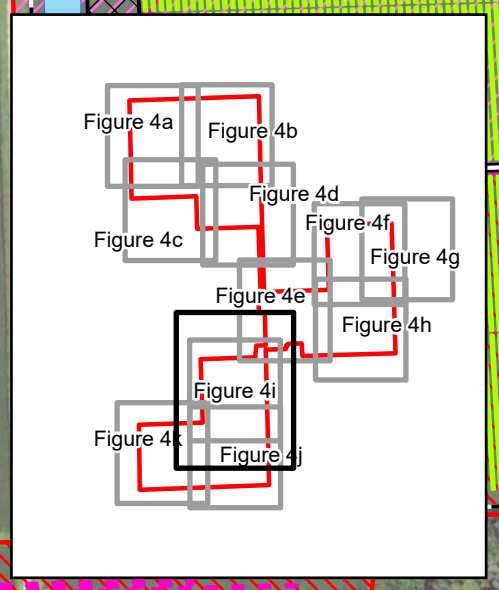


Residence B

131st St

190th Ave

Residence G

Elk Creek

Note: The configuration of the substation and O&M building is preliminary and subject to change with final engineering.

ELK CREEK SOLAR

0 250 500 Feet

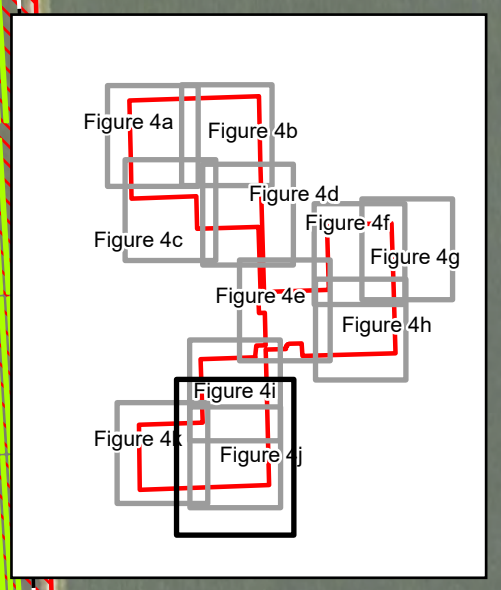
1:5,500

Data Source: National Grid Renewables, USGS, MN DOT
Imagery Source: 2021 FSA

Figure 4i
Preliminary Project Layout
Elk Creek Solar Project
Rock County, MN
43.67819, -96.09293

- Adjacent Residence
- Existing Substation
- Permanent Weather Stations
- Pole
- Underground Collection Line
- Overhead Collection Line
- Vegetation Screening
- 2020 Land Control Area
- Amended Land Control
- 2023 Land Control Area
- Security Fence
- Access Road
- Solar Array
- Inverter
- Project Substation
- O&M Facility
- Associated Facilities
- Laydown Area
- NHD Stream
- Drainage Basin

Date: 5/30/2023



Residence G

Elk Creek

121st St

190th Ave

Note: The configuration of the substation and O&M building is preliminary and subject to change with final engineering.

ELK CREEK SOLAR

0 250 500 Feet

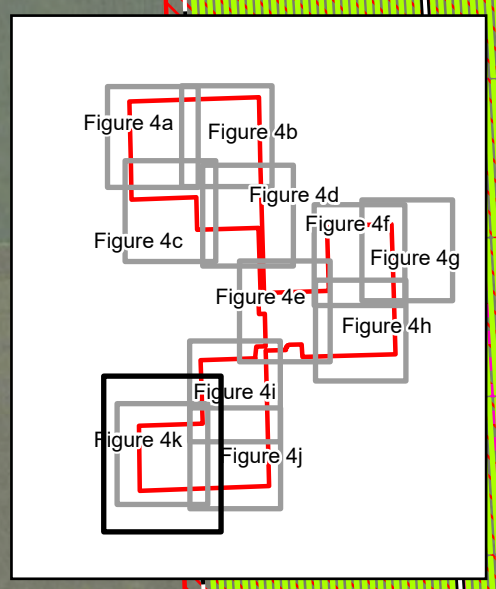
1:5,500

Data Source: National Grid Renewables, USGS, MN DOT
Imagery Source: 2021 FSA

Figure 4j
Preliminary Project Layout
Elk Creek Solar Project
Rock County, MN
43.67819, -96.09293

- Adjacent Residence
- Existing Substation
- Permanent Weather Stations
- Pole
- Underground Collection Line
- Overhead Collection Line
- Vegetation Screening
- 2020 Land Control Area
- Amended Land Control
- 2023 Land Control Area
- Security Fence
- Access Road
- Solar Array
- Inverter
- Project Substation
- O&M Facility
- Associated Facilities
- Laydown Area
- NHD Stream
- Drainage Basin

Date: 5/30/2023



180th Ave

Residence F

121st St

Elk Creek

Elk Creek

Note: The configuration of the substation and O&M building is preliminary and subject to change with final engineering.

ELK CREEK SOLAR

0 250 500 Feet

1:5,500

Data Source: National Grid Renewables, USGS, MN DOT
Imagery Source: 2021 FSA

Figure 4k
Preliminary Project Layout
Elk Creek Solar Project
Rock County, MN
43.67819, -96.09293

- Adjacent Residence
- Existing Substation
- Permanent Weather Stations
- Pole
- Underground Collection Line
- Overhead Collection Line
- Vegetation Screening
- 2020 Land Control Area
- Amended Land Control
- 2023 Land Control Area
- Security Fence
- Access Road
- Solar Array
- Inverter
- Project Substation
- O&M Facility
- Associated Facilities
- Laydown Area
- NHD Stream
- Drainage Basin

Date: 5/30/2023

Appendix A

Selected Soil Physical Features, Classifications, and Interpretations and Limitations

Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations

Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
				Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
2023 Preliminary Development Area (Potential Disturbance)																
Fence Area/Arrays	340.9	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	202.8	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	74.7	P21A	Marcus silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	64.4	P14B	Flandreau silt loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	54.3	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	48.7	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	47.5	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	44.5	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	39.5	P16A	Graceville silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Well drained	>18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	24.9	P28A	Ransom silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	20.0	P21A	Marcus silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	12.7	P28A	Ransom silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	11.4	P48B	Allendorf silty clay loam, 2 to 6 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	11.2	P29A	Rushmore silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	9.7	P14B	Flandreau silt loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	9.7	P29A	Rushmore silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	8.7	1015A	Havelock clay loam, 0 to 2 percent slopes, frequently flooded	fine-loamy	0-5	Poorly drained	>18	No	Not prime farmland	5w	Yes	No	No	Yes	Severe	No
	5.3	P12B	Everly silty clay loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	5.0	P12B	Everly silty clay loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	4.5	P16A	Graceville silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Well drained	>18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	4.2	P48B	Allendorf silty clay loam, 2 to 6 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	4.1	P15B	Galva silty clay loam, 2 to 5 percent slopes	fine-silty	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	4.0	P55A	Kato silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	3.4	1015A	Havelock clay loam, 0 to 2 percent slopes, frequently flooded	fine-loamy	0-5	Poorly drained	>18	No	Not prime farmland	5w	Yes	No	No	Yes	Severe	No
	3.4	P48A	Allendorf silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2s	No	No	No	No	Severe	No
	2.8	P31A	Spicer silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No

Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations

Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
				Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
Fence Area/Arrays	2.7	P43A	Wilmonton silty clay loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	2.4	P15B	Galva silty clay loam, 2 to 5 percent slopes	fine-silty	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	2.1	P55A	Kato silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	2.1	P48A	Allendorf silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2s	No	No	No	No	Severe	No
	2.1	P31A	Spicer silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	1.7	P12C2	Everly silty clay loam, 6 to 12 percent slopes, eroded	fine-loamy	>8-15	Well drained	>6-12	No	Farmland of statewide importance	3e	No	Yes	No	No	Severe	No
	1.7	P12C2	Everly silty clay loam, 6 to 12 percent slopes, eroded	fine-loamy	>8-15	Well drained	>6-12	No	Farmland of statewide importance	3e	No	Yes	No	No	Severe	No
	1.6	P43A	Wilmonton silty clay loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	1.3	1024A	Havelock clay loam, 0 to 2 percent slopes, occasionally flooded	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if protected from flooding or not frequently flooded during the growing season	2w	Yes	No	No	Yes	Severe	No
	0.6	1024A	Havelock clay loam, 0 to 2 percent slopes, occasionally flooded	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if protected from flooding or not frequently flooded during the growing season	2w	Yes	No	No	Yes	Severe	No
Access Roads	7.9	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	5.2	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	2.6	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	2.1	P21A	Marcus silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	1.9	P14B	Flandreau silt loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.8	P16A	Graceville silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Well drained	>18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	0.5	P48A	Allendorf silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2s	No	No	No	No	Severe	No
	0.3	P15B	Galva silty clay loam, 2 to 5 percent slopes	fine-silty	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.2	P28A	Ransom silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.2	P48B	Allendorf silty clay loam, 2 to 6 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.1	P12B	Everly silty clay loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.1	P29A	Rushmore silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No

Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations

Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
				Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
Access Roads	0.1	1015A	Havelock clay loam, 0 to 2 percent slopes, frequently flooded	fine-loamy	0-5	Poorly drained	>18	No	Not prime farmland	5w	Yes	No	No	Yes	Severe	No
	0.1	P55A	Kato silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.1	1024A	Havelock clay loam, 0 to 2 percent slopes, occasionally flooded	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if protected from flooding or not frequently flooded during the growing season	2w	Yes	No	No	Yes	Severe	No
	0.0	P43A	Wilmonton silty clay loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
Inverters	0.1	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.1	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.0	P14B	Flandreau silt loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.0	P21A	Marcus silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.0	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.0	P48B	Allendorf silty clay loam, 2 to 6 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.0	P15B	Galva silty clay loam, 2 to 5 percent slopes	fine-silty	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.0	P16A	Graceville silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Well drained	>18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
Laydown Yards	5.1	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	2.3	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	1.7	P21A	Marcus silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.9	P28A	Ransom silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.7	1024A	Havelock clay loam, 0 to 2 percent slopes, occasionally flooded	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if protected from flooding or not frequently flooded during the growing season	2w	Yes	No	No	Yes	Severe	No
	0.6	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
O&M/Substation	0.9	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.3	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.2	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.1	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.0	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No

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Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
				Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
Collection	0.5	P21A	Marcus silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.4	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.3	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.2	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.1	1015A	Havelock clay loam, 0 to 2 percent slopes, frequently flooded	fine-loamy	0-5	Poorly drained	>18	No	Not prime farmland	5w	Yes	No	No	Yes	Severe	No
	0.0	P29A	Rushmore silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.0	P28A	Ransom silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
Stormwater Basins	21.4	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	7.0	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	5.1	P21A	Marcus silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	2.0	P48B	Allendorf silty clay loam, 2 to 6 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	1.3	P16A	Graceville silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Well drained	>18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	1.3	P28A	Ransom silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	1.2	P29A	Rushmore silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	1.2	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	1.1	1015A	Havelock clay loam, 0 to 2 percent slopes, frequently flooded	fine-loamy	0-5	Poorly drained	>18	No	Not prime farmland	5w	Yes	No	No	Yes	Severe	No
	1.0	P31A	Spicer silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.8	P48A	Allendorf silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2s	No	No	No	No	Severe	No
	0.3	P14B	Flandreau silt loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.3	P55A	Kato silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.2	P12C2	Everly silty clay loam, 6 to 12 percent slopes, eroded	fine-loamy	>8-15	Well drained	>6-12	No	Farmland of statewide importance	3e	No	Yes	No	No	Severe	No
	0.1	P15B	Galva silty clay loam, 2 to 5 percent slopes	fine-silty	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.0	P12B	Everly silty clay loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
Land Under Control but Not Currently Planned for Development																
Project Area (Undisturbed)	60.9	P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	fine-silty	0-5	Moderately well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	58.7	1015A	Havelock clay loam, 0 to 2 percent slopes, frequently flooded	fine-loamy	0-5	Poorly drained	>18	No	Not prime farmland	5w	Yes	No	No	Yes	Severe	No

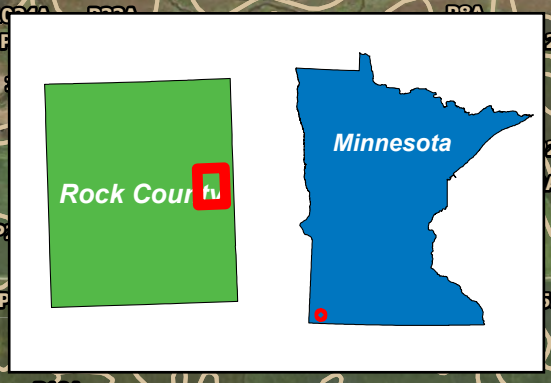
Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations

Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
				Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
Project Area (Undisturbed)	39.3	P27A	Primghar silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	34.7	P42A	Whitewood silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	32.7	P29A	Rushmore silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	16.6	P28A	Ransom silty clay loam, 1 to 3 percent slopes	fine-silty	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	16.3	P12B	Everly silty clay loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	16.1	P43A	Wilmonton silty clay loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>12-18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	15.2	1024A	Havelock clay loam, 0 to 2 percent slopes, occasionally flooded	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if protected from flooding or not frequently flooded during the growing season	2w	Yes	No	No	Yes	Severe	No
	14.9	P21A	Marcus silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	12.4	P48B	Allendorf silty clay loam, 2 to 6 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	10.7	P14B	Flandreau silt loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	10.4	P15B	Galva silty clay loam, 2 to 5 percent slopes	fine-silty	0-5	Well drained	>6-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	9.2	P38B	Thurman sandy loam, 2 to 6 percent slopes	sandy	0-5	Somewhat excessively drained	>18	No	Farmland of statewide importance	3e	No	No	No	No	Moderate	Yes
	6.1	P16A	Graceville silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Well drained	>18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	3.2	P55A	Kato silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	2.3	P48A	Allendorf silty clay loam, 0 to 2 percent slopes	fine-silty over sandy or sandy-skeletal	0-5	Well drained	>12-18	No	All areas are prime farmland	2s	No	No	No	No	Severe	No
	0.4	P12C2	Everly silty clay loam, 6 to 12 percent slopes, eroded	fine-loamy	>8-15	Well drained	>6-12	No	Farmland of statewide importance	3e	No	Yes	No	No	Severe	No
	0.1	P31A	Spicer silty clay loam, 0 to 2 percent slopes	fine-silty	0-5	Poorly drained	>12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No

1 Project Area (Undisturbed) includes soils under Elk Creek Solar lease but that are not anticipated to be disturbed during construction or operations.
2 Data obtained by merging facility polygons with the SSURGO spatial data in ArcGIS. Summations were performed in Microsoft™ Access.
3 Obtained directly by query of the SSURGO geospatial database.
4 Representative slope values are taken directly from the SSURGO database. The SSURGO2 database provides representative slope values for all component soil series. Slope classes represent the slope class grouping in percent that contains the representative slope value for a major component soil series. For example, a soil mapped in the 2-6% slope class has an average slope of 4%, which is within the 0-5% slope range.
5 Drainage class as taken directly from the SSURGO database.
6 Topsoil thickness is the aggregate thickness of the A horizons described in the SSURGO database.
7 Shallow Bedrock taken directly from the SSURGO database. Stony/Rocky soils are those soils that have either a cobbley, stony, boulder, shaly, very gravelly or extremely gravelly modifier to the textural class of the surface layer or that have a surface layer with > 5% stones or rocks > 3 inches in any dimension.
8 Includes soils in land capability classes 4e through 8e or that have a representative slope value greater than or equal to 9%.
9 Includes soils in wind erodibility groups 1 and 2.
10 Includes soils that are somewhat poorly drained to very poorly drained soils in loamy sands and finer textural classes.
11 Rutting potential hazard based on the soil strength as indicated by engineering texture classification, drainage class, and slope. In general, soils on low slopes in wetter drainage classes, and comprised of sediments with low strength will have potential rutting hazards.
12 Includes soils with a surface texture of sandy loam or coarser that are moderately well to excessively drained.

Appendix B

NRCS Soil Map for the Elk Creek Solar Project



151st St
CSAH 3
141st St
180th Ave
131st St
190th Ave

ELK CREEK SOLAR

0 0.25 0.5 Miles

1:18,000

Data Source: National Grid Renewables, MN DOT, Rock County
Imagery Source: 2021 FS

Appendix B
NRCS Soil Map for the Project
Elk Creek Solar Project
Rock County, MN
43.67819, -96.09293

2023 Land Control Area
SSURGO Soils

Date: 5/30/2023

Appendix C

Vegetation Management Plan, Revised May 2023

Vegetation Management Plan

Elk Creek Solar, LLC

Prepared for

Elk Creek Solar, LLC

Prepared by

Benjamin Staehlin, M.S., Michael Lopez, M.S., & Kim Chapman, Ph.D.

20276 Delaware Avenue

Jordan, MN 55352

Figures

Tables

EXECUTIVE SUMMARY

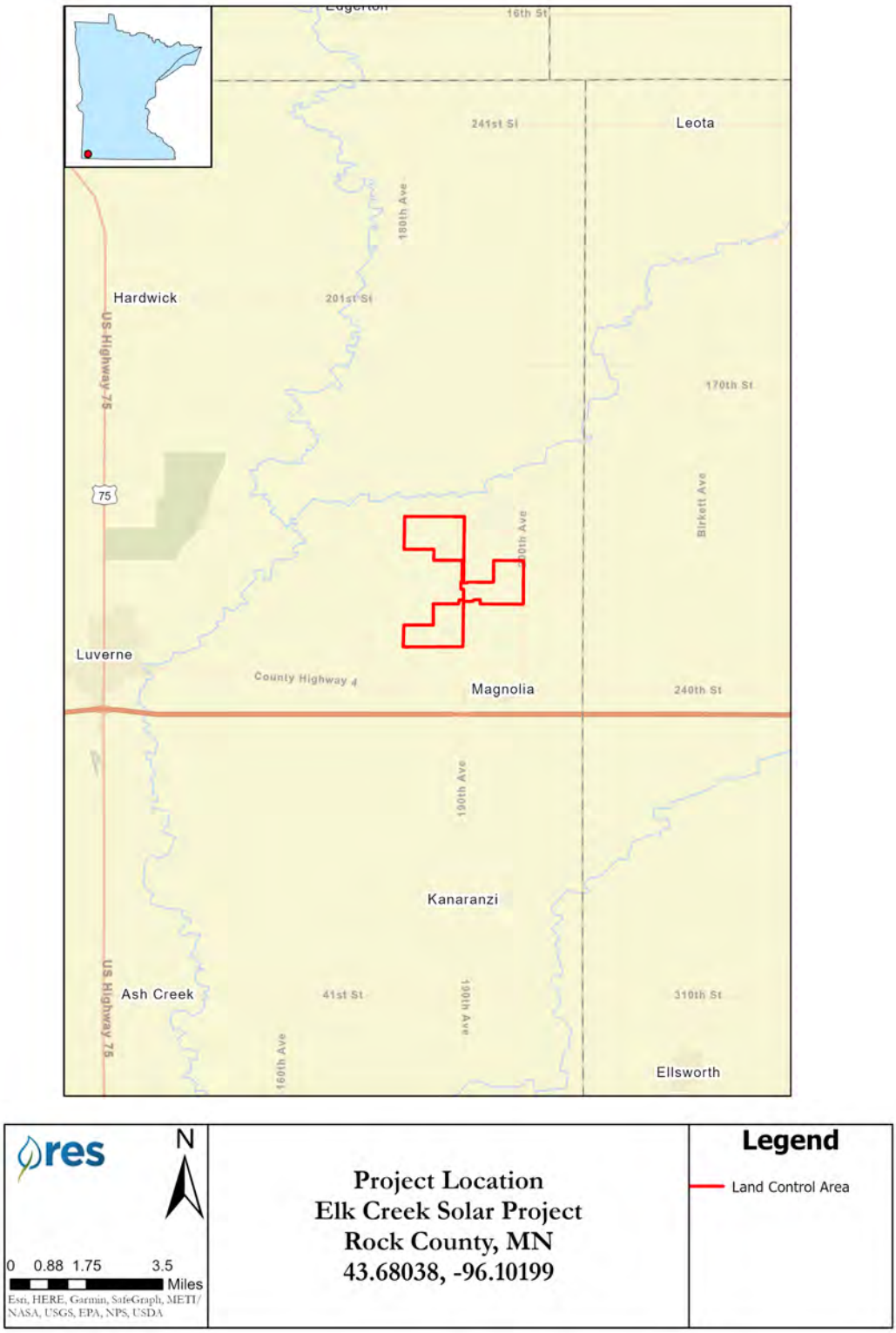
Elk Creek Solar, LLC (Elk Creek), has received a Site Permit to operate an 160 megawatt (MW) solar energy facility on approximately 1521 acres in Rock County, MN ("Site"). Elk Creek has developed this Vegetation Management Plan ("Plan") to guide Site preparation, installation of prescribed seed mixes, management of invasive species and noxious weeds, and control of erosion/sedimentation. During preparation of the Plan, MN State Agency Guidance for Developing a Vegetation Establishment and Management Plan for Solar Facilities was referenced[1].

This Plan will be used by the Contractor selected by Elk Creek and by Elk Creek for restoration of the Site ("Contractor"). The strategy outlined in this Plan consists of developing native vegetation cover within the footprint of the solar Project during operations. The mixes will achieve Elk Creek's goals for operating the Project, promote pollinator habitat, establish stable ground cover successfully, reduce erosion, reduce runoff, and improve infiltration.

This document is intended to be a working document. Revisions will be made as new information is obtained with respect to vegetation management, site characteristics, and availability of management practices evolve over time.

[1]Guidance for Developing a Vegetation Establishment and Management Plan for Solar Facilities (https://mn.gov/eera/web/project-file/11702/. March 2021).

FIGURE 1 SOLAR PROJECT LOCATION



1. VEGETATION MANAGEMENT GOALS

To carry out this Plan, Elk Creek has established short- and long-term goals for vegetation management. The remainder of the plan lists various objectives (implementation strategies) to reach the desired goals.

1.1 Short-Term Goals

Short-term goals are goals applicable to the post-construction establishment phase of the Project in Years 1-5. The general goal is to establish a sustainable, diverse, perennial grassland community, appropriate to site conditions and safe operation, maintenance, and inspection that complies with all permits and regulations pertaining to the Site. The primary short-term goals are:

- Comply with permit conditions for Site revegetation, per the Minnesota Pollution Control Agency Construction Stormwater General Permit.
- After the first growing season, vegetate at least 70 percent of the site, and ideally 80 percent of the site.
- Establish sustainable, diverse, perennial grassland community, appropriate to site conditions on 70 percent of the site and comprised on 90 percent native vegetation by Year 5.
- Implement cover crops to effectively assist in establishment of native vegetation, if practicable.
- Manage invasive species and noxious weeds per Minn. Stat., Sections 18.75 to 18.78, and 18.86.
- Establish vegetative screening for the adjacent residence. The landscaping screening area should be established, with limited ongoing plant mortality, within one year of installation. At the end of the establishment phase, 80 percent of the installed shrubs and trees shall be present in the landscaping/screening area.

1.2 Long-Term Goals

Long-term goals are defined as goals beyond year 5, following implementation of the short-term goals. Elk Creek will implement adaptive management of vegetation cover, guided by strategic integration of site-specific environmental conditions to maintain a perennial grassland community that keeps the soils on the site stabilized, improves soil conditions and preserves the site for agricultural use in the future. The primary long-term goals include:

- Maintain 95 percent of the Project Site in a vegetated state, and at least 90 percent of the cover comprised of native species.
- Establish six or more species of planted native graminoids and 12 or more species of planted native forbs across the Project Site.
- Maintain a mature landscaped screen that minimizes views of the solar array from an adjacent target parcel over the life of the Project.
- Establish a site that is suitable for haying and/or sheep grazing during facility operations, if determined to be a viable management strategy following construction. Accommodate

vegetative management of the Project Site using traditional vegetative management methods for areas not managed by haying or sheep grazing. The vegetative seed mixes are the same regardless of the management technique(s) employed.

- Prioritize the implementation of all required vegetation management activities for safe and efficient operations support including woody species control, height control of herbaceous species, wet area management, and landscape/screening management.

2. SITE DESCRIPTION

Understanding the existing site characteristics is the foundation of developing the management methods and seed mixes proposed. This section provides context of the existing site conditions to familiarize the Contractor with the Project setting.

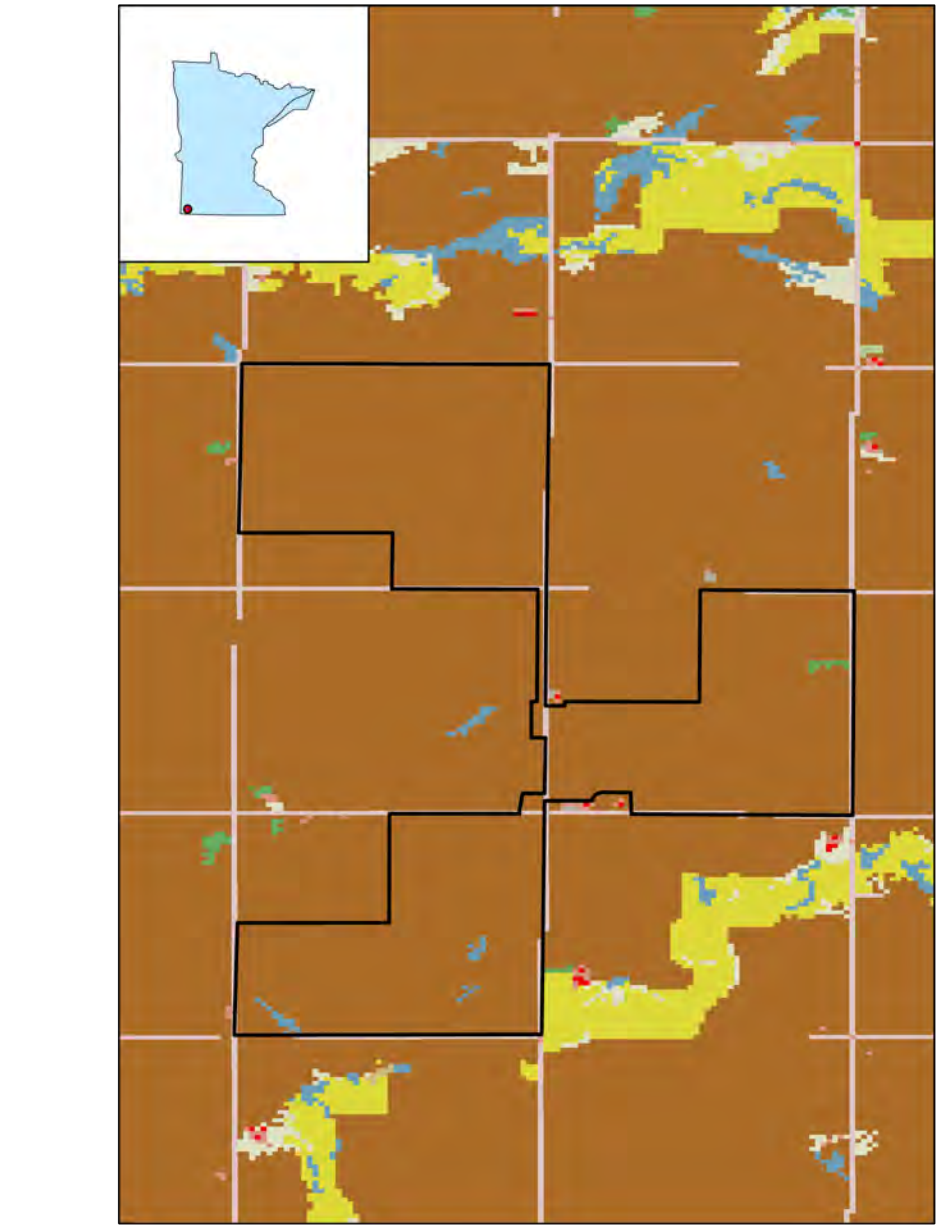
2.1 Project Location and Size

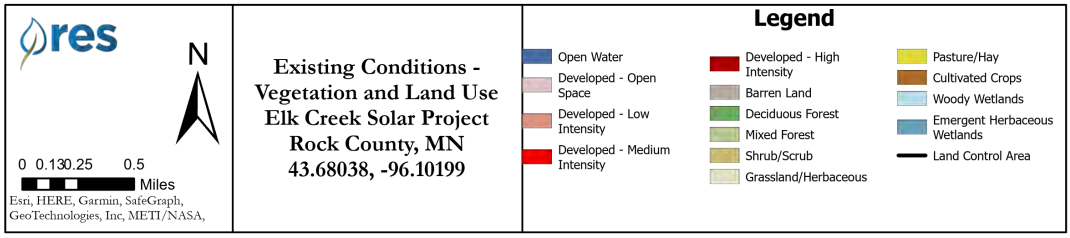
The Project will be located on approximately 1521 acres of land in Magnolia Township, Sections 27 and 35, Township 103 North, Range 44 West, Rock County, Minnesota (Figure 1). Approximately 1,165 acres will be affected by Project facilities. The Project lies north of Interstate 90 between County State Aid Highways (CSAH) 8 and 9, approximately three miles north of the Town of Magnolia and 6 miles northeast of the City of Luverne.

2.2 Existing Vegetation

Based on the USGS GAP landcover data, the Site consists of predominately agricultural land (Figure 2). Review of aerial photography confirms that the vast majority of the land is agricultural. Developed land and forest account for approximately 1.13 percent of the Site. Forested land consists of an isolated block of trees serving as a shelter belt or wind break around a farmstead. Additionally, based on surveys of the site, one wetland was identified, which will be avoided by Project construction and operation.

FIGURE 2 LAND USE

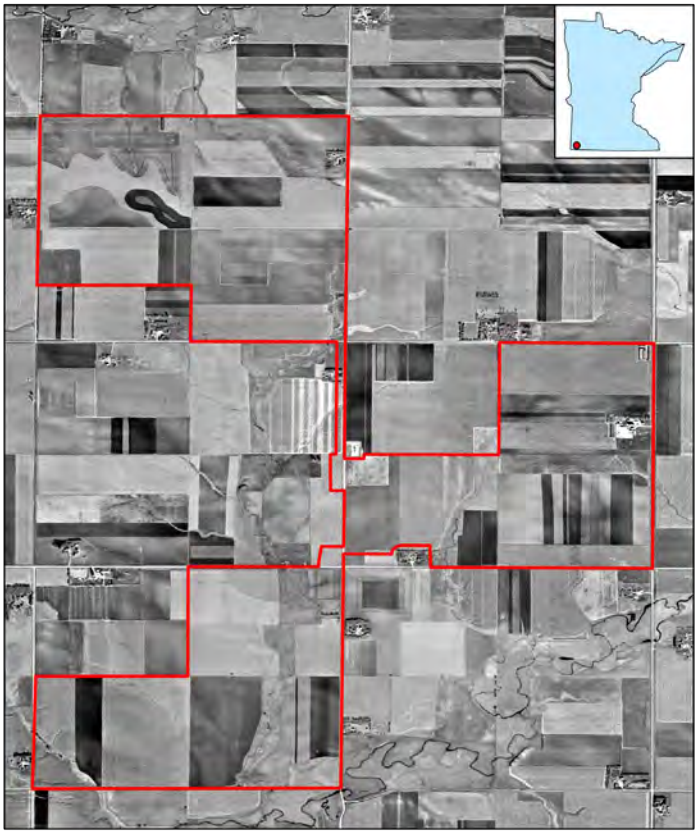


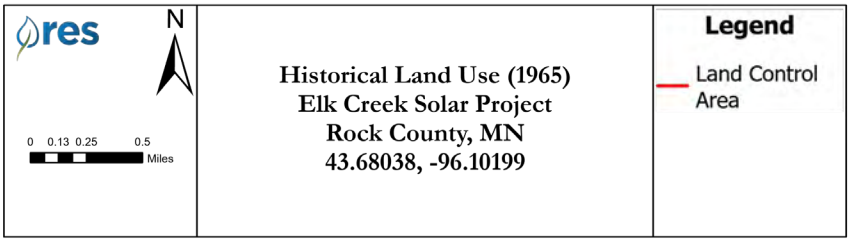


2.3 Existing Land Use

Based on Minnesota historic aerial imagery, virtually all of the Site ("Land Control Area") has been in agriculture starting prior to 1965 (Figure 3). Most of the agricultural land is prime farmland or prime farmland if drained. Typically, high value crops such as corn and soybean rotations are grown in the area.

FIGURE 3 HISTORICAL LAND USE (1965 IMAGERY)



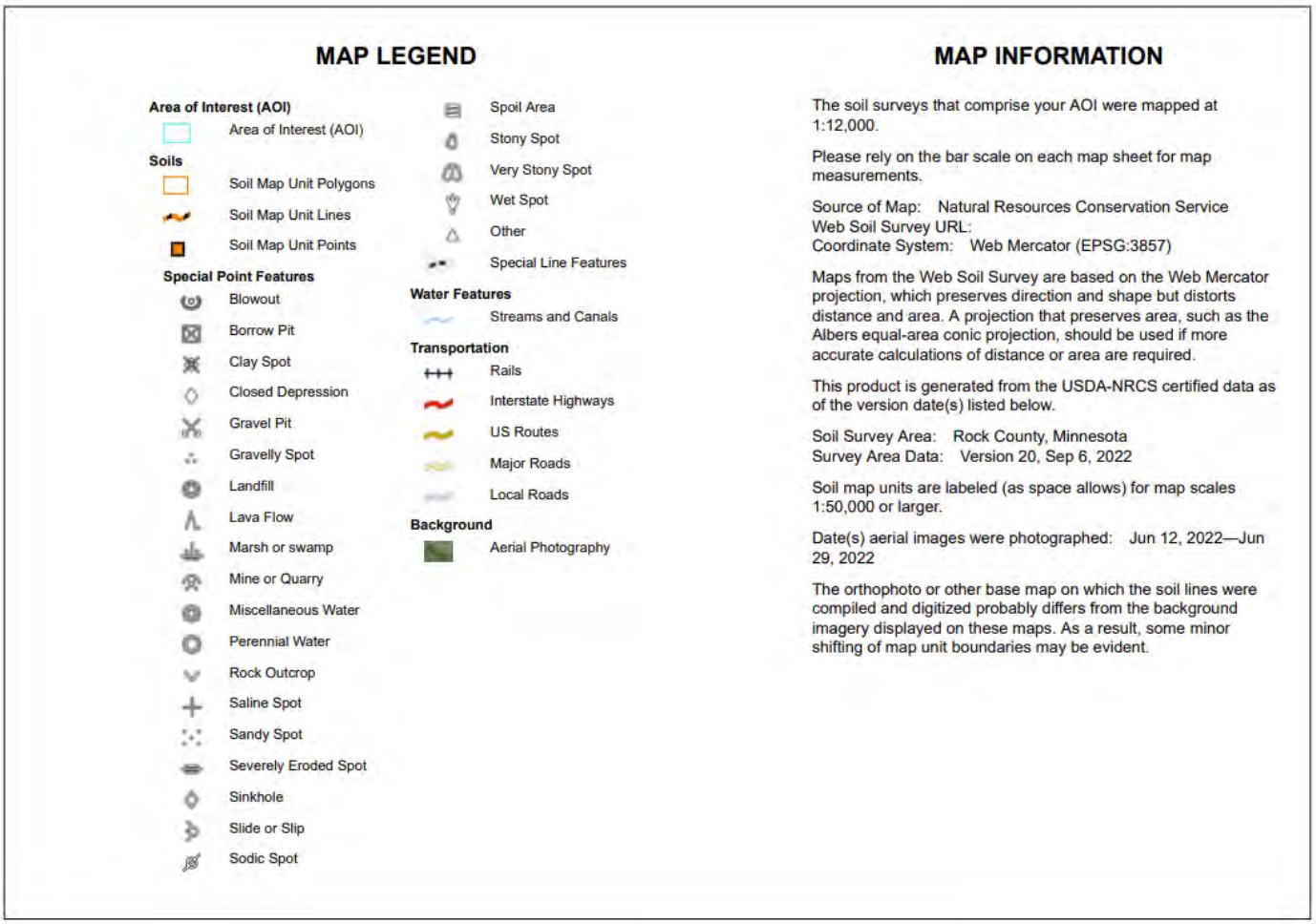


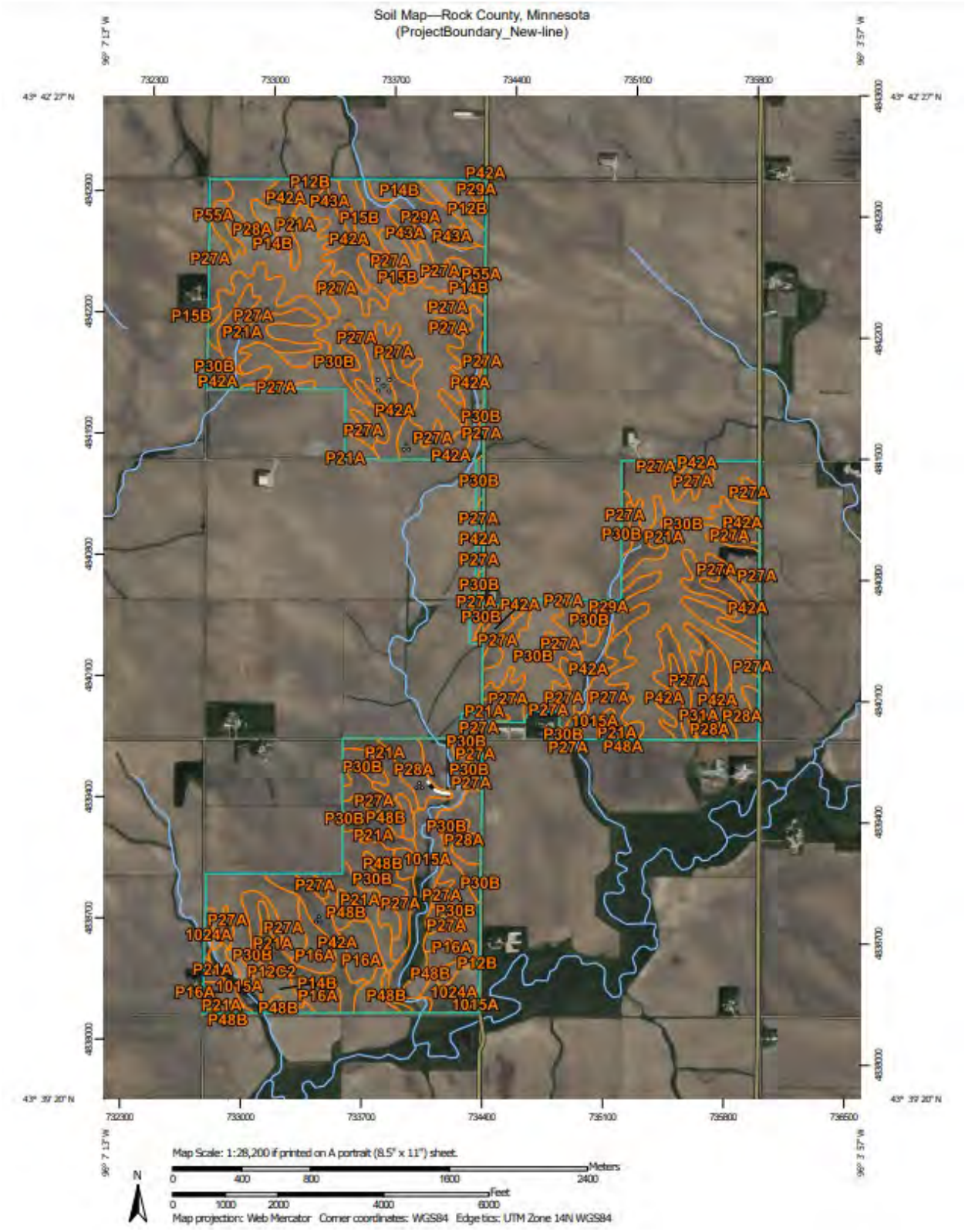
2.4 Soils

The Soil Survey Geographic Database ("SSURGO") is the digitized county soil survey and provides a GIS relating soil map unit polygons to component soil characteristics and interpretations. Soil map unit polygons in the SSURGO database were clipped to the site.

A soils map is below. For additional information regarding soils, best practices for segregation of topsoil and subsoil, as well as decompaction methods that will foster long term soil health and vegetative outcome success, refer to the Agricultural Impact Mitigation Plan (AIMP). The contractor is encouraged to visit the NRCS web soil survey to review detailed information about the soils across the site in more detail.

FIGURE 4 SOILS INFORMATION




Soil Map—Rock County, Minnesota
(ProjectBoundary_New-line)
96° 7' 13" W
96° 3' 57" W
43° 42' 27" N
43° 39' 20" N
732300
733000
733700
734400
735100
735800
736500
4842000
4842600
4841900
4841300
4840600
4840000
4839400
4838700
4838000
4837300
4836700
4836000
4835400
4834700
4834000
P12B
P42A
P43A
P14B
P29A
P55A
P28A
P21A
P15B
P27A
P30B
P48B
P1015A
P1024A
P16A
P12C2
Map Scale: 1:28,200 if printed on A portrait (8.5" x 11") sheet.
Meters
0
400
800
1600
2400
Feet
0
1000
2000
4000
6000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

Map Unit Legend

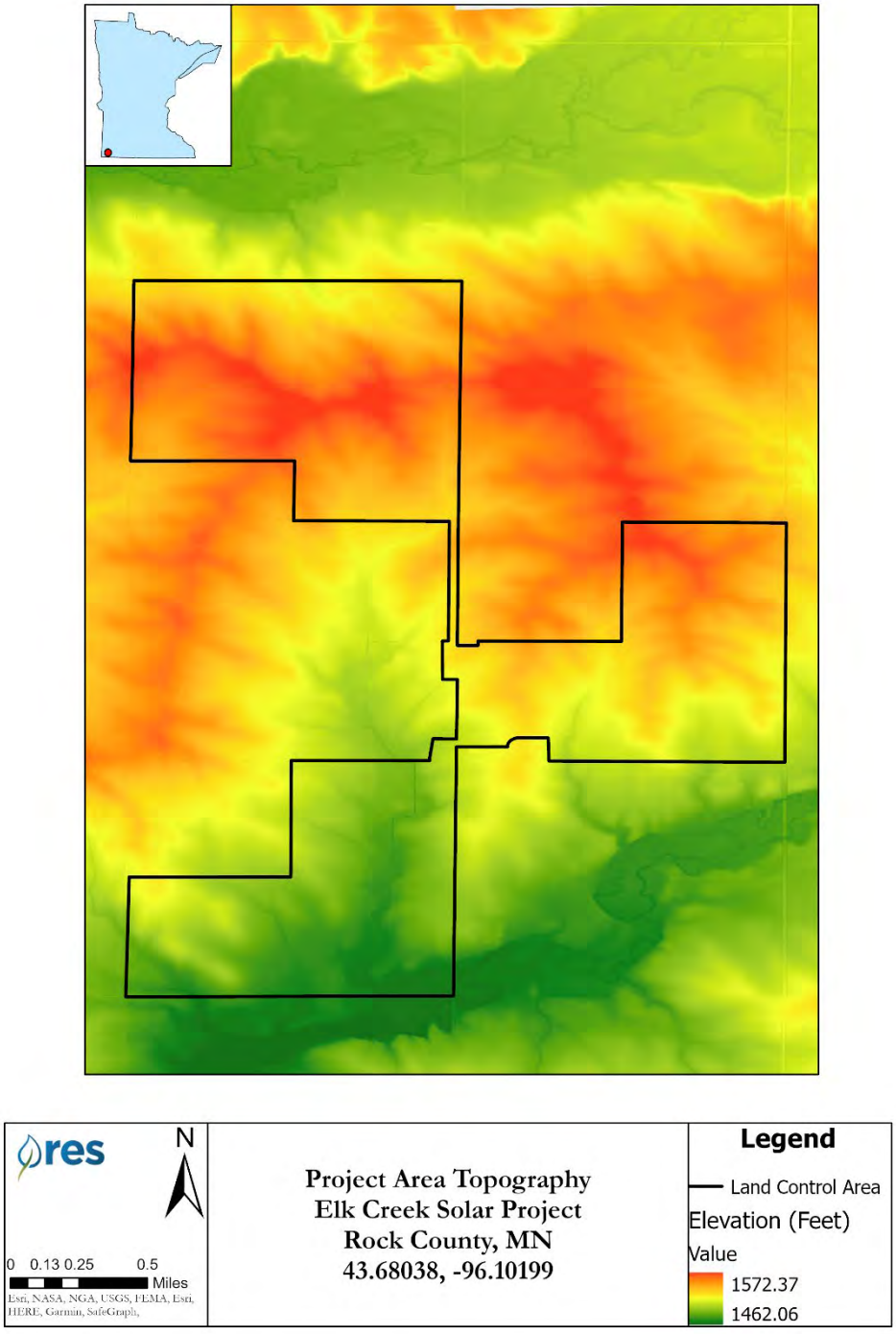
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1015A	Havelock clay loam, 0 to 2 percent slopes, frequently flooded	72.1	4.7%
1024A	Havelock clay loam, 0 to 2 percent slopes, occasionally flooded	17.9	1.2%
P12B	Everly silty clay loam, 2 to 6 percent slopes	26.7	1.8%
P12C2	Everly silty clay loam, 6 to 12 percent slopes, eroded	4.0	0.3%
P14B	Flandreau silt loam, 2 to 6 percent slopes	87.0	5.7%
P15B	Galva silty clay loam, 2 to 5 percent slopes	17.3	1.1%
P16A	Graceville silty clay loam, 0 to 2 percent slopes	52.1	3.4%
P21A	Marcus silty clay loam, 0 to 2 percent slopes	118.9	7.8%
P27A	Primghar silty clay loam, 1 to 3 percent slopes	304.9	20.0%
P28A	Ransom silty clay loam, 1 to 3 percent slopes	56.5	3.7%
P29A	Rushmore silty clay loam, 0 to 2 percent slopes	54.8	3.6%
P30B	Sac silty clay loam, loam substratum, 2 to 5 percent slopes	471.4	31.0%
P31A	Spicer silty clay loam, 0 to 2 percent slopes	6.0	0.4%
P38B	Thurman sandy loam, 2 to 6 percent slopes	9.2	0.6%
P42A	Whitewood silty clay loam, 0 to 2 percent slopes	152.6	10.0%
P43A	Wilmonton silty clay loam, 1 to 3 percent slopes	20.3	1.3%
P48A	Allendorf silty clay loam, 0 to 2 percent slopes	9.1	0.6%
P48B	Allendorf silty clay loam, 2 to 6 percent slopes	30.3	2.0%
P55A	Kato silty clay loam, 0 to 2 percent slopes	9.7	0.6%
Totals for Area of Interest		**1,520.7**	**100.0%**

2.5 Topography

The Project will be constructed on a nearly-level to gently rolling loess-mantled glacial till plain consisting of gray, calcareous pre-Wisconsin-aged till covered by a thin to thick mantle of Wisconsin-age loess. The area is generally flat with elevations ranging from 1460 to 1570 feet above sea level (Figure 5). The nearly-level topography combined with highly fertile soils, favorable moisture holding characteristics, and usually adequate supplies of moisture from precipitation are well suited to agriculture, which is currently the dominant land use for the

Project Area. Some grading will be necessary to accommodate the solar array, but generally topography across the site is anticipated to remain similar to existing site condition.

FIGURE 5 TOPOGRAPHY



2.6 Hydrology

The Project is located in the Elk Creek Watershed (Figure 6). The potential for wetlands within the Land Control Area was identified by reviewing desktop resources data followed by a formal wetland delineation within the Land Control Area in May 2019 and May 2023. National Wetlands Inventory (NWI) data identifies 5 palustrine emergent wetlands ("PEM") totaling 20.95 acres and one 0.37-acre freshwater pond within the Project boundary. Additionally, a network of swales and depressions runs through the Land Control Area. These swales and depressions were historically wet and have been converted by subsurface drainage to highly productive farmland.

FIGURE 6 WATERSHEDS AND HYDROLOGY

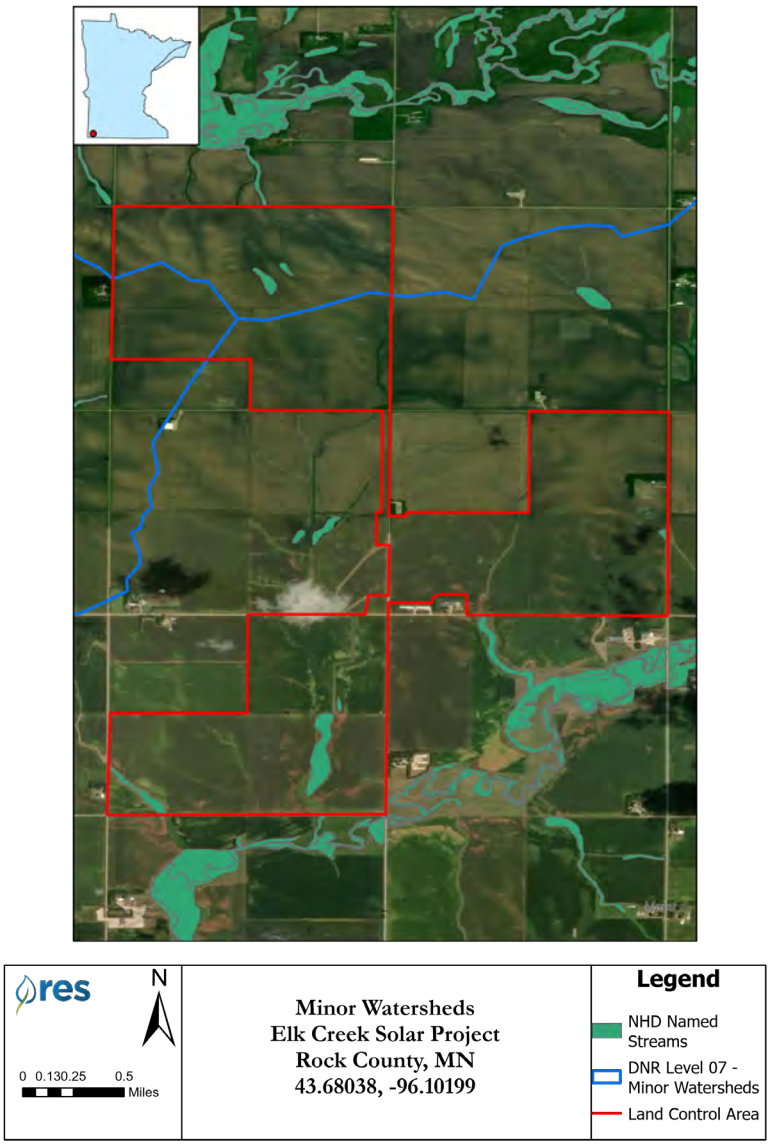
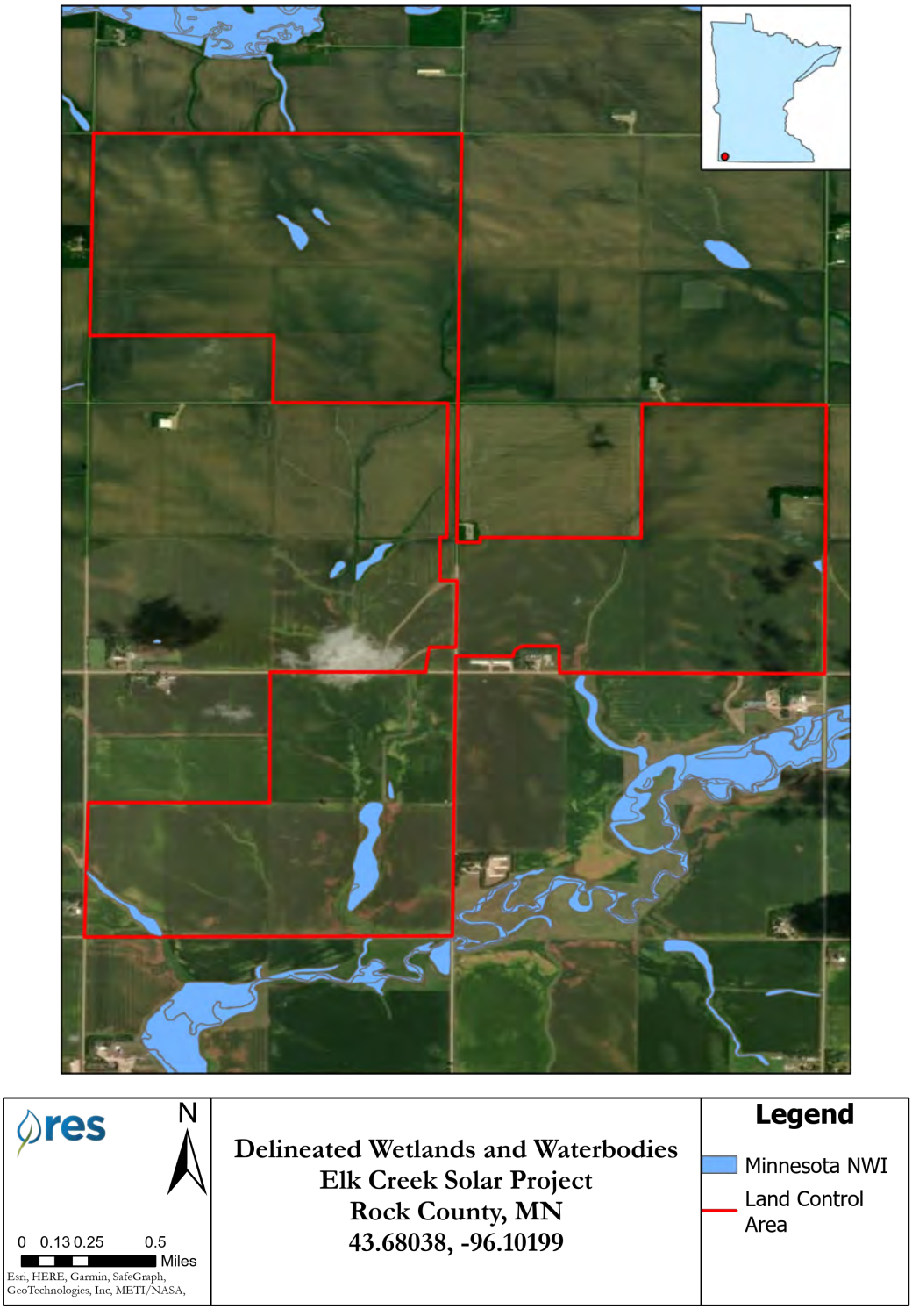
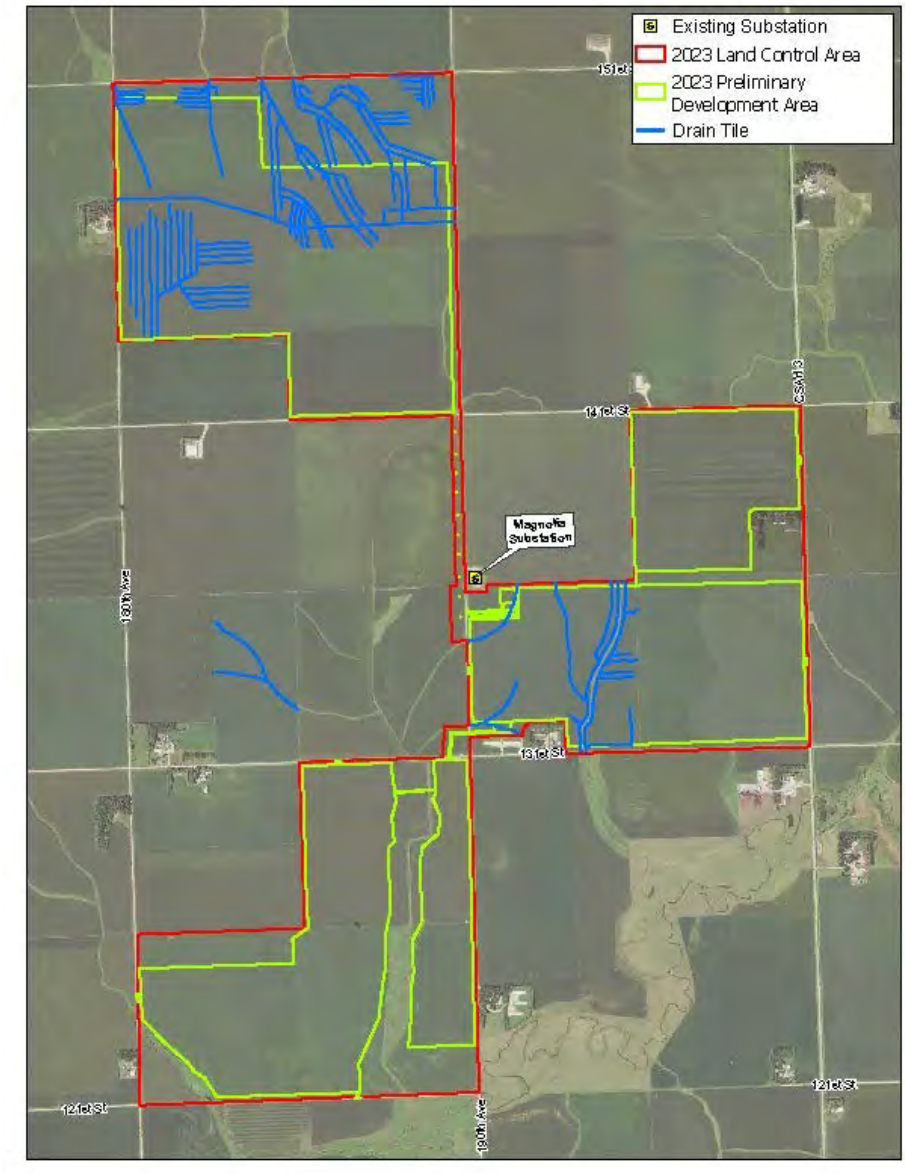


FIGURE 7 DELINEATED WETLANDS AND WATERBODIES



Elk Creek has secured drain tile maps for a majority of the Project area and will continue to coordinate for mapping on remaining parcels (Figure 8). Generally, the drain tile appears to be functioning based on the conditions found across the site. In the event the remaining drain tile mapping cannot be identified, Elk Creek will utilize other sources, including infrared aerial photographs, LiDAR data, and, if necessary, a site-specific tile locate survey. Continued site drainage fosters efficient operation of the Project. Site drainage is anticipated to generally remain in place during operation of the Project, with limited impacts from construction on the current drainage pattern. Elk Creek plans to repair any subsurface and surface drainage systems damaged during construction and will maintain all such systems while the Project is operational. Soil moisture levels are anticipated to be materially similar to what is found currently across the site.

FIGURE 8 KNOWN DRAIN TILE LOCATIONS



3. Description of Management Units

The Site is anticipated to be separated into smaller construction and management units for a common point of communication in management. For ease of reference, the management units will likely be designated by the array block numbering system already established as a part of the final engineering process. Each array block, which consists of approximately 10-20 acre area of panels, is designated per the DC collection system from the solar modules to a common inverter. Utilizing an array block is a common point of understanding for onsite managers to quickly and effectively communicate the area undergoing final site stabilization, requiring noxious weed treatment, or other vegetation management needs. As restoration progresses, a more simplified set of management units may be established by aggregating array blocks into larger units. This will be determined by onsite managers based on site outcomes and monitoring reports.

Generally, three distinct types of management are possible on the Site. These include the possibility of haying, mowing, or grazing, and these methods are laid out in more detail later in the plan. This Plan has been drafted to allow a 'scaling' of each management measure based upon availability at the time such management measure could be deployed. The goals and objectives for each management unit are the same and are provided above in this Plan.

4. VEGETATION INSTALLATION Vegetation Installation

4.1 Site Preparation, Clearing and Vegetation Removal

Prior to vegetation installation, management techniques can be utilized that will lead to more successful vegetation establishment for the short- and long-term goals. Most of the soil and vegetation disturbances will occur during the first phase of construction when the grading activities take place. The construction contractor will follow the recommendations of the AIMP to ensure that best practices are utilized during construction and to prepare the site for final stabilization. Additionally, to stabilize the soils, existing vegetation or plant material will be retained on the surface in areas that do not need to be graded. Any topsoil that is stripped or otherwise stockpiled during construction will be replaced and spread or otherwise stockpiled prior to seed bed preparation activities. Recommendations for weed control, and implementation of cover crops to assist in site stabilization prior to construction are below:

<u>Early Season Construction Start</u>

If construction begins prior to May 15, it is unlikely that site preparation activities, such as mowing or applying herbicide to agricultural weeds, will be employed. However, it may be advantageous to install a cover crop prior to construction or following site grading activities. Cover crops assist in site stabilization during construction activities and are especially helpful in areas that do not require grading activities. Early season cover crop installation is typically seed oats (*Avena sativa*), but Elk Creek will work with the Project Contractor/s to select the best option. A cover crop will not be planted prior to construction unless there is adequate time between the start of the growing season and the start of construction for the cover crop to grow to a sufficient height to provide soil surface protection during construction.

Mid-Late Season Construction Start

To limit the spread of weeds onsite during construction, broadcast application of herbicide may be necessary to treat agricultural weeds prior to the start of construction activities. Refer to Tables 7 and 8 for lists of target weeds. For most weeds, including the majority of annual weed species, the essential treatment window is between mid-May and mid-June to prevent seed set for the growing season. Depending on the distribution of the species to be treated, targeted mowing may also be employed.

4.2 Noxious Weed and Problem Plant Management Prior to Final Stabilization

Noxious weeds can be problematic for long term success if not controlled leading up to and during construction. Noxious weeds can outcompete native plants or spread to neighboring properties. During the growing season (May to September) portions of the construction period, a qualified professional with sufficient botanical experience identifying native plants, native plant communities, invasive species, and non-native species typical of Minnesota, and employed by the Contractor shall conduct monthly evaluations of the Project area to determine if noxious weeds or problem plants develop during construction. Refer to Tables 7 and 8 for lists of target weeds to identify and control.

Control of noxious weeds is essential to propagation of seed mixes. Recommendations for noxious weed control preceding and during seeding are listed below:

- Any listed weeds located within the area to be seeded should be treated with an approved herbicide (see Section 5.1.3).
- Reed canary grass (*Phalaris arundinacea*) should be sprayed with herbicide prior to any seeding activities, then mowed to remove existing dead biomass. A second herbicide treatment should occur in these areas after mowing, once the regrowth has reached 8-12 inches in height, to ensure all reed canary grass is killed prior to seeding. Soil disturbance activities in wet areas should also be avoided after the spraying to minimize cutting of the reed canary grass rhizomes or bringing reed canary grass seeds to the surface to germinate.

The appropriate treatment techniques to use and the timing of those treatments will be determined by the Contractor based on the plants that need to be treated, the construction activities occurring in the area to be treated and the length of time between the inspection and when seed bed preparation and other restoration activities will occur. If restoration activities are anticipated prior to noxious weed propagation, then treatment may not occur until after restoration activities are completed.

4.3 Seed Bed Preparation for Final Stabilization and Seeding

Seeding of the permanent vegetation will occur after all construction activities and site preparation are complete. Prior to seeding, per the AIMP, the soil will be decompacted to ensure good seed to soil contact and proper establishment. The soil will be prepped with the required methods and amendments if deemed necessary by the contractor.

4.3.1 Decompaction

Laydown areas and heavily travelled corridors and portions of the access road corridors that were used as temporary roadbeds must be decompacted to a depth of at least 6 inches. Refer to the AIMP for detailed guidance prior to implementation of the seeding plan.

4.4 Seed Mixes

Four seed mixes have been developed for the site. The first mix is a mesic graminoid mix to be installed in and around the solar arrays. The second mix is a mesic pollinator mix to be installed in the upland areas of the supplemental pollinator planting zone. The third mix is a wet-mesic mix for transitional areas between hydric and nonhydric soils. The fourth mix is a wet mix to be installed around stormwater basins and at locations that are predicted or known to hold surface water for part or most of the growing season (i.e., seasonally inundated ground). Seed mixes are provided in Tables 1-4, below. These seed mixes will ensure short-term and long-term establishment throughout the life of the project. The seed mixes chosen will help achieve the goals and objectives listed above.

All seed mixes must adhere to the specifications described in the Plan. Genetic source origin of all native seed shall be local, preferably from within a 200-mile radius of the Project Site, and the plant species should be native to Rock County (considerations of range shifts due to climate change may modify this guidance). Species shall be true to their scientific name as specified in Tables 1-4. Seed tags or nursery confirmation of the order must be provided to Elk Creek prior to installation[2]. Any species eliminations, substitutions, or source origin exceptions must be approved by Elk Creek prior to installation. If necessary, seeds shall be properly stratified and/or scarified to break seed dormancy. If applicable, all legumes shall be inoculated with proper rhizobia at the appropriate time prior to planting.

The completion date of construction affects both the type of cover crop installed and whether the cover crop is installed prior to the native seed mixes as temporary stabilization or concurrently with the native seed mixes. Instructions for seeding are presented in Section 4.6, with a summary table included at the end.

TABLE 1 MESIC ARRAY MIX

Scientific Name	Common Name	Oz/Acre	Lbs/Acre	% by Wt	Seeds/Sq Ft
Bouteloua curtipendula	Sideoats grama	30.00	1.88	18.3	4.1
Carex bicknellii	Bicknell's sedge	1.50	0.09	0.9	0.6
Carex brevior	Short beak sedge	2.00	0.13	1.2	1.3
Carex molesta	Troublesome sedge	2.00	0.13	1.2	1.1
Carex vulpinoidea	Fox sedge	1.00	0.06	0.6	2.3
Elymus canadensis	Canada wild rye	34.00	2.13	20.7	4.1
Elymus trachycaulus	Slender wheatgrass	26.00	1.63	15.9	4.1

[2] Seed of *Sporobolus heterolepis* and some *Carex* species must not have been stored longer than six months after the time of harvest or must have been frozen at the time of harvest and stored for no more than two years in a frozen state.

Elymus virginicus	Virginia wild rye	42.00	2.63	25.6	4.0
Festuca rubra ssp. *rubra*	Red fescue	6.30	0.39	3.8	5.0
Juncus interior	Inland rush	0.05	0.00	0.0	3.2
Juncus tenuis	Path rush	0.15	0.01	0.1	3.4
Schizachyrium scoparium	Little bluestem	14.00	0.88	8.5	4.8
Sporobolus compositus	Composite dropseed	2.50	0.16	1.5	1.7
Sporobolus heterolepis	Prairie dropseed	2.50	0.16	1.5	0.9
	Total	**164.00**	**10.25**		**40.8**

Recommended substitutions: *Bouteloua gracilis, Bouteloua hirsuta, Buchloe dactyloides, Elymus villosus, Muhlenbergia cuspidata*

TABLE 2 MESIC POLLINATOR MIX

Scientific Name	Common Name	Oz/Acre	Lbs/Acre	% by Wt	Seeds/Sq Ft
Bouteloua curtipendula	Sideoats grama	32.00	2.00	22.2	4.4
Carex bicknellii	Bicknell's sedge	1.45	0.09	1.0	0.6
Carex brevior	Short beak sedge	2.00	0.13	1.4	1.3
Carex molesta	Troublesome sedge	2.00	0.13	1.4	1.1
Carex vulpinoidea	Fox sedge	1.00	0.06	0.7	2.3
Elymus canadensis	Canada wild rye	36.00	2.25	25.0	4.3
Elymus trachycaulus	Slender wheatgrass	28.00	1.75	19.4	4.4
Juncus interior	Inland rush	0.05	0.00	0.0	3.2
Schizachyrium scoparium	Little bluestem	14.00	0.88	9.7	4.8
Sporobolus compositus	Composite dropseed	1.50	0.09	1.0	1.0
Sporobolus heterolepis	Prairie dropseed	2.00	0.13	1.4	0.7
	Total Graminoids	**120.00**	**7.50**	**83.3**	**28.3**
Achillea millefolium	Yarrow	0.25	0.02	0.2	1.0
Agastache foeniculum	Blue giant hyssop	0.50	0.03	0.3	1.0
Aquilegia canadensis	Red columbine	1.00	0.06	0.7	0.9
Asclepias syriaca	Common milkweed	3.00	0.19	2.1	0.3
Dalea candida	White prairie clover	1.50	0.09	1.0	0.7
Dalea purpurea	Purple prairie clover	2.00	0.13	1.4	0.8
Lespedeza capitata	Round-headed bush clover	2.00	0.13	1.4	0.4
Monarda fistulosa	Wild bergamot	1.00	0.06	0.7	1.6
Oligoneuron rigidum	Stiff goldenrod	1.50	0.09	1.0	1.4
Penstemon grandiflorus	Large-flowered beardtongue	2.50	0.16	1.7	0.8
Potentilla arguta	Prairie cinquefoil	0.25	0.02	0.2	1.3
Ratibida pinnata	Yellow coneflower	1.50	0.09	1.0	1.0
Rudbeckia hirta	Black-eyed Susan	2.00	0.13	1.4	4.2
Solidago missouriensis	Missouri goldenrod	0.50	0.03	0.3	1.4
Symphyotrichum ericoides	Heath aster	0.25	0.02	0.2	1.1
Symphyotrichum laeve	Smooth blue aster	0.75	0.05	0.5	0.9

Tradescantia bracteata	Long-bracted spiderwort	1.00	0.06	0.7	0.2
Verbena stricta	Hoary vervain	1.00	0.06	0.7	0.6
Zizia aptera	Heart-leaved alexanders	1.50	0.09	1.0	0.4
	Total Forbs	**24.00**	**1.50**	**16.7**	**20.3**
	Total	**144.00**	**9.00**		**48.6**

Recommended substitutions: *Bouteloua gracilis, Bouteloua hirsuta, Buchloe dactyloides, Elymus villosus, Muhlenbergia cuspidata; Amorpha canescens, Allium stellatum, Anemone cylindrica, Artemisia ludoviciana, Asclepias verticillata, Coreopsis palmata, Heliopsis helianthoides, Liatris aspera, Oenothera biennis, Sisyrinchium campestre, Solidago nemoralis*

TABLE 3 WET-MESIC MIX- TRANSITIONAL MIX

Scientific Name	Common Name	Oz/Acre	Lbs/Acre	% by Wt	Seeds/Sq Ft
Carex bebbii	Bebb's sedge	2.00	0.13	1.8	1.6
Carex tetanica	Mead's stiff sedge	1.00	0.06	0.9	0.4
Carex vulpinoidea	Fox sedge	1.00	0.06	0.9	2.3
Elymus canadensis	Canada wild rye	32.00	2.00	28.6	3.8
Elymus villosus	Silky wild rye	4.50	0.28	4.0	0.6
Elymus virginicus	Virginia wild rye	42.00	2.63	37.5	4.0
Glyceria striata	Fowl manna grass	1.00	0.06	0.9	3.7
Leersia oryzoides	Rice cut grass	2.00	0.13	1.8	1.6
Muhlenbergia mexicana	Leafy satin grass	1.00	0.06	0.9	4.0
Poa palustris	Fowl bluegrass	1.50	0.09	1.3	4.5
	Total Graminoids	**88.00**	**5.50**	**78.6**	**26.4**
Anemone canadensis	Canada anemone	1.50	0.09	1.3	0.3
Asclepias incarnata	Swamp milkweed	2.50	0.16	2.2	0.3
Bidens frondosa	Common beggar's ticks	2.25	0.14	2.0	0.3
Eupatorium perfoliatum	Common boneset	0.50	0.03	0.4	1.8
Euthamia graminifolia	Grass-leaved goldenrod	0.25	0.02	0.2	2.0
Helenium autumnale	Sneezeweed	0.50	0.03	0.4	1.5
Heliopsis helianthoides	False sunflower	8.00	0.50	7.1	1.2
Lobelia siphilitica	Blue lobelia	0.25	0.02	0.2	2.9
Lycopus americanus	American water horehound	0.50	0.03	0.4	1.5
Mimulus ringens	Allegheny monkeyflower	0.05	0.00	0.0	2.6
Pycnanthemum virginianum	Virginia mountain mint	0.50	0.03	0.4	2.5
Scutellaria lateriflora	Blue skullcap	1.00	0.06	0.9	1.5
Solidago gigantea	Late goldenrod	0.25	0.02	0.2	1.4
Symphyotrichum lanceolatum	Panicled aster	1.00	0.06	0.9	1.0
Symphyotrichum novae-angliae	New England aster	0.80	0.05	0.7	1.2
Verbena hastata	Blue vervain	1.00	0.06	0.9	2.1
Veronicastrum virginicum	Culver's root	0.15	0.01	0.1	2.8
Zizia aurea	Golden alexanders	3.00	0.19	2.7	0.8

Total Forbs	**24.00**	**1.50**	**21.4**	**27.6**
Total	**112.00**	**7.00**		**54.0**

Recommended substitutions: *Carex cristatella, Juncus torreyi, Panicum virgatum, Spartina pectinata; Agalinis tenuifolia, Helianthus grosseserratus, Liatris pycnostachya, Lysimachia ciliata, Mentha arvensis, Rumex britannica*

TABLE 4 WET MIX

Scientific Name	Common Name	Oz/Acre	Lbs/Acre	% by Wt	Seeds/Sq Ft
Beckmannia syzigachne	American slough grass	4.00	0.25	4.2	4.6
Calamagrostis canadensis	Bluejoint	0.75	0.05	0.8	4.8
Carex tetanica	Mead's stiff sedge	1.50	0.09	1.6	0.6
Carex vulpinoidea	Fox sedge	1.35	0.08	1.4	3.1
Elymus virginicus	Virginia wild rye	50.00	3.13	52.1	4.8
Glyceria striata	Fowl manna grass	1.00	0.06	1.0	3.7
Juncus torreyi	Torrey's rush	0.15	0.01	0.2	5.5
Panicum virgatum	Switch grass	16.00	1.00	16.7	5.1
Poa palustris	Fowl bluegrass	1.50	0.09	1.6	4.5
Scirpus atrovirens	Green bulrush	0.50	0.03	0.5	5.3
Spartina pectinata	Prairie cord grass	3.25	0.20	3.4	0.5
	Total Graminoids	**80.00**	**5.00**	**83.3**	**42.5**
Anemone canadensis	Canada anemone	1.00	0.06	1.0	0.2
Asclepias incarnata	Swamp milkweed	2.00	0.13	2.1	0.2
Boltonia asteroides	False aster	0.50	0.03	0.5	1.8
Eupatorium perfoliatum	Common boneset	0.50	0.03	0.5	1.8
Euthamia graminifolia	Grass-leaved goldenrod	0.25	0.02	0.3	2.0
Eutrochium maculatum	Spotted Joe Pye weed	0.75	0.05	0.8	1.6
Helenium autumnale	Sneezeweed	0.50	0.03	0.5	1.5
Helianthus grosseserratus	Sawtooth sunflower	1.50	0.09	1.6	0.5
Lobelia siphilitica	Great blue lobelia	0.20	0.01	0.2	2.3
Mimulus ringens	Blue monkey flower	0.05	0.00	0.1	2.6
Pycnanthemum virginianum	Virginia mountain mint	0.40	0.03	0.4	2.0
Rudbeckia triloba	Brown-eyed Susan	1.50	0.09	1.6	1.2
Symphyotrichum novae-angliae	New England aster	0.75	0.05	0.8	1.1
Symphyotrichum puniceum	Red-stemmed aster	0.75	0.05	0.8	1.4
Verbena hastata	Blue vervain	0.75	0.05	0.8	1.6
Vernonia gigantea	Tall ironweed	1.50	0.09	1.6	0.6
Veronicastrum virginicum	Culver's root	0.10	0.01	0.1	1.8
Zizia aurea	Golden alexanders	3.00	0.19	3.1	0.8
	Total Forbs	**16.00**	**1.00**	**16.7**	**25.2**

Total	**96.00**	**6.00**		**67.7**

Recommended substitutions: *Carex hystericina, Carex interior, Carex stipata, Carex stricta, Eleocharis acicularis; Alisma triviale, Bidens cernua, Desmodium canadense, Epilobium coloratum, Sagittaria latifolia, Scutellaria lateriflora, Vicia americana*

4.5 Seed Mix Substitutions

Procurement of seeds can be difficult to obtain in quantities necessary for large solar sites. Sourcing of proposed seed mixes should be done as soon as practicable. Substitutions to seed mixes will be completed by a qualified professional with sufficient botanical experience identifying native plants, native plant communities, invasive species, and non-native species typical of Minnesota. Any substitution will be approved by Elk Creek prior to implementation, and substitutions will have no effect on the short- and long-term goals of this Plan.

For consistency in management across the site, it is desired that the uniform seed mix recommended in the plan be utilized. However, should sourcing issues arise, Elk Creek has developed alternative species to utilize should procurement be problematic. Seed mix substitutions are listed beneath each seed mix shown above.

4.6 Seed Mix Application

Seeding shall be applied based on the locations specified in the Planting Plan (Figure 9). Seeding of the site may be conducted with a seed drill (preferred) and/or by broadcast seeding; the Contractor shall evaluate the site and determine which technique will produce the best results. Drill seeding typically produces higher observed plant density, so broadcast seeding may require an increased seeding rate or overseeding during the establishment period to achieve performance standards. Seed installed into a previous cover crop or other vegetation must be installed with a seed drill. Prior to installation, seed shall be divided into two equal parts. The first half shall be installed in one pass, and the second half installed in a second pass (perpendicular to the first pass, where possible). In areas where broadcast seeding is employed, raking, harrowing, or culti-packing of seeded areas shall be used to ensure good seed-to-soil contact.

Spring

If construction is completed in spring, allowing for seeding between the time when the soil is free of frost and in a workable condition but no later than June 30, native seed mixes shall be installed as specified and include 20 pounds per acre pure live seed (PLS) of oats (*Avena sativa*) as a cover crop.

Summer

If construction is completed in summer, allowing for seeding between July 1 and August 15, the site shall be seeded immediately with a cover crop consisting of 20 pounds per acre PLS of oats and 20 pounds per acre PLS of spring wheat (*Triticum aestivum*) to stabilize the soil and prevent erosion. In that same year, native seed shall be installed as

a fall dormant seeding, after November 1 but before the soil starts to freeze, with no additional cover crop added (see below).

Late Summer/Early Fall

If construction is completed in late summer or early fall, allowing for seeding between August 16 and October 31, the site shall be seeded immediately with a cover crop consisting of 20 pounds per acre PLS of winter wheat (*Triticum aestivum*) to stabilize the soil and prevent erosion. In that same year, the native seed mixes shall be installed as a fall dormant seeding with no additional cover crop added. (see below).

Late Fall

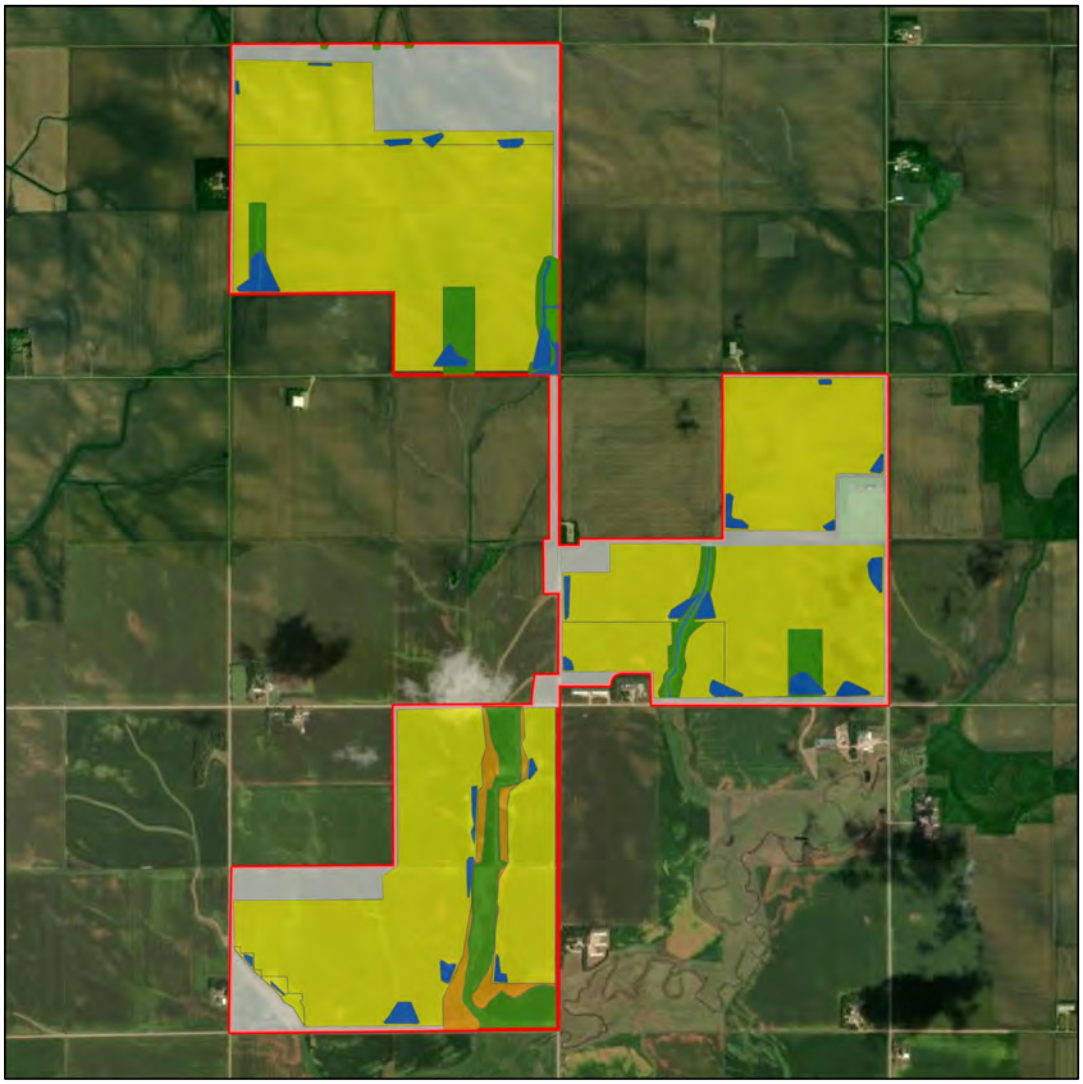
If construction is completed in late fall, allowing for seeding after November 1 but before the soil starts to freeze, native seed mixes shall be installed as specified and include 20 pounds per acre PLS winter wheat to provide a cover crop for the following year. If agreed to by both the Owner and the Contractor, a spring seeding in the following year can be substituted for a fall dormant seeding.

If a cover crop has been installed at any time during the calendar year, native seed mixes must be installed the same year with a fall dormant seeding, unless the Owner gives permission to the Contractor for a spring seeding. Prior to seeding into a cover crop, the Contractor shall evaluate the planting area and determine if any preparation is required prior to installation. Mowing may be required if the cover crop is too dense/robust. All native seeding into a cover crop must be completed by drill seeding.

TABLE 5. SEEDING INSTRUCTIONS BY SEASON

Timing of Seeding	Seed Type	Cover Crop Seeding Rate
January 1 – May 15	Do Not Plant	N/A
May 15 (or when soil thaws) – June 30	Seed Oats (*Avena sativa*) plus native seed mixes (see Section 4.4)	20 lbs. / acre
July 1 – August 15	Seed Oats Spring Wheat (*Triticum aestivum*)	20 lbs. / acre 20 lbs. / acre
August 16 – October 31	Winter Wheat (*Triticum aestivum*)	20 lbs. / acre
November 1 – November 21 (or when soil freezes)	Winter Wheat plus native seed mixes (see Section 4.4), or only native seed mixes if cover crop previously installed	20 lbs. / acre
November 28 – December 31	Do Not Plant	N/A

FIGURE 9 PLANTING PLAN



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N

0 0.13 0.25 0.5

Miles

Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA,

Proposed Planting Map
Elk Creek Solar Project
Rock County, MN
43.68038, -96.10199

Legend

Test

Seed Mix

- Mesic Graminoid Mix (1060.536 ac)
- Wet-Mesic Mix (147.91 ac)
- Wet Mix (50.18 ac)
- Pollinator Mix (29.69 ac)
- Undetermined (262.02 ac)

All seeds mixes for this Project are designed to be used with a vegetation management practice of traditional mowing but may also be managed by sheep grazing and or haying. All plant material must be installed as instructed, with regard for the time of installation, as described below. Any exceptions must be discussed with the Owner, and the Contractor shall receive written authorization for any changes prior to the start of work. In addition to the native seed mixes, a landscaping /screening area consisting of trees and shrubs shall also be installed in accordance with the proposed landscaping /screening plan proposed for the site (Appendix 4).

4.7 Undetermined Planting Areas

Project areas inside the parcel boundary but outside the fence line are marked "Undetermined" on the planting plan in Figure 10. Some of these areas may be returned to the landowner to be farmed. The rest of these areas will remain under the control of Elk Creek Solar; these areas will be prepared for seeding as described in Sections 4.1-4.3 and seeded with the Graminoid Array Mix presented in Table 2.

4.8 Visual Screening Area Planting

As per the agreement with the landowners, a vegetation screen will be installed on the east side of the project area just south of the intersection of 180th Avenue and 151st Street (Figure 10). The visual screen will extend approximately 600 linear feet along the exterior fence. To create an effective screen, woody plants will be installed in staggered double rows for the length of the screen. Prior to installation, the Contractor shall mark the location of all woody plants to be installed for approval from Elk Creek. In marking the location of trees and shrubs to be planted, the Contractor should not place shrubs and light-requiring trees in the direct shadow of tall, densely crowned trees. The quantities, sizing, and spacing of trees and shrubs to be installed is shown on Figure 10 and in Table 6. All live woody plants shall be transported and stored in such a manner as to insure adequate protection against desiccation, wind damage, and other physical damage. Before planting, biodegradable pots shall be split, and non-biodegradable pots or burlap shall be removed. Excess soil shall be removed to expose the top of the first woody root. Encircling woody roots shall be mechanically loosened to decompact the root ball. To avoid girdling the trunk at the root crown, the Contractor will loosen and straighten roots that are growing in a circular manner around the root ball.

TABLE 6 WOODY PLANT LIST FOR ELK CREEK SCREENING

DECIDUOUS & CONIFEROUS TREES				
QTY	**Scientific Name**	**Common Name**	**Size**	**Spacing**
6	*Crataegus arnoldiana 'Homestead'*	Homestead Arnold Hawthorn	10# Cont.	14' o.c.
7	*Picea glauca 'Densata'*	Black Hills Spruce	10# Cont.	15' o.c.
DECIDUOUS SHRUBS				
QTY	**Scientific Name**	**Common Name**	**Size**	**Spacing**
5	*Cornus sericea 'Isanti'*	Isanti Red Osier Dogwood	5# Cont.	6' o.c.
5	*Corylus americana*	American Hazelnut	5# Cont.	6' o.c.
6	*Prunus americana*	American Plum	5# Cont.	6' o.c.

FIGURE 10 PROPOSED LANDSCAPING / SCREENING AREA PLANTING PLAN

Woody plants should be installed in holes that are twice as wide as the width of the root ball and as deep as the distance from the bottom of the root ball to the top of the first woody root. After checking to ensure the stem/trunk is vertical and the first woody root is even with ground level, the hole shall be backfilled to the top of the first woody root, with care taken to prevent air pockets in the soil and a final root position that could result in girdling of the trunk. All installed woody plants shall be well-watered before and after back-filling and protected with 2-4" of mulch, with care taken to keep mulch well away from the stem/trunk. Depending on the weather following installation, additional watering may be required to prevent desiccation.

Following installation of plant material within the Visual Screening Area, areas of disturbed soil shall be seeded with the Mesic Array Mix (Table 1) as described in Section 4.6. Broadcast application of seed is the expected installation method, so seeding rates may be increased to ensure germination and establishment. Cover crop shall be added to the native seed mix according to the schedule in Table 5. Areas of intact vegetation within the Visual Screening Area will remain undisturbed and no additional seed will be installed.

4.9 Pesticide Drift

During the establishment phase, Elk Creek will contact each owner of land surrounding the Site to inform them of the native plants planted pursuant to this Plan, the likely use of the vegetation by pollinators and the need to avoid and minimize pesticide drift from adjacent land on the Land Control Area. The installation of access roads on the periphery of the entire SEF will operate as a buffer from potential pesticide spraying adjacent to the Land Control Area.

5. VEGETATION MANAGEMENT

After the land is cleared, the panels are installed, and final site stabilization is in process, a range of invasive plants will take advantage of the open soil and abundant light and germinate across the Project Site. For the purpose of this Plan, "invasive plants" refers to both non-native species and native species that grow in an invasive manner or have the potential to negatively affect the

success of the Project (Tables 7 and 8). This list also includes noxious weed designated in statute by the State of Minnesota. These invasive plants must be managed effectively during the first three years to ensure that the planted native species are given the opportunity to flourish. The care taken in the first three years after installation strongly determines the quality of the resulting plantings. The initial period of work onsite is referred to as the "establishment phase", while management after that period is called the "perpetual maintenance phase".

5.1 Establishment Phase (Short Term Goals)

The first five years of vegetation management are a concerted effort to remove invasive vegetation from the Project Site while also helping the planted native vegetation establish. General tasks described below will be applied as directed, while other management techniques will be used only if required by the unique conditions at the Elk Creek facility.

5.1.1 General Tasks for Managing Vegetation

Establishment Year 1. The first year of establishment is focused on consistent invasive plant control on a site-wide basis. Mowing the grassland areas during the first year should prevent invasive plants from adding new seeds to the soil and begin to exhaust the soil seed bank (a process that often requires several years to complete). From June 1 of the first establishment year, site-wide mowing to a height of 6-9 inches shall occur whenever vegetation reaches a height of 18-24 inches. The landscaped / screening area shall be spot sprayed during the establishment phase to control invasive plants. Attempting to mow between the landscaping plants will likely be difficult and may lead to unanticipated damages to the new plants. Mowing in wet areas will also be limited to those periods of time when the wet areas are not susceptible to rutting or compaction (*i.e.* frozen or dry conditions). Spot-spraying, use of a swing arm, brush saws, weed whips or similar equipment may be used in wet areas as necessary to prevent soil damage when the soils are wet.

Monthly evaluations of the plantings shall be conducted by a botanist employed by the Contractor, during the growing season (May to September) to determine the appropriate treatment techniques to use and the timing of those treatments based on the presence and development stage of both invasive plants and the native plantings. Invasive species should be treated prior to such plants flowering or seeding, with the goal of preventing seed set by noxious and invasive species.

Repeated mowing may produce a buildup of organic thatch, which discourages the development and persistence of diverse native vegetation. To help prevent thatch buildup onsite, mowing shall be conducted with a flail-type mower to mulch the cut vegetation, or the Project Site shall be hayed so that cut vegetation is removed. A swing arm specifically designed for mowing under solar panels is recommended for cutting beneath panels, but spot-mowing with brush saws, weed whips, and similar equipment is also permitted. It may be possible to coordinate with Elk Creek to adjust the orientation of the panels to increase the ease of mowing, but the Contractor should not depend on this coordination to complete its work. Any other techniques must be approved by Elk Creek prior to the start of work. Mowing equipment shall be cleaned prior to use onsite to prevent the introduction and spread of invasive and non-native species. This mowing

regime will prevent annual and perennial weeds from flowering and setting seed, prevent weeds from shading out the solar panels, and help control woody plant growth onsite. Additionally, noxious and perennial weeds shall be treated by spot-herbicide treatment, as described below, to prevent roots from resprouting.

Establishment Year 2. The second year of establishment continues invasive plant control but generally employs more targeted techniques. Site-wide mowing to a height of 6-9 inches shall occur when vegetation height reaches 18-24 inches.

Spot-mowing may be employed to treat specific problem areas as needed. Noxious and perennial weeds shall be treated with spot-herbicide during the growing season, typically in late May/early June and late July/early August, with the focus on preventing seed set and achieving the required performance standards (described below).

The landscaped/screening area shall be spot sprayed during the establishment phase to control invasive plants. Attempting to mow between the landscaping plants will likely be difficult and may lead to unanticipated damages to the new plants. Mowing in wet areas will also be limited to those periods of time when the areas are not susceptible to rutting or compaction. Spot-spraying or use of brush saws, weed whips, or similar equipment may be employed in wet areas as necessary to prevent soil damage when the soils are wet.

Monthly evaluations of the plantings shall be conducted by a qualified botanist, during the growing season (May to September) to determine the appropriate treatment techniques to use and the timing of those treatments based on the presence and development stage of both invasive plants and the native plantings. Invasive species should be treated prior to such plants flowering or seeding, with the goal of preventing seed set by noxious and invasive species.

Establishment Years 3-5. In the third, fourth, and fifth years of the establishment phase, invasive plant control should consist of spot-herbicide treatment to control the remaining small patches of persistent weeds. Efforts should be focused on achieving the required performance standards (described below).

Site-wide mowing to a height of 6-9 inches shall occur when vegetation height reaches 18-24 inches. Spot-mowing should be employed as needed to prevent vegetation interference with energy generation and infrastructure. Additional onsite treatment with spot-mowing or hand weeding may be employed at the discretion of the Contractor.

5.1.2 Prescribed Treatment for Common Invasive Species

Every SEF will express a suite of invasive plant species determined by the makeup of the seed bank and the seed inputs from the surrounding environment, so management must be flexible and respond to the specific needs of the Project Site. This Plan describes common techniques to manage a variety of invasive plants and common weeds growing in Minnesota, but not every technique will be required. In the establishment period, monthly evaluations of the plantings shall be conducted by a botanist employed by the Contractor, during the growing season (May to September) to determine the appropriate treatment techniques to use and the timing of those

treatments based on the presence and development stage of both invasive plants and the native plantings. In any event, invasive species should be treated prior to such plants flowering or seeding. Management techniques for five categories of weeds are described below.

The Contractor will have the botanical expertise to correctly identify plant species and know the difference between species that must be removed, and similar native species being established.

5.1.2.1 Annual Weeds

Annual weeds include all unwanted species that grow for a single year, set seed, and die. Common annual weeds include grasses like barnyard grass (*Echinochloa crus-galli*), witchgrass (*Panicum capillare*), fall panicum (*P. dichotomiflorum*), and foxtails (*Setaria* spp.), and broadleaf weeds like lambsquarters (*Chenopodium* spp.), velvetleaf (*Abutilon theophrasti*), Pennsylvania smartweed (*Polygonum pensylvanicum*), and black nightshade (*Solanum nigrum*) (University of Minnesota, 2018).

The most important purpose and result of treating annual weeds is to prevent seed production. Beginning around June 1, the Project Site shall be mowed as described above to prevent annual weeds from flowering and setting seed. Repeated mowing, however, may produce a buildup of organic thatch, which discourages the development and persistence of diverse native vegetation by changing soil nutrient composition and keeping the soil cool. Thatch favors cool-season forage and turf grasses and many species of agricultural weeds. Use of a flail-type mower or raking, baling, and removing cut vegetation can reduce thatch build-up.

5.1.2.2 Minnesota Department of Agriculture Noxious Weeds

The Minnesota Department of Agriculture maintains a list of noxious weeds in the state which must be controlled (Table 7). All species of noxious weeds present at Elk Creek shall be treated by mowing, herbicide, or a combination of both methods, with the intention of preventing the weeds from setting seed or spreading by rhizomes, stolons, or other vegetative means.

TABLE 7 MINNESOTA PROHIBITED NOXIOUS & INVASIVE WEEDS

Eradicate. *All above- and below-ground parts of the plant must be destroyed.*	
Common Name	**Scientific Name**
Palmer amaranth	*Amaranthus palmeri*
Oriental bittersweet	*Celastrus orbiculatus*
Diffuse knapweed	*Centaurea diffusa*
Brown knapweed	*Centaurea jacea*
Yellow star thistle	*Centaurea solstitialis*
Meadow knapweed	*Centaurea x moncktonii*
Poison hemlock	*Conium maculatum*
Black swallow-wort	*Cynanchum louiseae*
Grecian foxglove	*Digitalis lanata*
Common teasel	*Dipsacus fullonum*
Cut-leaved teasel	*Dipsacus laciniatus*
Giant hogweed	*Heracleum mantegazzianum*
Japanese hops	*Humulus japonicus*
Dalmatian toadflax	*Linaria dalmatica*
Control. *Effort must be made to prevent the spread, maturation, and dispersal of any propagating parts.*	
Common Name	**Scientific Name**
Common barberry	*Berberis vulgaris*
Narrowleaf bittercress	*Cardamine impatiens*
Plumeless thistle	*Carduus acanthoides*
Spotted knapweed	*Centaurea stoebe*
Canada thistle	*Cirsium arvense*
Leafy spurge	*Euphorbia esula*
Purple loosestrife	*Lythrum salicaria*
Wild parsnip	*Pastinaca sativa*
Common tansy	*Tanacetum vulgare*

5.1.2.3 Perennial Weeds

Perennial weeds include all unwanted species that persist for two or more years after germination, from biennials to those that live for many years. Many of these weeds greatly diminish during the establishment phase with proper maintenance, but several require special attention due to their highly competitive behavior. These include grasses like Kentucky bluegrass (*Poa pratensis*), reed canary grass (*Phalaris arundinacea*), common reed (*Phragmites australis*), and several species of bromes, especially smooth brome (*Bromus inermis*). Broadleaf weeds in this category include sweet clovers

(*Melilotus alba, M. officinalis*), cow vetch (*Vicia cracca*), crown vetch (*Securigera varia*), birdsfoot trefoil (*Lotus corniculatus*), Canada thistle (*Cirsium arvense*), and spotted knapweed (*Centaurea stoebe*). A list of common Minnesota perennial weeds that colonize former cropland and compete with native vegetation (in addition to the listed noxious weeds) is provided in Table 8.

TABLE 8 ADDITIONAL PROBLEM WEEDS TO REMOVE

Plant Group & Priority	Common Name	Scientific Name
Top Priority Grasses to Remove	Smooth brome grass	*Bromus inermis*
	Reed canary grass	*Phalaris arundinacea*
	Giant reed	*Phragmites australis*
	Kentucky bluegrass	*Poa pratensis*
Top Priority Forbs to Remove	Garlic mustard	*Alliaria petiolata*
	Musk thistle	*Carduus nutans*
	Bull thistle	*Cirsium vulgare*
	Crown vetch	*Securigera varia*
	Birds-foot trefoil	*Lotus corniculatus*
	White sweet clover	*Melilotus alba*
	Yellow sweet clover	*Melilotus officinalis*
Second Priority Grasses to Remove	Amur silver grass	*Miscanthus sacchariflorus*
Second Priority Forbs to Remove	Creeping Charlie	*Glechoma hederacea*
	Butter and eggs	*Linaria vulgaris*
	Japanese knotweed	*Polygonum cuspidatum*
	Perennial sow thistle	*Sonchus arvensis*
	Cow vetch	*Vicia cracca*
	Hairy vetch	*Vicia villosa*
Any Tree, Shrub, or Vine Outside the Screening Plantings		

Mowing is important to prevent invasive (and otherwise non-desirable plants) seed production (as described above), but herbicide is generally required to prevent the spread of perennial weeds. Perennial grasses shall be treated by spot-spraying, as warranted, with glyphosate or comparably effective herbicide, or the aquatic formulation of the same if near open water. Perennial broadleaf weeds shall be treated by spot-spraying, as warranted, with glyphosate, triclopyr, aminopyralid, or comparably effective herbicides. All herbicides shall be applied by a licensed applicator, following instructions provided by the manufacturer.

5.1.2.4 Problematic Native Plants

Several native species that are present in the soil seed bank or enter the Project Site by seed rain from neighboring properties have the potential to interfere with the functioning of the solar panels. Giant ragweed (*Ambrosia trifida*) grows tall enough to shade the panels. Several native vines have the potential to overgrow installations, including wild grape (*Vitis riparia*), wild cucumber (*Echinocystis lobata*), bur cucumber (*Sicyos angulatus*), and Woodbine/Virginia creeper (*Parthenocissus* spp.). Giant ragweed, or any other native species shading the arrays, should be controlled by mowing (see above). If growing under or near the solar panels, wild cucumber and bur cucumber can be pulled and removed manually, but woody vines such as wild grape and Woodbine/Virginia creeper shall be cut to within one inch of the ground and the stump treated with glyphosate, triclopyr, or a comparable herbicide by a licensed applicator, following instructions provided by the manufacturer.

5.1.2.5 Woody Species

Almost all woody species on Project Site can shade or otherwise interfere with the operation of solar panels. During the establishment phase, all woody plants must be removed. This can be done by mowing, applying herbicide, or a combination of both methods. All woody plants over 0.5 inches DBH (diameter at breast height, about 4.5 feet) shall be cut to within 1 inch of the ground and the stump treated with triclopyr or a comparable herbicide by a licensed applicator, following instructions provided by the manufacturer. Cut brush shall be removed from the Project Site.

5.1.3 Herbicide Specifications

All herbicide treatments shall be restricted to those pesticides and methods of application approved by the Minnesota Department of Agriculture, MNDNR, and the U.S. Environmental Protection Agency. Spraying should be conducted by certified applicators holding all necessary permits and licenses. All herbicides shall be applied in accordance with the applicable regulations and the label requirements and in a safe and cautious manner to avoid damaging adjacent properties. Herbicide shall be applied selectively where applicable to avoid damaging existing native vegetation.

Approved pre-emergent herbicides include indaziflam (trade name Esplanade) and aminopyralid/metsulfuron-methyl (trade name Opensight) or equivalent. Additionally, pre-emergent formulations are recommended to include an adjuvant such as trade name Grounded or equivalent. Approved foliar herbicides include glyphosate (trade name Aquaneat), triclopyr (trade name Garlon), and aminopyralid (trade name Milestone) or equivalent. The Contractor shall submit a list of all herbicides to be used on the project to Elk Creek for written approval prior to the start of work.

Pre-emergent herbicides are recommended to be applied in the spring once the temperature is above 55˚F. Foliar herbicides shall be applied during the growing season as a control measure to prevent noxious weeds and invasive species from flowering or setting seed. The Contractor shall

have knowledge of the phenology of species to treat on site to conduct herbicide treatments at the appropriate time and shall submit a schedule of planned visits each year prior to May 1.

The landowner shall be contacted at least 14 days prior to any application of herbicide on their property. Apiaries known by Elk Creek to be present within three miles of the Project should be notified of any herbicide spraying at least 14 days prior to such application. The herbicide applicator must keep documentation of location and timing of herbicide use, weather conditions on site during application, type of herbicide used, volume of herbicide used, number of acres treated, and species of plants treated, and submit a copy of all herbicide records to Elk Creek to be included in an annual report.

5.1.4 Re-seeding Bare Soil

Generally large areas of bare soil, being those areas that may cause erosion concerns, or that allow for significant invasive or noxious weeds to establish, can be problematic to long term establishment of native vegetation. Large areas of bare soil provide opportunities for the common invasive species described above to colonize and spread. Bare soil also contributes to soil loss by sheet erosion and may prevent Elk Creek from discharging its Stormwater Pollution Prevention Plan ("SWPPP") permit in a timely fashion. If areas of bare soil greater than 100 square feet are found onsite, the Contractor shall remedy the issue at its own expense by re-seeding the area, using the seed mix previously installed and following the timing instructions laid out in Section 2 (Vegetation Installation Plan). If the seeding has not been successful at the bare soil area due to compaction, the area shall be decompacted, as provided in this Plan, prior to reseeding.

5.2 Maintenance Phase (Long-Term Goals)

Following the end of the Establishment Phase of vegetation management, yearly management is still required to promote and maintain the desired vegetation community, control the re-establishment and spread of invasive species, combat the establishment of undesirable and invading trees and shrubs, and reduce biomass/fuel load onsite. This yearly management may take the form of mowing, haying or grazing, depending on Elk Creek's preference, site feasibility and whether partnerships can be formed with local farmers or management vendors who can harvest and use hay from the facility or otherwise utilize sheep to maintain SEF vegetation. Regardless of the general maintenance practices, some degree of hand weeding, spot-mowing, and/or spot-herbicide treatment may be warranted thereafter to maintain vegetation quality and achieve the Project goals (see Section 6.3).

The landscaped/screening portion of the Project will be managed separately from the general haying, grazing or mowing areas. To keep invasive plants under control and ensure the full development of the vegetation screen, inspections should be made (see Section 6.2) to identify the presence of noxious weeds and invasive plant species, and those species shall be controlled using standard weed control techniques described in Section 4. Since at least 80 percent of the installed shrub and trees shall be present in the landscaping/screening area after the establishment period, the Contractor shall monitor for indications of stress and take action to increase the vigor of the planted trees and shrubs. This may include hand-mowing competing

herbaceous vegetation within the drip line of a stressed woody plant, replenishing mulch, and watering.

5.2.1 Mowing

In any portion of the Project that is not being managed by haying or grazing (as described below), annual mowing to a height of 6-9 inches shall occur each Spring, prior to the start of the growing season. No more than one-third of the Project Site shall be mowed in any year. Where feasible, mowed vegetation shall be raked, baled, and removed to prevent the buildup of organic thatch, which will discourage the development and persistence of diverse native vegetation. If vegetation removal is not achievable, mowing shall be conducted with a flail-type mower to finely chop plant material and accelerate decomposition.

5.2.2 Haying

Elk Creek may elect to use haying as a long-term management technique in a portion of the Project that is not otherwise occupied by the solar array. These areas are primarily located around the periphery of the facility (within the fence) and in areas that were utilized as laydown areas during construction. Annual haying to a height of 6-9 inches shall occur each September prior to prairie plants going dormant to maximize forage value of the hay crop.

5.2.3 Grazing

Elk Creek may decide to use grazing with sheep as a long-term vegetation management technique in portions of the Project occupied by the solar array or those areas surrounding the arrays. Well-managed grazing can restrict woody vegetation and non-native species encroachment into grasslands, prevent excessive litter accumulation, improve forage production, and accelerate decomposition and nutrient cycling. Should grazing be selected as a management technique for some or all of the Project Site, the following methodologies will be followed.

After the start of the third growing season after installation, vegetation management within the portion of the Project occupied by the array may be performed by grazing the Project Site with sheep. This management approach would allow the Project Site to remain in agricultural use while generating power. This approach would also prevent vegetation biomass from accumulating onsite over time; a thatch layer favors non-native over native plant species and poses a fire hazard in dry weather conditions. Grazing SEFs using livestock is a developing management approach; therefore, the instructions in this Plan should be considered a guide, and actual practices must adapt year-to-year to the specific vegetation conditions at the Project Site. This Plan describes the grazing methods to be used on a small unit of the overall portion of the Project occupied by the array. These specifications can be scaled appropriately to accommodate grazing in larger or smaller portions of the array depending on the availability of sheep and appropriate partners to conduct the grazing operations. Any area that is not grazed can be managed using mowing or haying management techniques as outlined above.

Grazing will be utilized if Elk Creek is able to identify and form a partnership with a local sheep farmer that is willing and able to utilize a portion of the Project Site for grazing in accordance

with this Plan. The chosen partner must be able to comply with Project Site security requirements and site management process outlined in this Plan. The partner must have sufficient insurance to cover any damages caused during grazing of the Project Site. The seed mix has been formulated to be utilized for sheep grazing and to also function well if sheep grazing is not utilized.

5.2.3.1 Site Setup for Grazing

If a grazing partner is identified to provide sheep grazing, portions of the Project Site will be managed with rotational grazing, wherein animals are moved periodically among the four paddocks within each grazing unit, with the aim of maintaining a vegetation height of 10-12 inches across the portions of the Project Site that are grazed. The area of the Project Site to be grazed will be divided into grazing units of approximately 16 acres each in preparation for grazing, although grazing unit size my change with input from the grazing partner. The number of grazing units utilized in any given year will be determined at the beginning of each growing season based on either the number of acres to be grazed and the number of sheep available for grazing. For best outcomes for pollinator species, it is recommended that no more than 50% of the available forage be removed by grazers. The preferred method for dividing the Project Site is poly-wire or net electric fencing with plastic step-in poles; the grazing operator shall consult with the Elk Creek before other options are installed. Sensitive areas will also be fenced off to avoid inadvertent disturbance. The electric fencing shall be grounded independently of the SEF infrastructure, with the grounding stakes at least 66 ft from the SEF's grounding systems. The grazing operator shall consult Gopher State One Call before siting the grounding stakes and take underground utilities and travel corridors into consideration when placing the grounding stakes. The energizing unit for the electric fence must be independent of the solar facility infrastructure. The energizer can run on 110 V electrical current or be charged from a battery. The grazing operator shall be responsible for any damage to the solar facility infrastructure due to improper setup or maintenance of the electric fence. Fencing for sheep will not be greater than 5 feet in height, which should not significantly impact wildlife movement.

The grazing rotation in each 16-acre grazing unit will be managed by dividing the unit into four four-acre paddocks (e.g., unit 1, paddocks A-D), which will be grazed over the course of one month. For the first week of the month, the sheep in each unit will graze Paddock A. For the second week, the sheep will graze Paddock B, and so on. This pattern will result in each paddock being grazed for one week and rested for three weeks each month. Grazing will continue for the entire growing season (approximately May 15 – September 15).

When sheep are grazing each unit, they will need to be provided with drinking water. The method of watering the flock will be left to the grazing operator, with approval from Elk Creek. A mobile watering trough, especially one that does not kill vegetation while it remains in place, is preferred. Moving the watering trough from paddock to paddock as the flock moves will reduce damage to the vegetation under the trough and prevent areas of dead vegetation from forming. Watering shall occur as near to the center of the

paddock as possible; water is an attractant, and a trough set too far to a paddock side or corner can lead to uneven grazing of the paddock.

5.2.3.2 Stocking Rate and Management

The number of sheep in a grazing unit at any time is the stocking rate. The standard way to describe the stocking rate, or grazing pressure, is animal unit month ("AUM"). One animal unit is 1,000 lbs. of livestock, and one AUM is 1,000 lbs. of livestock grazing for one month. AUM is usually calculated on a per acre basis, so the final unit for stocking rate is AUM/acre. Depending on the variety of sheep used, 1 animal unit is approximately six ewes. The Natural Resources Conservation Service recommends that stocking on solar energy facilities start at 0.5 AUM/acre (J. Duchene, personal communication, December 27, 2018). If grazing units are 16 acres each (as described previously), this would mean an initial stocking rate of about 50 sheep per unit. Each 16-acre grazing unit would start with 50 sheep grazing Paddock A for one week, then all 50 sheep will be moved to Paddock B for the second week, then Paddock C in the third week, then Paddock D in the fourth week, and then back to Paddock A to start the rotation over again. Since the Elk Creek Project is anticipated to cover approximately 1100 acres, grazing the entire site would require approximately 69 grazing units and 3450 sheep. The actual number of sheep utilized will depend on the amount of forage present and will be adjusted by the grazing partner throughout the growing season.

The grazing partner shall be responsible for monitoring the response of the vegetation to grazing. The management goal is to have an average vegetation height of 10-12 inches when the sheep are first moved into a paddock and remove the sheep when the vegetation is an average of 6-8 inches. If grazing does not achieve the desired vegetation height and is shading the arrays, the Contractor shall immediately contact Elk Creek and be responsible for mowing the paddock to a uniform height of 4-6 inches. The Contractor shall determine with Elk Creek a change in stocking rate to improve the effect of grazing in the future. The grazing partner shall have access to additional livestock in case the stocking rate needs to be increased to achieve the vegetation management goal. Should the entire site be found to have met the vegetation height and forage removal, the sheep will be relocated offsite until grazing management is once again necessary.

If maintenance by grazing is no longer feasible or desired, vegetation height can be managed by mowing as outlined in Section 5.2.1 of this Plan.

6. MONITORING AND ADAPTIVE MANAGEMENT

6.1 Monitoring Team

An independent third-party inspector (Monitor), qualified to conduct native plant inspections and assessments, retained by Elk Creek shall conduct monitoring activities under this Plan. The independent third-party inspector shall be selected by Elk Creek prior to seed bed preparation activities outlined in this Plan. This Plan shall be updated with the name and contact information for the third-party inspector upon selection.

6.2 Monitoring Protocol

Vegetation monitoring at Elk Creek shall occur three times per year during the establishment phase (Years 1-5) and annually thereafter over the lifetime of the Project. During the establishment phase, inspections shall occur three times in the growing season to accurately document the presence of installed native species: late May/early June, mid-July, and late August/early September. After the establishment phase has concluded, inspections shall occur once per year, in mid-July. Once every five years during the management phase, inspections shall occur three times during the year, on the same schedule as the establishment phase, to record the continued presence of native species across the growing season.

The monitoring protocol shall include both microplots and a meander survey. Microplots provide accurate data for the Project Site but cover a small area. Vegetation can be patchy due to microtopography and other factors, so scattered microplots have the potential to miss species assemblages or new invasive species populations. For this reason, a meander survey shall also be conducted to provide a broad assessment of vegetation across the Project Site.

Microplot surveys shall be conducted during each inspection in the establishment phase. During the management phase, surveys should be undertaken at a time when spring- and fall-blooming species can be identified, usually July; the Monitor should assess the best timing for microplot surveys based on the advancement of the growing season. 50 microplots of 1m x 1m each shall be distributed at locations that represent conditions across the Project Site. For instance, lowland and upland areas should be sampled in proportion to their acreage. Microplots will be first selected using available maps and air photos, with the final location selected in the field on the day of sampling to represent the general area of the microplot. Before entering the field, the Monitor will provide Elk Creek with a map of the general locations of the 50 microplots. In each microplot all plant species present shall be recorded and assessed using a 1-10 scale (1 = ≤10%, 2 = >10% but ≤20%, etc.), based on the percent cover of the species in the microplot. The total percentage of vegetative cover and bare ground will also be recorded.

While traversing the site from microplot to microplot, the Monitor will follow a meandering path, recording all plants species seen. Upon completing the meander survey, each plant species recorded will be assessed on a 1-4 scale (1 = ≤10%, 2 = >10% but ≤30%, 3 = >30% but ≤50%, 4 = >50%) based on the percent cover of the species across the entire site along the meander path.

After each survey event, the percent cover of native and noxious plant species in microplots and along the meander survey, the total native and invasive vegetation cover and the total native species richness will be entered in an Excel spreadsheet. Each survey event's data will be compared to past survey event data to detect positive, negative, or neutral trends. A positive trend would be decreasing cover by invasive plants and increasing cover by native plants from one survey event to the next.

Each monitoring visit shall also conduct a hazard assessment. While on site and during the meander survey, the Monitor shall record the location of noxious weeds/invasive species, adventive trees/shrubs, large areas of bare soil, areas of significant erosion, and damage to the vegetative screening area. Any observed significant erosion or damage to the vegetative

screening area should be reported to the Owner immediately. The remaining hazards will be compiled in an annual report (see Section 6.4). Hazard assessments should also be conducted by the Contractor any time they are on site performing vegetation management. The Contractor hazard assessments should be submitted to the Monitor for review and inclusion in the annual report.

6.3 Targets and Projected Outcomes

Vegetation management should result in a diverse plant community dominated by native species, as envisioned in the planting plans. Permits and regulations impose additional requirements on the final quality and performance of native plantings.

6.3.1 Native Vegetation Targets

As noted in the short- and long-term goals, by the end of the first growing season of the vegetation establishment phase, at least 80 percent of the Project Site shall be vegetated. In order to discharge the SWPPP permit for the Project Site, at least 70 percent of the Project Site must be covered with uniform perennial vegetation; the contractor shall endeavor to achieve this by the end of the first growing season and must achieve this in the second growing season. By the end of the vegetation establishment phase (approximately 36-60 months after vegetation installation), at least 95 percent of the Project Site shall be vegetated, and at least 90 percent of the cover shall be comprised of native species. Six or more species of planted native graminoids and 12 or more species of planted native forbs shall be well-established across the Project Site. In the visual screening area, woody plant survival at the end of the establishment phase shall be at least 80%.

6.3.2 Noxious Weeds and Problem Plants

All Minnesota prohibited noxious weeds and other problem plants (Tables 7 and 8) shall be treated repeatedly with herbicide and mowed where appropriate at a frequency sufficient to prevent seed set and remove target weeds over time. Each treatment shall show evidence of at least 90 percent of the target vegetation having been affected by herbicide or removed. Two weeks after treatment, at least 95 percent of all herbicide-treated plants shall be dead or dying within any 100 square foot area.

By the end of the vegetation establishment phase (approximately 36-60 months after vegetation installation), all prohibited noxious and other problem plants shall not exceed 5 percent areal cover within any 100 square foot area across the Project Site. This will be determined as a portion of the annual report prepared for the Project, based on the observations made during the site walk inspection.

Although they are small narrow strips at the top of a subwatershed, areas seeded with the Wet Mix or the transitional Wet-mesic Mix will be susceptible to invasion by reed canary grass. As part of an adaptive management approach, regular monitoring may detect persistence of or gradual increase in reed canary grass over time, despite active invasive species management activities. Should this occur, the Owner may choose to discontinue managing areas where reed

canary grass cannot be effectively controlled. Reed canary grass control will, however, continue in areas seeded with the Mesic Array or Mesic Pollinator Mix.

6.4 Reporting

An independent third-party inspector, qualified to conduct native plant inspections and assessments and retained by Elk Creek shall prepare a report documenting the status of the established vegetation and hazards encountered during such year (i.e., a report every year for years 1-5 and a report for every fifth year thereafter). The report shall include the results of inspection and monitoring activities during the prior year and shall report how the vegetation on the Project Site has achieved or is achieving the goals and objectives set forth in this Plan. The report shall be submitted by February 1 of the following year in order to provide sufficient time to review the recommended actions for the upcoming growing season.

In addition to the above report content requirements, the reports shall also include descriptions of adaptive management actions to be completed in the upcoming year to meet management objections and management challenges encountered during the reporting period. These recommended actions may include, but are not limited to, mowing, spot-mowing, targeted herbicide application, or overseeding bare soil.

6.5 Adaptive Management

Every year during years 1-5 and every fifth year thereafter, a third-party independent monitor retained by Elk Creek will produce a report summarizing the status of the vegetation established on site and identifying hazards encountered during the reporting period. This report will address any areas of noncompliance and plan targeted remediation efforts for the upcoming reporting period, including altering the timing or extent of mowing or herbicide application, adjusting the rate or formulation of herbicide applied, or conducting targeted overseeding of appropriate seed mixes. The report will also record the presence and location of any noxious or invasive weeds to be treated, which will both guide the Contractor and document changes in the vegetation establishment and management approach over time. This protocol will ensure that timely management activities reflect reporting from the previous reporting period and address small issues before they become more serious or extensive.

6.6 Project Administration

Administrative responsibilities under this Plan will be undertaken by the following individuals and companies. Contact information for each person and entity will be updated prior to initiation of this Plan and will be revised as necessary. The Field Representative for Elk Creek has primary responsibility for the activities associated with this Plan. All communications associated with this Plan should be directed to the Field Representative. The third-party independent inspector is solely serving the role of an independent monitor and reporter under this Plan and has no authority to direct the work of the Contractor or any others working on the Project. Any issues or concerns noted by the third-party inspector should be directed to the Field Representative and the Contractor.

6.7 Construction Plan Specifications.

Detailed civil construction plans will be provided to the Contractor prior to the start of construction.

7. REFERENCES

Duchene, J. 2018. Natural Resources Conservation Service, Pelham, MN. Personal communication.

Guidance for Developing a Vegetation Establishment and Management Plan for Solar Facilities (https://mn.gov/eera/web/project-file/11702/. March 2021).

Minnesota Department of Agriculture. 2018. Minnesota Noxious Weed List. Accessed September 2018 at https://www.mda.state.mn.us/plants-insects/minnesota-noxious-weed-list

Minnesota Department of Natural Resources. Revised June 2018. Prairie Establishment & Maintenance Technical Guidance for Solar Projects. Accessed April 2019 at https://files.dnr.state.mn.us/publications/ewr/prairie_solar_tech_guidance.pdf

University of Minnesota. 2018. Common annual weeds. Accessed September 2018 at https://extension.umn.edu/weed-management/weed-identification

REVISION LOG

Date	Editor	Content
2019-08-05	Melissa Schmit, NG Renewables	Revised mowing text, added possible review of seed mixes for haying
2019-08-06	Benjamin Staehlin, AES	Added revision log
2019-08-12	B. Staehlin & Kim Chapman, AES	Modified timing of mowing; added text for haying option
2021-01-21	J. Duehr, Fredrikson & Byron	Updated plan to align with draft VMP guidance from EERA and Dept. of Ag.
2021-02-05	B. Staehlin, AES	Updated plan to align with draft VMP guidance from EERA and Dept. of Ag.
2021-04-29	B. Staehlin & K. Chapman, RES	Updated plan with DNR feedback
2023-04-28	B. Staehlin & M. Lopez, RES	Updated plan with new project boundary/layout

Appendix E

Draft Decommissioning Plan

DECOMMISSIONING REPORT FOR

Elk Creek Solar Project

Rock County, Minnesota

May 24, 2023

MPUC Docket No. IP-7009/GS-19-495

Prepared For:
Elk Creek Solar, LLC

Prepared By:
Westwood

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Date Updated	eDockets Link for Previous Version

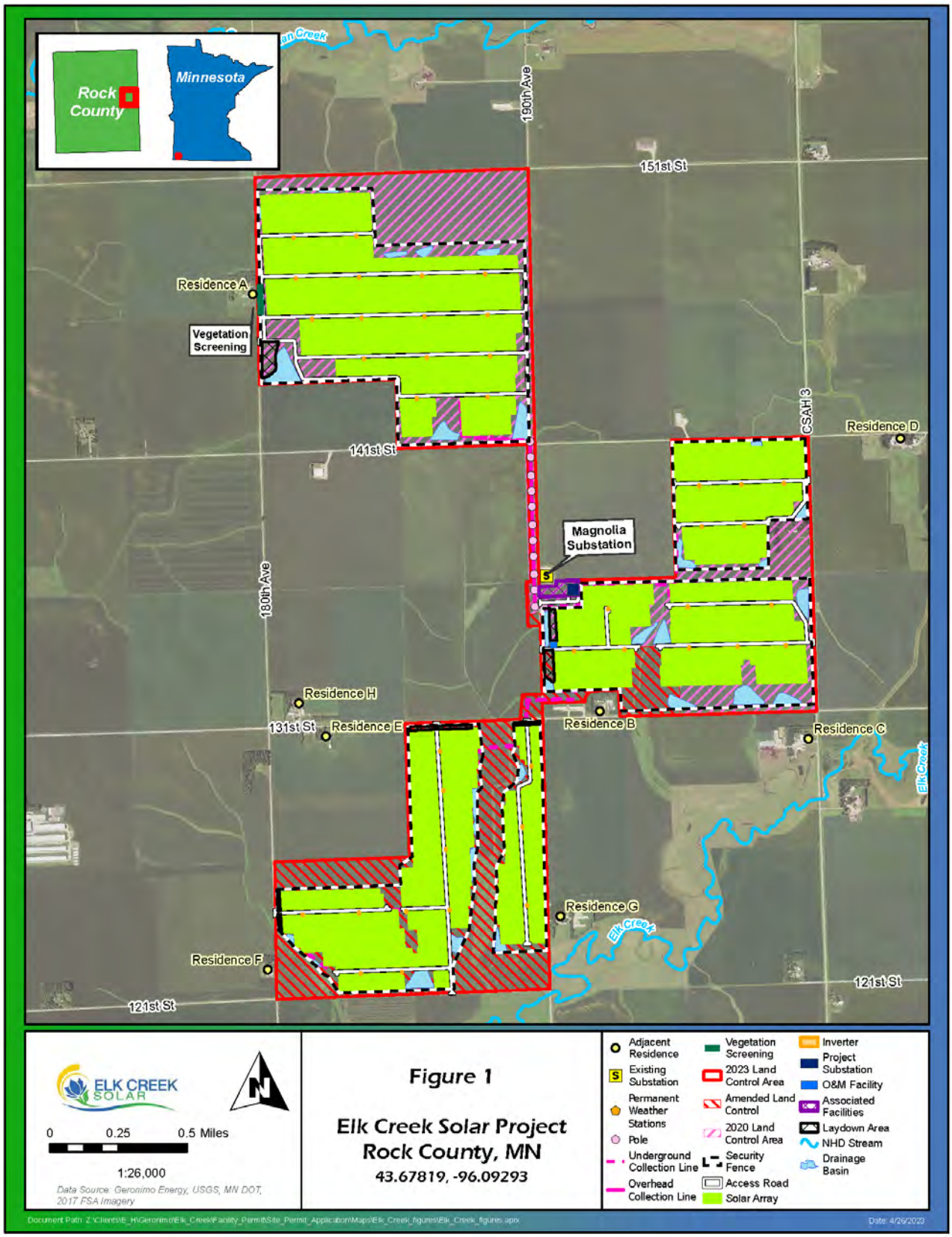
1.0 Introduction

Elk Creek Solar, LLC (Elk Creek) is developing the Elk Creek Solar Project (Project), an up to 160 MW solar photovoltaic (PV) facility located in eastern Rock County, Minnesota. The Project is located in Sections 27, 34, and 35, Township 103 North, Range 44 West, and Section 3, Township 102 North, Range 44 West, Rock County, Minnesota (Figure 1). The site permit for the Project was issued on **[To be added after Site Permit issuance]** under Docket No. IP-7009/GS-19-495.

The Project is in a rural area in Vienna and Magnolia Townships, approximately 0.7 mile north of Magnolia and 4.0 miles east of Luverne. Residences are scattered throughout the rural area where land use is dominated by agricultural fields, predominately corn planted in row crops. Other than County State Aid Highway (CSAH) 3, which forms the eastern boundary of the Project, roads that surround the Project are local county or township roads. The Project is bordered on the north by 151st Street, bordered on the south by 121st Street, and bisected by 131st and 141st Streets. To the east and west, the Project is bordered by 180th Avenue on the west, CSAH 3 on the east, and bisected by 190th Avenue. The Magnolia Substation is immediately adjacent to the central solar array unit with two transmission lines at least partially within the central unit, as well. The Project is located on relatively flat fields conducive to solar development.

The Project facilities will cover approximately 1,161 acres of the 1,522-acre area where Elk Creek has secured lease agreements for the Project (i.e., site control). There are approximately 360 acres for which Elk Creek has site control that are currently not contemplated for occupation by solar facilities; this area is currently under lease with the underlying landowner but will be excluded from the area leased by Elk Creek during operation of the Project. The underlying landowners can then continue to farm the area released from the lease for the life of the Project, estimated to be 30 years. The Project will interconnect into the Magnolia Substation, which is adjacent to central unit of the Project.

Project facilities will be sited within northern, central, and southern units that will be fenced during operation of the facility; the three units collectively total 1,161 acres. Project facilities will include 438,492 solar panels covering approximately 273 acres, 11.1 miles of gravel access roads, 13.9 miles of buried or hybrid aboveground/underground electrical collection line, 40 inverters, a 0.4-acre Operations and Maintenance (O&M) Building, 1.2-acre Project Substation, 28 stormwater basins (approximately 44.2 acres), and a 250-foot 161 kilovolt (kV) gen-tie line to connect the Project substation to the Magnolia Substation.


Rock County
Minnesota
190th Ave
151st St
Residence A
Vegetation Screening
141st St
CSAH 3
Residence D
Magnolia Substation
180th Ave
Residence H
131st St
Residence E
Residence B
Residence C
Elk Creek
Residence G
Residence F
121st St
121st St
ELK CREEK SOLAR
0 0.25 0.5 Miles
1:26,000
Data Source: Geronimo Energy, USGS, MN DOT, 2017 FSA Imagery
Figure 1
Elk Creek Solar Project
Rock County, MN
43.67819, -96.09293
Adjacent Residence
Existing Substation
Permanent Weather Stations
Pole
Underground Collection Line
Overhead Collection Line
Vegetation Screening
2023 Land Control Area
Amended Land Control
2020 Land Control Area
Security Fence
Access Road
Solar Array
Inverter
Project Substation
O&M Facility
Associated Facilities
Laydown Area
NHD Stream
Drainage Basin
Document Path: Z:\Clients\E_H\Geronimo\Elk_Creek\Facility_Permit\Site_Permit_Application\Maps\Elk_Creek_figures\Elk_Creek_figures.aprx
Date: 4/26/2023

The solar arrays within each unit will utilize PV panels with tempered glass, approximately 4 to 7 feet long by 2 to 4 feet wide, and 1 to 2 inches thick. The panels will be installed in a north to south orientation, on a tracking rack system that utilizes galvanized steel and aluminum foundations and frame with a motor that allows the racking to rotate from east to west throughout the day. Electrical wiring will connect the panels to inverters, which will convert the power from DC to AC. The AC will be stepped up through a transformer from the inverter output voltage to 34.5 kV and brought via the collection cables to the Project substation. The electrical collection system will be installed underground or a hybrid of underground and above-ground. For both options, the AC collection line that travels along 190th Avenue to connect the northern unit to the Project substation in the central unit may be installed either underground or above-ground, depending on final engineering design.

The Project's anticipated commercial operation date (COD) is Q4 2025. Elk Creek, an independent power producer (IPP), is actively marketing the Project to a number of potential off-takers and may sell the power in the form of a Power Purchase Agreement (PPA), or the Project could be owned directly by a utility.

The information in this Decommissioning Plan (Plan) is intended to ensure that Project facilities are properly removed and/or repurposed after their useful life. The Plan outline protocols for:

- removal of all structures, underground cables, above-ground cables, and foundations;
- restoration of underlying soil and vegetation; and
- a plan ensuring financial resources will be available to fully decommission the Project site according to the conditions described in the Minnesota Department of Commerce (DOC) Energy Environmental Review and Analysis (EERA) Recommendations on Review of Solar and Wind Decommissioning Plans, and in accordance with Section 9 of the Minnesota Public Utilities Commission (MPUC) Site Permit (MPUC Docket No. IP-7009/GS-19-495).

The Contractors will comply with requirements of all permits during the decommissioning process, and the land will be restored to its pre- construction condition to the extent practicable. A list of anticipated permit requirements is provided in Section 3.5.

2.0 Decommissioning and Reclamation Objective

Solar panels are expected to have a useful commercial lifespan of approximately 35 years. Project facilities must be decommissioned if: a) facilities reach the end of their serviceable life; or b) use of the facility is discontinued. The Site Permit issued by the Commission will be for a term of 30 years, at which point the Project's operational life may be extended (with Commission review and approval) or the Project may

cease to operate. When the Project ceases to operation, Elk Creek will be responsible for removal of all aboveground and underground equipment within the Project facility. Elk Creek will restore and reclaim the site to pre-construction topography and topsoil quality to the extent practical and assumes that most of the site will be returned to agricultural use after decommissioning.

Decommissioning includes removing the solar panels, solar panel racking, steel foundation posts and beams, inverters, transformers, overhead and shallow underground cables and lines, equipment pads and foundations, equipment cabinets, and ancillary equipment. The civil facilities, access road, security fence, and drainage structures and sedimentation basins are included in the decommissioning scope. Standard decommissioning practices would be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements.

After all equipment is removed, any holes or voids created by poles, concrete pads and other equipment will be filled in with native soil to the surrounding grade and the site will be restored to pre-construction conditions, to the extent feasible. All access roads and other areas compacted by equipment will be de-compacted to a depth necessary to ensure drainage of the soil and root penetration prior to fine grading and tilling to a farmable condition or maintaining the existing vegetation. In accordance with Site Permit requirements, the Project will have been maintained with perennial native vegetation which is expected to survive decommissioning activities. Consequently, efforts to restore the site under the arrays, if the land is not returned to row crop agriculture, is expected to be limited to over-seeding. Over-seeding would be completed by a qualified native seeding contractor. Restoration efforts may also include temporary seeding as farmland or re-development of the land for other beneficial uses, based on consultation with the landowner.

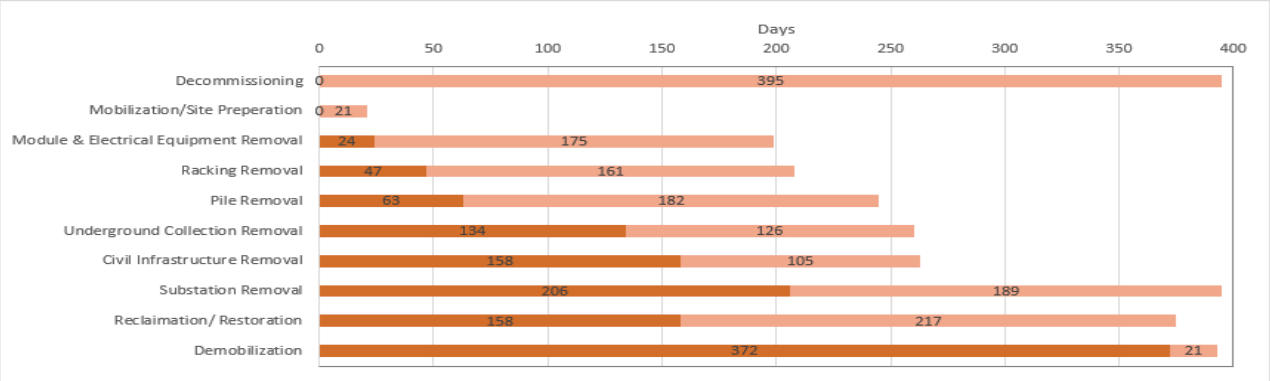
3.0 List of Decommissioning Activities

3.1 Timeline

Decommissioning is estimated to take approximately 13 months to complete. This timeline is based on the assumption that the removal of the modules, racking system, and pile foundations will take approximately the same duration to remove them as it did to install them. Approximately three (3) weeks are needed for site mobilization and demobilization for decommissioning. It is also assumed that no decommissioning work will be performed during the winter months or during times of inclement weather (high winds, heavy rains).

The estimated Project schedule, shown below, is an estimated timeline of the decommissioning activities. This schedule is subject to change based on actual field conditions, weather conditions, and any unforeseen conditions.

Estimated Project Schedule



**Some tasks may be completed concurrently depending upon scheduling and methods of the contractor.*
***Schedule shows duration total in calendar days and is subject to delays/changes based on weather conditions, winter and unforeseen conditions.*

The decommissioning crew(s) will ensure that all equipment and materials are recycled or disposed of properly.

3.2 Notice to Parties

Within ninety (90) days of the start of the decommissioning, a notice will be sent to landowners and local units of government. Permits will be obtained prior to the start of any work (refer to Section 3.4).

3.3 Removal and Disposal of Project Components

Details regarding the removal and disposal of the site components are found below. Typical construction equipment to be used during decommissioning will include, but is not limited to, truck-mounted cranes, loaders, bulldozers, dump trucks, and decompaction equipment.

Modules: Modules will be inspected for physical damage, tested for functionality, and disconnected and removed from racking. Functioning modules will be packed and shipped to an offsite facility for reuse or resale. Non-functioning modules will be packed, palletized and shipped to the manufacturer or a third party for recycling or disposal.

Racking: Racking and racking components will be disassembled and removed from the steel foundation posts, processed to appropriate size, and shipped to a metal recycling facility.

Steel Foundation Posts: All structural foundation steel posts will be pulled out to full depth, removed, processed to appropriate size, and shipped to a metal recycling facility. The posts can be removed using back hoes or similar equipment. During decommissioning, the area around the foundation posts may be compacted by equipment and, if compacted, the area will be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent to promote plant growth.

Aboveground and Underground Cables and Lines (Including Project Gen-Tie): All underground cables and conduits will be removed to a depth of 48 inches as specified in the lease agreements. Facilities deeper than 48 inches may remain in place to limit vegetation and surface disturbance. Topsoil will be segregated and stockpiled for later use prior to any excavation and the subsurface soils will be staged next to the excavation. The subgrade will be compacted to a density similar to the surrounding soils to promote plant growth and maintain drainage. Topsoil will be redistributed across the disturbed area.

Aboveground collection and gen-tie lines will be removed from the project and taken to a recycling facility. The poles will be felled within the Project site and any hardware, bracing, attachments will be transported along with the poles to a recycling facility. Removed pole locations will be revegetated with a seed mix specified in the approved Stormwater Pollution Prevention Plan (SWPPP) and Vegetation Management Plan (VMP).

Inverters, Transformers, and Ancillary Equipment: All electrical equipment will be disconnected and disassembled. All parts will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Elk Creek's sole discretion, consistent with applicable regulations and industry standards.

Substation: To disconnect the Project from the grid, the switchyard will isolate the substation from the grid before dismantling the system. During this period, customers will experience short outages when the Magnolia Substation is shut down and temporary service is being established. The timing and duration of any service interruptions would be determined and communicated by the interconnecting utility (ITC Midwest).

The final disposition of the substation is unknown and will occur at the utility's discretion. ITC Midwest may decide to leave the substation for future use. If the utility decides to not keep the substation, the system will be decommissioned. Electrical collection substation decommissioning requires deconstruction of the control house/switchgear, main power transformers, breakers, bus work, ground grid, steel supports, foundations, and yard rock base, as well as reclamation of the substation site.

Additionally, any permanent stormwater treatment facilities will be removed. Topsoil will be reapplied to match surrounding grade and maintain existing drainage patterns. The topsoil will be de-compacted to a minimum depth of 12 inches and tilled to a farmable condition or re-vegetated depending upon the location and land use at the time of decommissioning.

Much of the equipment is recycled, the main power transformers sold for refurbishing and re-use, and the remaining materials disposed of in a landfill. The substation's steel, copper ground grid, aluminum bus, and copper wire can be salvaged for scrap metal recycling. The typical transformer of this magnitude has a 40-year lifespan. All substation materials will be removed from the site via semi-trucks.

O&M Building: The O&M building will not be removed as part of the decommissioning of the Project as it can be repurposed for farm operations or other rural agri-business/light industrial/logistical uses. The Project will likely sell the O&M building and facility to a landowner or independent third party so that it can be utilized for another purpose.

Equipment Foundation and Ancillary Foundations: The ancillary foundations for Elk Creek Solar are pile foundations for both equipment skids and met stations. As described for the solar array steel foundation posts, the foundation piles will be pulled out completely. Duct banks will be excavated to a depth of at least 48 inches. All unexcavated areas compacted by equipment used for decommissioning will be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density similar to the surrounding soils. All materials will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Elk Creek's sole discretion, consistent with applicable regulations and industry standards.

Fence: All fence parts and foundations will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Elk Creek's sole discretion, consistent with applicable regulations and industry standards. Fence posts can be pulled out using skid-steer loaders or other light equipment. The surrounding areas will be restored to pre-Project conditions to extent feasible.

Access Roads: Facility access roads will be used for decommissioning purposes, after which removal of roads will be discussed with the landowner.

1) After final clean-up, roads may be left intact through mutual agreement of the landowner and Elk Creek, unless otherwise restricted by federal, state, or local regulations.

2) If a road is removed, aggregate will be excavated and loaded in dump trucks using front loaders, back hoes or other suitable excavation equipment, and shipped from the site to be reused, sold, or disposed of appropriately, at Elk Creek's sole discretion, consistent with applicable regulations and industry standards. Clean aggregate can often be used as "daily cover" at landfills for no disposal cost. Another disposal option is to provide the aggregate to local landowners as clean fill. All internal service roads are constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. Any ditch crossing connecting access road to public roads will be removed unless the landowner requests it remain. The subgrade will be de-compacted using a chisel plow or other appropriate subsoiling equipment. All large rocks will be removed. Topsoil that was stockpiled during the original construction will be distributed across the road corridor.

3.4 Restoration/Reclamation of Site

Elk Creek will restore and reclaim the site to the pre-Project condition consistent with the site lease agreement. Elk Creek assumes that most of the site will be returned to farmland and/or pasture after decommissioning and will implement appropriate measures to facilitate such uses. If no specific use is identified, Elk Creek will plant unvegetated portions of the site with a seed mix specified in the approved VMP. The goal of restoration will be to restore pre-construction land uses and plant communities to the greatest extent practicable while minimizing new disturbance and removal of vegetation established during operation of the facility. The decommissioning effort will implement best management practices (BMPs) outlined in the Project SWPPP to minimize erosion and to contain sediment on the Project site to the extent practicable. BMPs that will support these goals include:

1) Minimize new disturbance and removal of vegetation established during operation of the facility to the greatest extent practicable.
2) Removal of solar equipment and all access roads up to a minimum depth of 48", backfill with subgrade material, and cover with suitable topsoil to allow adequate root penetration for plants, and so that subsurface structures do not substantially disrupt groundwater movements.
3) Any topsoil that is removed from the surface for decommissioning will be stockpiled to be reused when restoring plant communities or agricultural land. Once decommissioning activity is complete, topsoil will be re-spread to assist in establishing and maintaining plant communities.
4) Stabilize soils and return them to agricultural or other use according to landowner discretion.
5) During and after decommissioning activities, install erosion and sediment control measures, such as silt fences, bio-rolls, and ditch checks in all disturbance areas where potential for erosion and

sediment transport exists, consistent with storm water management objectives and requirements.

6) Remediate any petroleum product leaks and chemical releases from equipment operation and electrical transformers prior to completion of decommissioning.

Decommissioning and restoration activities will be completed within 13 months after the solar energy farm ceases operation.

3.5 Permitting and Post-Restoration Monitoring

It is anticipated that the following permits may be needed prior to or during decommissioning:

- U.S. Army Corps of Engineers (USACE): Section 404 Permit
- U.S. Environmental Protection Agency (EPA): Spill Prevention, Control, and Countermeasures Plan (SPCC)
- Minnesota Pollution Control Agency (MPCA): Section 401 Water Quality Certification
- MPCA: National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) and SWPPP
- Minnesota Wetland Conservation Act Approval or No Loss Determination
- County work in right-of-way, utility, and moving permits

Decommissioning of the site will comply with permits listed above if grading activities are necessary and/or exceed permit thresholds. Elk Creek will coordinate with applicable agencies and regulatory staff to acquire needed permits prior to initiating decommissioning activities as well as notifying and coordinating with local governments and landowners. Decommissioning may include post-restoration monitoring as required by the NPDES/SDS CSW Permit and SWPPP, Agricultural Impact Mitigation Plan, VMP and other applicable requirements. In addition, Elk Creek's Field Representative assigned to decommissioning monitoring will stay in contact with the landowner, including onsite check-ins until the NPDES/ SDS CSW permit is closed.

4.0 Financial Assurance Plan

Elk Creek will be financially responsible for decommissioning the Project, which will include removal of all equipment, improvements, and facilities. The original decommissioning plan approved by the Commission will be updated and reviewed by a Professional Engineer licensed in the State of Minnesota every five years from the start of operation to account for uncertainties in future salvage values, and decommissioning costs.

Consistent with the Solar and Wind Decommissioning Working Group recommendation, the financial assurance will begin in year 10 and the surety will provide for full decommissioning costs prior to the expiration of any PPA. During the 10th year of operation, Elk Creek will enter into a surety bond agreement, create an escrow account, create a reserve fund, or provide another form of security that will ultimately fund decommissioning and site restoration costs after Project operations cease, to the extent that the salvage value does not cover decommissioning costs. Elk Creek will decommission the Project in accordance with the conditions outlined in the MPUC Site Permit. Elk Creek will notify the appropriate landowners and local governing bodies of the decommissioning schedule and has included an obligation to decommission the Project components in applicable real estate agreements.

5.0 Estimated Net Decommissioning Costs

The decommissioning costs are calculated using current pricing. In keeping with the EERA requirements, the estimate of net costs should be updated every 5 years and when ownership changes to recognize price trends for both decommissioning costs and the salvage and resale values of the components. The cost estimate uses current pricing for removal of components based on five years of degradation and depreciation of the solar modules. Subsequent revisions to the decommissioning plan and cost estimate may be required based on changes in construction techniques and technology and changing material scrap or resale values.

To estimate the Project's decommissioning costs and salvage revenues, Westwood utilized cost data from RS Means to obtain an industry-standard, April 2023 Midwest Costs Price for scrap metals, landfills, salvage yards, and recycling facilities in 563 Rock County, MN, a proxy for the Project area. The salvage revenue in the decommissioning cost estimate is based upon the scrap value of salvaged materials including material salvaged from the solar array, inverter, transformers, and other equipment rather than the sale and reuse of the equipment. Future salvage revenue from resale or reuse of all array equipment is an unknown. The estimated decommissioning costs and salvage revenues are expressed in present-day dollars and do not account for inflation or other future changes in costs or salvage values. For the purposes of the estimate, scrap values were obtained from www.scrapmonster.com on April 14, 2023.

The cost estimate for decommissioning the Project is provided in Section 5.1. For additional detail on the assumptions made see Section 5.2.

5.1 Cost Estimate

The estimated cost to decommission the Project and restore the Project site is $6,249,486 in present-day dollars. This total was determined by subtracting the estimated salvage revenue of $18,820,951 from the estimated decommissioning and site restoration cost of $25,070,437. Division of this estimated cost by the anticipated 160 megawatts ("MW") in the project results in a decommissioning cost of approximately $39,059 per MW.

Decommissioning Activities	Decommissioning Costs	Salvage Value	Estimated Decommissioning Cost	Estimated Cost/MW
Mobilization/ Demobilization/ Permitting	$1,413,000	$0	$1,413,000	$8,831
PV Site - Civil Infrastructure	$1,373,910	$77,114	$1,296,796	$8,105
PV Site - Structural Infrastructure	$2,345,312	$2,494,208	-$148,897	-$931
PV Site - Electrical Collection System	$10,056,217	$16,201,699	-$6,145,482	-$38,409
PV Site – Restoration	$5,371,526	$0	$5,371,526	$33,572
Substation – Transformer Removal	$123,277	$39,980	$83,297	$521
Substation – Demolition/Disposal of Substation Site Improvement Materials	$23,750	$1,750	$22,000	$138
Substation - Site Gravel Removal and Site Restoration	$111,600	$6,200	$105,400	$659
Project Management	$634,375	$0	$634,375	$3,965
Construction Totals	**$21,452,967**	**$18,820,951**	**$2,632,016**	$16,450
Contingency	$3,005,995	$0	$3,005,995	$18,787
County Administration Costs	$611,474	$0	$611,474	$3,822
Totals	**$25,070,437**	**$18,820,951**	**$6,249,486**	$39,059

*Based upon a preliminary project design of 40 power blocks.

The resale and salvage values are necessary for Elk Creek to account for the long-term assets and liabilities, and value as a going concern. Under EERA recommendations a financial assurance is not required during the first ten (10) years of operation. A bond will be posted no earlier than the 10th anniversary from the date of Operation with the County. The cost of decommissioning will be updated every five years after the tenth year of operation in accordance with the EERA recommendations.

5.2 Decommissioning Assumptions

To develop a cost estimate for the decommissioning of the Elk Creek Solar Project, Westwood engineers made the assumptions and used the pricing references provided below. Costs were estimated based on

current pricing, technology, and regulatory requirements. The assumptions are listed in order from top to bottom of the estimate spreadsheet. When publicly available bid prices or Minnesota Department of Transportation (MnDOT) bid summaries were not available for particular work items, we developed time and material-based estimates considering composition of work crews and equipment and material required using RS Means. When materials have a salvage value at the end of the Project life, the construction activity costs, and the hauling/freight cost are separated from the disposal costs or salvage value to make revisions to salvage values more transparent.

7) Decommissioning costs are based on current pricing. The initial financial security covers the first 10 years of operation, and at year 10 the cost estimate will be revised. The anticipated life of the Project is 30 years.
8) This Cost Estimate is based on preliminary drawings dated 05/01/2023 and site plan data provided by National Grid Renewables Development, LLC.
9) A project of this size and complexity requires a half-time project manager, full-time superintendent, two full-time field engineers, and a full-time clerk.
10) Common labor will be used for the majority of the tasks except for heavy equipment operation. Since MnDOT unit prices are used, for some items, the labor rates will reflect union labor rates.
11) Mobilization was estimated at approximately 7% of total cost of other items.
12) Permit applications required include the preparation of a SWPPP and a SPCC Plan.
13) Road gravel removal was estimated on a time and material basis using a 16-foot width and an 8- inch thickness for the access roads. Substation aggregate is included in the substation quantities. Since the material will not remain on site, a hauling cost is added to the removal cost. Road aggregate can often be disposed of by giving to landowners for use on driveways and parking areas. Many landfills will accept clean aggregate for use as “daily cover” and do not charge for the disposal.
14) Grade Road Corridor reflects the cost of mobilizing and operating light equipment to spread and smooth the topsoil stockpiled on site to replace the aggregate removed from the road.
15) Erosion and sediment control along road reflects the cost of silt fence on the downhill side of the road and surrounding all on-site wetlands.
16) Topsoil is required to be stockpiled on site during construction, therefore this topsoil is available on site to replace the road aggregate, once removed. The site is presumed to

be overseeded at the end of project life, as the decommissioning activities are not expected to heavily compact the soils, and the arrays will have been planted with native seed mixes.

17) Fence removal includes loading, hauling, and recycling or disposal. Fence and posts weigh approximately 10 pounds per foot.
18) Array support posts are generally lightweight "I" beam sections installed with a piece of specialized tracked equipment. Crew productivity is approximately 240 posts per day, and the same crew and equipment should have a similar productivity removing the posts, resulting in a per post cost of approximately $15.84.
19) A metal recycling facility (TJN Enterprises East Yard) is located in Sioux Falls, South Dakota, 32 miles from the Project site. Pricing was acquired from www.scrapmonster.com. The posts weigh approximately 150 pounds each, and we estimate the hauling costs at approximately $0.27 per ton mile. The pricing from Scrapmonster is adjusted to 75 percent of the published price to reflect the processing required for the posts to fit recycling requirements and TJN Enterprises East Yard's margin.
20) Based on the review of a manufacturer's details of the array support structures, the structures weigh approximately 15 pounds per linear foot or array. The facility has 438,492 modules, for a total module weight of 16,437 tons. The arrays are made of steel pipes so a crew with hand tools can disassemble and cut the pieces to sizes for recycling at a rate of about 1,800 pounds per person per hour, or about $100 per ton.
21) Hauling the steel to Sioux Falls, South Dakota at $0.27 per ton mile costs about $8.68 per ton.
22) The solar panels rated at 475 watts measure approximately 4.08 feet by 6.64 feet and weigh 75.0 pounds so they can easily be disconnected, removed, and packed by a three-person crew at a rate we estimate at 12 panels per person per hour.
23) Based on preliminary design information, it is expected that 4200 kVA inverters will be used on this Project. Pad mounted Inverters are modular medium sized enclosures (9'-2" long, 7'-7" tall, and 5'-3" deep (SC 4200 UP-US 4200 kVA US 1500 V) that are mounted on a metal frame. They weigh 8,800 pounds each and can be disconnected by a crew of electricians. They must be lifted by a truck mounted crane for transport to the recycler. They contain copper or aluminum windings.
24) Transformers for this Project will likely be mounted on the same equipment skids as the

inverters. The transformers and associated cabinets weigh approximately 20,000 pounds and contain either copper, or more commonly, aluminum windings that have significant salvage value. They are typically oil filled, but most transformer recyclers will accept the transformers with oil. The estimated costs include removal of the metal frames and conduits feeding the equipment.

25) Medium voltage (MV) equipment and SCADA equipment are mounted on the same equipment skid as the transformer and enclosed in weatherproof cabinets. Their size requires light equipment to remove them. The costs shown include the removal of the metal frame.
26) The underground collector system cables are placed in trenches, inside of PVC conduits, with a minimum of 3 feet of cover.
27) To reduce tracking of sediment off-site by trucks removing materials, we have included a rock construction entrance priced based on state MnDOT bid prices.
28) Perimeter control pricing is based on a sediment fence placed on the downgrade side of the work area perimeters and protecting wetlands and drainage swales within the Project area. Pricing is based on RS Means unit prices.
29) No topsoil will be removed from the landowner's property or used on other landowners' property during decommissioning. Most of the site will not have been compacted by heavy truck or equipment traffic so no topsoil will need to be imported, and very few areas will need to be decompacted.
30) Metal salvage prices (steel, aluminum, copper) are based on quotes from www.scrapmonster.com for the U.S. Midwest in April 2023. These prices are based on delivery to the recycling facility with the material prepared to meet size, thickness, cleanliness and other specifications. A reduction of 25% has been taken from this price to reflect the difficulty of realizing the full spot prices posted. The prices are three months old at the time they are displayed on the website.
31) The steel posts and array racking are priced based on 75% of the HMS (high melt steel) 80/20 the price listed on www.scrapmonster.com in April 2023.
32) Solar module degradation is approximately 0.50% per year, or 96% of capacity remaining after 5 years, and 83 percent capacity remaining after 30 years. The manufacturer guarantees that panels will have 98% the rated capacity when new, so combining the guaranteed capacity and the degradation, the estimate uses 96 percent capacity after five years. There is currently a robust market for used solar panels and pricing can be

found on Solar Biz, eBay and other sites. To avoid unconservative pricing for the used modules we used a pricing of 80 percent of the $0.0875 per watt price quoted by We Recycle Solar for a similar project within the last two months. The price is based on the buyer transporting panels placed on pallets from the Project site to a We Recycle Solar facility.

33) There is an active market for reselling and recycling electrical transformers and inverters with several national companies specializing in recycling. We have assumed that the electrical equipment will be obsolete at the time of decommissioning so we have based the pricing on a percentage of the weight that reflects the aluminum windings that can be salvaged. Pricing was obtained from scrapmonster.com in April 2023, for used transformer scrap at a price of $0.40 per pound.
34) The collection lines are priced assuming copper conductor wire for the DC circuits, which is typical. The prices used reflect a reduced yield of the copper resulting from the insulation and other materials that must be stripped from the wire so that the copper can be recycled. The estimate uses the Midwest price of #2 copper wire with an 50 percent recovery rate as found on www.scrapmonster.com in April 2023, which is $1.37 per pound. For the salvage value we have assumed 75 percent of the published price.
35) The underground collection lines are assumed to be aluminum conductor. The majority of the length of the collection lines will be buried deep enough so that they do not have to be removed. Those sections coming up out of the ground at junction boxes, or otherwise, can be salvaged. The salvage value is based on the Midwest price of E.C. Aluminum Wire as found on www.scrapmonster.com in April 2023, which is $1.21 per pound. We have reduced the price to 50 percent of the quoted price to reflect the complications of stripping insulation and separating the materials.
36) Care to prevent damage and breakage of equipment, PV modules, inverters, capacitors, and SCADA must be exercised, but removal assumes unskilled common labor under supervision.
37) All salvage is based on the weights of bulk material or equipment.

Appendix F

Emissions Calculations

Elk Creek Solar, LLC
Elk Creek Solar Project
Construction and Operating Emission Calculations
Summary

Emisisons From Construction Equipment	
Description	**Emissions (tons per project) Greenhouse Gas (CO_2e)**
Off-Road Engine Emissions	1,764
Construction Worker Vehicles	962
Construction Delivery Vehicles	224
Construction Equipment	**2,949**

Emissions From Equipment Fabrication	
Description	**Emissions (tons per year) Greenhouse Gas (CO_2e)**
Equipment Fabrication	15,556

Operating Emissions	
Description	**Emissions (tons per year) Greenhouse Gas (CO_2e)**
Electricity Use - O&M Building	8
Commuter Vehicles - Gasoline	8
Maintenance Trucks - Diesel	0
Total Operating Emissions	**17**

Elk Creek Solar, LLC
Elk Creek Solar Project
Construction and Operating Emission Calculations
Emission Factors for Construction Engines

Off-Road Construction Engines

Equipment	Quantity [a]	Hours per Day	Number of Days	Total Hours Used [b]	Max Power (HP)	Load Factor [c]	Loaded Power (HP)	Emission Factors [d,e] (g/hp-hr) CO_2	CH_4	N_2O
Air Compressor	0	0	0	0	80	1	80	188.262	0.008	0.002
ATV	42	8	124	41,664	20	0.5	10	188.262	0.008	0.002
Backhoe	2	8	240	3,840	75	0.8	60	188.262	0.008	0.002
Bulldozer	2	8	40	640	250	1	250	188.262	0.008	0.002
Compactor	0	0	0	0	300	1	300	188.262	0.008	0.002
Compactor, Vibratory	4	8	124	3,968	100	1	100	188.262	0.008	0.002
Fork Lift	8	8	154	9,856	120	1	120	188.262	0.008	0.002
Concrete Mixer Truck	6	8	30	1,440	325	1	325	188.262	0.008	0.002
Concrete Pump	0	0	0	0	300	1	300	188.262	0.008	0.002
Dump Truck	2	8	60	960	325	0.8	260	188.262	0.008	0.002
Excavator	4	8	160	5,120	138	1	138	188.262	0.008	0.002
Front End Loader	3	8	80	1,920	196	1	196	188.262	0.008	0.002
Generator	10	8	124	9,920	250	0.5	125	188.262	0.008	0.002
Guided Bore Machine	0	0	0	0	150	0.8	120	188.262	0.008	0.002
Light Tower	0	0	0	0	50	1	50	188.262	0.008	0.002
Manlift	0	0	0	0	50	1	50	188.262	0.008	0.002
Pickup Truck	20	8	220	35,200	150	0.25	38	188.262	0.008	0.002
Piping Truck	0	0	0	0	300	1	300	188.262	0.008	0.002
Skid steer loader	4	8	124	3,968	50	1	50	188.262	0.008	0.002
Water truck	4	9	200	7,200	100	0.5	50	188.262	0.008	0.002
Welding machine	0	0	0	0	35	0.8	28	188.262	0.008	0.002
Grader	2	8	240	3,840	35	0.8	28	188.262	0.008	0.002
Large Crane	0	0	0	0	15	0.21	3	188.262	0.008	0.002
Medium Crane	2	4	30	240	450	0.7	315	188.262	0.008	0.002
Fuel Truck	0	0	0	0	200	0.59	118	188.262	0.008	0.002
Hydrovac Truck	0	0	0	0	200	0.59	118	188.262	0.008	0.002
Road Bore Machine	0	0	0	0	260	0.79	205	188.262	0.008	0.002
6-inch Water Pump	0	0	0	0	30	0.69	21	188.262	0.008	0.002
4-inch Water Pump.	0	0	0	0	10	0.69	7	188.262	0.008	0.002
2-inch Water Pump	0	0	0	0	5	0.69	3	188.262	0.008	0.002
Pile Driver	7	8	124	6,944	49	1	49	188.262	0.008	0.002
100 HP Tractor	5	8	160	6,400	100	0.21	100	188.262	0.008	0.002
Light Tower	0			0	50	1	50	188.262	0.008	0.002

[a] Equipment counts based on experience with construction of a similar projects.

[b] Hours based on estimates from similar project.

[c] Load Factors from Appendix A of EPA 420_P-04-005, Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling , USEPA, April 2004.

[d] EPA 420-P-04-009, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.

[e] GHG emission factors from Title 40 Subchapter C Part 98 Subpart C Table C-1 and C-2 to Subpart C.

Elk Creek Solar, LLC

Elk Creek Solar Project

Construction and Operating Emission Calculations

Emission Estimates from Construction Engines

Equipment	Potential Emissions (ton/yr)			
	CO_2	CH_4	N_2O	CO_2e
ATV	86.46	3.5E-03	7.0E-04	86.76
Backhoe	47.81	1.9E-03	3.9E-04	47.98
Bulldozer	33.20	1.3E-03	2.7E-04	33.32
Compactor, Vibratory	82.35	3.3E-03	6.7E-04	82.63
Fork Lift	245.44	1.0E-02	2.0E-03	246.28
Concrete Mixer Truck	97.12	3.9E-03	7.9E-04	97.45
Dump Truck	51.80	2.1E-03	4.2E-04	51.98
Excavator	146.63	5.9E-03	1.2E-03	147.13
Front End Loader	78.10	3.2E-03	6.3E-04	78.36
Generator	257.33	1.0E-02	2.1E-03	258.21
Pickup Truck	273.93	1.1E-02	2.2E-03	274.87
Skid steer loader	41.17	1.7E-03	3.3E-04	41.31
Water truck	74.71	3.0E-03	6.1E-04	74.96
Grader	22.31	9.1E-04	1.8E-04	22.39
Medium Crane	15.69	6.4E-04	1.3E-04	15.74
Pile Driver	70.61	2.9E-03	5.7E-04	70.85
100 HP Tractor	132.81	5.4E-03	1.1E-03	133.27
TOTAL	**1,757.48**	**7.1E-02**	**1.4E-02**	**1,763.51**

Global Warming Potentials		
CO_2	CH_4	N_2O
1	25	298

Source: Title 40 Part 98 Table A-1.

Elk Creek Solar, LLC

Elk Creek Solar Project

Construction and Operating Emission Calculations

Emissions Estimates for Construction Commuters and Delivery Vehicles

On-Road Vehicles					
	Vehicles per day	**Miles per vehicle**	**Number of Days**	**Gallons Used per Project**	**CO_2 Emissions Tons**
Commuter Vehicles - Gasoline [b]	150	60	240	98,182	962
Delivery Trucks - Diesel [c]	18	60	120	19,938	224

[a] Assumes 1 gallon of gasoline = 8,887 grams CO_2 and 1 gallon of diesel = 10,180 g CO_2, per US EPA's "Greenhouse Gas Emissions from a Typical Passenger Vehicle," available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100U8YT.pdf

[b] Assumes commuters travel 30 miles each way (60 miles round trip) per day, with a fuel economy of 24 miles per gallon, per US EPA and US Department of Energy Fuel Economy data for combined city and highway driving in 2023, available online at: https://www.fueleconomy.gov/feg/download.shtml.

[c] Assumes delivery trucks travel 30 miles each way (60 miles round trip) per day, with a fuel economy of 6.5 miles per gallon, industry average.

1 short ton = 907,185 grams

Elk Creek Solar, LLC
Elk Creek Solar Project
Construction and Operating Emission Calculations
Emissions from Equipment Fabrication

	Solar - Utility [a] g CO2e / kWh	Elk Creek Solar Panel Fabrication Emissions g CO_2e / year	tons CO_2e / year
Direct Emissions	0	0	0
Infrastructure and Supply Chain Emissions	42	14,112,000,000	15,556
Biogenic CO2 emissions and Albedo Effect	0	0	0
Methane Emissions	0	0	0
Lifecycle emissions, including Albedo Effect (median)	42	14,112,000,000	15,556

[a] Intergovernmental Panel on Climate Change. 2014. Working group 3, Annual report 5, Annex III: Technology-specific Cost and Performance Parameters. Available online at: https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_annex-iii.pdf Accessed April 2023.

Assumptions:

Elk Creek Power Generation	336,000,000	kWh	
Conversion:	1 short ton =	907,185	grams
Project Lifetime	30	years	

Elk Creek Solar, LLC
Elk Creek Solar Project
Operating Emission Calculations
Emissions from Facility Operation

	kWh / month	kWh / year	GHG Emissions [a] tons CO_2e / year
Electricity Use - O&M Building	1,350	16,200	7.7

[a] Greenhouse gas emissions calculated using US EPA's Greenhouse Gas Equivalencies Calculator, available online at: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

	Vehicles per day	Fuel Usage gal/vehicle/week	Fuel Usage gal/year	GHG Emissions [a] tons CO_2e / year
Commuter Vehicles - Gasoline [b]	6	16	851	8.3
Maintenance Trucks - Diesel [c]	2	1	43	0.5

[a] Assumes 1 gallon of gasoline = 8,887 grams CO_2 and 1 gallon of diesel = 10,180 g CO_2, per US EPA's "Greenhouse Gas Emissions from a Typical Passenger Vehicle," available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100U8YT.pdf

[b] Assumes six commuters travel 30 miles each way (60 miles round trip) per day, with a fuel economy of 22.0 miles per gallon, per US EPA's "Greenhouse Gas Emissions from a Typical Passenger Vehicle," available online at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100U8YT.pdf

[c] Assumes two trucks travel 10 miles on site each day, with a fuel economy of 24 miles per gallon, per US EPA and US Department of Energy Fuel Economy data for combined city and highway driving of trucks in 2023, available online at: https://www.fueleconomy.gov/feg/download.shtml.