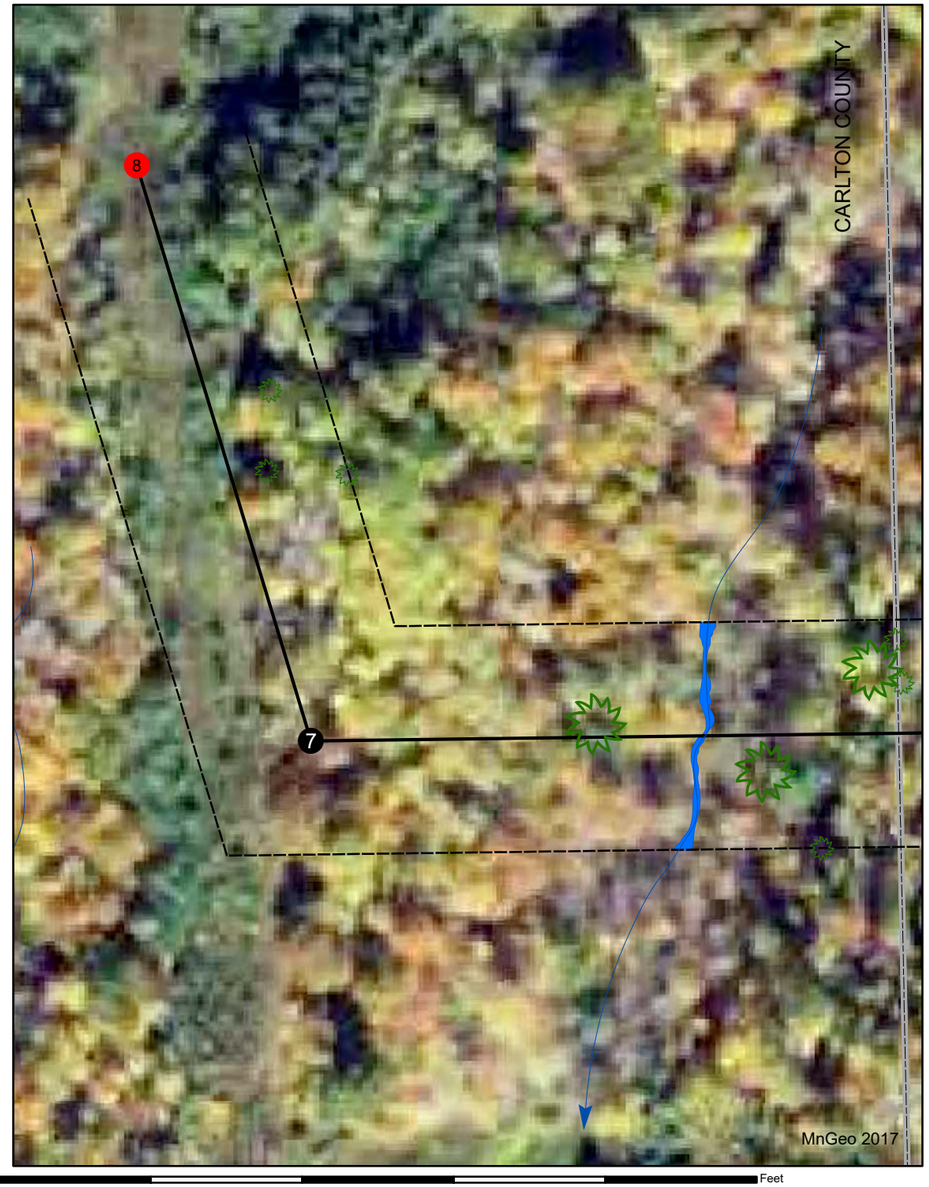
Figure 1

WETLAND REVIEW 2018
MINNESOTA POWER

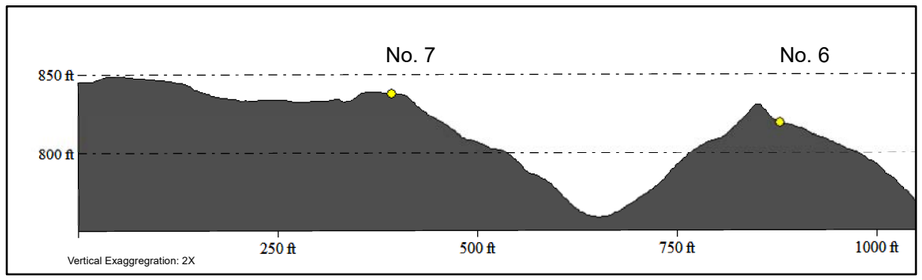
Proposed Transmission Line Re-Alignment
Carlton County, Jay Cooke State Park

Northeast Southeast Section 1
Township 48 North, Range 16 West
Carlton County (9)





0 100 200 300 400 500 600 700 800 900 1,000 Feet



N

Wetland

Surface Water Flow Direction

Figure 2

APPENDIX A

Historic Aerial Photographs

WETLANDS & VEGETATION REVIEW 2018 - MINNESOTA POWER

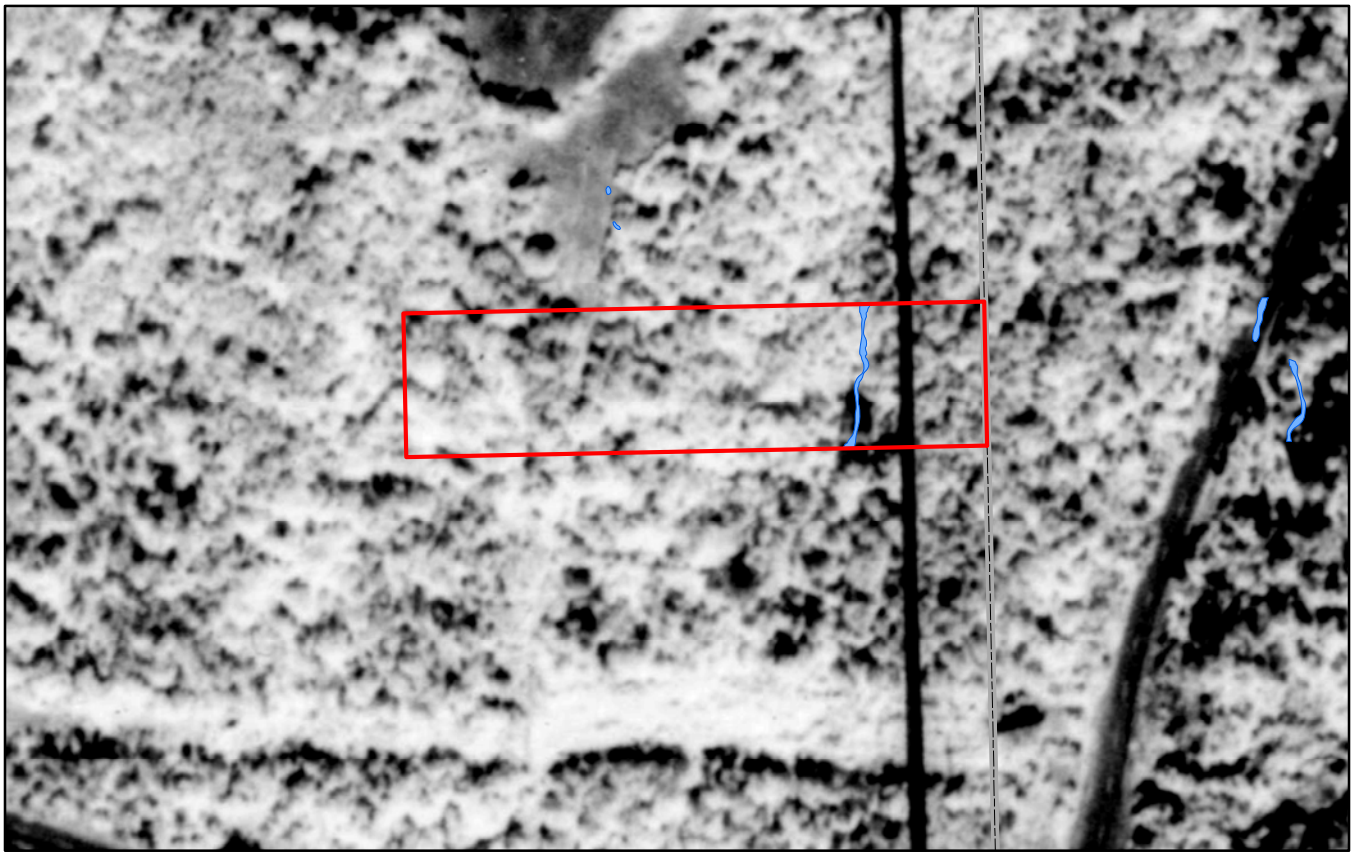
2009

2015

N

0 200 400 600 800 Feet

1948



1961

N

0 200 400 600 800 Feet

APPENDIX B

USDA NRCS Soils Map & Hydric Soil Ratings

Soil Map—Carlton County, Minnesota; and St. Louis County, Minnesota, Duluth Part
(15 LINE RELOCATION)

Map Scale: 1:1,010 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Carlton County, Minnesota
Survey Area Data: Version 15, Oct 4, 2017

Soil Survey Area: St. Louis County, Minnesota, Duluth Part
Survey Area Data: Version 14, Feb 1, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 27, 2014—Sep 8, 2016

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
367C	Campia silt loam, 2 to 12 percent slopes	0.5	23.5%
1020	Udorthents	1.5	72.8%
Subtotals for Soil Survey Area		**2.0**	**96.3%**
Totals for Area of Interest		**2.1**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
F155G	Udalfs-Eutrudepts complex, 25 to 70 percent slopes	0.1	3.7%
Subtotals for Soil Survey Area		**0.1**	**3.7%**
Totals for Area of Interest		**2.1**	**100.0%**

Hydric Rating by Map Unit—Carlton County, Minnesota; and St. Louis County, Minnesota, Duluth Part
(15 LINE RELOCATION)

Map Scale: 1:1,010 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Hydric Rating by Map Unit

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1020	Udorthents	10	1.5	72.8%
Subtotals for Soil Survey Area			**2.0**	**96.3%**
Totals for Area of Interest			**2.1**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
F155G	Udalfs-Eutrudepts complex, 25 to 70 percent slopes	5	0.1	3.7%
Subtotals for Soil Survey Area			**0.1**	**3.7%**
Totals for Area of Interest			**2.1**	**100.0%**

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

APPENDIX C

Plant List – June 2018

15 LINE REROUTE PROJECT

Plant List June 2018

Scientific Name	Habit	Common Name
Acer rubrum	FAC	Red Maple
Acer saccharum	FACU	Sugar Maple
Actaea rubra	FACU	Red Baneberry
Actaea sp.	UPL	Baneberry
Agrimonia gryposepala	FACU	Tall Hairy Agrimony
Allium tricoccum	FACU	Wild Leeks
Alnus incana ssp. rugosa	FACW	Speckled Alder
Amelanchier sanguinea	UPL	Roundleaf Serviceberry
Anemone quinquefolia	FACU	Wood Anemone
Apocynum androsaemiifolium	FAC	Spreading Dogbane
Aralia nudicaulis	FACU	Wild Sarsaparilla
Arisaema triphyllum	FAC	Jack-in-the-Pulpit
Athyrium filix-femina	FAC	Subarctic Lady Fern
Betula papyrifera	FACU	Paper Birch
Carex gracillima	FACU	Graceful Sedge
Carex pensylvanica	UPL	Pennsylvania sedge
Carex sp.		Sedge
Circaea lutetiana	FACU	Broad-leaf Enchanter's-Nightshade
Cornus canadensis	FAC	Canadian Bunchberry
Cornus rugosa	UPL	Roundleaf Dogwood
Corylus cornuta	FACU	Beaked Hazelnut
Cypripedium parviflorum	FAC	Yellow Lady's Slipper
Diervilla lonicera	UPL	Northern Bush Honeysuckle
Dryopteris intermedia	FAC	Intermediate Wood Fern
Eurybia macrophylla	UPL	Large-Leaf Wood-Aster
Fragaria virginiana	FACU	Virginia Strawberry
Fraxinus nigra	FACW	Black Ash
Galium boreale	FAC	Northern Bedstraw
Galium triflorum	FACU	Fragrant Bedstraw
Geranium bicknellii	UPL	Bicknell's Cranesbill
Gymnocarpium dryopteris	FACU	Northern Oak Fern
Hieracium sp.		Hawkweed
Lathyrus sp.		Vetchling
Lonicera canadensis	FACU	American Fly-Honeysuckle
*Lonicera cf. xbella**		Honeysuckle (Alien)
Luzula acuminata	FACU	Hairy Wood-Rush
Maianthemum canadense	FACU	False Lily-of-the-Valley
Maianthemum racemosum	FACU	Feathery False Solomon's-Seal
Matteuccia struthiopteris	FAC	Ostrich Fern
Onoclea sensibilis	FACW	Sensitive Fern
Oryzopsis asperifolia	UPL	Roughleaf Ricegrass
Ostrya virginiana	FACU	Eastern Hop-Hornbeam
Oxalis stricta	FACU	Common Yellow Sorrel
Phegopteris connectilis	FACU	Long Beech Fern
Picea glauca	FACU	White Spruce
Poa sp.		Blue Grass
Populus grandidentata	FACU	Big-Tooth Aspen
Populus tremuloides	FAC	Quaking Aspen
Prenanthes alba	FACU	White Rattlesnake Root
Prunella vulgaris	FAC	Common Heal's-all
Prunus virginiana	FACU	Choke Cherry
Pteridium aquilinum	FACU	Northern Bracken Fern
Pyrola americana	FAC	American Wintergreen
Quercus rubra	FACU	Northern Red Oak
*Ranunculus acris**	FAC	Tall Buttercup
*Rhamnus cathartica**	FAC	European Buckthorn
Ribes sp.		Currant
Rubus idaeus ssp. strigosus	FAC	Common Red Raspberry
Rubus parviflorus	FACU	Western Thimble-Berry
Sanguinaria canadensis	FACU	Bloodroot
Saxifraga pensylvanica	OBL	Eastern Swamp Saxifrage
Solidago gigantea	FACW	Giant Goldenrod
Sorbus americana	FAC	American Mountain-Ash
Symphyotrichum sp.		Aster
Taraxacum officinale	FACU	Common Dandelion
Thelypteris palustris	FACW	Eastern Marsh Fern
Thelypteris phegoteris	UPL	Northern Beech Fern
Tilia americana	FACU	American Basswood
*Trifolium pratense**	FACU	Red Clover
Trillium grandiflorum	UPL	Showy Trillium
Vicia americana	FACU	American Purple Vetch
Viola pubescens	FACU	Downy Yellow Violet
Viola sp.		Violet
Vitis riparia	FACU	Riverbank Grape

*** Invasive**

Botanist: Deb Pomroy

SEGMENT A
POLE NO. 7 to POLE NO. 8

	Scientific Name	Habit	Common Name	Scientific Name	Habit	Common Name
Canopy	*Acer saccharum*	FACU	Sugar Maple	*Populus tremuloides*	FAC	Quaking Aspen
	Picea glauca	FACU	White Spruce	*Quercus rubra*	FACU	Northern Red Oak
Subcanopy	*Ostrya virginiana*	FACU	Eastern Hop-Hornbeam	*Acer saccharum*	FACU	Sugar Maple
	Betula papyrifera	FACU	Paper Birch	*Fraxinus nigra*	FACW	Black Ash
	Populus tremuloides	FAC	Quaking Aspen			
Shrub layer	*Alnus incana ssp. Rugosa*	FACW	Speckled Alder	*Populus tremuloides*	FAC	Quaking Aspen
	Amelanchier sanguinea	UPL	Roundleaf Serviceberry	*Prunus virginiana*	FACU	Choke Cherry
	Betula papyrifera	FACU	Paper Birch	*Quercus rubra*	FACU	Northern Red Oak
	Fraxinus nigra	FACW	Black Ash	*Rhamnus cathartica*	FAC	European Buckthorn
	Lonicera sp.		Honeysuckle (Alien)	*Ribes sp.*		Currant
	Ostrya virginiana	FACU	Eastern Hop-Hornbeam	*Rubus idaeus ssp. strigosus*	FAC	Common Red Raspberry
	Picea glauca	FACU	White Spruce	*Vitis riparia*	FACU	Riverbank Grape
	Populus grandidentata	FACU	Big-Tooth Aspen			
Ground-cover	*Pteridium aquilinum*	FACU	Northern Bracken Fern	*Agrimonia gryposepala*	FACU	Tall Hairy Grooveburr
	Galium boreale	FAC	Northern Bedstraw	*Ranunculus acris*	FAC	Tall Buttercup
	Hieracium sp.		Hawkweed	*Viola pubescens*	FACU	Downy Yellow Violet
	Poa sp.		Blue Grass	*Anemone quinquefolia*	FACU	Wood Anemone
	Luzula acuminata	FACU	Hairy Wood-Rush	*Actaea sp.*	UPL	Baneberry
	Eurybia macrophylla	UPL	Large-Leaf Wood-Aster	*Arisaema triphyllum*	FAC	Jack-in-the-Pulpit
	Trifolium pratense	FACU	Red Clover	*Cypripedium parviflorum*	FAC	Yellow Lady's Slipper
	Vicia americana	FACU	American Purple Vetch	*Agrimonia gryposepala*	FACU	Tall Hairy Agrimony
	Apocynum androsaemiifolium	FAC	Spreading Dogbane	*Pteridium aquilinum*	FACU	Northern Bracken Fern
	Fragaria virginiana	FACU	Virginia Strawberry	*Symphyotrichum*		Aster
	Taraxacum officinale	FACU	Common Dandelion	*Apocynum androsaemiifolium*	FAC	Spreading Dogbane
	Maianthemum canadense	FACU	False Lily-of-the-Valley	*Solidago gigantea*	FACW	Giant Goldenrod

SEGMENT B
POLE NO. 6 to POLE NO. 7

	Scientific Name	Habit	Common Name	Scientific Name	Habit	Common Name
Canopy	*Acer saccharum*	FACU	Sugar Maple	*Pinus strobus*	FACU	Eastern White Pine
	Betula papyrifera	FACU	Paper Birch	*Populus tremuloides*	FAC	Quaking Aspen
	Fraxinus nigra	FACW	Black Ash	*Quercus rubra*	FACU	Northern Red Oak
Subcanopy	*Quercus rubra*	FACU	Northern Red Oak	*Picea glauca*	FACU	White Spruce
	Picea glauca	FACU	White Spruce	*Acer saccharum*	FACU	Sugar Maple
	Betula papyrifera	FACU	Paper Birch	*Tilia americana*	FACU	American Basswood
	Acer saccharum	FACU	Sugar Maple	*Quercus rubra*	FACU	Northern Red Oak
	Acer rubrum	FAC	Red Maple	*Acer rubrum*	FAC	Red Maple
	Fraxinus nigra	FACW	Black Ash	*Ostrya virginiana*	FACU	Eastern Hop-Hornbeam
Shrub layer	*Acer rubrum*	FAC	Red Maple	*Picea glauca*	FACU	White Spruce
	Acer saccharum	FACU	Sugar Maple	*Populus tremuloides*	FAC	Quaking Aspen
	Alnus incana ssp. rugosa	FACW	Speckled Alder	*Prunus virginiana*	FACU	Choke Cherry
	Amelanchier sanguinea	UPL	Roundleaf Serviceberry	*Quercus rubra*	FACU	Northern Red Oak
	Cornus rugosa	UPL	Roundleaf Dogwood	*Rhamnus cathartica*	FAC	European Buckthorn
	Corylus cornuta	FACU	Beaked Hazelnut	*Ribes sp.*		Currant
	Diervilla lonicera	UPL	Northern Bush Honeysuckle	*Rubus parviflorus*	FACU	Western Thimble-Berry
	Fraxinus nigra	FACW	Black Ash	*Sorbus americana*	FAC	American Mountain-Ash
	Lonicera canadensis	FACU	American Fly-Honeysuckle	*Vitis riparia*	FACU	Riverbank Grape
	Ostrya virginiana	FACU	Eastern Hop-Hornbeam			
Ground-cover	*Actaea rubra*	FACU	Red Baneberry	*Maianthemum racemosum*	FACU	Feathery False Solomon's-Seal
	Actaea sp.	UPL	Baneberry	*Matteuccia struthiopteris*	FAC	Ostrich Fern
	Agrimonia gryposepala	FACU	Tall Hairy Agrimony	*Onoclea sensibilis*	FACW	Sensitive Fern
	Allium tricoccum	FACU	Wild Leeks	*Oryzopsis asperifolia*	UPL	Roughleaf Ricegrass
	Anemone quinquefolia	FACU	Wood Anemone	*Oxalis stricta*	FACU	Common Yellow Sorrel
	Aralia nudicaulis	FACU	Wild Sarsaparilla	*Phegopteris connectilis*	FACU	Long Beech Fern
	Arisaema triphyllum	FAC	Jack-in-the-Pulpit	*Poa sp.*		Blue Grass
	Athyrium filix-femina	FAC	Subarctic Lady Fern	*Prenanthes alba*	FACU	White Rattlesnake Root
	Carex gracillima	FACU	Graceful Sedge	*Prunella vulgaris*	FAC	Common Heal's-all
	Carex pensylvanica	UPL	Pennsylvania sedge	*Pteridium aquilinum*	FACU	Northern Bracken Fern
	Carex sp.		Sedge	*Pyrola americana*	FAC	American Wintergreen
	Circaea lutetiana	FACU	Broad-leaf Enchanter's-Nightshade	*Ranunculus acris*	FAC	Tall Buttercup
	Cornus canadensis	FAC	Canadian Bunchberry	*Sanguinaria canadensis*	FACU	Bloodroot
	Dryopteris intermedia	FAC	Intermediate Wood Fern	*Saxifraga pensylvanica*	OBL	Eastern Swamp Saxifrage
	Eurybia macrophylla	UPL	Large-Leaf Wood-Aster	*Solidago gigantea*	FACW	Giant Goldenrod
	Fragaria virginiana	FACU	Virginia Strawberry	*Symphyotrichum sp.*		Aster
	Galium triflorum	FACU	Fragrant Bedstraw	*Taraxacum officinale*	FACU	Common Dandelion
	Geranium bicknellii	UPL	Bicknell's Cranesbill	*Thelypteris palustris*	FACW	Eastern Marsh Fern
	Gymnocarpium dryopteris	FACU	Northern Oak Fern	*Thelypteris phegoteris*	UPL	Northern Beech Fern
	Hieracium sp.		Hawkweed	*Trifolium pratense*	FACU	Red Clover
	Lathyrus sp.		Vetchling	*Trillium grandiflorum*	UPL	Showy Trillium
	Luzula acuminata	FACU	Hairy Wood-Rush	*Vicia americana*	FACU	American Purple Vetch
	Maianthemum canadense	FACU	False Lily-of-the-Valley	*Viola sp.*		Violet

APPENDIX D

Data Forms

Valley Bottom, Between Pole No. 6 & No. 7

Hillside

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MINNESOTA POWER 15 LINE REROUTE City/County: Carlton, St. Louis Sampling Date: 6/4-14/2018
Applicant/Owner: Minnesota Power State: MN Sampling Point: 1
Investigator(s): R Barnes, D Pomroy, Kiff Samuelson Section, Township, Range:
Landform (hillslope, terrace, etc.): valley floor Local relief (concave, convex, none): concave
Slope (%): 0 Lat.: 46.6701 Long.: -92.3017 Datum: NAD 83
Soil Map Unit Name Udorthents NWI Classification: NA
Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? circumstances" present? Yes
(If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y		
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Dry Conditions

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Microtopographic Relief (D4)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	4
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Concentrated stream flow

VEGETATION - Use scientific names of plants

Sampling Point: 1

Tree Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1	*Fraxinus nigra*	20	Y	FACW
2				
3				
4				
5				
6				
7				
8				
9				
10				
		20	= Total Cover	

Sapling/Shrub Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1	*Fraxinus nigra*	10	Y	FACW
2				
3				
4				
5				
6				
7				
8				
9				
10				
		10	= Total Cover	

Herb Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1	*Athyrium filix-femina*	40	Y	FAC
2	*Matteuccia struthiopteris*	10	N	FAC
3	*Thelypteris palustris*	10	N	FACW
4	*Saxifraga pensylvanica*	10	N	OBL
5	*Onoclea sensibilis*	5	N	FACW
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
		75	= Total Cover	

Woody Vine Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0	= Total Cover	

50/20 Thresholds

	20%	50%
Tree Stratum	4	10
Sapling/Shrub Stratum	2	5
Herb Stratum	15	38
Woody Vine Stratum	0	0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	10	x 1 =	10
FACW species	45	x 2 =	90
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	105 (A)		250 (B)

Prevalence Index = B/A = 2.38

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains
**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Suface (A11)
___ Thick Dark Surface (A12)
_X_ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) (**LRR R, MLRA 149B**)
___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**
___ Loamy Mucky Mineral (F1) (**LRR K, L**)
_X_ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**
___ Coast Prairie Redox (A16) (**LRR K, L, R**)
___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
___ Dark Surface (S7) (**LRR K, L**
___ Polyvalue Below Surface (S8) (**LRR K, L**)
___ Thin Dark Surface (S9) (**LRR K, L**)
___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? _Y_

Remarks:
Saturated ground. Cobbled channel flow