Appendix I

Draft Vegetation Management Plan

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DRAFT Vegetation Management Plan

Solway Solar

Developed by Otter Tail Power Company

Revised September 4, 2024

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Executive Summary

Otter Tail Power Company (OTP) is developing a 50 MWac (Point of Interconnection) solar installation project on approximately 267 acres of land in Lammers Township, Beltrami County, MN (Project). The Project will be constructed, owned, and operated by OTP.

The overall goal of this Vegetation Management Plan (VMP or Plan) is to achieve a healthy, sustainable, ground cover complimenting both the solar array and the surrounding environment. This Plan incorporates three different seed mixes, accommodating the unique features found at the site. A low-grow mix will be planted underneath the array areas, a wet mix will be seeded in areas expected to experience extended periods of saturation, and a perimeter mix will be seeded in area with no height constraints. This three-mix portfolio is typical for utility-scale solar sites.

Goals and Objectives

OTP has developed this Plan to guide site preparation, installation of prescribed seed mixes, management of invasive species and noxious weeds, and control of erosion/sedimentation.

Specific goals of this Plan include:

- Establish diverse native vegetative cover that complies with all permits and regulations and provides beneficial habitat within the footprint of the Project.
- Describe the short-term and long-term vegetation management practices that will be used on site to cost-effectively maintain ground cover in alignment with Plan goals and objectives.
- Meet the beneficial habitat standards consistent with Minnesota Statutes, Section 216B.1642.
- Manage noxious weeds per Minn Statutes, Section 18.78

This document is a working document, and revisions will be made as new information becomes available regarding site characteristics, feasibility of management practices, and availability of services. Additionally, seed mixes are subject to availability at the time of purchase and substitutions may occur if necessary.

Responsible Parties and Location of Management

Owner: Otter Tail Power Company

Vegetation Management Plan Developer: Otter Tail Power Company

Site Contractor: TBD

Vegetation Maintenance Responsible Party: TBD

Site Description

Solway Solar is located within Beltrami County, MN just north of the City of Solway and will be capable of generating up to 50 megawatts (MW) of energy at the Point of Interconnection. The project boundary is approximately 487 acres in area (Project Area) including approximately 267 acres inside the project fence (Project Footprint) and 220 acres outside the project fence. The

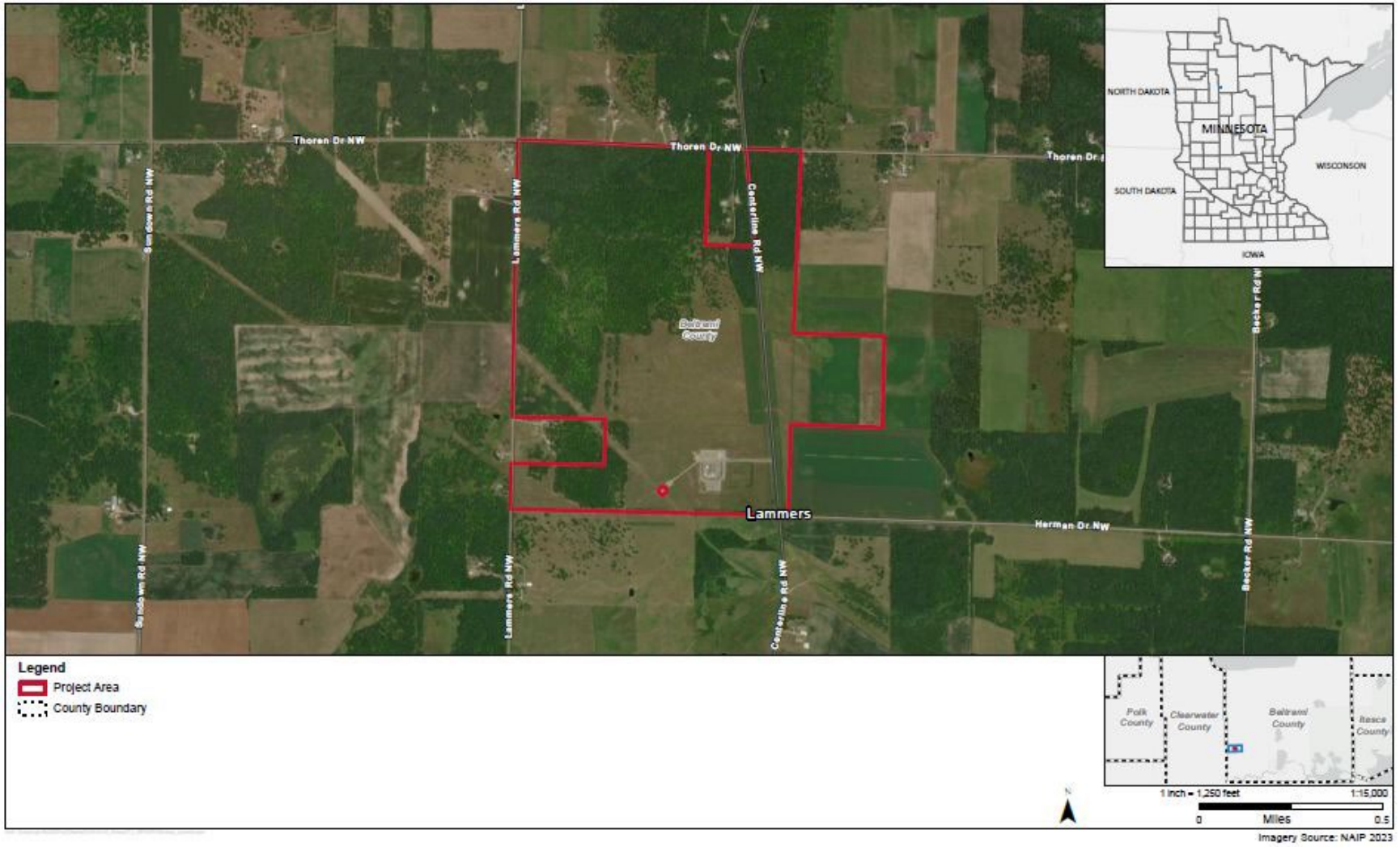
Project would include approximately 100,000 photovoltaic (PV) solar modules laid out in rows in a north-south orientation.

The Project Area consists primarily of timberland (39% land cover) and pastureland (36% land cover) with smaller areas of cultivated crops (12% land cover) and scrub brush (5% land cover). Small wetlands are scattered throughout the northwest quadrant of the area. Approximately 13.9 acres of delineated wetlands are located within the Project Area, of which nearly all are located outside the project fence.

Significant site features include Centerline Road, a paved road, which transects the Project Area in a north-south orientation. A natural gas pipeline passes underneath the southwest quadrant of the Project Area. An existing OTP-owned combustion turbine and substation are positioned in the southern half of the Project Area.

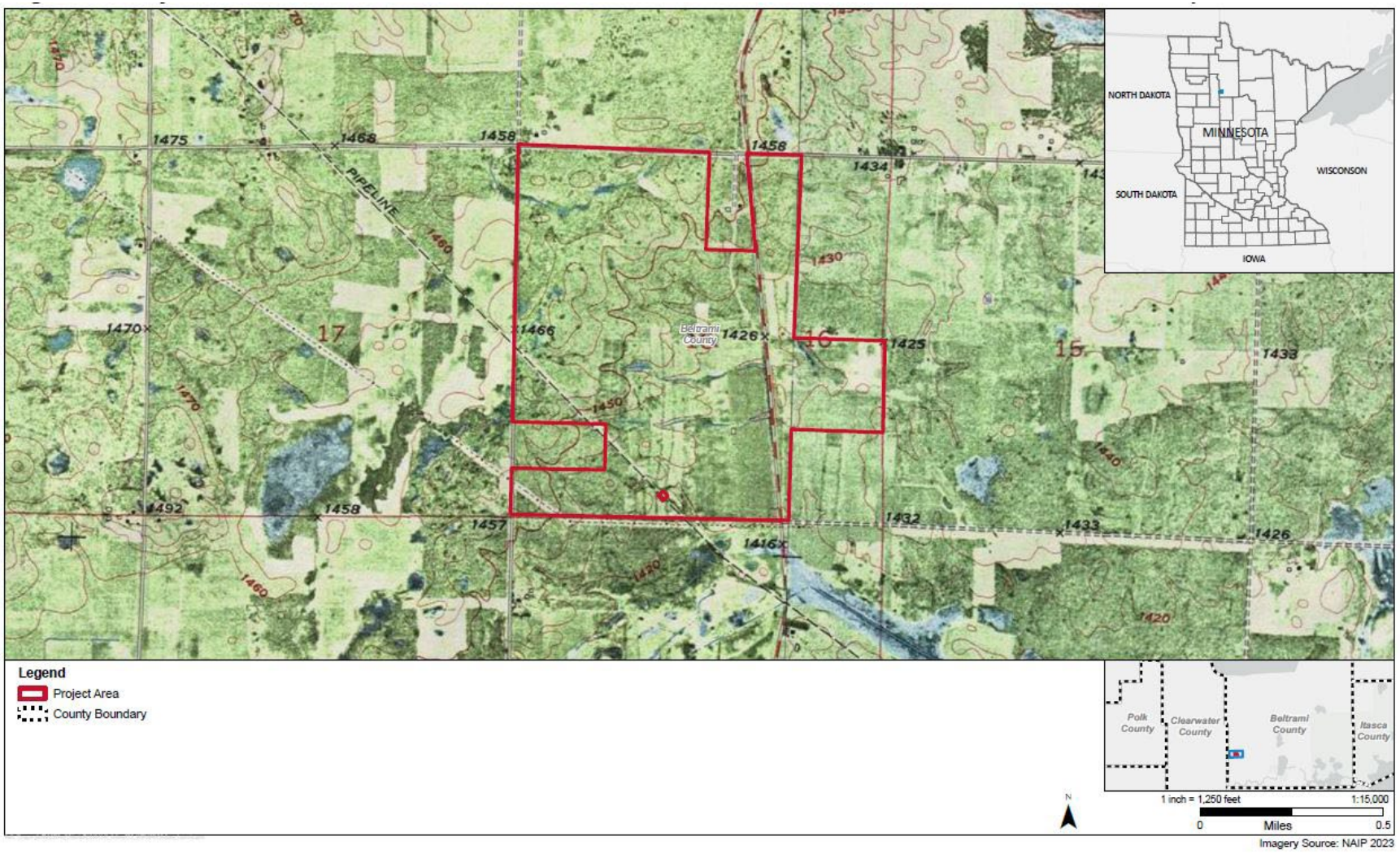
A preliminary project layout figure is in Appendix 5. As the Project approaches final design, updated drawings will be added to the appendix.

Figure 1 – Project Location



Source: *Solway Solar Surplus Application,* Prepared by HDR.

Figure 2 – Project Topography



Source: *Solway Solar Surplus Application,* Prepared by HDR.

GEOLOGY AND SOILS

The soils in the Project Area are characterized by glacial sediments (ground moraines, stagnation moraines, and outwash plains) deposited during the Wisconsin Glaciation overlying Precambrian Age bedrock. Moraine sediments from the Sol and Nary complexes comprises much of the Project Area's surficial deposits. It is described as cobbly sandy loam and cobbly fine sandy loam.

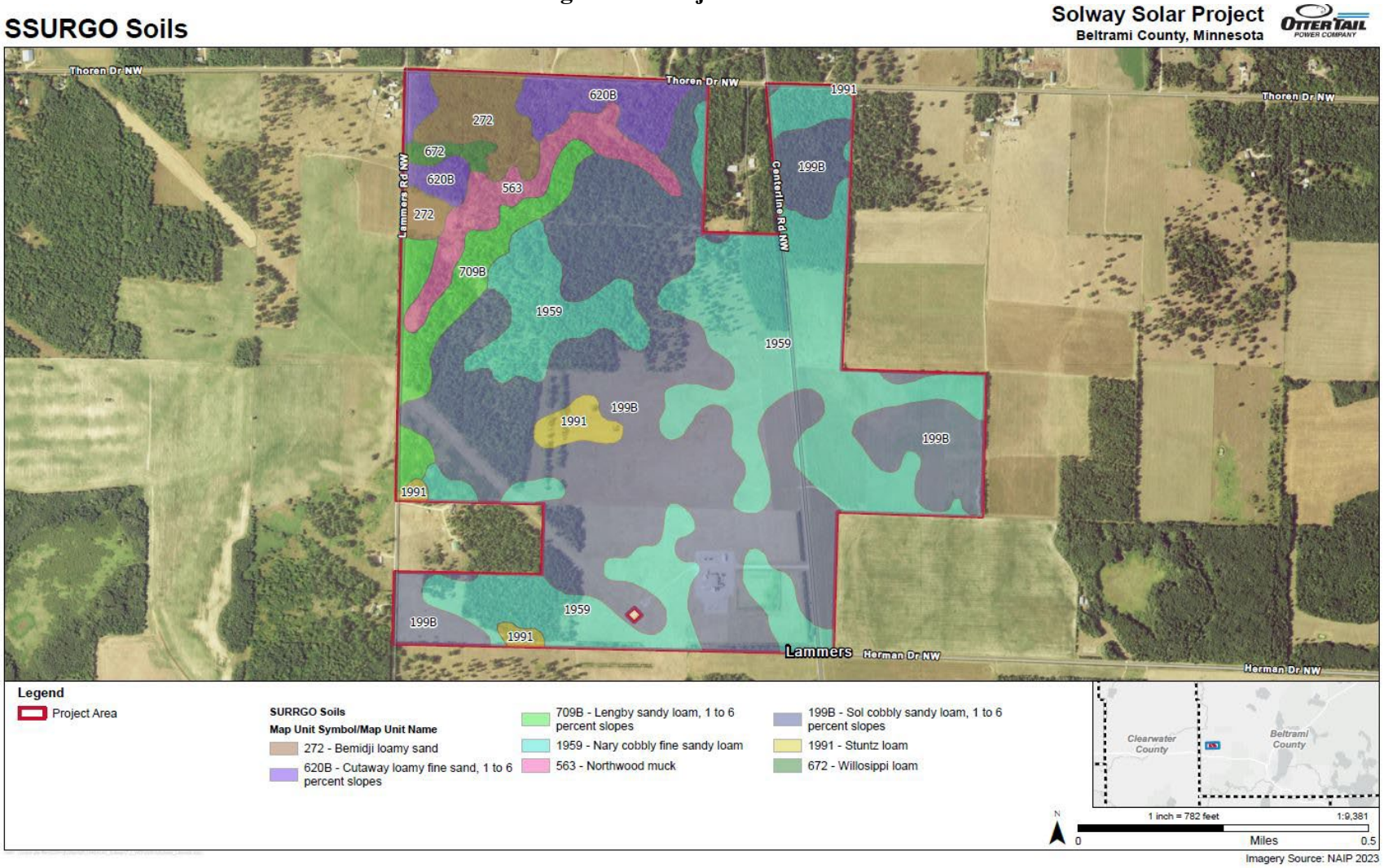
Eight different soil types exist within the Project Area. The soils are primarily sandy loam soil types. Only a small portion of the soils are considered hydric. These hydric soils consist primarily of the Northwood muck and Willosippi loam soil types. Approximately 89.4% of the soils are considered well-drained.

Table 1 – Soil Survey Information

Soil Type	Acres in Project Area (acres)	% of Project Area	Soil Type	Drainage
Sol cobbly sandy loam, 1 to 6 percent slopes	228.9	45.7	Sandy loam	Well drained
Bemidji loamy sand	19.2	3.8	Loamy sand	Well drained
Northwood muck	19.9	4.0	Muck	Very poorly drained
Cutaway loamy fine sand, 1 to 6 percent slopes	21.1	4.2	Loamy sand	Well drained
Willosippi loam	3.3	0.7	Loam	Poorly drained
Lengby sandy loam, 1 to 6 percent slopes	22.6	4.5	Sandy loam	Well drained
Nary cobbly fine sandy loam	177.9	35.5	Sandy loam	Moderately Well drained
Stuntz loam	8.4	1.7	Loam	Somewhat poorly drained

Source: *Offsite Wetland Delineation Report, Solway Solar Project,* Prepared by HDR Inc., July 2024.

Figure 3 – Project Site Soils

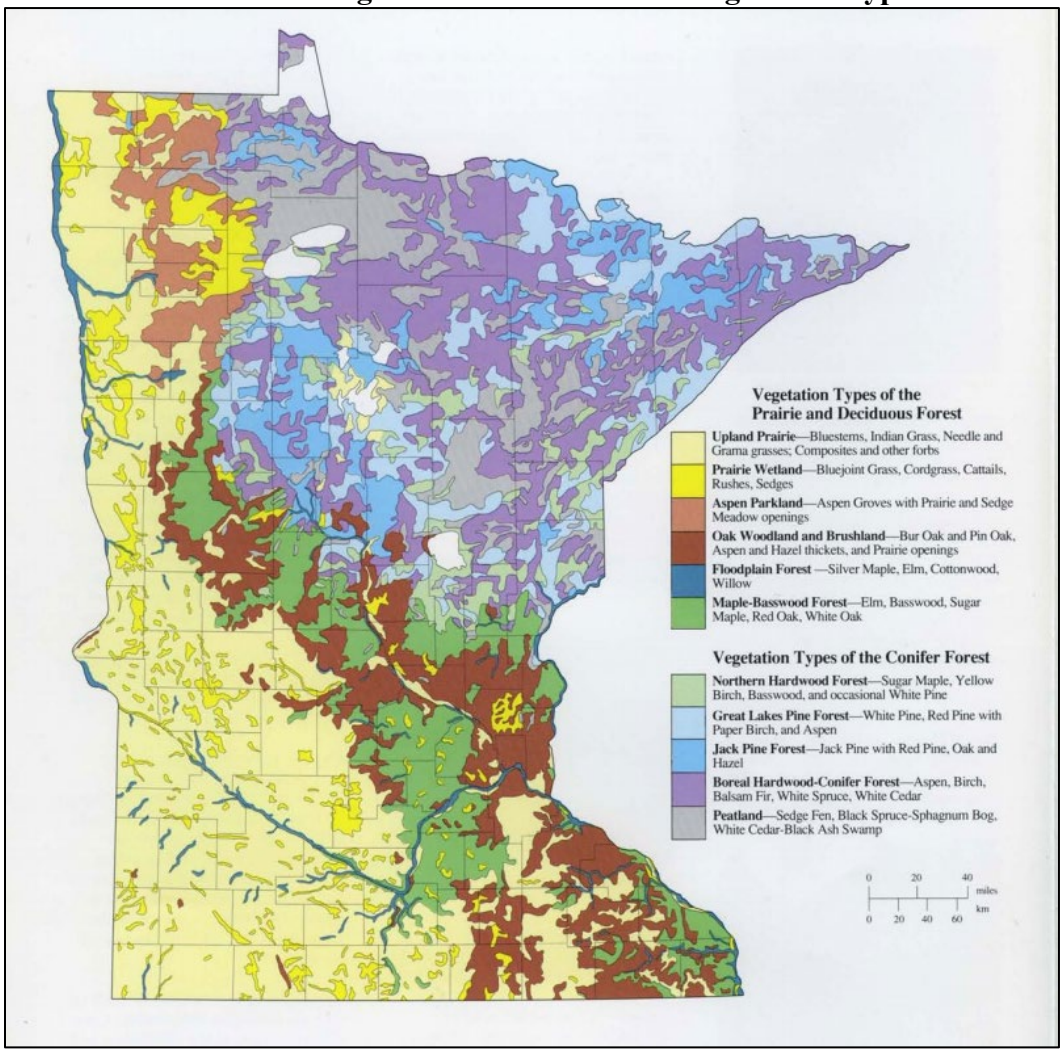


Source: *Solway Solar Agricultural Impact Mitigation Plan,* Prepared by HDR, September 6, 2024.

HISTORY OF THE NATIVE LANDSCAPE

Solway Solar is located within conifer forest pre-European vegetation types: primarily in the jack pine forest type with a mixture of deciduous and conifer forests. Areas of upland prairie also existed approximately ten miles to the southeast of the project area. Prairie dominated the central North American landscape prior to European settlement. Minnesota's once eighteen million acres of prairie have been reduced to less than 100,000 acres today. There are many distinct types or subcategories of prairie – wet, mesic, dry, bluff, and black soil prairies to name a few. The three primary ecological classifications of prairie in North America are: tall grass (in the east), mixed grass (central Great Plains), and short grass (western Great Plains) all a result of the available rainfall. Species composition usually includes 10-20 percent grasses and 80-90 percent forbs. Some species are rare while others are common.

Figure 4 – Pre-Settlement Vegetation Types



Source: *Natural Vegetation of Minnesota*, Minnesota Department of Natural Resource. 1988.

Native Landscape vs. Turf and Ornamental Maintenance

A native landscape takes time to develop, requiring patience and careful management the first few years. However, if the native area was prepared and planted correctly and necessary maintenance is performed, the restoration will mature into a unique and low-maintenance landscape.

Ongoing native landscape maintenance uses different practices from turf lawns and cultivated ornamental plants. Native landscapes require ongoing maintenance, but the intensity and frequency are much less than turf and ornamental beds.

Table 2 compares the maintenance practices of these landscapes.

Table 2 – Maintenance Practices by Landscape Type

Landscape Type	Weekly mowing	Fertilizer	Soil aeration	Watering during dry weather	Overseeding	Insect pest control	Weed control	Thatch removal	Brush control (mowing or burning)
Turf Lawn	X	X	X	X	X		X	X	
Ornamental Beds		X		X		X	X		
Native Woodland							X		X
Native Prairie					X		X	X	X

Management Approach

The main objectives of management include the following:

1. Manage exotic and invasive plant species among the native plant communities to reduce competition from weeds and to allow the native plants to flourish.

2. Utilize mowing practices to encourage native species growth while reducing competition from annual/biennial non-native vegetation.

3. Utilize integrated practices to control a variety of undesirable species while allowing the native species to flourish. Integrated Pest Management (IPM) techniques include spot mowing, spot spraying, and herbicide wicking. The right IPM technique needs to be applied to the right plant and implemented at the right time to ensure the best control while also minimizing collateral damage.

Factors that influence management procedures can vary from one area of a site to another. Unique moisture, soil, and solar exposure areas within the Project Area may require modification of the timing and use of management practices. The practices can vary for the panel zone, alley zone, and perimeter of a solar array. Stormwater ponds, if present, can also require specialized management practices.

Figure 5 – Typical Solar Array Vegetation Locations

Solar sites offer unique challenges that require the necessary experience and equipment to implement the proper management plan. Swing arm rotary mowers are recommended to perform most mowing activities within the array due to their efficiency and performance. Flail mowers are also used when applicable. Custom built ATV/tractor mounted boom applicators allow our crews to spot apply herbicide with precision and efficiency within the confines of the array.

Initial Revegetation

Where practical, site pre-seeding will occur to promote early vegetation establishment. Since pre-seeding occurs prior to construction, this technique allows for ease of installation without pilings, panels, and other obstacles to work around. Following construction, all areas within the Project Area planned for revegetation that were not pre-seeded will be revegetated with the applicable seed mix. Ground preparation and seeding will occur as soon as construction activities have progressed enough to prevent any further soil disturbance within sections of the project. It is anticipated that some seeding will occur as early as spring/summer while others will be ready in the fall. Seeding will be appropriately timed in consideration of winter dormancy and plant survival. The soil will be raked and/or disked as necessary prior to planting to allow for seeding penetration and anchoring.

Seed Mix

OTP will collaborate with a seeding vendor to develop diverse and appropriate seed mixes for the Project Area. The seed mixes are presented in Appendix 3. Three distinct mixes – the Array Mix, Perimeter Mix, and Wet Mix have been designed for the site.

The 2-foot-tall Array Mix will be planted inside the security fence and will make up the majority of the Project Footprint – approximately 267 acres. The mix is comprised of both grasses and forbs. The mix is purposely made of native species that grow to a height which will not interfere with the safe and reliable operation of the solar array.

The Perimeter Mix will be planted in areas outside the fence and will cover approximately seventeen (17) acres. The mix is comprised of both grasses and forbs and has approximately twice the species diversity as the Array Mix. There are no height restrictions placed on this seed mix as areas outside of the security fence do not present operational concerns.

The Wet Mix will be utilized in areas of the Project Area that are expected to experience routine moist conditions. These areas include constructed stormwater ponds and draws. The mix is expected to cover less than five (5) acres. It is comprised of both grasses and forbs and has a similar number of grass species as the Perimeter Mix and a forb diversity of species less than the Perimeter Mix but more than the Array Mix.

The seed mixes are subject to availability at the time of purchase and substitutions may occur if necessary. New species substituted into the mix will meet the same general criteria as those removed – native to the region, two-foot maximum height (for areas inside the fence), local origin, and seasonal blooming category.

Seed shall be sourced regionally and as locally as possible to promote compatibility with actual site climate and conditions. Seed shall be purchased on a "Pure Live Seed" (PLS) basis. Seed tags should identify purity, germination, testing dates, total weight, and PLS weight, weed content, and supplier information. Seed will be used within the time frames required under Minnesota Rules and regulations.

Seeding Techniques

The seed mixes will be drill or broadcast seeded based on site conditions and timing of seeding to uniformly distribute the mix under and around the solar array site. If a seed drill is used, seed will be sown at a depth of no more than 0.25 inches. If broadcasting is the planting method, native seed broadcasters (e.g., Vicon seeder) should be used as they are adapted to spread mixes with different sized seeds. Hydro seeding may be used as necessary at locations where standard broadcast or drilling are not practical. The seed mixes will be sown with oats or winter wheat as a cover crop to limit erosion and suppress weed growth.

Reseeding Bare Soil

Areas of bare soil are detrimental to successful establishment of native vegetation. Bare soil provides opportunities for the common invasive species described above to colonize and spread. Bare soil also contributes to soil loss by sheet erosion. If areas of bare soil are found on site, the Contractor shall remedy the issue at their own expense by re-seeding the area, using the seed mix previously installed.

ESTABLISHMENT PHASE

The first three years of vegetation management are a concerted effort to remove invasive vegetation from the site while also helping the planted native vegetation establish. After the land is cleared and the panels are installed, a range of invasive plants will take advantage of the open soil and abundant light and germinate across the site. For 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 (Appendix 2). 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 work done during this initial period is referred to as the "establishment phase," while management after that period is called the "long-term maintenance phase."

Year 1

The first year of establishment is focused on consistent invasive plant control. Mowing 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 4-6 inches shall occur every four weeks, or whenever vegetation reaches a height of 18-24 inches, whichever comes first.

Repeated mowings may produce a buildup of organic thatch, which discourages the development and persistence of diverse native vegetation. To help prevent thatch buildup, mowing shall either be conducted with a flail-type mower, or the site shall be hayed so that biomass 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 may also be necessary. Any other techniques must be approved by OTP prior to use.

Mowing equipment shall be cleaned before use on site 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 spraying with herbicide to prevent roots from resprouting.

Year 2

The second year of establishment continues invasive plant control but generally employs more targeted techniques. Site-wide mowing shall occur when vegetation height reaches 18-24 inches; expected frequency is 1-2 times in the growing season, once in mid-June and once in mid-August if needed, but additional mowing may be required as vegetation height and weed development dictates. Spot-mowing may be employed to treat specific problem areas as needed. Noxious and perennial weeds shall be treated at least twice with spot spraying.

Year 3
In the third year of the establishment phase, invasive plant control should consist of spot spraying to control the remaining small patches of persistent weeds. Additional onsite treatment with spot-mowing or hand weeding can be used at the contractor's discretion.

Establishment Phase Management Schedule

Establishment Phase (growing seasons 1, 2 and 3)

Year 1: Complete site mowings to control annual/biennial weed canopy and prevent production of viable seed.

- 2-3 mowings are typical depending on soils and weather patterns.
- Mowing performed using specialized rotary mowers with swing arm.
- Target mowing height of 4-6 inches.
- Reporting to follow each visit including a recap of activities, site conditions and recommendations.

Year 2: Complete site mowing to control annual/biennial weed canopy and prevent production of viable seed.

- 1 mowing in the late spring or early summer.
- Mowing performed using specialized rotary mowers with swing arm.
- Target mowing height of 4-6 inches.
- Reporting to follow each visit including a recap of activities, site conditions and recommendations.

Vegetation Management (VM)

- 2-3 site visits are typical depending on growth and weed populations.
- Includes spot mowing, spot spraying, herbicide wicking, etc.
- Equipment used includes ATVs, backpack sprayers and weed whips.
- Reporting to follow each visit including a recap of activities, site conditions and recommendations.

Year 3: Vegetation Management

- 3 site visits are typical depending on growth and weed populations.
- Includes spot mowing, spot spraying, herbicide wicking, etc.
- Equipment used includes ATVs, backpack sprayers and weed whips.
- Reporting to follow each visit including a recap of activities, site conditions and recommendations.

Long-Term Maintenance Phase

As with any native landscape, vegetation management inputs following the establishment period will tend to decrease. The length of the establishment period can vary from site to site and is dependent on a multitude of factors including:

- Soil type
- Vegetation history
- Seed mix composition
- Thoroughness of initial site preparation
- Weather patterns

In most cases, the native landscape will reach a point of maturity somewhere between the 3rd and 5th growing season. At this point, the site enters the Long-Term Maintenance Phase. In this phase, the expectation is that vegetation can be adequately managed in 1 to 1.5 IPM visits per growing season. The factors listed above can play a role in the ultimate number of visits needed to a particular site.

Other Notes on Long-Term Management:

- At no point will the site ever be maintenance free.
- The site should be mowed once every 3 years to replicate the beneficial aspects of a prescribed burn. These mowings would typically occur during the spring, often before the ground thaws.
- Additional mowing or trimming may be needed if shading of the panels occurs, either by native or non-native vegetation. This type of mowing, if needed, should be limited to the areas immediately in front of the panel's lower edge. Mowing the entire aisles would entail mowing flowers in bloom which would defeat the purpose of the pollinator planting.
- Continual monitoring of the vegetation is required to determine best practices going forward.

Woody Species

Almost all woody species on the 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, herbiciding, or a combination of both methods. All woody plants over 0.5 inches diameter at breast height (about 4.5 feet) shall be cut to within one inch of the ground and the stump treated with triclopyr or a comparable herbicide by a licensed applicator, following instructions provided by the manufacturer.

Problematic Native Plants

Several native species present in the soil seed bank or enter the site by seed rain from neighboring properties can 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 1 inch of the ground and the stump treated with glyphosate, tryclopyr, or a

comparable herbicide by a licensed applicator, following instructions provided by the manufacturer.

Grazing

Grazing may be considered as a maintenance strategy if livestock are compatible with the vegetation and site characteristics. If grazing is planned, a Grazing Plan is needed summarizing the goals of grazing, the type and number of animals to be used, plans for fencing, the time and duration of grazing, and the decision-making process for ensuring that vegetation is not over-grazed.

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APPENDIX 1: MANAGEMENT PRACTICES FOR SOLAR ARRAYS

DESCRIPTION OF TECHNIQUES FOR SOLAR ARRAYS

Proper installation is the first crucial step toward a restored native prairie landscape. The next step is managing the restored plant communities. In all likelihood, proper management is as crucial as proper installation. Effective management of a restored area is achieved through a variety of management practices.

Each of these techniques plays a key role in the development and success of a native landscape. These techniques are used in a system to achieve the best results possible for the control of undesirable species and for the overall quality of the site. A complete understanding of the plant's life cycles and growth characteristics is essential in dictating the management technique that is implemented.

Monitoring

As simple as it sounds, monitoring is a critical facet for successful management of native prairie landscapes. Monitoring involves the periodic inventorying of plant species found at each of the sites. Because the restored habitat is an ever-changing environment, it is important to always be aware of the current vegetative composition. Being aware of which species are thriving within a given area and their life cycles are crucial for determining which management technique will be implemented. A walk through of the area being managed should be conducted at least once a year. A good field guide, such as this management plan, should be used during the walk through and be used to evaluate the success of previous, current, and future management techniques. Planting improvements can be made at any time, however, because many forb species require several growing seasons to reach maturity, a five-year establishment period should be allowed before making large-scale renovations.

Dormant Mowings

Dormant mowings, used as an alternative to fire, are simply mowings conducted during the time of the year when prairie plants are not actively growing. The dormant mowing cleans up the appearance of the standing dead stems of prairie plants for aesthetic purposes. Chopping the previous year's growth also speeds up the breakdown of accumulated biomass, which allows for increased vigor in the plants the following year. Dormant mowings can also increase the density of the prairie by dispersing grass and flower seeds. The dormant mowing should be conducted in early spring or late fall, either before or after prairie plants are showing active growth. Special consideration is given to soil moisture conditions to minimize disturbance to the site. Within arrays, this practice is especially important due to the unavailability of prescribed fire.

Dormant mow with flail mower

Vegetation Management (VM)

VM is an accumulation of many precise, targeted management techniques used during the growing season. The purpose of VM includes removing undesirable plant species from within an established or semi-established native landscape. Once again, an understanding of growth characteristics of targeted species is necessary for selecting the most efficient and effective control methods.

Spot Spraying

Spot spraying is the primary method used to control unwanted perennial plant species. This method is designed to combat single plants or smaller colonies of undesirable plants intermixed among the native species. Accuracy in spraying is needed for this management practice. This task can be achieved with the use of a backpack sprayer or an ATV sprayer. These types of sprayers are conveniently mobile, assembled for accurate chemical application, and are necessary for use on many managed prairies. Chemicals are "species specific," meaning that certain chemicals are needed for weed species. A dye or spray indicator is commonly used for a more accurate application. The proper surfactants and adjuvants are also used according to the chemical labels.

A gravity herbicide applicator may also be used to administer chemical to unwanted plant species. This device enables the prairie manager to wipe various chemicals onto an individual weed or a colony of undesirable plant species. For solar projects, custom built spray applicators may be an available option. The customized equipment allows the targeting of specific plants in an efficient manner within the physical confines of the array.

Spot Mowing

Spot mowing can be accomplished with a tractor mower or weed whip. Spot mowing is valuable in controlling individual plants or colonies of unwanted annual or biennial plants. Spot mowing is conducted just prior to or during the flowering stage of plants. The goal of spot mowing is to prevent the annual or biennial species from producing viable seed, thus terminating their habitation of an area. Spot mowing may also be used to breach seed development by perennial plants. However, this method will not eradicate perennials from an area, only prevent these species from spreading further via seed.

Complete site mowings

Complete site mowings are typically performed in recently seeded areas. Mowings are conducted to remove the shading created by annual or biennial plant growth, which quickly invades an area after the related soil disturbance. Flail or rotary type mowers are conveniently used for this purpose and can be easily adjusted to different mowing heights. Mowings are performed at a height not to cut and set back the growth of the prairie seedling, typically four to eight inches in the first growing season. Within arrays, specialized rotary mowers with swing arms are utilized to mow more thoroughly and efficiently around the array infrastructure.

Tractor mowing a three month old prairie

QUICK REFERENCE TO CONTROL METHODS

Unwanted Plant Groups	Control Methods
Annuals	**Spot mowing** (best if used prior to or at flowering stage) **Complete site mowing** (best method if 70% or more of the site needs treatment)
Biennials	**Spot mowing** **Complete site mowing** **Spot spraying** (only if mechanical means are not possible)
Perennials	**Spot spraying** (use selective herbicides, spray only targeted species) **Spot or complete site mowing** (will reduce current season seed dispersal only, use as last resort)

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APPENDIX 2: UNDESIRABLE, INVASIVE AND NON-NATIVE PLANT SPECIES

Managing undesirable non-native and invasive plant species is a regular task in native landscapes. In many cases, plant communities are threatened by or dominated by these species of plants. They can threaten diversity, degrade habitat, and ruin aesthetics. It is important to be well versed in the techniques for controlling invasive species in existing native plant communities or in newer restorations of those communities.

Many states have invasive species lists that are designed to help prevent the spread and promote the management of these invasive species. Minnesota's can be found here http://www.dnr.state.mn.us/invasives/index.html. North Dakota's can be found here *http://www.ag.ndsu.edu/extension-aben/invasives*)

INDEX TO COMMON UNDESIRABLE PLANTS THAT MAY BE FOUND

Annuals

Annual weeds include all unwanted species that grow for a single year, set seed, and die. The most important purpose and result of treating annual weeds is preventing seed production.

Common Name	**Scientific Name**
Velvetleaf	*Abutilon theophrasti*
Redroot pigweed	*Amaranthus retroflexus*
Giant ragweed	*Ambrosia trifida*
Hoary allysum	*Berteroa incana*
Wild mustard	*Brassica kaber*
Japanese brome	*Bromus japonicus*
Hemp	*Cannabis sativa*
Lambsquarters	*Chenopodium album*
Field sandbur	*Conchrus incertus*
Large crabgrass	*Digitaria sanguinalis*
Prickly lettuce	*Lactucia scariola*
Pennsylvania smartweed	*Polygonum pensylvanicum*
Yellow foxtail	*Setaria glauca*
Green foxtail	*Setaria viridis*
Field pennycress	*Thlaspi arvense*
Cow vetch	*Vicia cracca*

Biennials

Biennial weeds include all unwanted species that complete their growth in two years. The first year, the plant produces leaves and stores food. The second year, it produces fruits and seeds. Biennial weeds are most commonly found in no-till fields, pastures, and fencerows that are not mowed.

Common Name	**Scientific Name**
Common burdock	*Arctium minus*
Plumeless thistle	*Cardus acanthoides*
Musk thistle	*Cardus nutans*
Bull thistle	*Cirsium vulgare*
Wild carrot,	*Daucus carota*
Grecian foxglove	*Digitalis lanata*
White sweet clover	*Melilotus alba*
Yellow sweet clover	*Melilotus officinalis*
Common evening primrose	*Oenothera biennis*
Wild parsnip	*Pastinaca sativa*
Common mullein	*Verbascum thapsus*

Perennials

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 vegetation establishment phase with proper maintenance.

Common Name	**Scientific Name**
Quackgrass	*Agropyron repens*
Garlic mustard	*Alliaria petiolata*
Common milkweed	*Asclepias syriaca*
Smooth brome	*Bromus inermis*
Flowering rush	*Butomus umbellatus*
Spotted knapweed	*Centaurea maculosa*
Canada thistle	*Cirsium arvense*
Crown vetch	*Coronill varia*
Yellow nutsedge	*Cyperus esculentus*
Ground ivy	*Glechoma hederacea*
Orange hawkweed	*Hieracium aurantiacum*
Yellow iris	*Iris pseudacorus*
Leafy spurge	*Euphorbia esula*
Common toadflax	*Linaria vulgaris*
Birdsfoot trefoil	*Lotus corniculatus*
Oxeye daisy	*Leucanthemum vulgare*
Purple loosestrife	*Lythrum salicaria*
Amur silver grass	*Miscanthus sacchariflorus*
Catnip	*Nepeta cataria*

Reed canary	*Phalaris arundinacea*
Blackseed plantain	*Plantago rugelii*
Japanese knotweed	*Polygonum cuspidatum*
Swamp smartweed	*Polygonum coccineum*
Pale dock	*Rumex altissimus*
Curly dock	*Rumex crispus*
Sowthistle	*Sonchus arvensis*
Common Tansy	*Tanacetum vulgare*
Dandelion	*Taraxacum officinale*
Red Clover	*Trifolium pratense*
Dutch-white clover	*Trifolium repens*
Tall nettle	*Urtica procera*

HERBICIDE USE IN NATIVE PLANT MANAGEMENT

Herbicide use in native plant landscapes is a necessary tool that is sometimes seen as a necessary evil. Herbicides should always be used as an integrated approach that results in actions that fit the specific site and considers long term consequences. The goal is always to apply precision treatment that takes out targeted vegetation and does not harm desirable species. Only certified and licensed applicators may utilize restricted use herbicides, and knowledge of growing cycles of undesirable as well as desirable plant species is key in herbicide application.

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APPENDIX 3: SEED MIXES

Solway Solar						
Proposed Seed Mix						
2-Foot Native Seed Mix						
Roughly 2-Foot Tall Vegetation for Array Areas for Heavy Soils						
Grass Mix						
			PLS Pounds/			
Common Name	**Scientific Name**	**Mix %**	**Acre**	**Seeds/Sq Ft**	**Plant Height**	**Bloom Season**
Side oats grama	Bouteloua curtipendula	52	5.2	11.45	2 ft.	June-August
Blue grama	Bouteloua gracilis	15	1.5	22.04	1-2 ft.	July-September
Eastern star sedge	Carex radiata	0.5	0.05	0.75	1-2 ft.	June-July
Knotsheath sedge	Carex retrorsa	2	0.2	0.81	1-2 ft.	June-August
Long-beaked sedge	Carex sprengelii	0.3	0.03	0.11	2 ft.	July-July
Revenue Slender wheatgrass	Elymus trachycaulum	11.2	1.12	2.84	2 ft.	July- August
Fowl bluegrass	Poa palustris	19	1.9	90.73	2 ft.	June- September
		100	**10**	**128.73**		
Wildflower Mix						
			PLS Ounce			
Common Name	**Scientific Name**	**Mix %**	**Acre**	**Seeds/Sq Ft.**	**Plant Height**	**Bloom Season**
Yarrow	Achillea millefolium	2	0.32	1.29	2 ft.	June-September
Canada anemone	Anemone canadensis	0.5	0.08	0.01	1-2 ft.	May-July
Columbine	Aquilegia canadensis	0.5	0.08	0.07	2 ft.	May-July
Partridge pea	Chamaecrista fasciculata	10	1.6	0.10	1-2 ft.	July- September
White prairie clover	Dalea candida	20.1	3.22	1.40	2 ft.	June-July
Purple prairie clover	Dalea purpurea	32.25	5.16	1.78	2 ft.	June-August
Large-leaved aster	Eurybia macrophylla	1.6	0.26	0.16	2ft.	July-October
Wild geranium	Geranium maculatum	0.05	0.01	0.001	2 ft.	May-June
False Solomon's seal	Mainathemum racemosum	0.3	0.05	0.0004	2 ft.	May-June
Monkey flower	Mimulus ringens	0.5	0.08	4.22	2 ft.	June-September
Black-eyed Susan	Rudbeckia hirta	12	1.92	4.06	2 ft.	June-October
Calico aster	Symphyorichum lateriflorum	0.1	0.02	0.09	2 ft.	August-October
Hoary vervain	Verbena stricta	20.1	3.22	2.07	2 ft.	June-September
		100	**16**	**15.25**		

Solway Solar						
Proposed Seed Mix Options						
Perimeter Seed Mix						
No Height Restriction						
Grass Mix						
			PLS Pounds/			
Common Name	**Scientific Name**	**Mix %**	**Acre**	**Seeds/Sq. Ft.**	**Plant Height**	**Bloom Season**
Big bluestem	Andropogon gerardii	10	0.8	2.94	2-7 ft.	July-August
Side oats grama	Bouteloua curtipendula	25	2	4.41	2 ft.	June-August
Blue grama	Bouteloua gracilis	5	0.4	5.88	8-28 in.	July-September
Mandan Canada wild rye	Elymus canadensis	5	0.4	0.76	1-5 ft.	July-August
Revenue Slender wheatgrass	Elymus trachycaulum	5	0.4	1.01	2 ft.	July- August
Switch grass	Panicum virgatum	5	0.4	2.06	3-6 ft.	June-August
Rosana Western wheatgrass	Pascopyrum smithii	5	0.4	1.01	1-3 ft.	July-August
Fowl bluegrass	Poa palustris	5	0.4	19.1	2 ft.	June- September
Little bluestem	Schizachyrium scoparium	25	2	11.02	3 ft.	August-September
Indian grass	Sorghastrum nutans	10	0.8	3.53	3-7 ft.	August-September
		100	**8**	**51.71**		
Wildflower Mix						
Common Name	**Scientific Name**	**Mix %**	**PLS/Acre**	**Seed/Sq. Ft.**	**Plant Height**	**Bloom Season**
Yarrow	Achillea millefolium	1.25	0.40	1.61	2 ft.	June-September
Fragrant giant hyssop	Agastache foeniculum	1.25	0.40	0.83	3 ft.	June-October
Leadplant	Amorpha canescens	4.50	1.44	0.53	2 ft.	June-August
Canada anemone	Anemone canadensis	1.00	0.32	0.06	1-2 ft.	May-July
Columbine	Aquilegia canadensis	1.00	0.32	0.28	2 ft.	May-July
Swamp milkweed	Asclepias incarnata	3.25	1.04	0.11	1-4 ft.	June-September
Common milkweed	Asclepias syriaca	3.25	1.04	0.10	2-5 ft.	June-August
Canada milk vetch	Astragalus canadensis	3.00	0.96	0.37	2 ft.	June-August
Partridge pea	Chamaecrista fasciculata	3.00	0.96	0.06	1-2 ft.	July- September
White prairie clover	Dalea candida	8.50	2.72	1.19	2 ft.	June-July
Purple prairie clover	Dalea purpurea	8.50	2.72	0.94	2 ft.	June-August
Canada tick trefoil	Desmodium canadense	3.75	1.20	0.15	2-6 ft.	July-September
Sneezeweed	Helenium autumnale	1.00	0.32	0.96	2-5 ft.	August-October
Maximillian sunflower	Helianthus maximiliani	4.50	1.44	0.43	2-10 ft.	July-October
Common ox-eye	Heliopsis helianthoides	5.25	1.68	0.24	2-6 ft.	June-September
Bush clover	Lespedeza capitata	1.00	0.32	0.06	2-5 ft.	July-September
Great St. John's wort	Hypericum pyramidatum	3.00	0.96	4.19	2-5 ft.	July-August
Rough blazing star	Liatris aspera	1.00	0.32	0.12	1-4 ft.	July-September
Meadow blazing star	Liatris ligulistylis	1.00	0.32	0.07	1-3 ft.	August-September
Tall blazing star	Liatris pycnostachya	1.00	0.32	0.08	2-5 ft.	July-September
Wild bergamot	Monarda fistulosa	1.25	0.40	0.64	2-4 ft.	June-August
Evening primrose	Oenothera biennis	3.00	0.96	1.98	2-6 ft.	July-October
Long-headed coneflower	Ratibida columnifera	5.00	1.60	1.54	1-3 ft.	June-August
Black-eyed Susan	Rudbeckia hirta	8.00	2.56	5.41	2 ft.	June-October
Stiff goldenrod	Solidago rigida	3.00	0.96	0.90	1-5 ft.	August-September
Smooth aster	Symphyotrichum laeve	1.50	0.48	0.61	1-3 ft.	August- October
New England aster	Symphyotrichum novae-angliae	1.25	0.40	0.61	3-7 ft.	August-October
Western spiderwort	Tradescantia occidentalis	1.00	0.32	0.07	1-2 ft.	May-September
Blue vervain	Verbena hastata	5.00	1.60	3.42	1-6 ft.	June-September
Hoary vervain	Verbena stricta	5.00	1.60	1.03	2 ft.	June-September
Golden Alexander	Zizia aurea	6.00	1.92	0.48	1-3 ft.	May-July
		100	**32**	**29.05**		

Solway Solar						
Proposed Seed Mix						
Wet Seed Mix						
No Height Restriction						
Grass Mix						
Common Name	**Scientific Name**	**Mix %**	**PLS Pounds/Acre**	**Seeds/Sq. Ft.**	**Plant Height**	**Bloom Season**
Big bluestem	Andropogon gerardii	34	2.04	7.49	2-7 ft.	July-August
Fringed brome	Bromus ciliatus	5	0.3	1.10	2-4 ft.	July-September
Pointed broom sedge	Carex comosa	5	0.3	3.31	1-3 ft.	June-August
Porcupine sedge	Carex hystericina	5	0.3	3.31	1-3 ft.	June-July
Fox sedge	Carex vulpinoidea	5	0.3	11.02	1-3 ft.	June-July
Virginia wild rye	Elymus virgnicus	19	1.14	1.76	1-4 ft.	July-September
Switch grass	Panicum virgatum	5	0.3	1.54	3-6 ft.	June-August
Fowl bluegrass	Poa palustris	15	0.9	42.98	2 ft.	June-September
Green bulrush	Scirpus atrovirens	1	0.06	10.14	3-5 ft.	July-August
Wool grass	Scirpus cyperinus	1	0.06	37.47	3-6 ft.	July- September
Red River Cord grass	Spartina pectinata	5	0.3	0.73	3-8 ft.	August-October
		100	**6**	**120.83**		
Wildflower Mix						
			PLS Ounce			
Common Name	**Scientific Name**	**Mix %**	**Acre**	**Seeds/Sq. Ft.**	**Plant Height**	**Bloom Season**
Yarrow	Achillea millefolium	1	0.16	0.64	2 ft.	
Canada anemone	Anemone canadensis	1	0.16	0.03	1-2 ft.	
Swamp milkweed	Asclepias incarnata	19	3.04	0.33	1-4 ft.	
Beggar's tick	Bidens frondosa	3	0.48	0.06	1-3 ft.	July-October
Canada tick trefoil	Desmodium canadense	4	0.64	0.08	2-6 ft.	July-September
Flat-topped aster	Doellingeria umbellata	1	0.16	0.25	2-7 ft.	July-October
Boneset	Eupatorium perfoliatum	1	0.16	0.59	2-4 ft.	July-October
Grass-leaved goldenrod	Euthamia graminifolia	1	0.16	1.29	2-4 ft.	July-October
Joe-Pye weed	Eutrochium maculatum	1	0.16	0.35	2-10 ft.	July-September
Sneezeweed	Helenium autumnale	1	0.16	0.48	2-5 ft.	August-October
Common ox-eye	Heliopsis helianthoides	7	1.12	0.16	2-6 ft.	June-September
Great St. John's wort	Hypericum pyramidatum	7	1.12	4.89	2-5 ft.	July-August
Meadow blazing star	Liatris ligulistylis	1	0.16	0.06	1-3 ft.	August-September
Tall blazing star	Liatris pycnostachya	2	0.32	0.08	2-5 ft.	July-September
Great blue lobelia	Lobelia siphilitica	1	0.16	1.84	1-4 ft.	July-October
Monkey flower	Mimulus ringens	2	0.32	16.90	2 ft.	June-September
Mountain mint	Pycnanthemum virginianum	1	0.16	0.81	1-3 ft.	July-September
Black-eyed Susan	Rudbeckia hirta	8	1.28	2.70	2 ft.	June-October
Bog goldenrod	Solidago uliginosa	1	0.16	0.48	2-5 ft.	August-September
Panicled aster	Symphyotrichum lanceolatum	1	0.16	0.57	1-5 ft.	July-October
Red-stalked aster	Symphyotrichum puniceum	1	0.16	0.29	1-7 ft.	August-October
Tall meadow rue	Thalictrum dsycarpum	5	0.8	0.20	2-8 ft.	June-July
Blue vervain	Verbena hastata	10	1.6	3.42	1-6 ft.	June-September
Ironweed	Vernonia fasciculata	1	0.16	0.09	3-6 ft.	July-September
Golden Alexander	Zizia aurea	19	3.04	0.77	1-3 ft.	May-July
		100	**16**	**37.34**		

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APPENDIX 4: MN BWSR HABITAT FRIENDLY SOLAR SITE ASSESSMENT FORM FOR PROJECT PLANNING

<To be completed once seed mixes and acreages are finalized>

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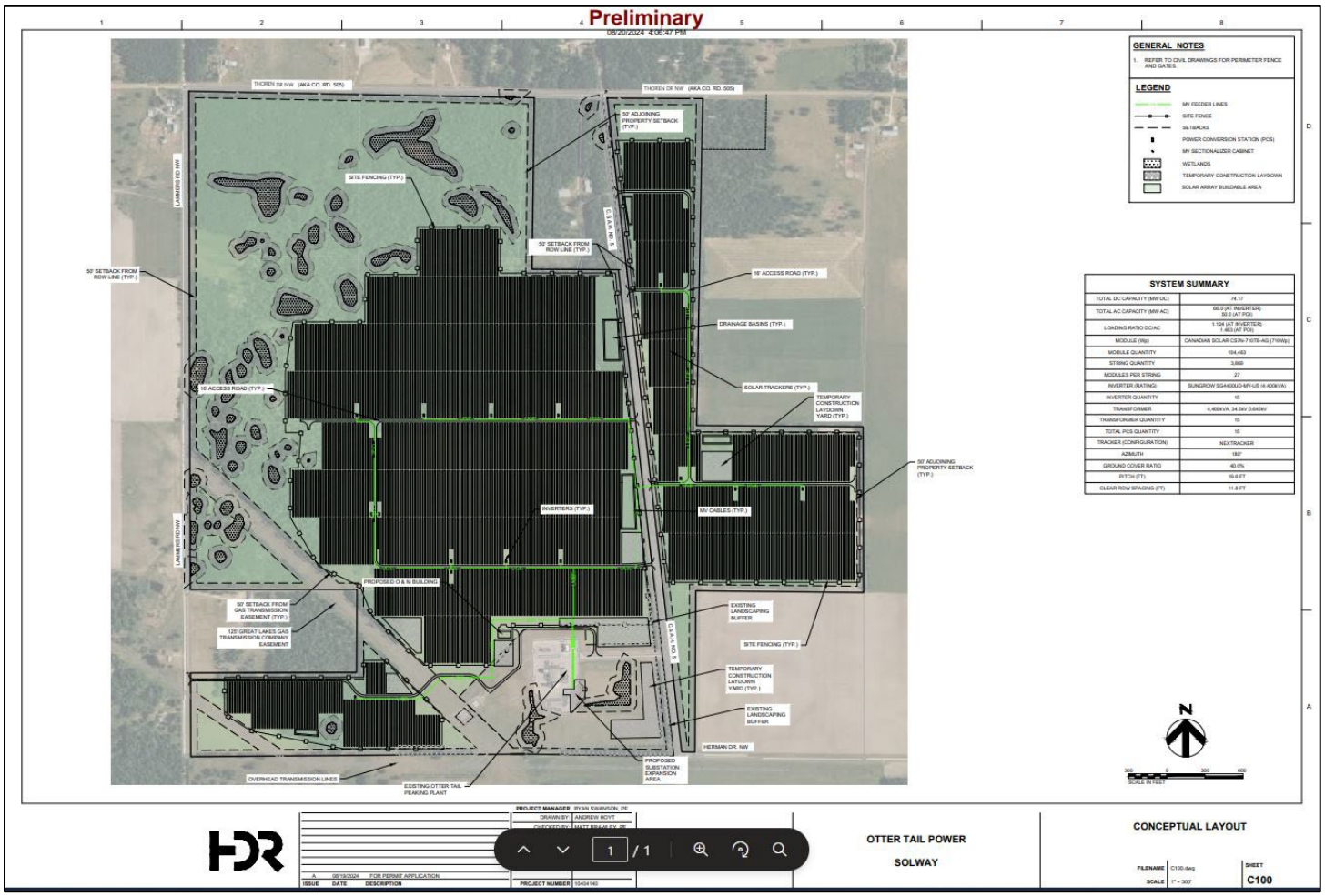
APPENDIX 5: SITE DRAWINGS



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