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August 30, 2019

Ms. Tanowa Troupe, Secretary
Ohio Power Siting Board
Docketing Division
180 East Broad Street, 11th Floor
Columbus, OH 43215

Re: Case Nos. 17-773-EL-BGN and 18-1360-EL-BGN
In the Matter of the Applications of Hardin Solar Energy LLC/Hardin Solar Energy II LLC for a Certificate of Environmental Compatibility and Public Need to Construct a Solar-Powered Electric Generation Facility in Hardin County, Ohio.

Certificate Compliance: Case No. 17-773-EL-BGN (Conditions 14 and 22); and Case No. 18-1360-EL-BGN (Conditions 14 and 21) – Vegetation Management and Landscaping Plan

Dear Ms. Troupe:

Hardin Solar Energy LLC/Hardin Solar Energy II LLC (“Applicant”) is certified to construct a solar-powered electric generation facility in Hardin County, Ohio, in accordance with the orders issued by the Ohio Power Siting Board (“OPSB”) in the above-referenced cases. By Entry issued May 16, 2019, the OPSB approved the merger of the certificates issued to Hardin Solar Energy LLC and Hardin Solar Energy II LLC, for a combined generating capacity of 320 megawatts (“MW”). The Applicant is currently preparing to begin construction on the initial 150 MWs of the 320-MW project.

At this time, the Applicant is filing the attached Vegetation Management Plan in compliance with Conditions 14 and 22 of the OPSB’s February 15, 2018 Order in Case No. 17-773-EL-BGN, and Conditions 14 and 21 of the OPSB’s May 16, 2019 Order in Case No. 18-1360-EL-BGN.

We are available, at your convenience, to answer any questions you may have.

Respectfully submitted,

/s/ Christine M.T. Pirik
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cc: Jim O’Dell

COLUMBUS 39579-24 121945v1



Vegetation Management and Landscape Plan

August 2019

Hardin Solar I & II Energy Centers Hardin County, Ohio

TRC Project No. 314071.0000.0000

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Confidential Business Information

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Attachment A Landscaping Plans

Attachment B Ohio Site Pollinator Habitat Planning and Assessment Form/Pollinator Scorecard
and Pollinator Job Sheet

Attachment C Prohibited Noxious Weeds List Identified by the Ohio State University Extension

Acronyms

B&B	Balled and Bur Lapped
BMPs	Best Management Practices
GIS	Geographic Information Systems
HSE	Hardin Solar Energy, LLC
HSE II	Hardin Solar Energy II LLC
MW	Megawatt
NLCD	National Land Cover Database
ODNR	Ohio Department of Natural Resources
OPSB	Ohio Power Siting Board
OSU	Ohio State University
Plan	Vegetation Management and Landscape Plan
Project	Hardin Solar Energy LLC and Hardin Solar Energy II LLC
Staff	Staff of the Public Utilities Commission of Ohio
SWPPP	Stormwater Prevention and Protection Plan
TCIA	Tree Care Industry Association
TRC	TRC Companies, Inc.
USDA	United States Department of Agriculture
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey

1.0 Introduction

On behalf of Hardin Solar Energy LLC (HSE) and Hardin Solar Energy II LLC (HSE II) (collectively, the “Project”), TRC Companies, Inc. (TRC) has prepared this Vegetation Management and Landscape Plan (Plan) as part of the Ohio Power Siting Board (OPSB) conditions and requirements for a proposed solar facility project. Hardin Solar I and Hardin Solar II Energy Centers are anticipated to have a nameplate capacity of 150 Megawatts (MW), and 170 MW respectively, for a total of 320 MW. The Hardin Solar Area, to encompass both phases, is approximately 5,060 acres. The land is privately owned and is located approximately 2.5 miles (3.9 kilometers) southeast of Alger, in Hardin County, Ohio. The Hardin Solar Area is bisected by Township Roads 37, 120, and 130 (east/west) and County Roads 130 and 110 (east/west) and is bounded by State Route 235 to the west, Township Road 100 to the north, County Road 75 to the east, and County Road 150 to the south in Hardin County, Ohio (Figure 1 - USGS Topographical Hardin Solar Area Map).

This Plan will identify areas of proposed vegetation and vegetation clearing and describe appropriate procedures for the clearing to be completed and revegetation strategies to be implemented. This Plan will also describe appropriate procedures for protecting trees, installing visual mitigation and landscape screening, implementing the use of native plants and pollinator-friendly species, and providing strategies for invasive plants and noxious weed control and maintenance and monitoring methods over the lifetime of the Project. The Plan is intended to be a “living” document, able to be updated for evolving site conditions and vegetation management methods over the Project life.

Coordinate System: NAD 1983 2011 StatePlane Ohio North FIPS 4411 R US (Foot US)
Map Rotation: 0

Legend

- [Red Outline] Hardin Solar Area
- [Black Outline] Township
- [Yellow Outline] USGS 7.5-minute Topographic Quadrangle

Townships: CESSNA TOWNSHIP, MARION TOWNSHIP, ROUNDHEAD TOWNSHIP, LYNN TOWNSHIP, McDONALD TOWNSHIP

Quadrangles: Alger Quadrangle 11, Roundhead Quadrangle

Scale: 1" = 2,500' / 130,000 Feet

Inset Map: Shows location in Ohio relative to MI, PA, WV, KY, IN.

Project Information:

PROJECT:		HARDIN SOLAR I ENERGY CENTER HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION
TITLE:		USGS TOPOGRAPHIC MAP HARDIN SOLAR AREA MAP
DRAWN BY:	P. JACQUES	PROJ NO.: 314071.0000.0000
CHECKED BY:	M. ROSS	
APPROVED BY:	M. ROSS	
DATE:	AUGUST 2019	

FIGURE 1

TRC

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FILE NO.: H81_H8_2_Fig1_USGS_11x17_20190813.mxd

2.0 Purpose and Intent

Generally, this Plan outlines directives regarding the management of existing and future vegetation found growing within the Hardin Solar Area, to ensure the safe and reliable production and delivery of electrical power consistent with responsible land use and minimal impacts or benefit to the ecosystem in and around the Hardin Solar Area. It aims to serve as a tool in providing consistent and predictable implementation strategy, improving the overall health and quality of the surrounding environment.

Specifically, the purpose and intent of this Plan is to describe how the final design of the Project includes the implementation, planting, and maintenance of pollinator-friendly, native plantings; identify landscape screening strategy (Appendix A); identify all areas of proposed tree and vegetation clearing, the extent of clearing, and how the clearing will be done in a way to minimize the removal of tree and other woody vegetation; how trees and shrubs near construction/maintenance activities will be protected; and outline plans to control planted and invasive vegetation during construction and operations. This Plan incorporates recommendations identified in the Staff of the Public Utilities Commission of Ohio *Staff Report of Investigation* (Case No. 17-0773-EL-BGN) and referenced in the Ohio Power Siting Board Order (OPSB) - OPSB (17-773-EL-BGN V. (2.) (b.) and VI. (18) and (22).

This Plan includes how vegetation activities, methods, and processes address potential ecological impacts, with respect to the Hardin Solar Area conditions, as described in the *Staff Report* specifically under the *Ecological Conditions* (Section IV, page 35) and *Nature of Probable Environmental Impact* sections (Section III, page 12), which were assembled in consideration of responses and coordination with: Staff of the Public Utilities Commission of Ohio (Staff), the Ohio Department of Natural Resources (ODNR), and the United States Fish & Wildlife Service (USFWS). Additionally, recommendations from the Ohio Pollinator Habitat Initiative and the inclusion of the Ohio Site Pollinator Habitat Planning and Assessment Form/Pollinator Scorecard and Pollinator Job Sheet (Attachment B) were considered in developing this Plan. The Pollinator Habitat Initiative Job Sheet provides an overview of the pollinator process and further guidance with respect to purpose, description, establishment, preparation, planting, and evaluation/monitoring. The Pollinator Scorecard also provides structured goals of implementation, benchmarks for design, and program schedules regarding maintenance and monitoring activities.

3.0 Existing Conditions

3.1 Characterization Methods

The site characterizations for the Vegetation Management and Landscape Plan were completed using a combination of existing information available from public sources including on-line data bases, public literature and documents, reports, and geographic information systems (GIS) data. Additional information was obtained by field scoping views, agency consultation, and through collaboration efforts with landowners and field specialists or other qualified professionals.

The Project received a Technical Assistance Letter from the USFWS dated, June 25, 2018 (USFWS 2018b), which provided information on any areas precluded from development, sensitive habitats, and occurrences of species of concern within a 1.0-mile (1.6-kilometer) radius of the Hardin Solar Area. Additionally, correspondence dated July 2, 2018 from the ODNR Natural Heritage Database (ODNR 2018a), provided similar information on state-managed resources. This correspondence also provided recommendations and best management practices (BMPs) to minimize erosion and prevent non-native invasive plant species from establishing, to help protect and preserve natural buffer systems around streams and wetlands and to avoid or minimize impacts on high quality habitats for fish and wildlife, which was incorporated into the *Staff Report* to OPSB. For this Plan, this correspondence was used to identify if any sensitive resources exist within the Hardin Solar Area which could require special attention in the Plan, and to inform the ground cover and management strategy.

A site characterization field survey was completed on May 24, 2018, May 29, 2018, June 12, 2018, and June 13, 2018 within the Hardin Solar Area to confirm USFWS and ODNR consultation feedback and further describe existing conditions. Further, a field scoping view of the Hardin Solar Area was also conducted on June 11 and 12, 2019. During this field visit, land cover types were ground-truthed to confirm their accuracy with United States Geological Survey (USGS) National Land Cover Database (NLCD) (2017a) data, to identify trees/wooded areas, and provide additional information useful to developing the ground cover strategy and Landscaping Plan. The following publicly available data sources were used to create the land cover map used in the field scoping view:

- Google Earth™ ("Google Earth – Google Earth." Google Earth. Google, no date (n.d.) Web. 1 June 2018. <https://earth.google.com/>).
- National Land Cover Database (NLCD) (Survey, U.S. Geological. "National Land Cover Database (NLCD)." LCS Program: NLCD. N.p., n.d. Web. 1 June 2018. https://www2.usgs.gov/climate_landuse/lcs/projects/nlcd.asp).

3.2 Desktop Data and Agency Consultation Summary

Based on data reviewed, agency consultation (USFWS 2018b, ODNR 2018a) and subsequent field reconnaissance, no federal wilderness areas, state or federal wildlife refuges or areas, nature

preserves, designated critical habitats, unique ecological sites, geologic features, scenic rivers, animal assemblages, plant communities of concern, or protected animals or plants, were identified within the Hardin Solar Area or within the surrounding 1.0-mile (1.6-kilometer) radius.

3.3 Existing Land Use and Land Cover

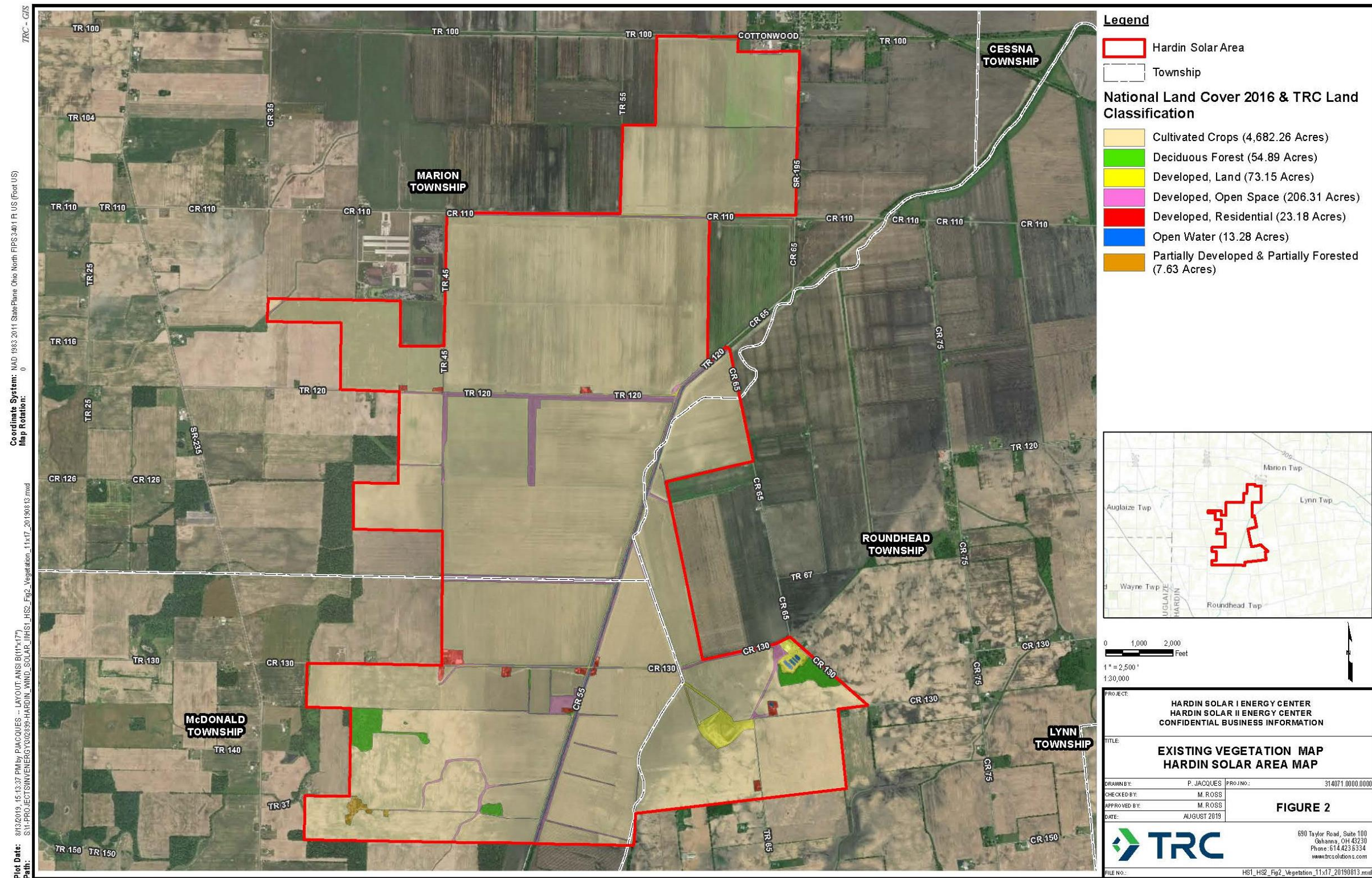
As shown on Figure 2, over 92 percent of the approximately 5,060 acres within the Hardin Solar Area is comprised of cultivated crops. In addition to cultivated crops, dominant cover types include approximately four (4) percent (206.31 acres) open space, one and a half (1.5) percent (73.15 acres) developed land, and one (1) percent (54.89 acres) is deciduous forest distributed amongst several patches. The remaining Hardin Solar Area includes approximately 0.45 percent (23.18 acres) residential area, 0.26 percent (13.28 acres) open water and 0.15 percent (7.63 acres) is partially developed and partially forested. The developed portion of the Hardin Solar Area consists of an abandoned homestead and dilapidated shed or storage type structures.

The Hardin Solar Area is located within the Eastern Corn Belt Plains Ecoregion which is generally characterized as having loamy and well-drained soils associated with rolling plains and local end moraines. The vegetation of the ecoregion was originally dominated by American Beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*) and American basswood (*Tilia americana*) forests however, field observations, aerial photography and National Land Cover Database USGS (2017a) mapping show this landscape has been significantly altered by farming practices allowing for other plant species such as locust (*Robinia sp.*), walnut (*Juglans sp.*), and other old field growth plants to move in and establish.

Deciduous hardwood tree species dominate the tree canopies of the existing woodland and forested portions of the Hardin Solar Area. Predominant tree species found in these areas include oaks (*Quercus spp.*) and maples (*Acer spp.*). Understory plants are comprised mostly of young maple and oak saplings. Additionally, primary crops planted throughout the numerous farm fields surrounding the Hardin Solar Area and vicinity include; soybean, wheat, alfalfa, and corn. Soil conditions within the Hardin Solar Area are generally characterized as loamy and well drained and the land is used heavily for agriculture, resulting in strips or pockets of old field growth, hedge rows, and forested areas.

Invasive plants and other noxious weeds are prevalent along the edges of roads, hedge rows, and farm field where crops are not typically planted. Noxious weeds and invasives identified during the field scoping view include; burdock (*Arctium lappa*), maretail (*Conyza canadensis*), Canada thistle (*Cirsium arvense*), Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), common dandelion (*Taraxacum officinale*), and johnsongrass (*Sorghum halepense*). Additional non-native plant species (including a variety of ornamental trees and shrubs) have been planted as landscaping on the few residential properties existing in and around the Hardin Solar Area.

Figure 2 Existing Vegetation Map



Below are selected images that represent typical examples of existing vegetation growth and surrounding conditions that can be found within the Hardin Solar Area.



Figure 3 A typical farm field with planted crops located in between an existing wooded area and a farm field hedge row.



Figure 4 A typical residential setting in the Hardin Solar Area.



Figure 5 Example of a typical farm field with recently planted crops.



Figure 6 One of the few working farms in the area.



Figure 7 An example of a vegetative (grass) buffer strip and drainage ditch with tall grasses along the existing road.



Figure 8 Example of an existing residential structure located within a working farm field.

Note, the non-native landscape plantings in the distance that have been planted around the residence.



Figure 9 Inside an existing forested area within the Project.

Note, the understory is dominated by maple saplings.



Figure 10 Typical understory growth found in another existing forested area within the Project.

4.0 Vegetation Planting and Revegetation Implementation

To the extent possible, the Project will implement vegetation management and landscaping measures including:

- planting of temporary vegetation and long-term vegetation,
- planting of solar array groundcover and pollinator-specific groundcover,
- invasive weed control,
- protection of woody vegetation,
- tree clearing, and
- vegetation monitoring, maintenance and management.

4.1 Temporary Vegetation

During construction and/or extensive maintenance activities, temporary stabilization practices must be implemented to reduce soil erosion during stormwater events and minimize damage to soils during intensive equipment traffic. Best management practices to address these concerns, including use of temporary (annual) seed mixes and winter cover crops, are outlined in the Project's Stormwater Prevention and Protection Plan (SWPPP) and will be implemented to ensure all land and water resources are protected during construction and operations.

4.2 Long-Term Vegetation and Landscaping Plan

4.2.1 Landscape Plan

The visual mitigation and landscaping screen for each location identified in final Project site plans will include approximately 60 percent Eastern red cedar (*Juniperus virginiana*) and 40 percent white spruce (*Picea glauca*) native evergreen tree plantings, unless otherwise agreed to by the landowner. The evergreen trees will be four (4) to five (5) feet in height and balled and bur lapped (B&B) root. These, or substantially similar, visual buffers will be developed for existing residences where mitigation against any potential views of the proposed solar arrays is required.

Attachment A provides a sample Landscaping Plan for an existing residence located at 13657 Township Road 65. The existing conditions observed within the Hardin Solar Area are suitable for the plant species identified in the Landscaping Plan however, if wetter or more shaded areas are encountered then the herbaceous plant species in the example can be substituted with shade/water-tolerant species such as Virginia wildrye (*Elymus virginicus*) or deertongue 'tioga' (*Panicum clandestinum*) could be used as viable substitutes.

4.2.2 Solar Array Ground Cover

Within the solar array, low-growing seed mixes specifically created for the use under the arrays will be used as the long-term ground cover (Attachment A). This mix may be comprised of warm

and cool season grasses that do not typically exceed height of two (2) feet thus, eliminating any concerns for shading. As a result, the proposed pollinator-specific seed mix can be sown everywhere possible to promote a pollinator-friendly habitat. A seed mix of shorter height not only reduces mowing regimens but will also allow for the pollinator-friendly species to grow to their naturally occurring heights resulting in optimum flower production in these areas.

It may include low-growing flowering forbs such as wild garlic or onion (*Allium canadense*), wild columbine (*Aquilegia canadensis*), Ohio goldenrod (*Oligoneuron ohioense*), black-eyed susan (*Rudbeckia hirta*), or wild geranium (*Geranium maculatum*) if such species are readily available in quantity at the time of planting. Recommended examples of grass species for the solar array panels include: creeping red fescue (*Festuca rubra*), sheep fescue (*Festuca ovina*), hard fescue (*Festuca brevipila*), blue fescue (*Festuca ovina* var. *glauca*), Kentucky bluegrass (*Poa pratensis*), and autumn bentgrass (*Agrostis perennans*) (Table 1).

Table 1. Proposed Solar Array Ground Cover

NATIVE/NATURALIZED SOLAR FARM SEED MIX				
BOTANICAL NAME	COMMON NAME	MIX CONCENTRATION	RATE (LBS/ACRE)	RATE (LBS/1000 FT ²)
FESTUCA RUBRA	CREeping RED FESCUE	34%	262	6
FESTUCA OVINA	SHEEP FESCUE	33%		
FESTUCA BREVIPILA 'BEACON'	HARD FESCUE 'BEACON'	10%		
FESTUCA OVINA VAR. DURIUSCULA 'RHINO'	HARD FESCUE 'RHINO'	5%		
FESTUCA OVINA VAR. GLAUCA (F. ARVERNENSIS) (F. GLAUCA), 'BLUE RAY'	BLUE FESCUE 'BLUE RAY'	5%		
POA PRATENSIS 'ARGYLE'	KENTUCKY BLUEGRASS 'ARGYLE'	5%		
POA PRATENSIS 'SHAMROCK'	KENTUCKY BLUEGRASS 'SHAMROCK'	5%		
AGROSTIS PERENNANS, ALBANY PINE BUSH-NY ECOTYPE	AUTUMN BENTGRASS, ALBANY PINE BUSH-NY ECOTYPE	3%		

4.2.3 Pollinator-Specific Ground Cover

A pollinator-specific seed mix will be used in select areas to provide additional ecological benefit and enhance visual aesthetics of the Project. These select areas include, for example: along the fence line perimeters, access roads, and other places where pockets of space are created due to odd angles in the fence line perimeter, solar array configurations, or buffer areas. A conceptual figure has been provided below to illustrate pocket areas of a typical solar site that can be used for pollinator-friendly species (Figure 11). Since this seed mix is intended for areas away from panel arrays, the species selected can be allowed to grow taller than the ground cover maintained within the solar array. Proper raking, tilling, and finish grading techniques shall be performed prior to sowing the pollinator-specific seed mix. Some examples of pollinator-friendly species include purple coneflower (*Echinacea purpurea*), black-eyed susan (*Rudbeckia hirta*), plains coreopsis (*Coreopsis tinctoria*), Ohio spiderwort (*Tradescantia ohiensis*), and zigzag aster (*Aster Prenanthoides*) (Table 2).

4.2.4 Long-Term Vegetation and Landscaping Plan Requirements

The following actions or requirements are described to ensure success of the long-term ground covers or areas receiving visual screening pursuant to the Landscaping Plan, and shall be adhered to during site reclamation following construction or any significant maintenance activities requiring earth disturbance.

All labor, plants, approved seed mix, and materials shall be provided in quantities sufficient to complete any revegetation work necessary prior to implementation, and all trees/shrubs being used for any/all revegetation efforts shall be acclimated by the supply nursery to the local hardiness zone, be certified that the planting material has been grown for a minimum of two (2) years at the source, and obtained within 200 miles of the Project unless otherwise approved and agreed upon by the Project. The average frost-free growing season for the Hardin Solar Area is mid-April through the end of October.

Any plant material used for revegetation efforts within the Hardin Solar Area shall be guaranteed upon installation and any/all plants, trees, and shrubs shall be healthy and free of disease before, during, and after substantial completion and acceptance by the Project. Individual trees and shrubs shall be typical of their species or variety, with normal habit of growth. In addition, trees and shrubs shall be sound, healthy, vigorous, well-branched and densely foliated when in leaf, free of disease, insect pests, eggs or larvae and they shall have healthy and well-developed root systems. Any dead or unhealthy plants shall be replaced following the guidelines and directives of guarantee(s) provided and agreed upon. Final acceptance of any revegetation efforts shall be made only if all plants meet the guarantee requirements including the maintenance directives put forth in this Vegetation Management and Landscape Plan.

Figure 11 Concept Figure for Pollinator-Specific Ground Cover (Pocket Area Plantings)

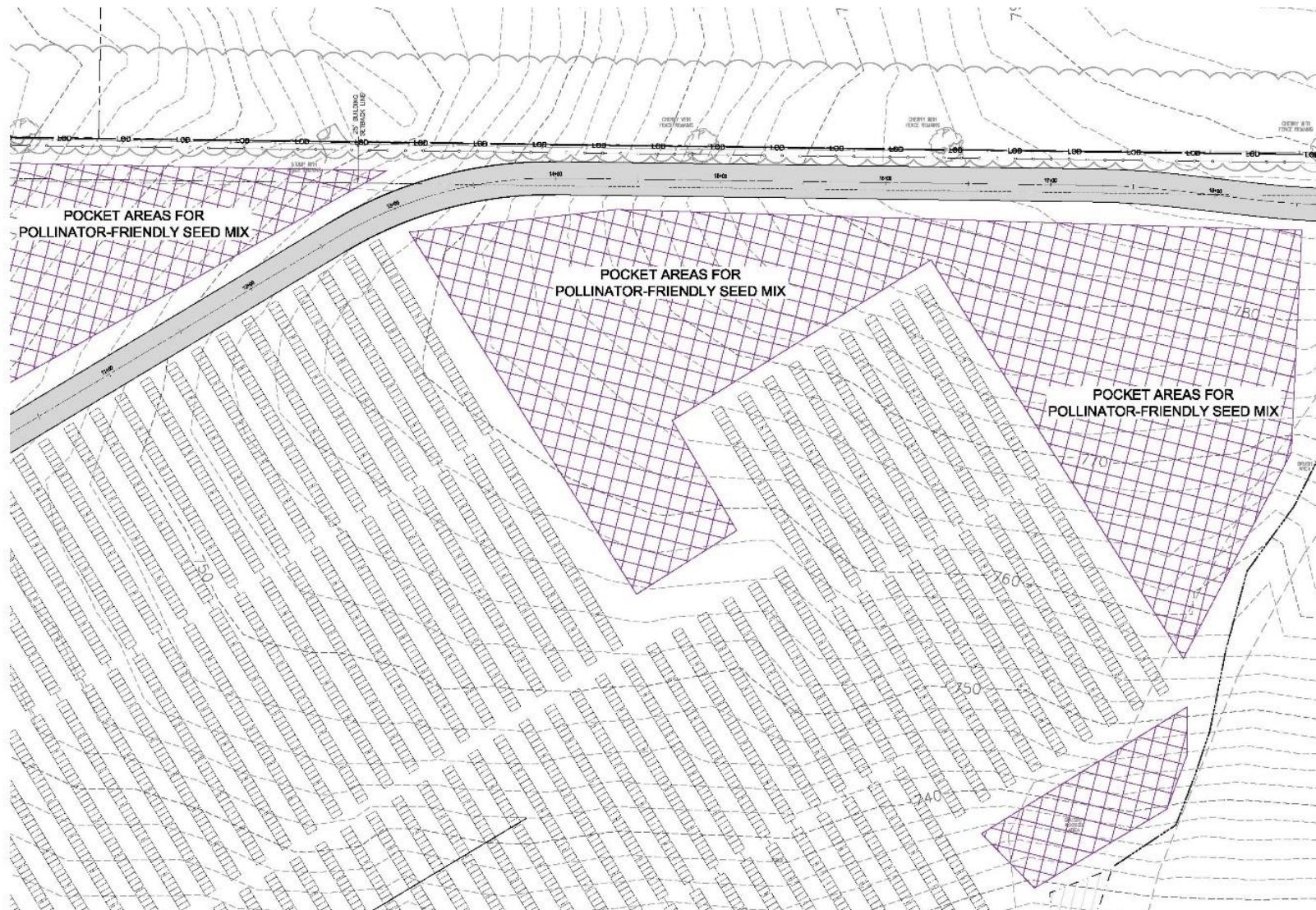


Table 2. Proposed Pollinator-specific Ground Cover

NORTHEAST NATIVE WILDFLOWER & GRASS MIX				
BOTANICAL NAME	COMMON NAME	MIX CONCENTRATION	RATE (LBS/ACRE)	RATE (LBS/1000 FT ²)
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	40%	20	0.46
BOUTELOUA CURTIPENDULA	SIDEOATS GRAMA	23.40%		
COSMOS BIPINNATUS	COSMOS	7.30%		
COREOPSIS LANCEOLATA	LANCELEAF COREOPSIS	3.50%		
ECHINACEA PURPUREA	PURPLE CONEFLOWER	3.50%		
ELYMUS VIRGINICUS	VIRGINIA WILDRYE	3%		
SORGHASTRUM NUTANS	INDIANGRASS	2.50%		
LUPINUS POLYPHYLLUS	BIGLEAF LUPINE	2.20%		
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	2%		
DELPHINIUM AJACIS	ROCKET LARKSPUR	2%		
RUDBECKIA HIRTA	BLACKEYED SUSAN	2%		
GAILLARDIA ARISTATA	BLANKET FLOWER	1.50%		
SENNA HEBECARPA	WILD SENNA	1%		
PENSTEMON DIGITALIS	TALL WHITE BEARDTONGUE	1%		
PAPAVER RHOEAS	SHIRLEY MIX (CORN POPPY, SHIRLEY MIX)	0.60%		
ANDROPOGON GERARDII	BIG BLUESTEM	0.50%		
ELYMUS CANADENSIS	CANADA WILDRYE	0.50%		
COREOPSIS TINCTORIA	PLAINS COREOPSIS	0.50%		
LIATRIS SPICATA	BLAZING STAR	0.40%		
ASCLEPIAS SYRIACA	COMMON MILKWEED	0.40%		
ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED	0.40%		
ZIZIA AUREA	GOLDEN ALEXANDERS	0.30%		
ASCLEPIAS INCARNATA	SWAMP MILKWEED	0.30%		
MONARDA FISTULOSA	WILD BERGAMONT	0.20%		
PENSTEMON LAEVIGATUS	APPALACHIAN BEARDTONGUE	0.20%		
SENNA MARILANDICA	MARYLAND SENNA	0.20%		
SOLIDAGO NEMORALIS	GRAY GOLDENROD	0.10%		
TRADESCANTIA OHIENSIS	OHIO SPIDERWORT	0.10%		
ASTER LAEVIS	SMOOTH BLUE ASTER	0.10%		
ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	0.10%		
ASTER PRENANTHOIDES	ZIGZAG ASTER	0.10%		
HELIOPSIS HELIANTHOIDES	OXEYE SUNFLOWER	0.10%		

Additionally, all tree/shrub planting locations should be coordinated with Project utilities. A site layout, grading and/or utility plan will be referenced to locate storm, sanitary, gas, electric, telephone and water lines whenever possible and care should always be exercised when digging in areas of potential conflict with underground or overhead utilities.

Seeding of the long-term ground cover should take place by broadcast method during the dormant planting window unless otherwise specified. This window in Ohio is mid-December until March 1. All areas of the Hardin Solar Area should be planted during this time for optimum results.

Wherever necessary, topsoil shall be installed at a minimum depth of four (4) inches as needed to establish proper planting conditions. Although no soil samples were taken during the field scoping view, soil samples can help confirm suitable seed mixes are chosen. If the local seed provider determines this information is necessary to confirm seed selection, topsoil samples will be submitted to a certified testing laboratory to determine PH, fertility, organic content and mechanical composition prior to any planting or sowing of seed. The topsoil samples should be placed in a ziplock plastic bag or a plastic bucket with sealed container lid and submitted within three (3) month from the time the sample has been taken. The topsoil testing can be completed at a Regional Extension Office of the United States Department of Agriculture (USDA) or other qualified facility and the resulting amendment recommendations for good plant growth and proper soil acidity should be incorporated into the existing soil prior to any sowing of seed or planting that is to occur.

Additionally, no phosphorous shall be used at the time of planting unless soil testing has been completed and tested by a horticultural testing lab and soil tests specifically indicate a phosphorous deficiency that is harmful or will prevent new grasses and plantings from establishing properly. If soil tests do indicate a phosphorous deficiency that will impact plant and grass establishment then phosphorous shall be applied at the minimum recommended level prescribed in the soil test following all applicable standards, requirements, and/or regulations.

5.0 Vegetation Maintenance and Monitoring

The implementation of a vegetation monitoring program and schedule combined with appropriate vegetation management practices can provide numerous benefits to the Hardin Solar Area, as well as minimize overall maintenance costs over the Project life. Proper monitoring and maintenance techniques will help enhance the overall vitality of the existing or planted native vegetation located within the Hardin Solar Area and limit the spread of unwanted, invasive, or noxious plant species in the Hardin Solar Area.

Some maintenance activities, like tree protection, may occur during both construction and operations phases of the Project, while others, like monitoring for invasive weeds, begin as the long-term ground cover is being planted. Monitoring of the Hardin Solar Area for invasive weeds and areas requiring vegetation maintenance (e.g., pruning of dead limbs creating a safety hazard) shall occur at a minimum in the spring and in the fall in the first two (2) growing seasons following initial installation of the long-term ground cover. After the first two (2) years, the vegetation within the Hardin Solar Area will be monitored on an as-needed basis.

5.1 Invasive Weed Control, Monitoring, and Management

The monitoring regime will include identifying the presence of invasive or unwanted species and the extent of their occurrence. During the first two (2) growing seasons following planting of the long-term ground cover, the Project is most vulnerable to invasive and/or noxious weed species infestation due to the recent soil disturbance from construction activities. Should any invasive species be identified within the Hardin Solar Area, the invasive species shall be removed according to methods most likely to be effective in controlling that species and, where necessary, supplementing its replacement with an approved vegetation and seed mix identified for the Hardin Solar Area or an approved equal alternative option. Attachment C contains the Prohibited Noxious Weeds list identified by the Ohio State University (OSU) Extension that can be used as a reference for which Invasive plants may occur in the Hardin Solar Area.

Below are images of prohibited noxious weeds or invasive plant species that were commonly observed within the Hardin Solar Area during the field scoping view.



Figure 12 Burdock (*Arctium lappa*)



Figure 13 Marestalk (*Conyza canadensis*)



Figure 14 Canada thistle (*Cirsium arvense*)



Figure 15 Virginia Creeper (*Parthenocissus quinquefolia*) and some Poison Ivy (*Toxicodendron radicans*)



Figure 16 Common Dandelion (*Taraxacum officinale*)



Figure 17 Johnsongrass (*Sorghum halepense*)

5.2 Protection of Woody Vegetation

Tree (or woody vegetation) protection BMPs are utilized to protect a tree's crown and/or root zone from damage during construction-type activities, though these could occur throughout the life of the Project. It is far easier to protect a tree from damage than to repair or replace it. The primary tree protection method will be a fencing barrier that is set up around the perimeter of the root zone protecting this area from equipment compaction and/or damage to the trunk of any tree located in or around construction activities. In addition to protecting individual tree and shrub species, the exclusionary fencing can also be used for larger areas of woody vegetation located within the limits of construction. These larger areas of vegetation may include existing wood line edges, hedge rows, and shrubby growth areas such as old fields and successional growth that is to be preserved.

5.3 Tree Clearing

Tree clearing, although not expected to occur during construction or operation of the Project, will be minimized and only occur to the extent necessary. Any necessary tree clearing activity will follow the seasonal clearing guidance provided by USFWS. The Project will avoid potential impacts to listed bat species by avoiding any clearing of trees or branches greater than three (3) inches in

diameter between April 1 and September 30. If any tree clearing must occur in this period, additional coordination with USFWS and/or ODNR will occur prior to clearing, unless the tree/branch to be cleared is determined hazardous to human life or property. Prior to construction, if any tree clearing is required, the locations of all trees to be cleared will be mapped and included on final site plan drawings.

5.4 Maintenance of Vegetation

Maintenance responsibilities include approved cultivating, mowing, spraying (when necessary), weeding, watering, tightening of tree strap guys, pruning, fertilizing, mulching, and any other operations necessary to maintain plant viability. Maintenance responsibilities shall be implemented over the lifetime of the Project from the onset of construction through decommissioning. Maintenance services and practices will vary in need, type, and intensity during the lifecycle of the Project. Mowing regimens will vary as well depending on the time of year and rainfall intensity, though mowing will occur as infrequently as vegetation growth will allow. Additionally, pruning efforts should lessen over time if proper pruning practices and standards are implemented.

The long-term ground cover was selected to eliminate the need for frequent mowing. The primary objective of mowing is to keep the vegetation below two (2) feet in height to avoid panel shading. It is recommended that a minimum of one (1) to two (2) mowings occur each year to maintain a healthy viable groundcover stand throughout the Hardin Solar Area. Mowing will be needed to control annual weeds that are typical after a ground disturbance. The purpose of the mowing is to prevent annual weeds and any long-lasting perennial weeds from seeding out. These mowings typically occur at least twice the first year and normal windows are June to July, and July to August.

The first mowing should be at no less than three (3) inches in early spring around the time new growth begins and the second mowing should occur once maximum heights are reached. Mowing heights can vary between five (5) and ten (10) inches during the second mowing to achieve the goals of preferred height limitations and maximizing benefits to wildlife. A 10-inch mowing height will be used whenever possible for the second mow to align with the guidelines in the Ohio Pollinator Initiative however, shorter mowing heights of five (5) to six (6) inches may be needed if panel shading issues are encountered in that year. Occasionally, a third mowing may be needed during wetter and hotter growing season conditions. All mowing should be completed by August 31st.

Selective herbicide used to control weeds and unwanted vegetation growth may be necessary but will be avoided whenever possible and all other options and/or methods to control vegetation will be considered prior to herbicide use. The Ohio Site Pollinator Habitat Initiative provides additional guidelines (Attachment B) on herbicide use in pollinator-friendly habitat management, which will be implemented where and when reasonably appropriate. Should herbicide use be necessary, herbicide application strategy will be determined and applied by personnel qualified in its use to ensure proper selection and application, as treatment approach can vary greatly

depending on target species, time of year, extent of area, or other factors. Depending upon agreements with Project landowners, the use of herbicide will require their input and approval, which the Project will obtain prior to implementation.

All pruning shall conform to the Tree Care Industry Association (TCIA) ANSI a300 (part 1) - 2017 pruning standards. Pruning standards performed by the Project on trees and shrubs within the Hardin Solar Area shall manage risk, manage health, develop structure, provide clearance, manage size or shape, improve aesthetics, manage production of fruit, flowers to benefit the existing pollinator habitat, and/or manage wildlife habitat. Developing structure through proper pruning practices will improve branch and trunk architecture, promote or subordinate certain leaders, stems, or branches. It will also promote desirable branch spacing, promote or discourage growth in a particular direction (directional pruning), minimize future interference with vehicular traffic, lines of sight, infrastructure, or other plants.

Proper pruning methods also restore plants following any damage, and pruning can rejuvenate shrubs. Pruning for clearance between infrastructure and vegetation shall ensure safe and reliable utility services and minimize interference with traffic, lines of sight, infrastructure, or other plants. Proper pruning practices can also raise crown(s) for movement of traffic or light penetration, ensure lines of sight or desired views, provide access to sites, buildings, or other structures; and/or comply with additional requirements, recommendation, and guidelines found within the Plan. Pruning shall adhere to all seasonal clearing restrictions (See Section 5.3, above).

6.0 Conclusion

Native pollinator ground covers are intended to provide excellent wildlife food and shelter that will attract a variety of pollinators and songbirds. They may also serve as a foundation for the local community to support beekeeping initiatives. Native wildflowers and grasses in pollinator seed mixes provide an attractive display of color from spring to fall and the pollinator seed mixes are intended to provide nectar and food sources for a variety of pollinators and larva. Native wildflowers and grasses will be sown throughout the Hardin Solar Area, using a lower-growing array seed mix comprised mostly of shorter grasses (to reduce shading of panels), and a taller-growing pollinator-friendly seed mix comprised mostly of wildflowers and other forbs (to provide additional ecological benefits). The array mix is to be used throughout the Hardin Solar Area, and the pollinator-friendly mix will be planted in select locations within the fence line where shading is not a concern. This Plan, as set forth, provides a simple framework to implement and maintain native ground cover in the Hardin Solar Area throughout the life of the Project.

The following shall serve as a quick reference guide of the key components, steps, or sequences listed the Vegetation Management and Landscape Plan. The average frost-free growing season for the Project is mid-April through the end of October and all monitoring and maintenance activities listed below shall take this growing season into consideration when performing or practicing any related tasks, scheduling, or services.

- Keep this Vegetation Management and Landscape Plan available for reference throughout construction and operations;
- Implement appropriate erosion control and/or site construction BMPs as outlined in the SWPPP;
- For best results, plant long-term ground cover during the dormant window, between mid-December and March 1;
- Identify all areas of concern as it relates to vegetation management (soil erosion, lack of vegetation growth, etc.) and maintenance control needs (weed growth, re-seeding), and promptly address each concern to reduce negative impacts;
- Identify areas within the Project that will require monitoring and maintenance needs per the direction of this Plan (twice annually during construction and the first two (2) years; as-needed thereafter);
- Prepare a monitoring/maintenance schedule and approach to address vegetation management and maintenance control needs, ensuring that the appropriate times, time frames, and/or time periods of all vegetation management practices are addresses and realized and do not cause overlap or conflict with any other on-site activities or schedules that are pending. Generally, mowing should occur one to two (2) times per year, and before August 31;

- Perform all maintenance activities as needed and/or required according to any/all practice standards and/or guidelines, including this Plan; and
- Have protocols in place for emergency situations (such as fallen vegetation on structures or utility lines, wind or storm damage, spillage of material, etc.), additional vegetation efforts, monitoring activities, and/or unexpected maintenance needs identified within the Hardin Solar Area.

7.0 References Cited

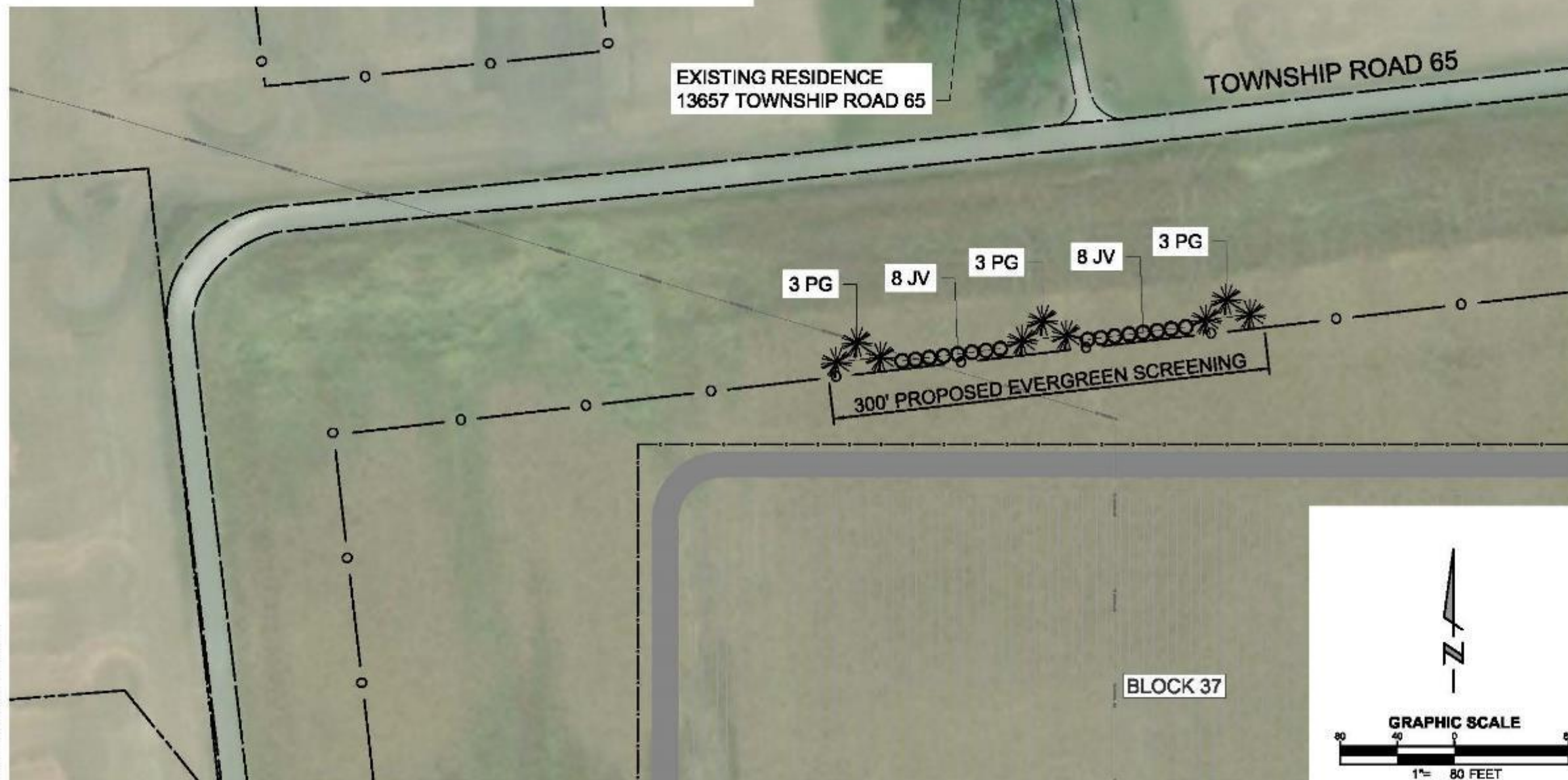
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- OSU Extension (Ohio State University Extension) Prohibited Noxious Weeds list. <https://extension.osu.edu>
- TCIA Tree Care Industry Association (TCIA) ANSI a300 (part 1) - 2017 pruning standards. <https://www.tcia.org>
- The Staff of the Public Utilities Commission of Ohio Staff Report of Investigation (Case No. 17-0773-EL-BGN). Case No. 18-1360-EL-BGN. Submitted to the OPSB Ohio Power Siting Board February 26, 2019. <https://www.opsb.ohio.gov>
- USFWS (2018b). Technical Assistance Letter from the USFWS dated, June 25, 2018
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**Attachment A:
Example Landscaping Plan**

EVERGREEN TREES

SYMBOL	BOTANICAL NAME/ COMMON PLANT NAME	QUANTITY	SIZE	ROOT
JV	JUNIPERUS VIRGINIANA EASTERN RED CEDAR	16	5'-6' HT.	B&B
PG	PICEA GLAUCA WHITE SPRUCE	9	5'-6' HT.	B&B

TO THE EXTENT DEVELOPER PLACES ABOVE-GROUND SOLAR FACILITIES ON PARCEL 312500030000, DEVELOPER AGREES TO PLANT TREES ON THE NORTH SIDE OF PARCEL 312500030000 ACROSS TR 65 FROM THE OWNER'S PROPERTY. DEVELOPER SHALL PLANT TREES OF A SPECIES OF DEVELOPER'S CHOICE, BUT WHICH WILL BE OF THE EVERGREEN VARIETY, IN A THREE HUNDRED FEET (300') LINE. AT PLANTING, SUCH TREES WILL BE A MINIMUM OF 4' TALL AND 6' APART.



NO.	REVISION	DATE

PROPERTY OWNER
13657 Township RD 85
Bella Center, OH



TRC Companies, Inc.
4800 Ritten Road
Mechanicsburg, PA 17050
Tel: 717.671.6430
www.trccompanies.com

Applent

INVENERGY
One South Wacker Drive
Suite 1800
Chicago, IL 60606

LANDSCAPE SCREENING
12657 TOWNSHIP ROAD 65
BELLE CENTER, OH

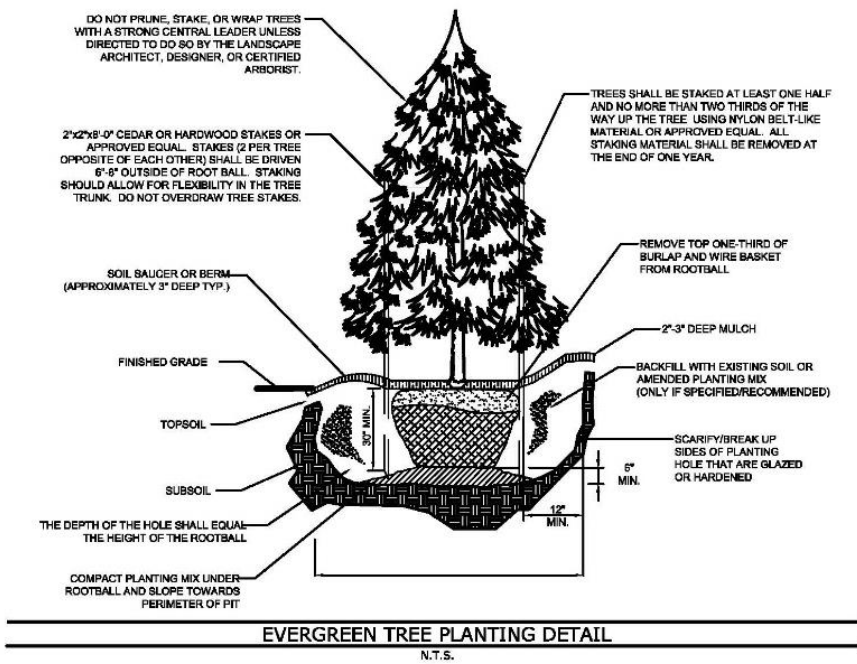
**LANDSCAPE SCREENING
PLAN**

REAL:	RALD AS NOTED DATE: JUNE 28, 2019 DRAWN BY: TRW CHECKED BY: MJR PROJECT: 314071.0000.0000 (1-WORKING) (1-NC) <div style="text-align: center;">1 of 2</div>
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GENERAL LANDSCAPING NOTES AND VEGETATION MANAGEMENT RECOMMENDATIONS

1. THE LANDSCAPE PLAN AND DETAILS ARE FOR LANDSCAPING INFORMATION ONLY. PLEASE REFER TO THE SITE LAYOUT PLAN, GRADING PLAN AND/OR UTILITIES PLAN FOR ALL OTHER INFORMATION.
2. THE CONTRACTOR SHALL MONITOR AND GUARANTEE THAT ALL PLANTS, TREES, AND SHRUBS SHALL BE HEALTHY AND FREE OF DISEASE FOR A PERIOD OF (1) ONE YEAR AFTER SUBSTANTIAL COMPLETION AND ACCEPTANCE BY THE OWNER. CONTRACTOR SHALL REPLACE ANY DEAD OR UNHEALTHY PLANTS AT CONTRACTOR'S EXPENSE. FINAL ACCEPTANCE SHALL BE MADE IF ALL PLANTS MEET THE GUARANTEE REQUIREMENTS INCLUDING MAINTENANCE. MAINTENANCE RESPONSIBILITIES INCLUDE INVASIVE SPECIES MONITORING, REMOVAL, AND SUPPLEMENTATION. MONITORING OF THE PROJECT SITE SHALL OCCUR IN THE SPRING AND THE FALL TO DETERMINE THE PRESENCE OF INVASIVE SPECIES. SHOULD ANY INVASIVE SPECIES BE IDENTIFIED WITHIN THE PROJECT SITE, THE INVASIVE SPECIES SHALL BE REMOVED ACCORDING TO METHODS MOST LIKELY TO BE EFFECTIVE IN CONTROLLING THAT SPECIES AND SUPPLEMENTING ITS REPLACEMENT WITH APPROPRIATE VEGETATION AND SEED MIX IDENTIFIED (AND APPROVED) ON THIS PLAN AND/OR AN APPROVED EQUAL. ADDITIONAL MAINTENANCE RESPONSIBILITIES INCLUDE: APPROVED CULTIVATING, SPRAYING, WEEDING, WATERING, TIGHTENING OF TREE STRAP GUYS, PRUNING, FERTILIZING, MULCHING, AND ANY OTHER OPERATIONS NECESSARY TO MAINTAIN PLANT VIABILITY. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER PLANTING AND CONTINUE UNTIL 90 DAYS AFTER FINAL ACCEPTANCE.
3. THE CONTRACTOR SHALL SUPPLY ALL LABOR, PLANTS, APPROVED SEEDING MIX, AND MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWING(S) AND LISTED IN THE PLANT SCHEDULE(S) AND/OR SEEDING TABLE(S). IN THE EVENT OF A DISCREPANCY BETWEEN QUANTITIES SHOWN IN THE PLANT SCHEDULE AND/OR SEEDING TABLE AND THOSE REQUIRED BY THE DRAWINGS, THE LARGER SHALL APPLY. ALL PLANTS SHALL BE ACCLIMATED BY THE SUPPLY NURSERY TO THE LOCAL HARDINESS ZONE AND BE CERTIFIED THAT THE PLANTING MATERIAL HAS BEEN GROWN FOR A MINIMUM OF (2) TWO YEARS AT THE SOURCE AND OBTAINED WITHIN 200 MILES OF THE PROJECT UNLESS OTHERWISE APPROVED AND AGREED UPON BY THE PROJECT.
4. THE LOCATIONS FOR PLANT MATERIAL ARE APPROXIMATE AND ARE SUBJECT TO FIELD ADJUSTMENT DUE TO SLOPE, VEGETATION, AND SITE FACTORS SUCH AS THE LOCATION OF ROCK OUTCROPS. PRIOR TO PLANTING THE CONTRACTOR SHALL ACCURATELY STAKE OUT THE LOCATIONS FOR ALL PLANTS. THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT SHALL APPROVE THE FIELD LOCATIONS OR ADJUSTMENTS OF THE PLANT MATERIAL.
5. ALL SHRUB MASSING SHALL BE MULCHED TO A DEPTH OF 2" AND SHREDDED HARDWOOD BARK MULCH SHALL BE USED FOR SHRUB MASSING AREAS.
6. NO PLANT SHALL BE PLACED IN THE GROUND BEFORE ROUGH GRADING HAS BEEN COMPLETED AND APPROVED BY THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE CONTRACTOR. STAKING THE LOCATION OF ALL TREES AND SHRUBS SHALL BE COMPLETED PRIOR TO PLANTING FOR APPROVAL BY THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT. STAKING OF THE INSTALLED TREE MUST BE COMPLETED THE SAME DAY AS IT IS INSTALLED. ALL TREES SHALL BE STAKED OR GUYED AS PER THE DETAIL. SEE LANDSCAPING PLAN(S) FOR PLANTING DETAILS.
7. COORDINATE PLANT MATERIAL LOCATIONS WITH SITE UTILITIES. SEE SITE LAYOUT, GRADING AND/OR UTILITY PLANS FOR STORM, SANITARY, GAS, ELECTRIC, TELEPHONE AND WATER LINES. UTILITY LOCATIONS ARE APPROXIMATE. EXERCISE CARE WHEN DIGGING IN AREAS OF POTENTIAL CONFLICT WITH UNDERGROUND OR OVERHEAD UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE DUE TO CONTRACTOR'S NEGLIGENCE AND SHALL REPLACE OR REPAIR ANY DAMAGE AT CONTRACTOR'S EXPENSE.
8. LANDSCAPE PLANTING PITS MUST BE FREE DRAINING. PAVEMENT, COMPACTED SUBGRADE, AND BLASTED ROCK SHALL BE REMOVED TO A DEPTH OF 2' OR TO A GREATER DEPTH IF REQUIRED BY PLANTING DETAILS OR SPECIFICATIONS. REPLACE SOIL WITH MODERATELY COMPACTED LOAM OR SANDY LOAM FREE FROM STONES AND RUBBISH 1" OR GREATER IN DIAMETER AND ANY OTHER MATERIAL HARMFUL TO PLANT GROWTH AND DEVELOPMENT. PLANTING INSTALLATION SHALL BE AS DETAILED AND CONTAIN PLANTING MIX AS SPECIFIED UNLESS RECOMMENDED OTHERWISE BY SOIL ANALYSIS.
- PLANTING SOIL MIXTURE:
2 PARTS PEAT MOSS
5 PARTS TOPSOIL
MYCORHIZA INOCULANT - "TRANSPLANT 1-STEP" AS MANUFACTURED BY ROOTS, INC. OR APPROVED EQUAL. USE PER MANUFACTURER'S RECOMMENDATIONS FOR TREES AND SHRUBS. FERTILIZER/LIME APPLY AS RECOMMENDED BY SOIL ANALYSIS
- TREES, AND SHRUBS: TREES AND SHRUBS SHALL BE NURSERY GROWN UNLESS OTHERWISE NOTED AND HARDY UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN THE LOCATION OF THE PROJECT. THEY SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY, WITH NORMAL HABIT OF GROWTH. THEY SHALL BE SOUND, HEALTHY, VIGOROUS, WELL-BRANCHED AND DENSELY FOLIATED WHEN IN LEAF. THEY SHALL BE FREE OF DISEASE, INSECT PESTS, EGGS OR LARVAE. THEY SHALL HAVE HEALTHY AND WELL-DEVELOPED ROOT SYSTEMS. ALL TREES SHALL HAVE STRAIGHT SINGLE TRUNKS WITH THEIR MAIN LEADER INTACT UNLESS OTHERWISE STATED. THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT SHALL ONLY PERMIT SUBSTITUTIONS UPON WRITTEN APPROVAL. THEIR SIZES SHALL CONFORM TO THE MEASUREMENT SPECIFIED ON THE DRAWINGS. PLANTS LARGER THAN SPECIFIED ON THE DRAWINGS MAY BE USED IF APPROVED. THE USE OF SUCH PLANTS SHALL NOT INCREASE THE CONTRACT PRICE. ALL TREES AND SHRUBS SHALL BE MULCHED IN ACCORDANCE WITH THE RESPECTIVE PLANTING DETAIL(S) PROVIDED IN THE LANDSCAPING PLAN.

- ALL PRUNING SHALL CONFORM TO THE TREE CARE INDUSTRY ASSOCIATION (TCIA) ANSI A300 (PART 1) - 2017 PRUNING STANDARDS. PRUNING STANDARDS SHALL RECOGNIZE BUT, ARE NOT LIMITED TO, THE FOLLOWING PRUNING OBJECTIVES: MANAGE RISK, MANAGE HEALTH, DEVELOP STRUCTURE, PROVIDE CLEARANCE, MANAGE SIZE OR SHAPE, IMPROVE AESTHETICS, MANAGE PRODUCTION OF FRUIT, FLOWERS, OR OTHER PRODUCTS, AND/OR MANAGE WILDLIFE HABITAT. DEVELOPING STRUCTURE SHALL IMPROVE BRANCH AND TRUNK ARCHITECTURE, PROMOTE OR SUBORDINATE CERTAIN LEADERS, STEMS, OR BRANCHES; PROMOTE DESIRABLE BRANCH SPACING; PROMOTE OR DISCOURAGE GROWTH IN A PARTICULAR DIRECTION (DIRECTIONAL PRUNING); MINIMIZE FUTURE INTERFERENCE WITH TRAFFIC, LINES OF SIGHT, INFRASTRUCTURE, OR OTHER PLANTS; RESTORE PLANTS FOLLOWING DAMAGE; AND/OR REJUVENATE SHRUBS. PROVIDING CLEARANCE SHALL ENSURE SAFE AND RELIABLE UTILITY SERVICES; MINIMIZE CURRENT INTERFERENCE WITH TRAFFIC, LINES OF SITE, INFRASTRUCTURE, OR OTHER PLANTS; RAISE CROWN(S) FOR MOVEMENT OF TRAFFIC OR LIGHT PENETRATION; ENSURE LINES OF SIGHT OR DESIRED VIEWS; PROVIDE ACCESS TO SITES, BUILDINGS, OR OTHER STRUCTURES; AND/OR COMPLY WITH REGULATIONS.
- TOPSOIL SHALL BE INSTALLED AT A MINIMUM DEPTH OF 4 INCHES. CONTRACTOR SHALL SUBMIT TOPSOIL TO A CERTIFIED TESTING LABORATORY TO DETERMINE PH, FERTILITY, ORGANIC CONTENT AND MECHANICAL COMPOSITION. THE CONTRACTOR SHALL SUBMIT THE TEST RESULTS FROM REGIONAL EXTENSION OFFICE OF USDA TO THE OWNER, CERTIFIED LANDSCAPE INSPECTOR, OR LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL. CONTRACTOR SHALL INCORPORATE AMENDMENTS FOR GOOD PLANT GROWTH AND PROPER SOIL ACIDITY RECOMMENDED FROM THE TOPSOIL TEST.
- NO PHOSPHOROUS SHALL BE USED AT PLANTING TIME UNLESS SOIL TESTING HAS BEEN COMPLETED AND TESTED BY A HORTICULTURAL TESTING LAB AND SOIL TESTS SPECIFICALLY INDICATE A PHOSPHOROUS DEFICIENCY THAT IS HARMFUL, OR WILL PREVENT NEW LAWNS/GRASSES AND PLANTINGS FROM ESTABLISHING PROPERLY.
- IF SOIL TESTS INDICATE A PHOSPHOROUS DEFICIENCY THAT WILL IMPACT PLANT AND LAWN ESTABLISHMENT, PHOSPHOROUS SHALL BE APPLIED AT THE MINIMUM RECOMMENDED LEVEL PRESCRIBED IN THE SOIL TEST FOLLOWING ALL APPLICABLE STANDARDS, REQUIREMENTS, AND/OR REGULATIONS.
- ALL SLOPES GREATER THAN 3:1 RECEIVING A WILDFLOWER, WETLAND, AND/OR GRASS SEEDING MIXTURE SHALL BE COVERED WITH AN EROSION CONTROL BLANKET.
- ALL WILDFLOWERS AND GRASSES SOWN SHALL BE ALLOWED TO GROW TO THEIR NATURALLY OCCURRING HEIGHTS WHENEVER POSSIBLE. NATIVE WILDFLOWERS AND/OR GRASSES CAN BE MOWED/MAINTAINED (WITHIN ACCEPTABLE AREAS IDENTIFIED AND/OR APPROVED BY APPROPRIATE REGULATORY AGENCIES) AS OFTEN AS NEEDED TO KEEP THE VEGETATION AT A DESIRED AND/OR MANAGEABLE/MANICURED HEIGHT.



RECOMMENDED SOLAR FARM GRASS SEED MIXES

NATIVE/NATURALIZED SOLAR FARM SEED MIX				
BOTANICAL NAME	COMMON NAME	MIX CONCENTRATION	RATE (LBS/ACRE)	RATE (LBS/1000 FT ²)
FESTUCA RUBRA	CREEPING RED FESCUE	34%	262	6
FESTUCA OVINA	SHEEP FESCUE	33%		
FESTUCA BREVIPILO	'BEACON'	10%		
FESTUCA OVINA VAR. DURIUSCULA 'RHINO'	HARD FESCUE 'RHINO'	5%		
FESTUCA OVINA VAR. GLAUCA (F. ARVERNENSIS) (F. GLAUCA), 'BLUE RAY'	BLUE FESCUE 'BLUE RAY'	5%		
POA PRATENSIS 'ARGYLE'	KENTUCKY BLUEGRASS 'ARGYLE'	5%		
POA PRATENSIS 'SHAMROCK'	KENTUCKY BLUEGRASS 'SHAMROCK'	5%	3%	
AGROSTIS PERENNANS, ALBANY PINE BUSH-NY ECOTYPE	AUTUMN BENTGRASS, ALBANY PINE BUSH-NY ECOTYPE			

NOTE:

GRASS SEED MIXES ARE COMPRISED OF GRASSES THAT ARE NATIVE AND/OR INDIGENOUS TO THE AREA AND/OR CONSIDERED FAVORABLE FOR WILDLIFE HABITAT AND SUSTAINABLE GROWTH. ADDITIONALLY, THE SOLAR FARM SEED MIX WAS DEVELOPED ESPECIALLY FOR NATIVE GRASS PLANTINGS AROUND SOLAR ARRAY FIELDS AND SHALL BE UTILIZED ACCORDINGLY. THESE GRASSES WILL MATURE OUT TO A HEIGHT OF APPROXIMATELY 2 TO 2 1/2 FEET HIGH. THERE ARE NO WILDFLOWER OR POLLINATOR SEED SPECIES CONTAINED IN THESE NATIVE GRASS SEED MIXES.

RECOMMENDED FLOWERING HERBACEOUS LAYER/NATIVE POLLINATOR SEED MIXES

NORTHEAST NATIVE WILDFLOWER & GRASS MIX				
BOTANICAL NAME	COMMON NAME	MIX CONCENTRATION	RATE (LBS/ACRE)	RATE (LBS/1000 FT ²)
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	40%	20	0.46
BOUTELOUA CURTIPENDULA	SIDE-OATS GRAMA	23.40%		
COSMOS BIPINNATUS	COSMOS	7.30%		
COREOPSIS LANCEOLATA	LANCELEAF COREOPSIS	3.50%		
ECHINACEA PURPUREA	PURPLE CONEFLOWER	3.50%		
ELYMUS VIRGINICUS	VIRGINIA WILDRYE	3%		
SORGHASTRUM NUTANS	INDIAN GRASS	2.50%		
LUPINUS POLYPHYLLUS	BIGLEAF LUPINE	2.20%		
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	2%		
DELPHINIUM AJACIS	ROCKET LARKSPUR	2%		
RUDBECKIA HIRTA	BLACKEYED SUSAN	2%	0.50%	0.50%
GAILLARDIA ARISTATA	BLANKET FLOWER	1.50%		
SENNA HEBECARPA	WILD SENNA	1%		
PENSTEMON DIGITALIS	TALL WHITE BEARDTONGUE	1%		
PAPAVER RHOEAS	SHIRLEY MIX (CORN POPPY, SHIRLEY MIX)	0.60%		
ANDROPOGON GERARDII	BIG BLUESTEM	0.50%		
ELYMUS CANADENSIS	CANADA WILDRYE	0.50%		
COREOPSIS TINCTORIA	PLAINS COREOPSIS	0.50%		
LIATRIS SPICATA	BLAZING STAR	0.40%		
ASCLEPIAS SYRIACA	COMMON MILKWEED	0.40%		
ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED	0.40%	0.30%	0.30%
ZIZIA AUREA	GOLDEN ALEXANDERS	0.30%		
ASCLEPIAS INCARNATA	SWAMP MILKWEED	0.30%		
MONARDA FISTULOSA	WILD BERGAMONT	0.20%		
PENSTEMON LAEVIGATUS	APPALACHIAN BEARDTONGUE	0.20%		
SENNA MARIANDICA	MARYLAND SENNA	0.20%		
SOLIDAGO MEMORIALIS	GRAY GOLDENROD	0.10%		
TRADESCANTIA OHIENSIS	OHIO SPIDERWORT	0.10%		
ASTER LAEVIS	SMOOTH BLUE ASTER	0.10%		
ASTER NOVAE-ANGLOE	NEW ENGLAND ASTER	0.10%		
ASTER PRENANTHOIDES	ZIGZAG ASTER	0.10%	0.10%	
HELIOPSIS HELIANTHOIDES	OXEYE SUNFLOWER			

NOTE:

NATIVE POLLINATOR SEED MIXES ARE INTENDED TO PROVIDE A EXCELLENT WILDLIFE FOOD AND SHELTER THAT WILL ATTRACT A VARIETY OF POLLINATORS AND SONGBIRDS. THE NATIVE WILDFLOWERS AND GRASSES IN THIS MIX PROVIDE AN ATTRACTIVE DISPLAY OF COLOR FROM SPRING TO FALL. POLLINATOR SEED MIXES ARE INTENDED TO PROVIDE NECTAR AND FOOD SOURCES FOR A VARIETY OF POLLINATORS AND LARVA. THESE MIXES ARE COMPRISED OF A FAIRLY EVEN MIX OF NATIVE AND/OR INDIGENOUS WILDFLOWERS AND GRASSES. THE POLLINATOR SEED MIX IS INTENDED TO BE SOWN THE DESIGNATED AREAS OUTSIDE OF THE SOLAR ARRAY FIELD WHEREVER POSSIBLE.

NO.	REVISION	DATE
PROPERTY OWNER: 13857 Township RD 65 Belle Center, OH		
TRC Companies, Inc. 4900 Ritter Road Mechanicsburg, PA 17050 Tel: 717.871.6430 www.trccompanies.com		
Applicant:	INVENERGY One South Wacker Drive Suite 1800 Chicago, IL 60606	
LANDSCAPE SCREENING 13857 TOWNSHIP ROAD 65 BELLE CENTER, OH		
DRAWING TITLE: LANDSCAPE NOTES & DETAILS		
SEAL:	SCALE: AS NOTED DATE: JUNE 28, 2019 DRAWN BY: TKM CHECKED BY: MJR PROJECT: 314071.0000.0000 DRAWING NO.: 2 of 2	

Attachment B:
Ohio Site Pollinator Habitat Planning and Assessment Form/Pollinator
Scorecard and Pollinator Job Sheet

Ohio Solar Site Pollinator Habitat Planning and Assessment Form

1. Percent of total site planted with native or beneficial introduced flowering plants.

- | | |
|----------------------------------|-----------|
| <input type="checkbox"/> 25-50% | 10 points |
| <input type="checkbox"/> 51-75% | 20 points |
| <input type="checkbox"/> 76-100% | 30 points |

2. Flowering plant diversity in site perimeter & buffer area (species with more than 1% cover).

- | | |
|--|-----------|
| <input type="checkbox"/> 9-12 species | 5 points |
| <input type="checkbox"/> 13-16 species | 10 points |
| <input type="checkbox"/> 17-20 species | 15 points |
| <input type="checkbox"/> 20+ species | 20 points |
| <input type="checkbox"/> Site specific Milkweed included @2,000 pbs/ac minimum | 10 points |

If no boxes were selected in questions 1 or 2 then your site does not meet criteria to be considered as an OPHI Solar Pollinator Habitat. However, OPHI can work with you on ways to increase the pollinator score of your site.

3. Flowering plant seed mixes and plantings to be used.

Native species local to the site are preferred; otherwise species native to Ohio are encouraged.

- | | |
|--|-----------|
| <input type="checkbox"/> Includes only native plant species | 15 points |
| <input type="checkbox"/> Includes native and beneficial introduced plant species | 10 points |
| <input type="checkbox"/> Includes only beneficial introduced plant species | 5 points |

4. Flowering plant diversity in rows & under solar array.

- | | |
|--|-----------|
| <input type="checkbox"/> 4-6 | 5 points |
| <input type="checkbox"/> 7+ | 10 points |
| <input type="checkbox"/> Site specific Milkweed included @2,000 pbs/ac minimum | 10 points |

5. Seasons with at least 3 blooming species. Check all that apply.

- | | |
|---|----------|
| <input type="checkbox"/> Spring (April – May) | 5 points |
| <input type="checkbox"/> Summer (June – August) | 5 points |
| <input type="checkbox"/> Fall (September – October) | 5 points |

6. Available habitat components within ¼ mile of site.

Check all that apply.

- | | |
|--|----------|
| <input type="checkbox"/> Native grasses | 2 points |
| <input type="checkbox"/> Trees and shrubs | 2 points |
| <input type="checkbox"/> Forest edge habitat | 2 points |
| <input type="checkbox"/> Cavity nesting sites | 2 points |
| <input type="checkbox"/> Clean perennial water sources | 2 points |

7. Planned vegetative buffers adjacent to the solar site. Check all that apply.

- | | |
|---|-----------|
| <input type="checkbox"/> Site has planned buffer adjacent to solar site | 5 points |
| <input type="checkbox"/> Buffer is at least 30 feet wide as measured from any fencing or edge of flower plantings | 5 points |
| <input type="checkbox"/> Buffer is at least 50 feet wide as measured from any fencing or edge of flower plantings | 10 points |
| <input type="checkbox"/> Buffer includes flowering shrubs/trees and other shrubs/trees that provide food for wildlife | 5 points |

8. Habitat site preparation prior to implementation.

- | | |
|---|------------|
| <input type="checkbox"/> Measures taken to control weeds and invasive species prior to seeding/planting. | 10 points |
| <input type="checkbox"/> Appropriate soil preparation done to reduce erosion and enhance germination/growth | 5 points |
| <input type="checkbox"/> None | -10 points |

9. Planned management practices for areas designated as part of the pollinator habitat site. Check all that apply.

- | | |
|--|-----------|
| <input type="checkbox"/> Detailed establishment and management plan developed for site | 10 points |
| <input type="checkbox"/> Mowing follows OPHI mowing schedule for months each year | 5 points |
| <input type="checkbox"/> Mowing is staggered over a 2 week period | 5 points |
| <input type="checkbox"/> Signage indicating site is wildlife & pollinator-friendly | 5 points |
| <input type="checkbox"/> Creation of habitat features (e.g. boxes, pass-through tunnels, bee hotels) | 5 points |
| <input type="checkbox"/> Long-term monitoring plan developed that includes re-certification as Solar Site Pollinator Habitat | 10 points |

10. Insecticide risk. Check if applicable.

Communication with adjacent landowners about the project and possible impacts of their insecticide use is critical

- | | |
|--|------------|
| <input type="checkbox"/> Site is adjacent to land (within 120 ft.) where insecticides are used | -20 points |
| <input type="checkbox"/> Planned on-site insecticide use (including pre-treated seeds/plants) | -40 points |

Total Points: 0

Provides High Quality Pollinator Habitat > 85
Meets OPHI Solar Pollinator Habitat Standards 70-84

Site Owner/Operator:

Project Location:

Project Size (acres):

Planned Source of Seeds:

Planned Seeding Date:

Habitat & Vegetation Consultant:

Refer to www.ophi.info for more information regarding solar pollinator habitat development.

Version 1 - March 2018

Developed by the OPHI Solar Pollinator Program Advisory Team





SOLAR ARRAY POLLINATOR HABITAT ESTABLISHMENT

Pollinator Job Sheet

January 2019

Description

The purpose of this practice is to enhance vegetative cover with habitat for pollinators. By establishing this cover, butterflies, bees, other insects and some birds which are important for the pollination of many plant species will have a variety of food and nectar sources.

The vegetation established will be a diverse mix of at least 9 pollinator-friendly shrubs (optional), legumes or wildflowers; it must provide at least three species in each of the bloom periods (early, middle, and late). Forbs and wildflowers shall be planted at the rate of 25-30 PLS per square foot (minimum).

Grasses may be used in mix at no more than 25% of mix based on PLS per square foot. Native Grasses should be used. Little Bluestem is highly recommended. Only "short" Native Grasses should be used. Tall grasses such as Indiangrass, and Big Bluestem tend to outcompete other species and therefore shouldn't be used.

Perennial Establishment

Given the nature of perennial plants these stands will take time to develop. In most cases it takes 3-4 years before a stand is considered established and most of the species from the seed mix will be visible. Some species may even take longer. Patience is must when establishing native perennial plants.



Establishment Overview

Because some of the seeds are light, hairy or fluffy, the best results are obtained using a specialized drill. Broadcast seeding may also be an option for the small areas planted to the legumes or wildflowers found in the pollinator mix. The germination times may vary between the many species included in the mix.

Site Preparation and Planting

Apply soil amendments as needed and described on the specifications sheet. Soil amendments, if needed, shall be applied prior to seedbed preparation or before planting if a no-till drill is used. Normally, the application of lime and/or fertilizer is not needed when establishing native legumes and forbs.

Because planting depth is critical for these plants, a firm, level seedbed is necessary. Also, because some species germinate later than most other plants typically found in fields, it is important to have a weed-free seedbed. In some cases, site preparation may be necessary the year before seeding.

Seeds should be planted no deeper than 1/4 inch. If planted properly, it is acceptable to see some seed on the surface after planting. If drilling, ensure that the drill is properly calibrated and setup.

Seed the species listed on the specifications sheet. Seed at rates and according to methods described on the specifications sheet.



No-till Planting

The first step is to kill or suppress existing vegetation. If planting into an existing sod, treatment will need to begin the year before planting. Mow the existing sod and follow with a fall application of appropriate burndown herbicide to control grasses and broadleaved plants. New growth will occur in the spring prior to planting, so an additional burndown treatment may be necessary. If the previous crop was a row crop, use a non-selective burndown herbicide to control existing vegetation at the time of planting. Once competing vegetation is controlled, use a drill designed for no-till seeding these kinds of plants. Seed should be drilled uniformly at a depth no greater than $\frac{1}{4}$ inch.

Prepared Seedbed

A firm seedbed is important when seeding native grasses. Initial tillage (plow, chisel, disc) should begin at least a month prior to seeding. About 2 weeks should be planned between initial tillage or construction final grading and final seedbed preparation to allow the weeds to germinate and be killed by the final seedbed preparation. A non-selective herbicide can be used prior to seeding to control weeds, especially the perennial weeds. The final seedbed if tilled should be cultipacked until firm enough to leave footprints only $\frac{1}{4}$ to $\frac{1}{2}$ inch deep. Once the seedbed is prepared, seed the area by:

- Drill Seeding – Uniformly drill the seed $\frac{1}{4}$ inch deep

OR

- Broadcast Seeding – Use an “air-flow” fertilizer applicator or broadcast seeder capable of handling these seeds to uniformly seed the area. A carrier may be needed if using a fertilizer spreader. Cultipack again after broadcast seeding to achieve seed coverage and seed-to-soil contact. Rolling or cultipacking before and after broadcasting seed should be performed for all broadcast seedings that occur outside of the dormant seeding period. All slopes must be smooth and free of gullies and/or rills

Seeding Dates

The best time to seed the forbs and legumes is April 1 until May 30. Dormant seedings may be done from December 15 until March 1.



Maintenance during Establishment

Mow, clip or spray during the growing season to control weeds, insects or other undesirable species. Do not mow shorter than 10-12 inches. The goal the seeding year is to reduce the shade pressure that weeds can exert on the plant seedlings, and reduce any annual weed seed introduction. The seeding should be mowed at least twice before mid August. The use of herbicides labeled for some native forbs and legumes have proven to be very effective in helping the seeding get established. However, some caution must be used so that these materials do not harm desirable species included in the mix.

Areas that fail to become established should be re-seeded during the next seeding period.

Stand Evaluation

Native forbs and legumes often have slower germination than typical introduced cool-season grasses and legumes. It is appropriate to give the stand sufficient time to develop when evaluating stand success.

The Initial Evaluation

The Evaluation should be made 6-8 weeks after planting. Check and record seedling density (plants per square foot) and distribution in several areas of the field. This is also a time to check weed pressures. If it appears that undesirable cool season grasses and legumes are overtaking the desired species, consider using an Imazapic or Clopyralid herbicide over the top to kill or suppress the cool season grasses.

The Second Evaluation

This Evaluation should be made in late summer of the seeding year to evaluate stand adequacy based on density of established plants. An average of at least 2-4 strong seedlings per square foot should be the minimum acceptable stand.

The Final Evaluation

This Evaluation should be made during the early summer of the second year. If an average of 2 healthy plants are found per square foot, a successful stand and cover should be accomplished.

Maintenance after Establishment

After the initial establishment is completed, maintain the planting according to your conservation plan. Maintenance activities should only be performed between between July 16th -20th, October 1st and February 28 (This follows the monarch mowing schedule and is outside outside of the primary nesting and brood-rearing season for Ohio).

Scout fields in May to early June to identify problems such as thistle, johnsongrass, other noxious weeds or trees. These may need treatment to control.

Spot treatment necessary to control noxious weeds or pests that will damage the cover may need to be treated. Try to avoid treating affected areas during the primary Wildlife and Monarch nesting and season (March 1 to October 1). If treatment is necessary during the primary nesting seasons the method used should be the least damaging to nesting wildlife and Monarch habitat.

Mow no shorter than 10-12 inches. Do not mow after August 15th in order to allow regrowth for winter cover and nectar for pollinators. Mowing shorter than 10 inches will also damage or kill the desired species and promote cool season grasses.

Periodic mowing, mowing for cosmetic purposes and annual mowing for generic weed control are not recommended and can be detrimental to the stand.



POLLINATOR HABITAT SPECIFICATIONS SHEET

For:	County:				
Field(s):	District:				
Planned By:	Date:				
3' SOLAR WILDFLOWER/LEGUME SEEDING					
Acres to be seeded:					
Recommended Species and Seeding Rates					
Grasses			Wildflowers		
Species	Rate PLS lb./ac	Total PLS lb./ac	Species	Rate PLS lb./ac	Total PLS lb./ac
Little Bluestem	0.500	0.000	Alexander, Golden	0.250	0.000
Prairie Dropseed	0.100	0.000	Aster, Calico	0.011	0.000
Prairie Junegrass	0.050	0.000	Aster, Frost	0.020	0.000
Sideoats Grama	0.700	0.000	Aster, Sky Blue	0.035	0.000
..			Beardtongue, Hairy	0.012	0.000
..			Beardtongue, Pale	0.016	0.000
..			Cinquefoil, Prairie	0.020	0.000
..			Clover, Alsike	0.060	0.000
..			Clover, Crimson	0.400	0.000
..			Clover, Ladino / White	0.080	0.000
..			Coneflower, Upright	0.075	0.000
..			Coreopsis, Plains	0.045	0.000
..			Coreopsis, Lanceleaf	0.150	0.000
..			Goldenrod, Gray	0.015	0.000
..			Lobelia, Great Blue	0.008	0.000
..			Lobelia, Pale Spiked	0.005	0.000
..			Milkvelch, Canada	0.175	0.000
..			Milkweed, Butterfly	0.030	0.000
..			Milkweed, Whorled	0.012	0.000
..			Mint, Narrow Leaf Mountain	0.008	0.000
..			Mint, Virginia or Mountain	0.015	0.000
..			Partridgepea	1.000	0.000
..			Prairieclover, Purple	0.200	0.000
..			Seedbox	0.003	0.000
..			Susan, Black-eyed	0.105	0.000
..			Vervain, Hoary	0.100	0.000
..			Yarrow	0.050	0.000
..			..		
..			..		
Total Grasses (lbs./acres)	1.350	0.000	Total Wildflowers (lbs./acre)	3.300	0.000

Practice Implementation Contacts:				
Name	Email:	Affiliation	Phone	
Mowing:				
Herbicide:				
Seeding:				
Special Notes:				
Maintenance Contacts:				
Name:	Email:	Affiliation	Phone	
Special Notes:				
Additional Contacts:				



For more information about the Ohio Pollinator Habitat Initiative Check out our website: <http://www.ophi.info/>

Like us on facebook:
www.facebook.com/Ohio-Pollinator-Habitat-Initiative-102481783426975/

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Attachment C:
Prohibited Noxious Weeds List Identified by the
Ohio State University Extension

Prohibited Noxious Weeds List Identified by the Ohio State University Extension

Chapter 901:5-37 Noxious Weeds

901:5-37-01 Prohibited noxious Weeds.

The following plants are hereby designated "prohibited noxious Weeds":

- (A) Shatter cane (*Sorghum bicolor*).
- (B) Russian thistle (*Salsola Kali* var. *tenuifolia*).
- (C) Johnsongrass (*Sorghum halepense*).
- (D) Wild parsnip (*Pastinaca sativa*).
- (E) Grapevines (*Vitis* spp.), when growing in groups of one hundred or more and not pruned, sprayed, cultivated, or otherwise maintained for two consecutive years.
- (F) Canada thistle (*Cirsium arvense*),
- (G) Poison hemlock (*Conium maculatum*).
- (H) Cressleaf groundsel (*Senecio glabellus*).
- (I) Musk thistle (*Carduus nutans*).
- (J) Purple loosestrife (*Lythrum salicaria*).
- (K) Mile-A-Minute Weed (*Polygonum perfoliatum*).
- (L) Giant Hogweed (*Heracleum mantegazzianum*).
- (M) Apple of Peru (*Nicandra physalodes*).
- (N) Maretail (*Conyza canadensis*)
- (O) Kochia (*Bassia scoparia*).
- (P) Palmer amaranth (*Amaranthus palmeri*).
- (Q) Kudzu (*Pueraria montana* var. *lobata*).
- (R) Japanese knotweed (*Polygonum cuspidatum*).
- (S) Yellow Groove Bamboo (*Phyllostachys aureasculata*), when the plant has spread from its original premise of planting and is not being maintained.
- (T) Field bindweed (*Convolvulus arvensis*).
- (U) Heart-podded hoary cress (*Lepidium draba* sub. *draba*).
- (V) Hairy whitetop or ballcress (*Lepidium appelianum*).
- (W) Perennial sowthistle (*Sonchus arvensis*).
- (X) Russian knapweed (*Acroptilon repens*).
- (Y) Leafy spurge (*Euphorbia esula*).
- (Z) Hedge bindweed (*Calystegia sepium*).
- (AA) Serrated tussock (*Nassella trichotoma*).
- (BS) Columbus grass (*Sorghum x alnum*).
- (CC) Musk thistle (*Carduus nutans*).
- (OD) Forage Kochia (*Bassia prostrata*).
- (EE) Water Hemp (*Amaranthus tuberculatus*).

Effective: 9/14/2018

Five Year Review (FVR.) Oates:6/29/2018 and 09/14/2023

Promulgated Under: 119.03

Statutory Authority: 901.10, 5579.04

Rule Amplifies: 5579.05, 5579.08

Prior Effective Oates: 10/15/1987, 02/05/1988, 06/30/1992, 11/21/1994, 01/25/2005, 03/26/2007, 11/12/2010

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Case No(s). 17-0773-EL-BGN, 18-1360-EL-BGN

Summary: Notice of Certificate Compliance: Case No. 17-773-EL-BGN (Conditions 14 and 22); and
Case No. 18-1360-EL-BGN (Conditions 14 and 21) – Vegetation Management and Landscaping Plan electronically filed by Christine M.T. Pirik on behalf of Hardin Solar Energy II LLC and HARDIN SOLAR ENERGY LLC