Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C.

50 Century Hill Drive, Latham, NY 12110 518.786.7400 FAX 518.786.7299 www.ctmale.com

February 3, 2025

Dan Cahalane U.S. Light Energy 8 British American Blvd, Floor 2 Latham, NY 12110 Email: <u>dcahalane@uslightenergy.com</u>







Re: Visibility Analysis - Summary Moreau Community Solar Project Town of Moreau, Saratoga County, New York C.T. Male Project No. 24.5097

Dear Dan:

C.T. Male Associates, Engineering, Surveying, Architecture, Landscape Architecture, and Geology D.P.C. (C.T. Male) has completed a Visibility Analysis for the Moreau Community Solar Project that is proposed at 65 Reynolds Road in Town of Moreau. This work was completed to assess potential visual impacts related to the project and provide for appropriate mitigation.

Site Information

The project site is a vacant abandoned golf course property spanning two (2) parcels with approximately 130 linear feet of road frontage along Reynolds Road (NYS Route 197). The solar farm development is sited in the center and rear portions of the ± 120.4 -acre property and situated completely west of the National Grid powerlines that run north-south through this area. The site cover consists of successional old field, shrub land, and forested areas. Most of the land is covered in shrubs and brush. Ponds, wetlands, and streams are present on the site.

The proposed solar farm development is adjoined to the west by an on-site stream, vacant wooded land, and the former Tee-Bird North golf course beyond. It is adjoined to the east by an on-site stream, wooded land, National Grid powerlines, a former railroad, and residential properties along Fort Edward Road beyond. It is adjoined to the south by on-site portions of the former golf course that will be preserved around the ponds, and residential properties along Reynolds Road beyond. It is adjoined to the north by off-site wooded land in the rear of residential properties along Reservoir Road.

Visibility Analysis Moreau Community Solar Town of Moreau, NY Page - 2

Methodology

C.T. Male prepared a line-of-sight analysis, which depicts elevation profiles of the site from one (1) location on Reynolds Road, one (1) location on Fort Edward Road, one (1) location on Reservoir Road, and two (2) locations along the parcel boundaries near neighboring residences that were determined to have the greatest likelihood of public visibility into the project site.

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Relevant details are shown on the elevation profiles such as existing conditions photographs facing the direction of the profiles that were taken during leaf-off conditions, approximate parcel boundaries, existing roadways, dimensions of existing vegetation stands, the proposed solar development area, and approximate clearing limits based on preliminary site plans. The elevation profiles were developed using publicly available data and orthoimagery from the NYS GIS Clearinghouse. The line-of-sight profiles are included as **Attachment 1**. Sheet C-801 depicts the line-of-sight profiles, stationing, and the project layout in plan view, and Sheets C-802 to C-806 depict the elevation profiles

Representative Viewsheds

Based on the line-of-sight analysis, the following findings are made:

- Portions of the project will be visible from the north-adjoining properties and Reservoir Road. As such existing tree lines and brush growth north of the site will be preserved to the maximum extent that is practicable, and additional landscape screening is proposed, consisting of spruce trees and shrub willow hedgerow. Given the relatively flat topography in this area, and the placement of landscaping at the highest elevation possible along this viewshed, the landscape screening should be effective after a few years growth, substantially screening most of the project. **Attachment 2** contains representative information on the proposed shrub willow plantings and photographic examples during leaf-on and leaf-off conditions from locations in upstate New York.
- The remainder of the viewsheds from the east, south, and west are not expected to be significantly impacted due to the preservation of existing wooded areas, riparian areas, and brush areas surrounding the project, which provides a natural undisturbed buffer, as well as the provision of significant property line setbacks to the project, particularly from the south-adjoining residences. Overall, the topography between the surrounding properties and the project does not lend itself to high or significant off-site visibility.

Visibility Analysis Moreau Community Solar Town of Moreau, NY Page - 3

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Other Visual Considerations

Utility Poles: Two (2) series of seven (7) utility poles will be located parallel to the access road within the site so that the power generated from the solar farm can be connected into the existing circuit along Reynolds Road. The utility poles will be standard timber, 40-foot poles that will house the interconnection equipment, some of which will owned by the utility. The remainder of the electrical lines within the array and up to the poles will be underground. The utility pole series associated with the utility interconnection is an unavoidable component of the project. However, the poles are of similar visual character to the existing lines that run along Reynolds Road, they haven been sited next to the existing National Grid transmission lines, and are not expected to create a significant visual impact that is substantially different than the existing condition.

Equipment Pads: The electrical equipment pads will house the transformers and switchgears, which is relatively short equipment (5± feet tall). This equipment will be pad-mounted and placed within the array, behind the existing and proposed vegetative screening and fence line, and substantially setback from any adjoining residence or surrounding roadway. This equipment is not expected to cause a significant visual impact. No other appurtenant structures are proposed.

Lighting: No lighting is proposed.

Summary

The project is not expected to be a highly visible solar farm, due to the following factors:

- Siting the project in the central and rear portions of the property, thereby preserving dense wooded buffers and setbacks around most of the array, and eliminating visibility of the array from NY-197.
- Preservation of lands not needed for solar development on the property as continued natural growth, as much as practicable.
- Lack of higher elevation vantage points with visibility of the project in the surrounding area.
- Lack of significant or officially designated important viewsheds surrounding or associated with the project site.
- Siting the interconnection poles near the existing National Grid transmission lines to best blend visual character, and placing the remaining electric lines within the site underground.
- Application of vegetative screening on the north side of the project that is expected to be fast-growing and appropriate for the site setting, and will supplement the continued growth of the current brush and tree cover.

Visibility Analysis Moreau Community Solar Town of Moreau, NY Page - 4

Respectfully Submitted,

C.T. MALE ASSOCIATES

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Chris Koenig Project Manager Environmental Planner

Attachment: 1. Line-of-Sight Profiles (1-5) 2. Shrub Willow Information

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Martin Schmidt Assistant Project Manager Civil Designer

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ATTACHMENT 1 LINE-OF-SIGHT PROFILES

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ATTACHMENT 2 SHRUB WILLOW INFORMATION

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Cornell University College of Agriculture and Life Sciences

FACT SHEET

'SX67' Salix miyabeana

S^{X67} is a fast-growing shrub willow that produces high biomass yields across a variety of sites. It is disease and beetle resistant, and is well suited for biomass plantings and privacy hedges.







'SX67' Salix miyabeana

http://willow.cals.cornell.edu



Botanical Name: Salix miyabeana 'SX67' (Family: Salicaceae)

Hardiness: U.S.D.A. Zones 4 - 6

Origin: 'SX67' was obtained from the University of Toronto as part of a research project to develop new willow cultivars that generate high biomass yields on a variety of sites, display resistance to diseases and pests, and possess agronomic traits suitable for mechanical planting, harvesting, and post-harvest processing. *S. miyabeana* is tetraploid and native to Asia.

Significance: 'SX67' is a shrub willow cultivar displaying exceptionally rapid growth, annually produces 4-6 dry tons of woody biomass per acre in yield trials, and displays low incidence of rust disease or damage by beetle. Woody stems can be harvested every three to four years, and new shoots will re-sprout the following season. Repeated harvesting of shrub willow plantations can be sustained for at least 15 years.

Description:

Height and Width: 15-20 feet tall, 3-5 foot crown spread at 3 years when grown at 2 x 3 foot spacing.

Habit: Fast-growing, deciduous shrub with multiple small-diameter, vertical stems. **Foliage:** Green oblong leaves, typically 3-3.5 inches long, 0.5-1 inches wide, with foliage April through October in Zone 5.

Bark: Three-year old stem is green with slightly cracking bark and red lenticels. **Flowers:** Male, early spring.

Seeds: No seeds produced

Culture: Adaptable to a wide range of soil and moisture conditions. Prefers maximum sunlight.

Propagation: Roots easily from dormant stem cuttings.

Uses: Excellent for bioenergy plantations, privacy hedges, living snowfences and in ornamental plantings.

Availability: Available from Double A Willow (www.doubleawillow.com)

Originally published 2007 by SUNY-ESF

Kimberly D. Cameron¹, Lawrence Smart^{1*}, Benjamin Ballard², Timothy Volk³, and Lawrence Abrahamson³

¹Dept. of Horticultural Sciences, ²SUNY at Morrisville, NY 13408, ³SUNY College of Environmental Science & Forestry, Syracuse, NY 13210

*Contact: lbs33@cornell.edu, 315-787-2490

Funding provided by New York Farm Viability Institute to LB Smart.

This variety is licensed by the research foundation of SUNY exclusively to Double A Willow



ILLOWPEDIA



Cornell University College of Agriculture and Life Sciences

FACT SHEET

'Preble' Salix viminalis x S. miyabeana

U.S. Plant Patent 24,537

[•]**P**^{reble' is a fast-growing hybrid shrub willow bred and selected for high biomass yield and pest and disease resistance. It has performed well across a wide range of sites and has agronomic traits suitable for efficient mechanical planting and harvesting.}



'Preble' Salix viminalis x S. miyabeana



Botanical Name: Salix viminalis × S. miyabeana 'Preble' U.S. Plant Patent 24,537 (Family: Salicaceae) Issued June 10, 2014

Hardiness: U.S.D.A. Zones 4 - 6

Development: 'Preble' was produced through controlled willow breeding in 2001 in Syracuse, NY, as part of a research project to produce new willow cultivars that generate high biomass yields on a variety of sites. 'Preble' displays resistance to diseases and pests and has agronomic traits suitable for mechanical planting and harvesting, and post-harvest processing. 'Preble' was produced by crossing *Salix viminalis* 'SV2' with *S. miyabeana* '9970-037'(a sibling of 'Canastota').

Significance: 'Preble' has outperformed most other cultivars in yield trials in IL, MI, NY, and VT, producing 2-6 dry tons per acre annually resulting in an 18% increase in maximum first-rotation yield compared to the previous best commercial cultivar, SX61. It displays low incidence of rust disease or damage by beetles or leaf sawfly. Woody stems can be harvested every three to four years with vigorous re-sprouting the following season. Repeated harvesting of shrub willow plantations can be sustained for at least 25 years. 'Preble' has grown so rapidly in some plantings that harvesting on a two-year cycle may be warranted.

Description:

Height and Width: 20-25 feet tall, 3-5 foot crown spread at 3 years when grown at 6,000 plants per acre.

Habit: Fast-growing, deciduous shrub with multiple large-diameter, vertical stems.

Foliage: Green lanceolate leaves, typically 5-6 inches long, 0.8-1 inches wide, with foliage April through November in Zone 5.

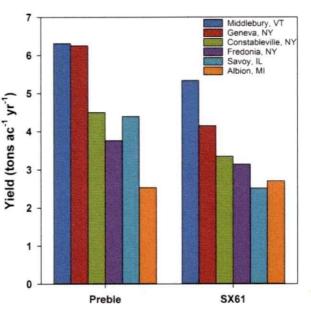
Bark: Blue-green when young, turning greyed-green with age; greyed-orange buds in winter.

Flowers: Female, early spring.

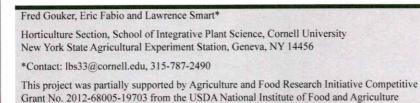
Seeds: No seeds are produced because 'Preble' is a sterile triploid.

Culture: Adaptable to a wide range of soil and moisture conditions. Requires maximum sunlight.

Propagation: Roots easily from dormant stem cuttings. **Uses:** Excellent for bioenergy plantations, living snowfences, and ornamental structures. Dried stems can be used in basketry.



Availability: Available from Double A Willow (www.doubleawillow.com)



This cultivar is licensed by the Research Foundation of SUNY exclusively to Double A Willow



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Cornell University College of Agriculture and Life Sciences

FACT SHEET

'Onondaga' Salix purpurea

Onondaga' is a fast-growing, high-yielding variety of shrub willow. It is disease resistant, produces multiple small stems, and is well suited for biomass plantings, snowfences, streambank restoration, and riparian buffers.



http://willow.cals.cornell.edu

'Onondaga' Salix purpurea



Botanical Name: Salix purpurea 'Onondaga' (Family: Salicaceae) Hardiness: U.S.D.A. Zones 4 - 6

Development: 'Onondaga' was produced through controlled willow breeding in 1999 as part of a research project to produce new willow cultivars that generate high biomass yields on a variety of sites, display resistance to diseases and pests, and possess agronomic traits suitable for mechanical planting, harvesting, and post-harvest processing. 'Onondaga' was produced by crossing *Salix purpurea* 'SH3' with *S. purpurea* '94002'.

Significance: 'Onondaga' is a shrub willow cultivar displaying exceptionally rapid growth, annually producing 4-5 tonnes per acre in yield trials, with low incidence of rust disease or damage by beetle, potato leaf hopper or sawfly. Woody stems can be harvested every three to four years, and new shoots will re-sprout the following season. Repeated harvesting of shrub willow plantations can be sustained for at least 15 years.

Description:

Height and Width: 15-20 feet tall, 3-5 foot crown spread at 3 years when grown at 2 x 3 foot spacing.

Habit: Fast-growing, deciduous shrub with multiple small-diameter, vertical stems.

Foliage: Dark green oblong leaves, typically 2-3 inches long, 0.5-1 inches wide, with foliage April through October in Zone 5.

Bark: Brown when young, turning green and smooth with age; yellow-orange buds in winter.

Flowers: Male, early spring. Seeds: No seeds produced.

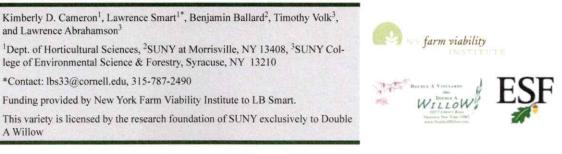
Culture: Adaptable to a wide range of soil and moisture conditions. Prefers maximum sunlight.

Propagation: Roots easily from dormant stem cuttings.

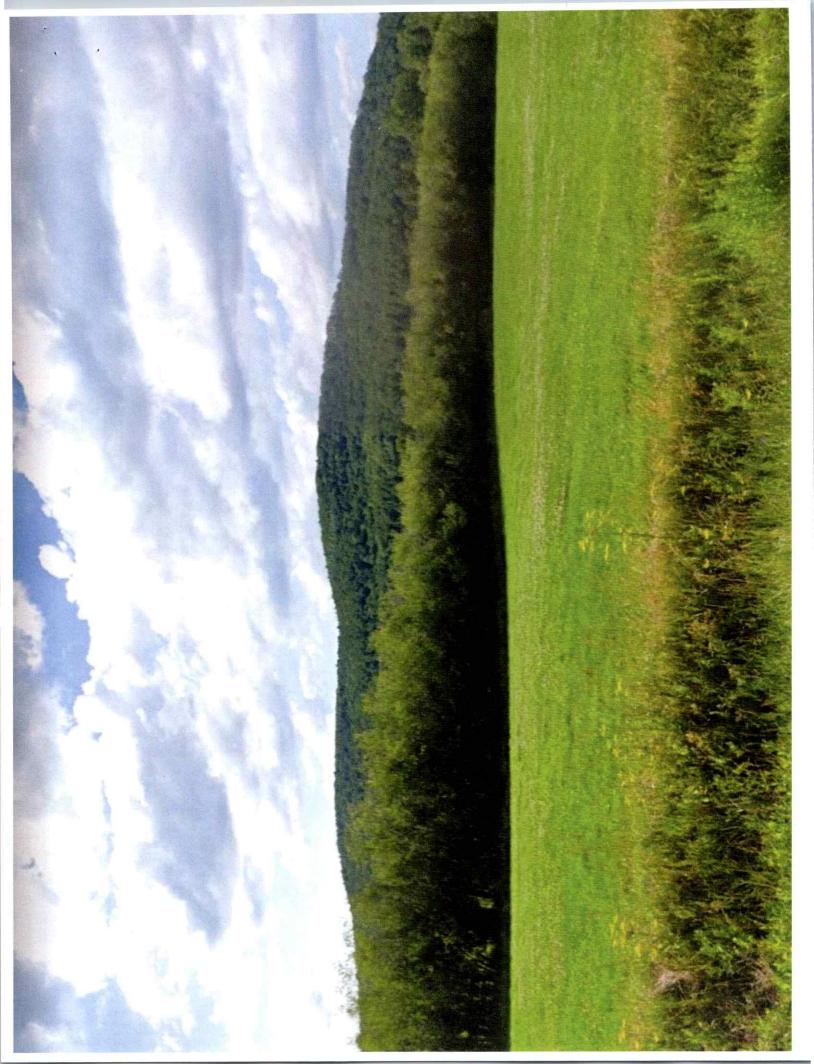
Uses: Excellent for bioenergy plantations, streambank restoration, living snowfences, and riparian buffers. Dried stems can be used in basketry.

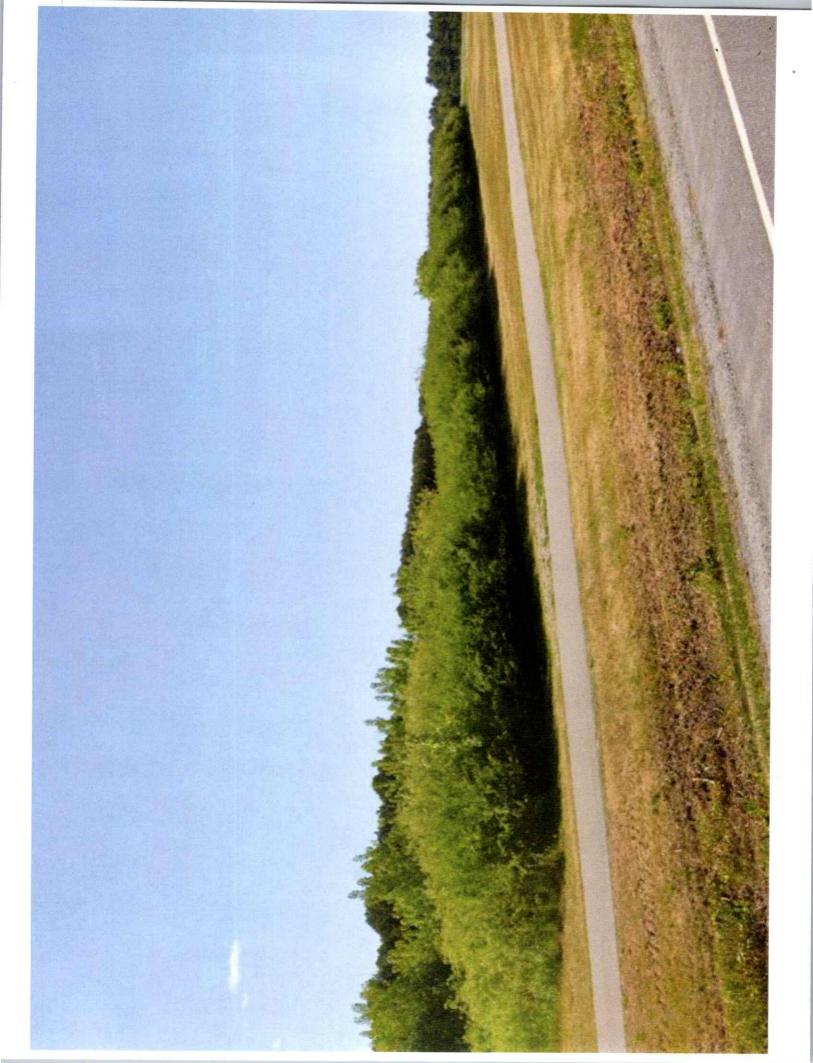
Availability: Available from Double A Willow (www.doubleawillow.com)

Originally published 2007 by SUNY-ESF



REPRESENTATIVE PHOTOS LEAF-ON CONDITION IN UPSTATE NY









SHRUB WILLOW

Renewable Energy Environmental Benefits

OPPORTUNITIES FOR RURAL DEVELOPMENT

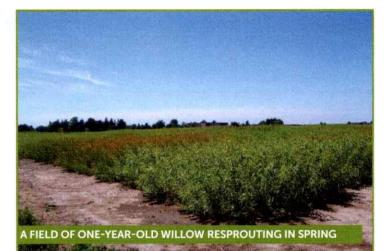
www.esf.edu/willow

An alternative crop with multiple benefits

Driven by the challenges of rural development, energy independence and environmental sustainability, research on willow biomass crops for renewable energy and environmental applications has been ongoing at SUNY College of Environmental Science and Forestry (ESF) since 1986. SUNY-ESF has teamed up with more than 20 universities, commercial partners and non-profit organizations throughout the U.S. and Canada to conduct research and facilitate the commercialization of willow biomass crops.

- Willow biomass crops are planted once and harvested every three to four years, up to seven times.
- Improvements to the willow production system are increasing potential returns for landowners.
- It is now possible to achieve internal rate of return (IRR) up to 10 percent, with a payback period of three to four harvests (10 to 14 years after planting). If incentive programs such as USDA BCAP are available to establish and grow willow, returns may be 20 percent or greater with a payback as short as one or two harvests (four to eight years).

Willow biomass crops have been tested on a range of sites throughout the Northern U.S. and Southern Canada. The crop consistently yields four to five dry tons of wood chips per acre per year (green areas on map). Continued research and development will further increase these yields in future years.



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YIELD MAP FOR WILLOW BIOMASS CROPS. DARKER GREEN IS HIGHER POTENTIAL YIELD.

Promoting Rural Development and the Environment



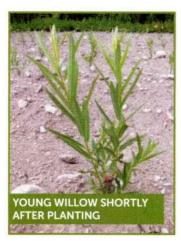
Willow biomass is a low-maintenance crop that stimulates rural economies and enhances the local environment in several ways:

- Shrub willow crops generate income for landowners and create jobs in the local community when converted into renewable energy and products.
- Shrub willow can be grown on marginal farm land so production does not directly compete with food or feed crops.
- Willow is a "carbon neutral" fuel source, meaning no additional CO2 emissions are created in the production and use of the crop.
- Shrub willows can improve biodiversity, mitigate pollution and provide other environmental benefits to local ecosystems.
- Bird diversity and density in willow biomass crops is similar to natural shrub land and forests.

www.esf.edu/willow

Energy, green products and environmental services

Why Grow Shrub Willow?





CROP AT HARVEST

Shrub willow is easy to establish, grows quickly and provides multiple benefits:

- Adapted to a wide range of site conditions.
- Easily propagated from stem cuttings which grow new roots, shoots and leaves.
- Rapid growth rate, produces hardwood biomass 10-15 times faster than local forests.
- After each harvest, new stems quickly re-grow from the remaining plant.
- Limited maintenance between harvests.
- Willow wood chip properties are similar to forest residue chips and suitable for mixing.
- High ornamental and landscape aesthetic value.

Producing Shrub Willow Crops



PLANTING WILLOW CROPS IN SPRING

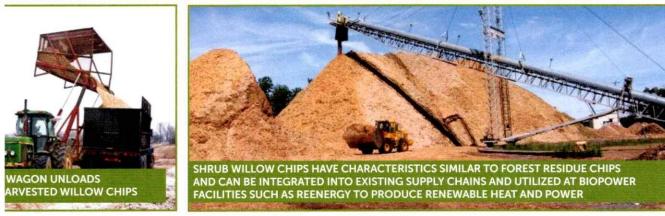
 WILTIPLE STEMS ON MATURE WILLOW PLANT

Planting and harvesting equipment for shrub willow crops is currently available at reduced costs through the NEWBio program. (www.newbio.psu.edu). Willow biomass crops can be planted on marginal agricultural land. A grower can harvest shrub willow up to seven times from a single planting.

- Land is prepared in fall prior to planting by clearing existing vegetation, plowing and disking.
- Unrooted stems are inserted into prepared ground using a tractor-mounted planter.
- Planting stock is available for purchase from Double A Willow (www.doubleawillow.com).
- Stems are cut back (coppiced) once to encourage more stems and vigorous growth.
- Each plant produces numerous woody stems with diameters approximately 1 2 inches at harvest.



Harvesting and Utilizing Shrub Willow Crops



Woody biomass from shrub willow can be converted into different forms of renewable energy and environmentally friendly products that offset the use of non-renewable fossil fuels.

- After planting and coppice, the crop can be harvested once every three to four years.
- New Holland Agriculture has developed an effective woody crop header (FB 130) that fits on their FR 9000 series of forage harvesters and is now available.
- The harvester cuts and chips the crop in one pass while chip collection vehicles follow beside it.
- Heat and electricity can be produced from harvested wood chips by direct combustion, co-firing with other fuel sources, or gasification.
- For every one unit of fossil fuel energy used to produce shrub willow crops, about 15 units of renewable electricity are produced, or about 30 units of renewable heat and electricity via co-generation.
- Wood pellets, liquid "biofuels", biodegradable plastics, and other green products can also be produced from willow.
- All end uses provide local and regional economic benefits.

Other Uses for Shrub Willows



In addition to being a source of renewable energy and green products, the unique characteristics of the shrub willow make it ideal for a wide range of environmental applications:

- Living Snow Fences prevent blowing snow on roadways
- Vegetated Buffers prevent fertilizers and chemicals from entering streams, ponds and waterways
- Protect Soil Resources prevent erosion and stabilize stream banks
- Environmental Remediation clean up and restore former industrial sites
- Vegetated Cover a green alternative for effectively capping landfills

For more info visit www.esf.edu/willow or contact The Willow Project at SUNY-ESF willow@esf.edu or 315-470-6775

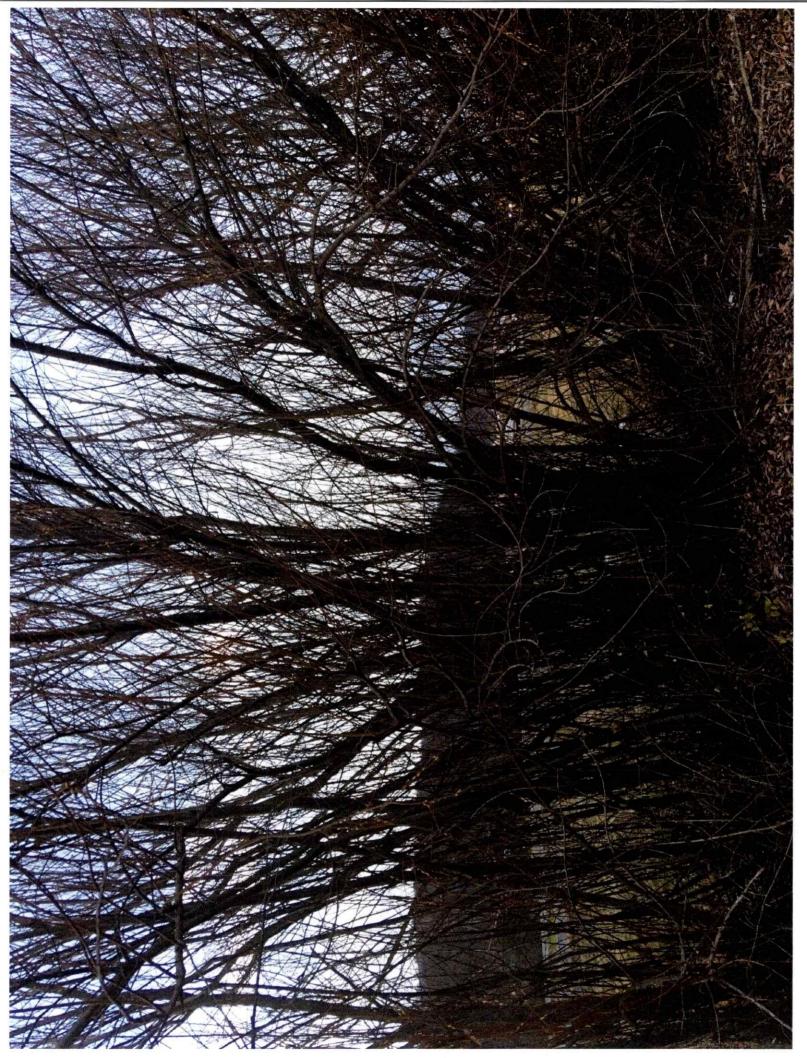
Justin P. Heavey and Timothy A. Volk. © 2014 The Research Foundation for the State University of New York College of Environmental Science and Forestry. Syracuse, NY.

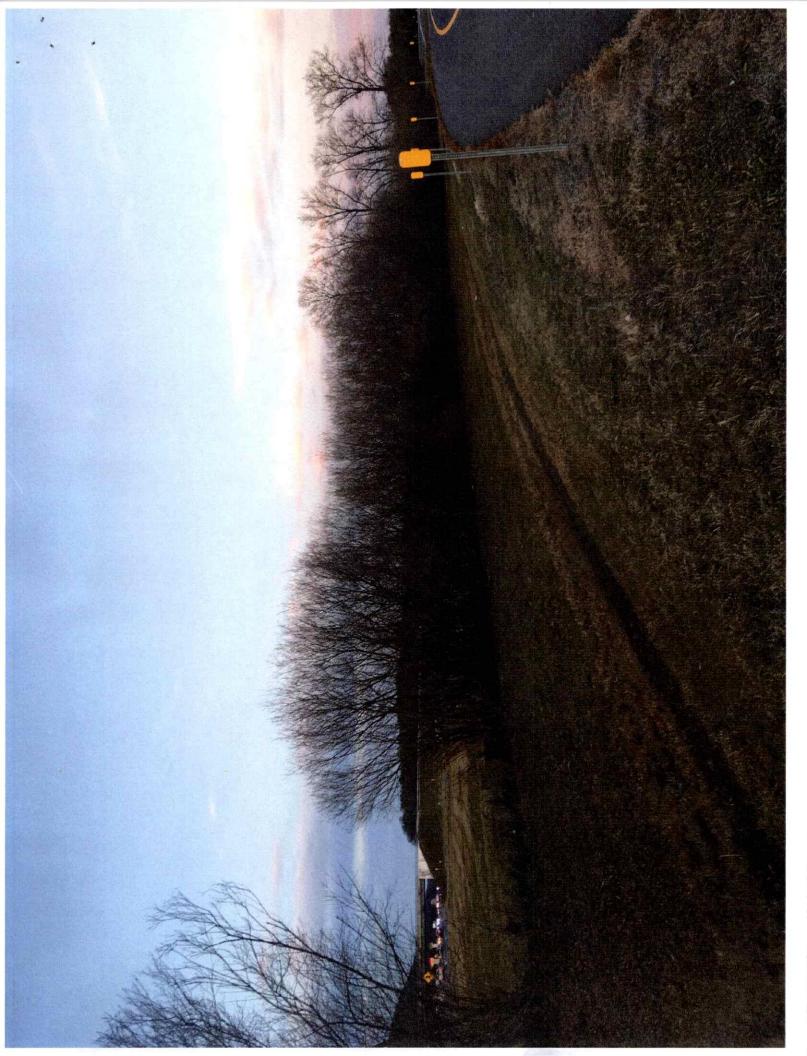
Support for shrub willow research and development has been provided by the United States Department of Agriculture (USDA), United States Department of Energy (USDOE), New York State Energy Research and Development Authority (NYSERDA), Empire State Development Division of Science, Technology & Innovation (NYSTAR), and the New York State Department of Transportation (NYSDOT)



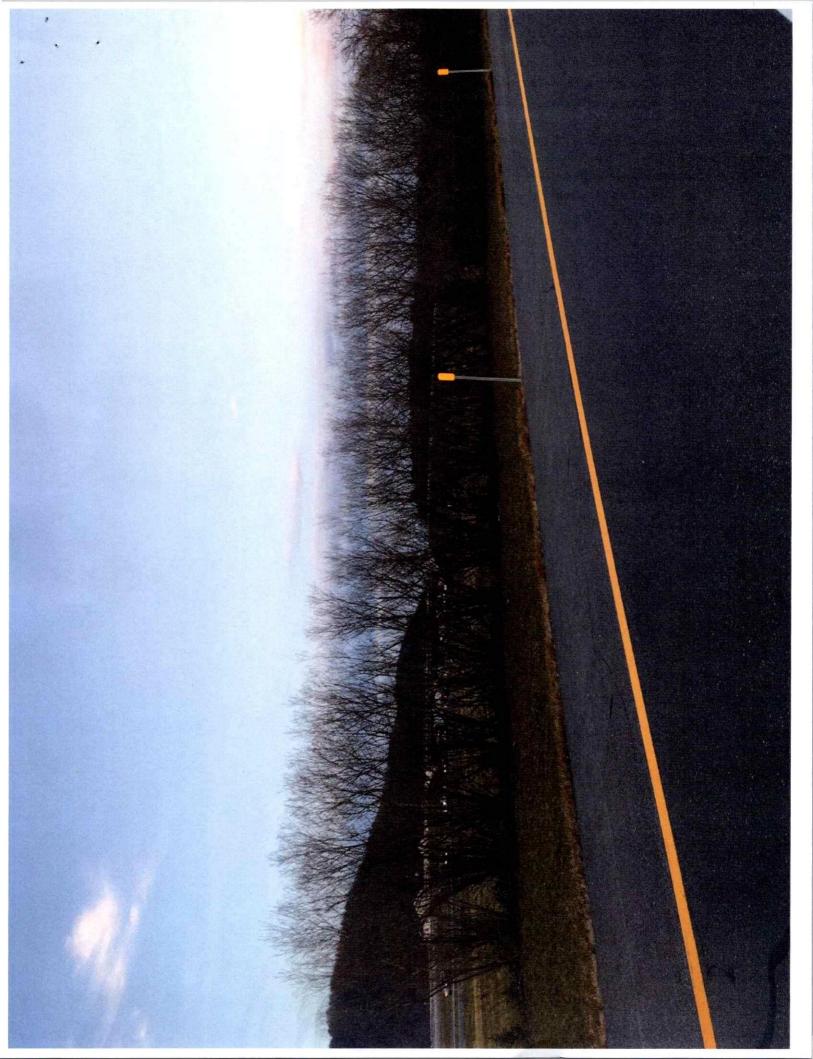
REPRESENTATIVE PHOTOS LEAF-OFF CONDITION IN UPSTATE NY

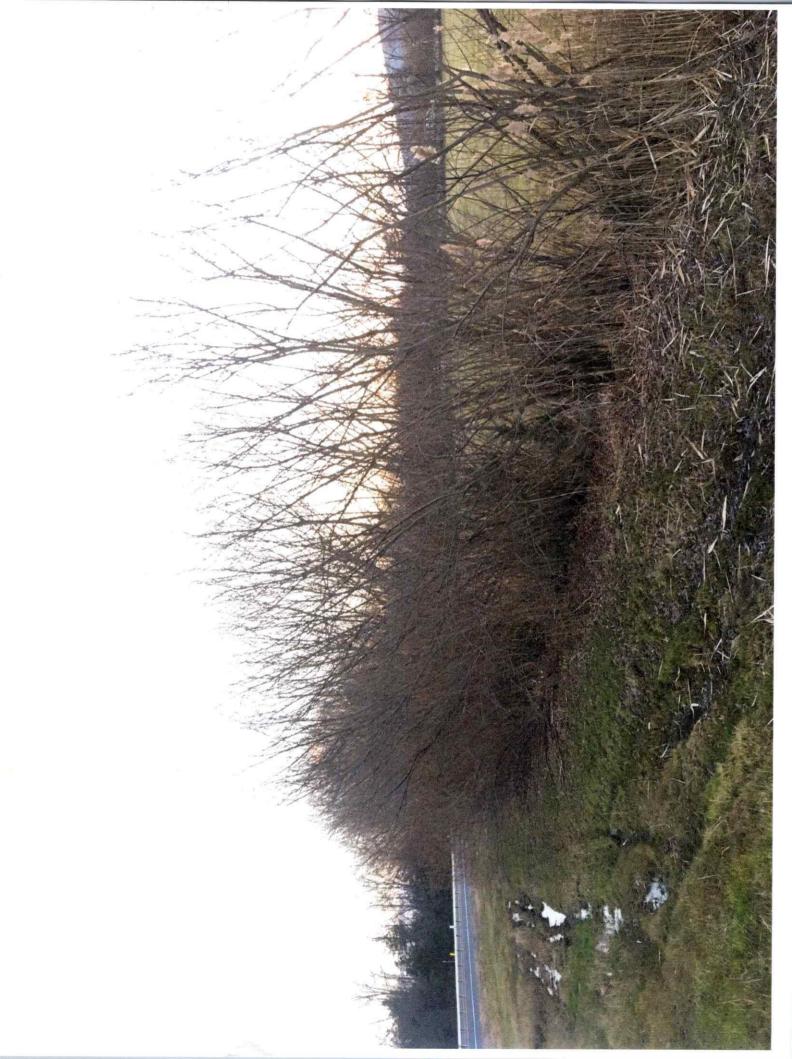


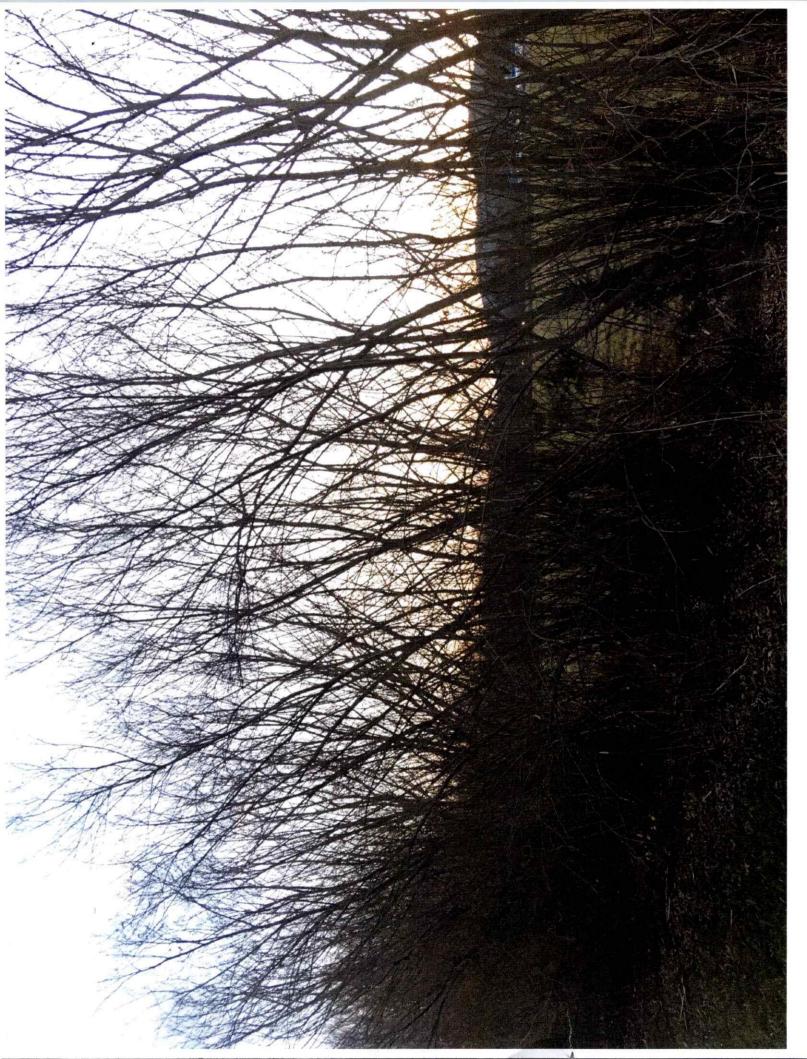








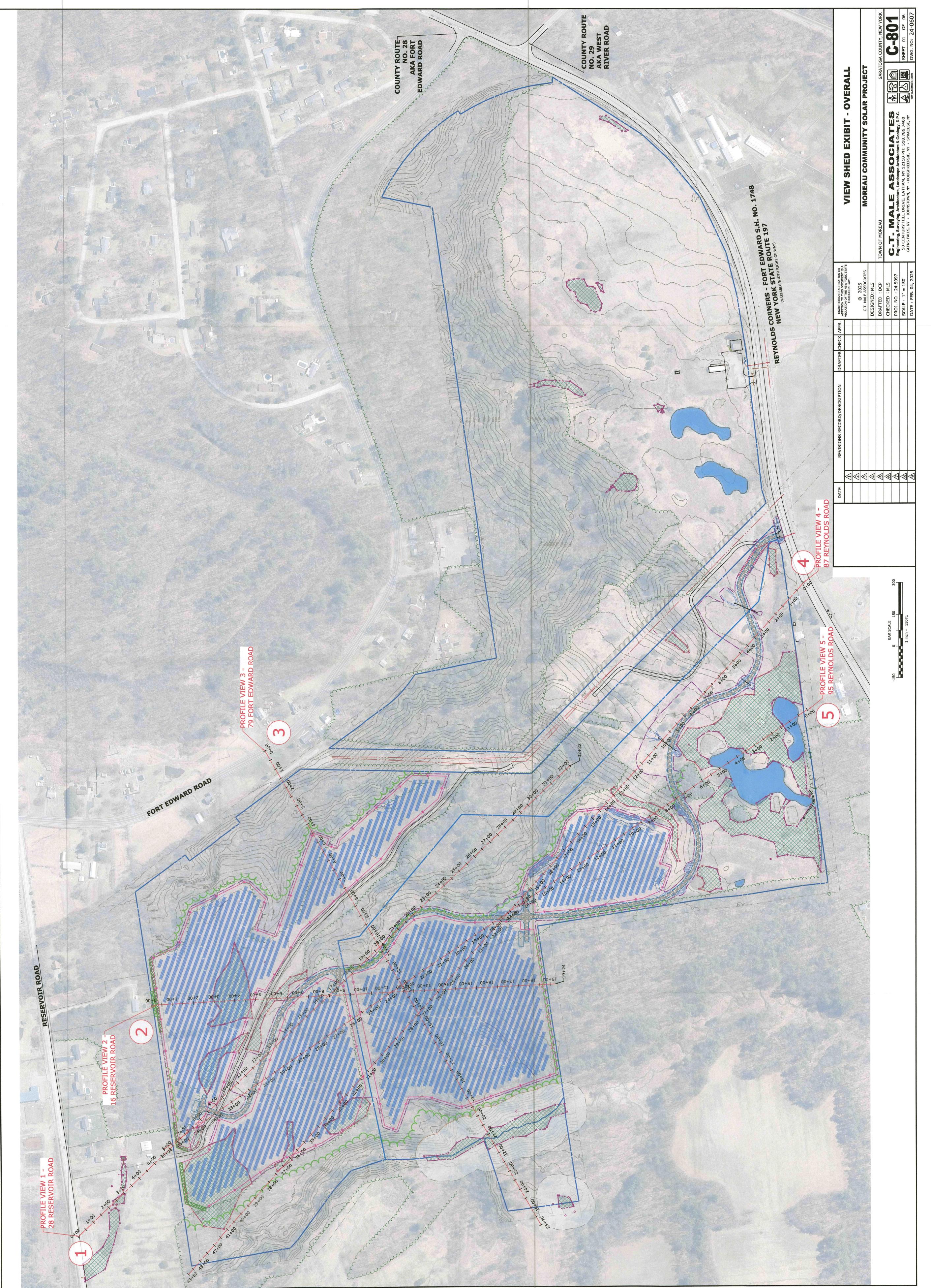












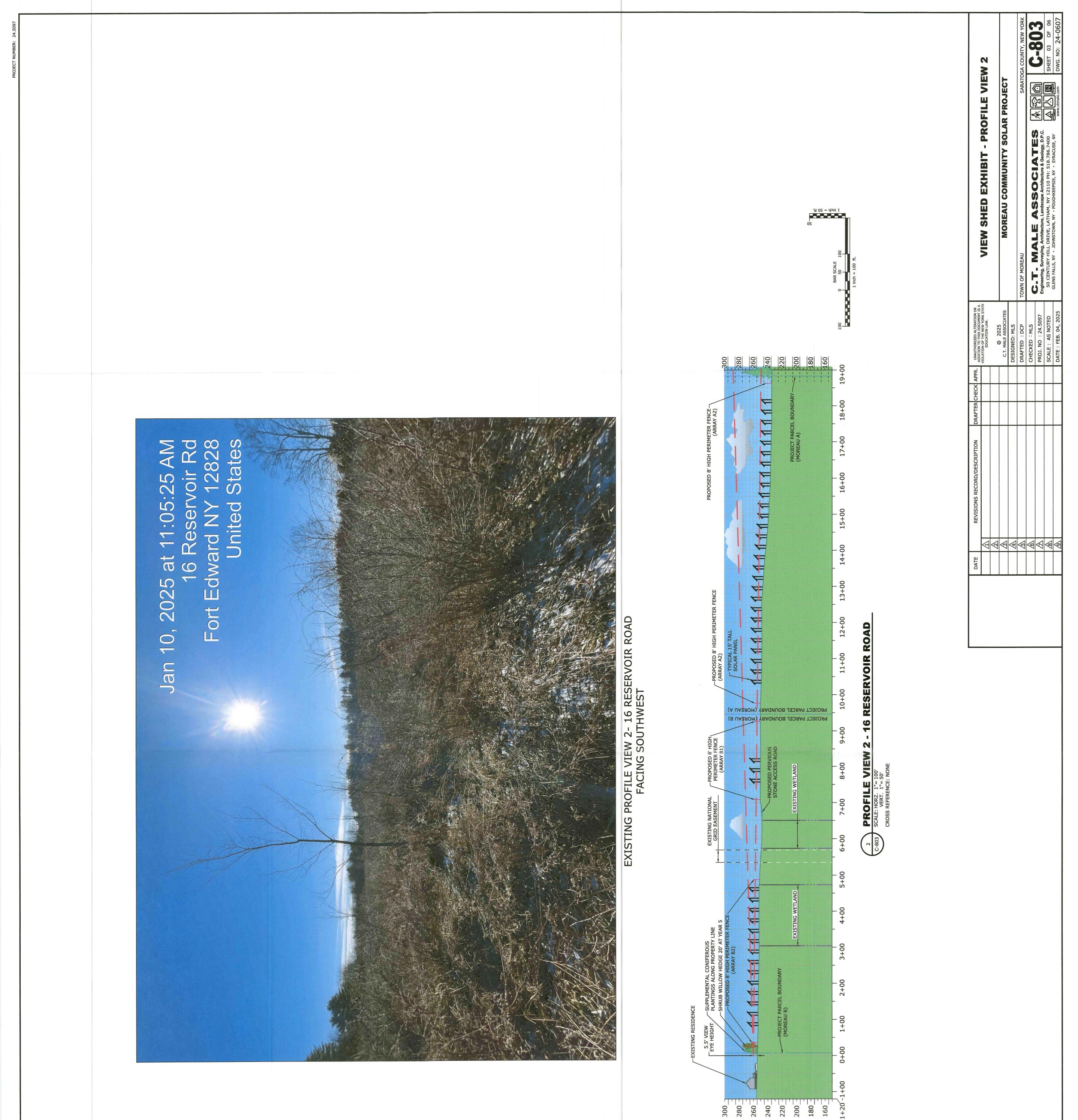
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Jan 10, 2025 ai 12:57-41 PM 38-66 Reservoir Rd Fort Edward NY 12828 United States







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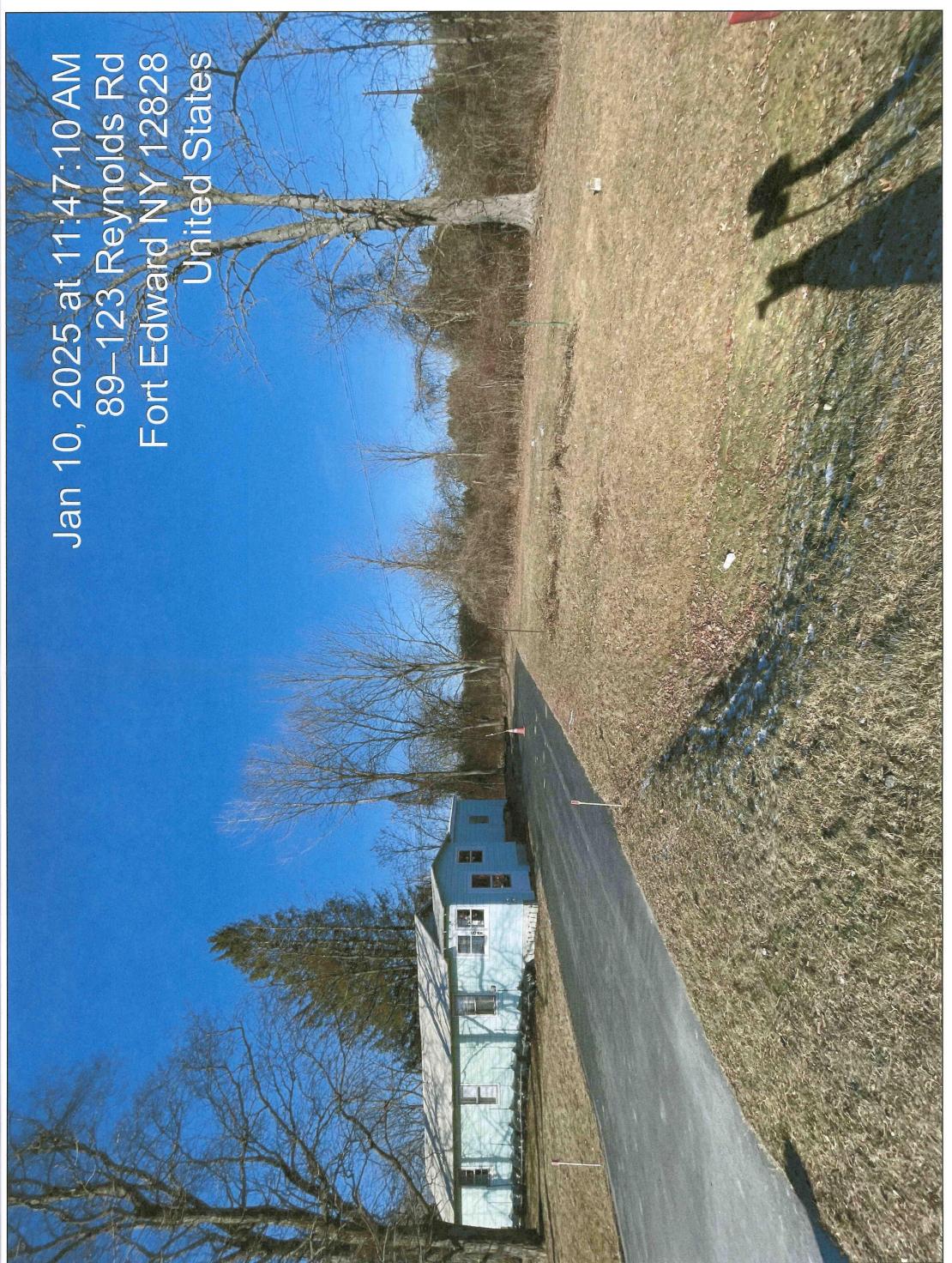


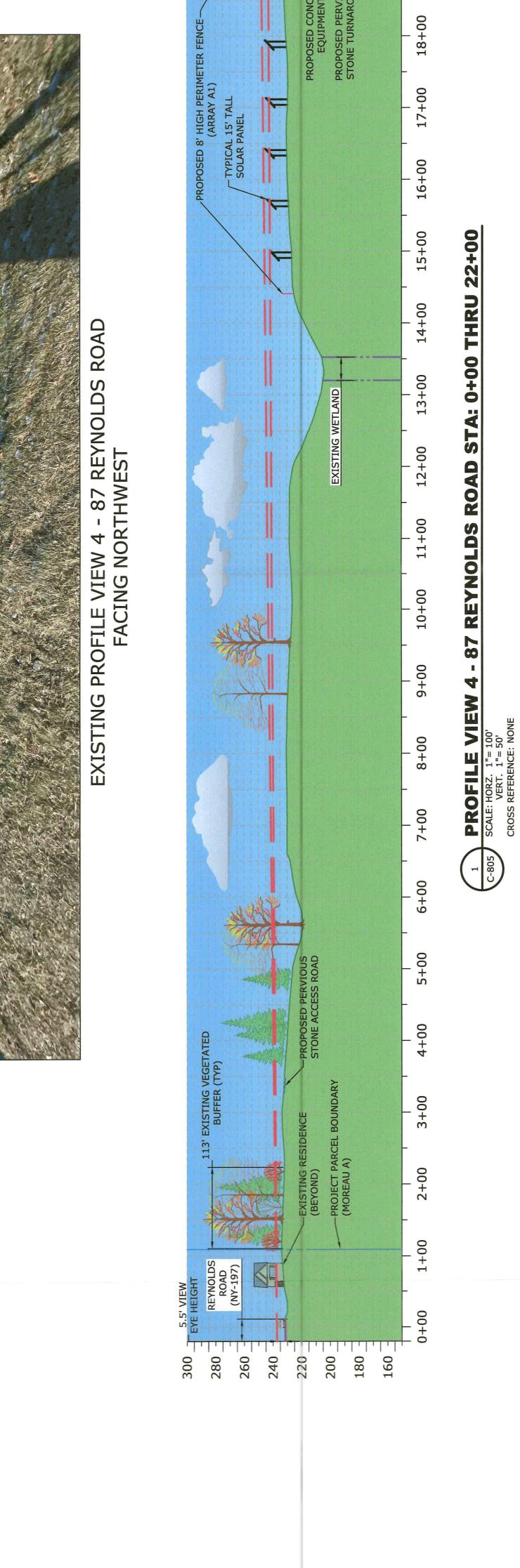


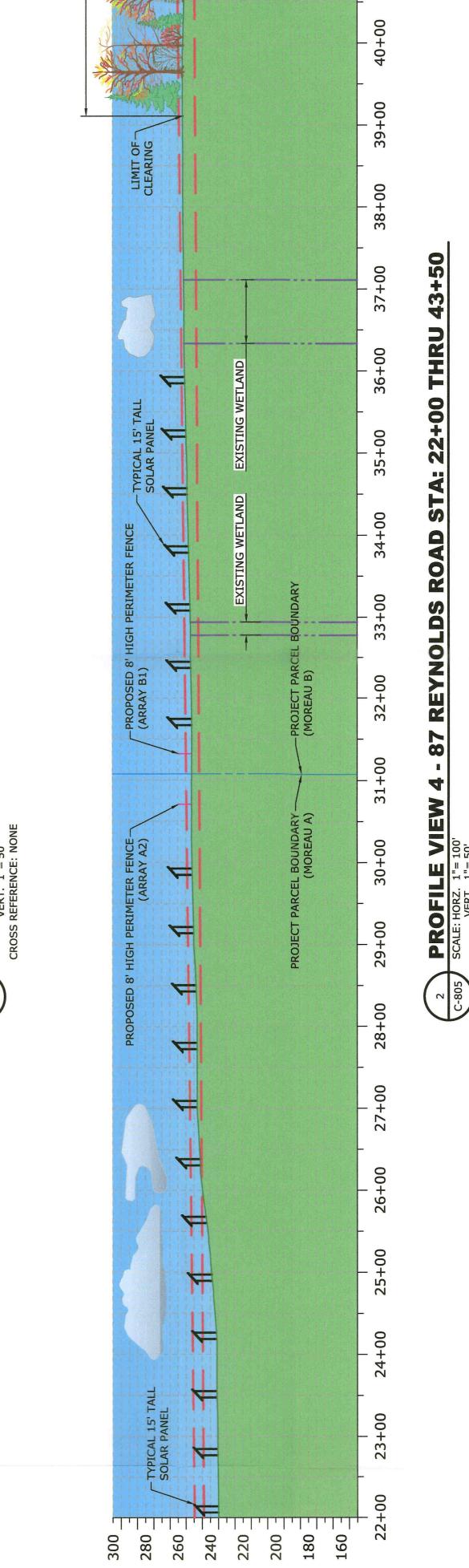
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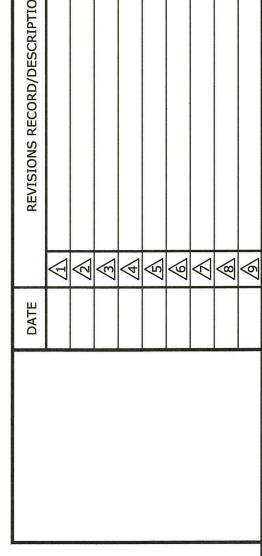


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