

Appendix B.
Gravel Pit Solar Project | Town of East Windsor, Hartford County, Connecticut
Revised Landscape Mitigation Plan



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Section 1 | Introduction

This mitigation plan is a supplement to the visibility assessment for the Gravel Pit Solar Project and describes the potential mitigation options available to reduce and minimize potential visual impacts associated with the 120MW solar powered electric generation plant proposed by Gravel Pit Solar.

Successful siting and design of solar facilities requires consideration of the relationship between the proposed Project and the surrounding landscape, focusing on the minimization and mitigation of potential visual impacts. This plan utilizes vegetation as a key component in the mitigation approach to provide ecological benefits while also improving the overall aesthetics of the Project. This approach is increasingly the preferred mitigation method for solar facilities throughout the United States (e.g., Scenic Hudson, 2018; Sullivan and Abplanalp, 2013; Walston, et al. 2018).

When developing mitigation strategies for solar facilities, the retention of existing plant material is also an important consideration. Retention of this plant material provides screening, allows for the Project to better fit into the surrounding context, and retains existing habitat. Removing this vegetation from a Project site can result in a stronger visual contrast between the Project and the surrounding environment (Sullivan and Abplanalp, 2013). Where feasible, the retention of existing plant material in key areas helps to preserve both the visual and natural character of the existing landscape.

This mitigation plan is designed to consider site conditions as well as the natural and vernacular character of the surrounding landscape. The use of native plant material helps to replicate and compliment the surrounding landscape in order to minimize potential visual impacts resulting from the Project. This plan provides solutions that fit the scale and context of the Project and the visual character of the surrounding landscape. While the use of native trees and shrubs will not necessarily result in the complete screening of the Project, it's implementation will serve to minimize the Project's visibility and reduce potential visual impacts, while providing ecological benefits to local fauna.

Section 2 | Design Methodology

The design methodology developed for the Gravel Pit Solar Project focuses on integrating the Project Site into the surrounding landscape context through the utilization of planting modules and material selections. These planting modules are broadly repeatable, while maintaining the flexibility to respond to different circumstances that occur throughout the Project Site. The use of native plants and shrubs, along with pollinator-friendly plant species, will help to soften potential visibility and visual impacts resulting from the installation of the Gravel Pit Solar Project. This planting module strategy was developed utilizing the following approach:

- Documentation of landscape character and vegetation within the Project Site
- Build on inspiration from the surrounding landscape in development of the mitigation plan
- Maintain existing viewsheds where possible
- Maintain existing vegetation where feasible
- Integrate the Project into the surrounding context by softening Project appearance and visual contrast
- Utilize native plant material to provide ecological benefits

Native Trees & Shrubs

Native trees and shrubs promote the diversification of existing wood lots and hedgerows present on the Project site while providing region-appropriate screening and buffering of the proposed solar Project. In addition, native species are in keeping with local and state initiatives to promote the planting of native plant material in order to minimize invasive and non-native plants while providing ecological benefits to local fauna (see section 5)

Pollinator Species

Agrarian landscapes, such as the area surrounding the Project, have a unique character, characterized by fields with little vertical impediment to open vistas. Use of grasses and wild flowers in the mitigation plan helps to provide habitat for local pollinators while maintaining views of the pastoral landscape. In addition to the ecological benefits, visual benefits such as color variety will be apparent, particularly in the late spring summer and fall.

Materials Selection

Gravel Pit Solar is considering the use of an agricultural style fence material for the perimeter of the solar arrays. This type of fencing maintains Project safety and security while utilizing a more vernacular type of material which incorporates a wood post and wire mesh system. Metal fence posts may also be incorporated into the design where required.

Section 3 | Plant Material Selection & Maintenance

When developing a conceptual planting plan, the context of the site is essential for the development of the plant palette. Existing plant species and visual character in the vicinity of the Project provide building blocks for planting plan development. To create the plant list shown on subsequent pages, several variables were considered – most notably plant origin. Native plantings are a crucial component of the conceptual planting plan. The use of native plant material can provide a higher likelihood of plant success as well as better visual integration into the existing landscape. To develop this list of native plant material a number of sources were used, including but not limited to: on-site observation, the U.S. Department of Agriculture (USDA) Plants Database, the USDA Forest Atlas, the University of Connecticut, College of Agriculture, Health and Natural Resources Plant Database, and Connecticut Invasive Plants Council: Connecticut Invasive Plant List (Oct 2018).

The existing vegetation observed near the proposed Project is largely agricultural, but hedgerows and wood lots are an integral part of the landscape character. This patchwork of agricultural fields, intermixed with hedgerows, play a key role in the species selection.

Plant Material Maintenance

While the plant material outlined in this report has been selected for their compatibility with the existing landscape and to reduce the need for prolonged maintenance, Gravel Pit Solar has developed a strategy to review the plant material after initial installation to ensure the intents of the mitigation plan remain a viable mitigation strategy once the Project is operational.

For woody plant material, Gravel Pit Solar will ensure that maintenance staff are familiar with the appearance of unhealthy or damaged vegetation associated with the Project mitigation. Staff will periodically monitor the planting modules to ensure adequate establishment. Gravel Pit Solar will remove and replace plantings that fail in materials, workmanship or growth within one-year following the completed installation of plantings. Periodic review of the planting will continue for up to three years to evaluate the health of wood plant material remains.

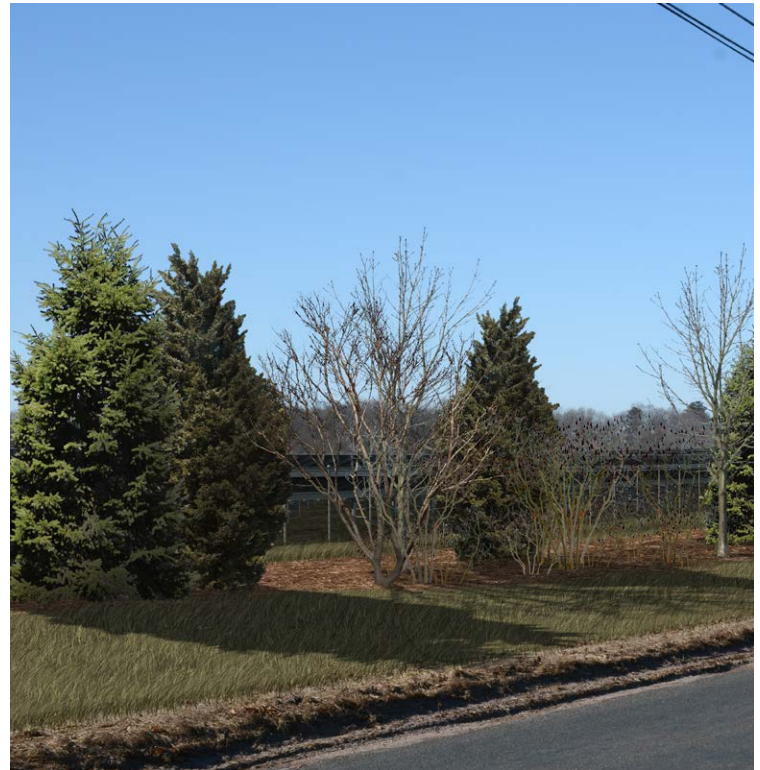
If die-back occurs after the three year period outlined above, Gravel Pit Solar will evaluate to determine if the mitigation planting is still accomplishing the goals outlined in this report. Typically limited die-back still provides the vegetative cover necessary to meet the module objectives once the plants begin to mature. If the remaining vegetation accomplishes these goals, no further action will be taken. If significant die-back occurs, Gravel Pit Solar will work with qualified individuals to identify additional mitigating requirements.

For herbaceous plant material, Gravel Pit Solar will conduct periodic mowing to assist in the establishment of this material and promote propagation. Areas of die-back will be reviewed by Gravel Pit Solar to evaluate if further action will be needed to meet the mitigation goals outlined in this report.

Section 4 | Planting Modules

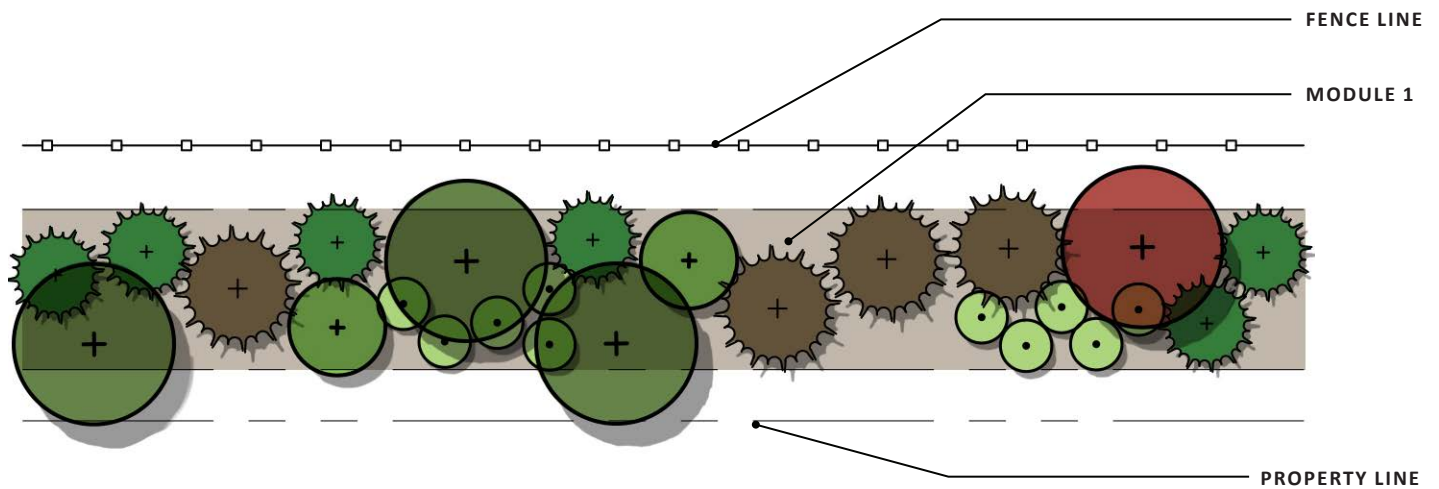
Module 1 | Adjacent Residence

Module 1 is designed be used when the highest level of screening is desired, most notably where stationary adjacent uses could be impacted by the Project. The use of trees and shrubs, and the incorporation of more evergreen material will provide significant screening during the summer and winter seasons. Additionally, the module is intended be adaptable to conform to the unique site conditions. For example, in areas where the module is south, west or east of a proposed solar array, tree species that are taller in height can be replaced with smaller species already specified in other modules to avoid shading of the Project. It is important to note that the intent of this module is not to screen the Project entirely, rather to provide a vegetative buffer that feels appropriate in the existing contextual landscape (i.e. maintaining views across the Project to middle ground and background features).



Sample Simulation | Module 1

See Section 5 for detailed planting information.



Sample Layout | Module 1

Section 4 | Planting Modules

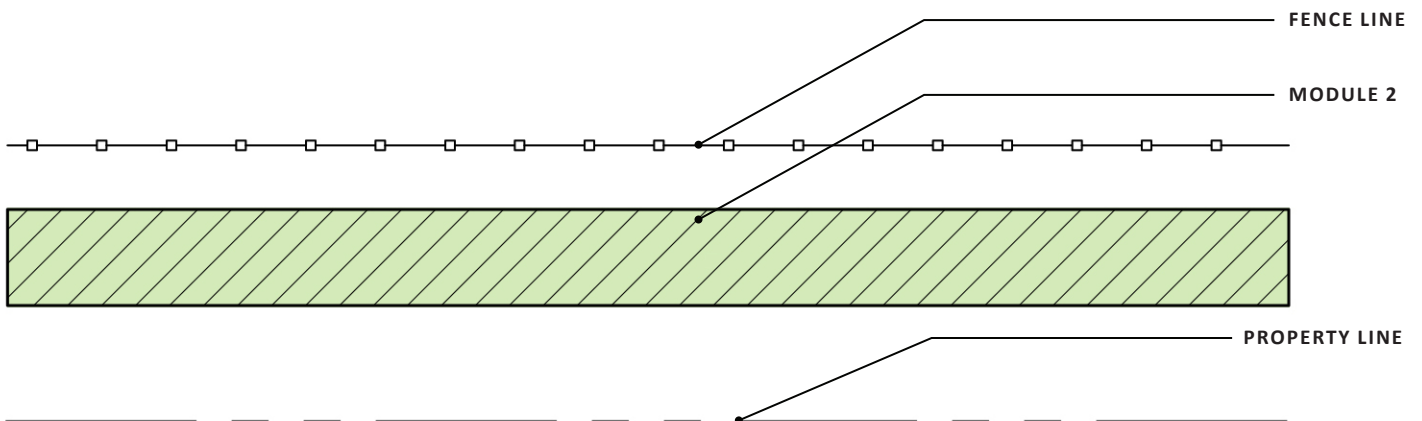
Module 2 | Pollinator Habitat

Module 2 is intended to help establish a visual and ecological buffer along the fence line in areas where viewer exposure is generally low or fleeting in nature. The mix of herbaceous plant material is intended to provide habitat for local pollinators as well as provide seasonal color and interest.

See Section 5 for an example composition of the pollinator seed mix.



Sample Imagery | Module 2



Sample Layout | Module 2

Section 5 | Plant Palette



Red Oak (*Quercus rubra*)

Native to Connecticut: Yes

Fall color: Russet red to bright red

Maximum Growth Height: 50'-75'

Ecological Benefit: Northern Red Oak provides cover and nesting material for a wide variety of birds and mammals; acorns provide a food source for many birds and mammals. Adaptable to unproductive environments and therefore useful in rehabilitation projects.

Form & Texture: Rounded in youth, round topped and symmetrical with age; medium texture; fast growing.



Red Maple 'Red Sunset' (*Acer Rubrum 'Red Sunset'*)

Native to Connecticut: Yes ('Red Sunset' is a cultivated variety of acer rubrum)

Fall color: Excellent orange to red

Maximum Growth Height: 40'-50'

Ecological Benefit: Maples provide food and cover for many species of wildlife. Red Maple is tolerant of many types of disturbed sites, and water-logged soils.

Form & Texture: Pyramidal to rounded outline; medium texture; medium to fast growing



White Spruce (*Picea glauca*)

Native to Connecticut: Yes

Fall color: Evergreen

Maximum Growth Height: 40'-60'

Ecological Benefit: Provides forage, cover, denning and nesting sites for mammals and birds. White spruce can be found growing in abandoned agricultural fields in New England.

Form & Texture: Narrow, conical, branches held horizontally. Dense when young, becoming looser and more open with age. Medium texture.



Shadblow Serviceberry (*Amelanchier canadensis*)

Native to Connecticut: Yes

Fall color: Gold

Maximum Growth Height: 25'-30'

Ecological Benefit: Fruit provides an important food source for many birds and other wildlife.

Form & Texture: Large shrub or multi-stemmed small understory tree. Medium in texture

Section 5 | Plant Palette (continued)



Eastern Red Cedar (*Juniperus Virginiana*)

Native to Connecticut: Yes

Fall color: Evergreen. Needles may have a bronze cast in the coldest months.

Maximum Growth Height: 30'-65'

Ecological Benefit: Many birds and mammals eat the berry-like cones, especially in winter. The evergreen foliage provides good nesting and roosting cover. Eastern Red Cedar is tolerant of difficult sites and commonly found along interstate highway medians.

Form & Texture: Conical in youth, becoming open and irregular with age. Medium in texture; moderate growth rate.



Northern Bayberry (*Myrica Pensylvanica*)

Native to Connecticut: Yes

Fall color: Semi-evergreen, can turn bronze or tan through autumn and winter.

Maximum Growth Height: 5'-10'

Ecological Benefit: Fruit is a food source to birds. Provides shelter for game and other mammals. As a nitrogen-fixing plant bayberry improves soil fertility; it is adaptable to difficult growing conditions including roadsides; provides soil stabilization.

Form & Texture: Semi-evergreen to deciduous shrub with upright spreading branch habit. Multi-stemmed and suckering to form colonies. Medium in texture, interesting branch habit visible in winter.



Highbush Blueberry (*Vaccinium corymbosum*)

Native to Connecticut: Yes

Fall color: Excellent variety of red, orange, purple and yellow.

Maximum Growth Height: 6'-12'

Ecological Benefit: Blueberries provide important summer and early fall food for numerous species of birds. Some mammals and humans alike enjoy the highly palatable fruit. Bees are the primary pollinator.

Form & Texture: A deciduous twiggy multi-stem shrub with an irregular to rounded outline. Medium texture.



Winged Sumac (*Rhus copallina*)

Native to Connecticut: Yes

Fall color: Rich red, crimson, and scarlet.

Maximum Growth Height: 7'-15'

Ecological Benefit: Mature sumac berries are eaten by grouse, wild turkey and songbirds; the thickets of winged sumac provide environmental protection for a variety of birds and mammals. Soil adaptable.

Form & Texture: A small deciduous suckering tree with an open, irregular crown and crooked branches, becoming picturesque with age. Medium texture in summer, coarse in winter; growth rate fast from root suckers, slower on old wood.

Section 5 | Plant Palette (continued)



Pollinator Mix

Native to Connecticut: Yes

Fall color: A pollinator meadow will offer a wide range of colors typical of fall foliage.

Maximum Growth Height: 3'-5'

Ecological Benefit: Individual plants are selected for their value as a pollinator species. A pollinator meadow will attract and provide habitat for a variety of pollinators and songbirds.

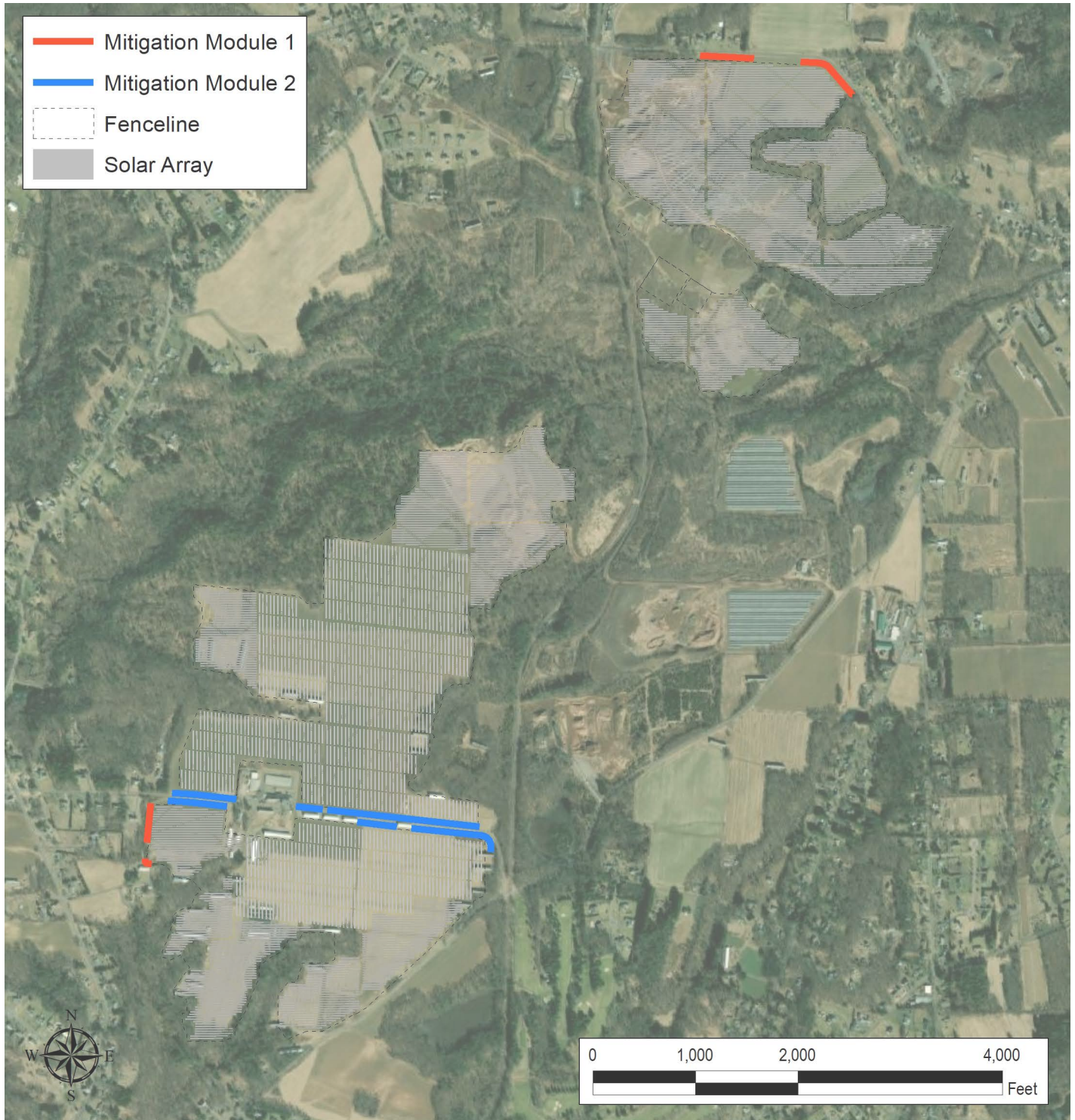
Form & Texture: Being a mix of native grasses and wild flowers pollinator meadows provide a beautiful variety of intertwined form and texture.

Pollinator Seed Mix - Example Composition

Common name	Scientific name	Percent composition
Little Bluestem	Schizachyrium scoparium	35.00%
Sundial Lupine	Lupinus perennis	15.00%
Partridge Pea	Chamaecrista fasciculata	15.00%
Round-head Bush Clover	Lespedeza capitata	11.00%
Wild Bergamot	Monarda fistulosa	10.00%
Butterfly Milkweed	Asclepias tuberosa	10.00%
Hyssop-leaved Thoroughwort	Eupatorium hyssopifolium	1.10%
Showy Goldenrod	Solidago speciosa,	1.00%
Gray Goldenrod	Solidago nemoralis	1.00%
Blue Wood (Heartleaf) Aster	Symphyotrichum cordifolium	0.50%
False Indigo	Baptisia tinctoria	0.20%
New York Ironweed	Vernonia noveboracensis	0.20%
<p>Note: This mix may be varied based on seed availability. The addition of other native species, including grasses is encouraged. Avoid planting species protected by the CT Endangered Species Act.</p>		

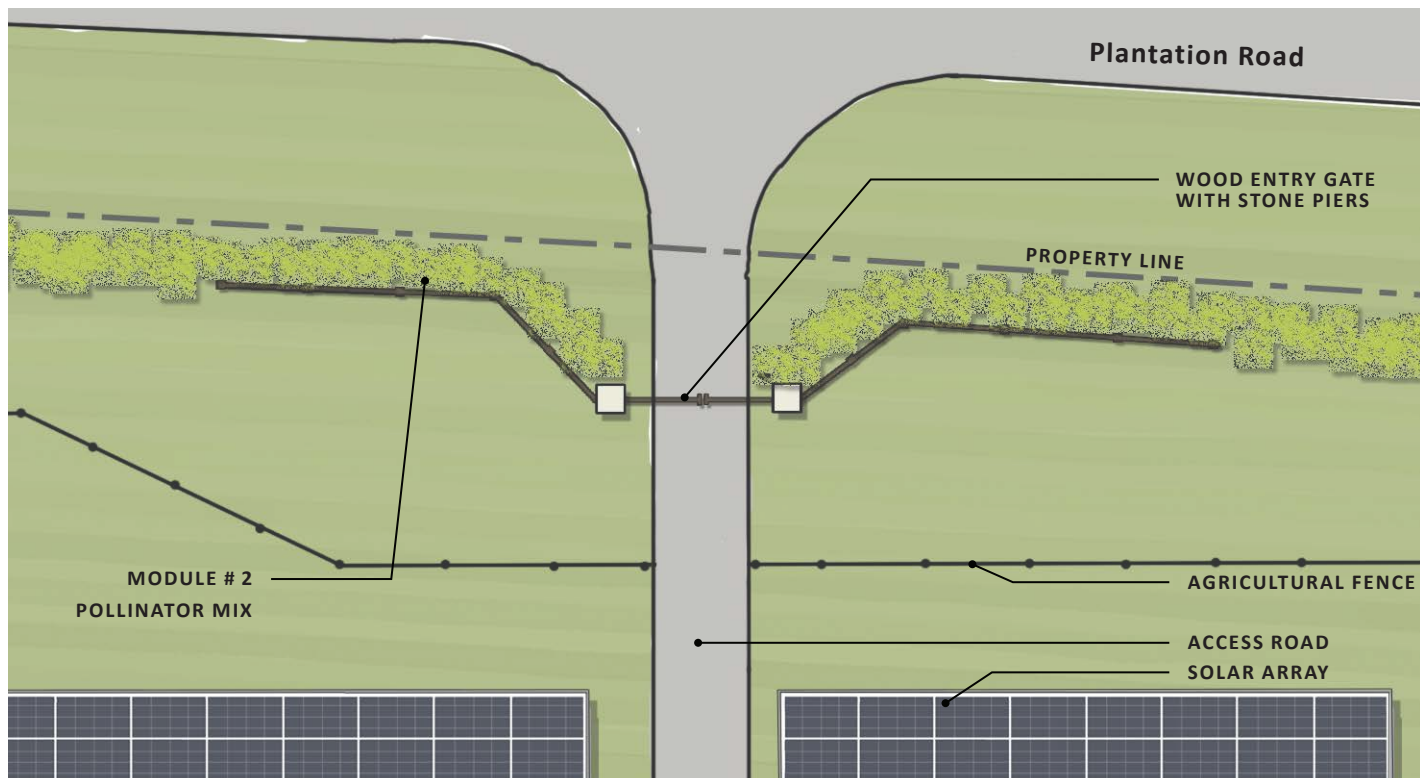
Section 6 | Location of Planting Modules

Landscape Architects at EDR used desktop analysis and information gathered on-site to propose potential appropriate locations for the proposed modules outlined in Section 4. These locations were selected to match the proposed module with the anticipated degree of Project visibility and viewer exposure/activity. This review determined which module type will be most fitting for specific portions of the Project, including seldom seen areas, areas adjacent to roadsides, and areas adjacent to residences that have little or no existing screening.



Section 7 | Enhancement of Access Road Entry Points

Access roads are an important component to assist in the long-term maintenance and functionality of the Project. The interface between the access roads and the public road network provides an opportunity to create a gateway to better integrate the access road into the surrounding context. The example provided below illustrates a potential entry treatment that could be applied to each of the site entry points. However, it should be noted that site specific conditions such as roadway line of sight along local roads and space constraints may require variability at each entrance location. The entry point on Apothecaries Hall Road is an existing entry which was previously enhanced through the use of earthen berms and vegetative screening. While the vegetative screen could be amended and enhanced, no additional mitigation is recommended at this location due to the desire to maintain a safe entry point established by existing lines of sight. In addition, GPS has placed a large setback (190') between the facility gate and Apothecaries Hall Road to reduce potential visibility.



Plan Rendering | Access Road Entry Point



Agricultural Fence



Reclaimed Lumber Fence



Split Rail Fence

Precedent Imagery | Access Road Entry Point

Section 8 | Conclusion

The recommended mitigation strategies provided in this plan would likely result in a regionally and locally appropriate visual buffer, which is also intended to enhance habitat and foraging opportunities for a local fauna. In agricultural landscapes, such as the Project Site, it is important to maintain the character of the visual setting while providing mitigation that responds to the potential visual effects resulting from the Project. As illustrated in this plan and in the Visibility Assessment, the proposed mitigation for the Gravel Pit Solar Project aims to achieve the following goals:

- Minimize the visibility of the Project along portions of Apothecaries Hall Road which will effectively reduce potential visual impacts to neighboring residents.
- Provide ecological benefits by using native plant material which will provide foraging and habitat opportunities for fauna.
- Promote native species indigenous to the region while reducing the presence of invasive species on the Project Site.
- Provide annual and perennial plants that will be beneficial to native pollinators.
- Minimize the industrial connotation suggested by the use of chain link fencing, by using a wood post agricultural style fencing.
- Enhance the Project access roads where they meet public roads by introducing materials and plantings that soften the entrance.

It is anticipated the proposed plan will be effective in achieving the goals of the Project. However, appropriate planting medium, the presence of utilities, and input from the local municipality and Project stakeholders may result in alterations or substitutions of the proposed materials. It is anticipated the concepts included in this plan would result in the successful mitigation of the potential visual effects resulting from the Project.