

SCHEDULE D

**OAK HILL COMMUNITY SOLAR 1 AND 2
DECOMMISSIONING STATEMENT**



ORIGINAL

ENTERED ON: 8/5/19
BY: DW 3:35

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1. INTRODUCTION

Oak Hill Solar 1 & 2, LLC (the "Applicant"), a New York limited liability company, hereby submits this plan for the eventual decommissioning of the two proposed 5 MWAC/7.5 MWDC community solar electric generation facilities located at 13950 Duanesburg Road, Delanson, NY 12053, in the Town of Duanesburg (the "Town") within Schenectady County in New York State (the "Projects") and the establishment of a decommissioning fund (the "Decommissioning Fund") for review as part of the "Solar Energy Facilities Law" as adopted by the Town of Duanesburg through Resolution NO. 107-2016 (the "Solar Bylaw"), before the planning board of the Town of Duanesburg (the "Board").

A site location plan is provided at Appendix 1 for reference.

2. DECOMMISSIONING ACTIVITIES

The Projects are anticipated to operate for 25-30 years. At the time the Projects ceases to operate, Applicant will perform decommissioning which shall include removal of all energy facilities, structures and equipment including any subsurface wires and footings from the parcel. Any access roads created for building or maintaining the system shall also be removed and re-planted with vegetation. The solar panels and all other equipment removed from the project site, unless being reused or repurposed for another project, shall be recycled in accordance with all applicable New York State policies and procedures in effect at the time of decommissioning.

Further, decommissioning will include restoring the property to its pre-installed condition, including grading and vegetative stabilization to eliminate any negative impacts to surrounding properties. Specifically, such decommissioning shall include, but is not limited to, physical removal of all ground-mounted solar collectors, structures, equipment, security barriers and transmission lines from the site.

3. COST OF DECOMMISSIONING

The fully inclusive cost to decommission each Project, as defined in Section 2 herein, is estimated at \$211,381 (the "Estimated Decommissioning Cost"), as detailed in Appendix 2.

The Estimated Decommissioning Cost shall be adjusted annually to account for inflation, based upon the current Consumer Price Index ("CPI") as maintained by the Bureau of Labor Statistics (the "Revised Estimated Decommissioning Cost").

4. ESTABLISHMENT OF DECOMMISSIONING FUND

The Decommissioning Fund will be funded with either (i) a surety bond (the "Bond") or (ii) an irrevocable standby Letter of Credit (the "LC") that is solely for the benefit of the Town. No other entity, including Applicant, shall have the ability to demand payment under the Decommissioning Fund. A draft LC form is attached to this Plan as Appendix 4. The LC or other Board-approved financial security, shall be in place and filed with the Board prior to commencement of construction.

Every five years and for the Project's life, Applicant shall file a report with the Board on the effect of the annual inflation adjustment, as noted above, including a Revised Estimated Decommissioning Cost. If the Revised Estimated Decommissioning Cost exceeds the then current Estimated Decommissioning Cost, Applicant shall create a new or amended Bond (or other appropriate financial security) to be issued to reflect the Revised Estimated Decommissioning Cost. In the event the CPI has a negative value at the time the annual adjustment is calculated, the value of the Bond (or other appropriate financial security) shall not be reduced.

At the end of the Project's useful life, and in the event Applicant does not seek Board approval to repower the Project, Applicant will decommission the Project as required under the Board's Solar Bylaw. Upon completion of decommissioning, Applicant shall seek a certification of completion from the Board. The certification will be provided to the issuing bank with instructions to terminate the LC (or another appropriate financial security).

The Board shall have the right to draw on the LC (or other appropriate financial security) to pay the costs of decommissioning in the event that Applicant (or its successor) is unable or unwilling to commence decommissioning due to dissolution, bankruptcy, or otherwise. Prior to the Board drawing on the LC (or other appropriate financial security), Applicant shall have a reasonable period of time to commence decommissioning, not to exceed ninety days following issuance of a Board order requiring decommissioning of the Project.

5. DEMOLITION INSTRUCTIONS

The following list is the sequential procedure that should be followed by the town for removal of the system pursuant to this plan:

a. **Project Component Removal**

All control cabinets, electronic components, and internal cables will be removed along with the panels, racks, and inverters. These components will be lowered to the ground where they will be transported whole for reconditioning and reuse, or disassembled/cut into more easily transportable sections for salvageable, recyclable, or disposable components.



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b. PV Module Removal

The Project's solar photovoltaic panels are manufactured according to the regulatory toxicity requirements based on the Toxicity Characteristic Leaching Procedure (TCLP). Under these regulations, solar panels are not considered hazardous waste. The panels used in the Project will contain:

Glass	75%
Polymers	10%
Aluminum	8%
Silicon	5%
Copper	1%
Silver	1%

All which have recycling or resale value. Modules will be dismantled and packaged per manufacturer, approved recyclers or resellers specifications and shipped to an approved off-site solar panel recycler.

It is important to recognize that solar panels have a minimum 10 year product warranty and a minimum 25 year performance guarantee. Those warranties have a direct impact on the panels' salvage value. The earlier the decommissioning event the higher salvage value.

International Renewable Energy Agency (IRENA) and the International Energy Agency's Photovoltaic Power Systems Programme (IEA-PVPS) published a detailed report titled, "The End-of-Life Management: Solar Photovoltaic Panels" that projects the PV panel waste volumes to 2050 and highlights that recycling or repurposing of solar PV panels at the end of their 30-year lifetime will unlock a large stock of raw materials and valuable components. The report estimates that PV panel waste, comprised could total 78 million tonnes globally by 2050. The value of the recovered material could exceed \$15 billion by 2050. This potential material influx could produce 2 billion new panels or be sold into global commodity markets.

Below is a short list of American companies that already operate in the solar panel recycling or repurposing market.

<http://www.tekoverly.com/>

<http://www.morgenindustries.com/index.html>

<https://echoenvironmental.com/solar-panel-recycling/>

<http://www.glnow.com/>

<http://www.intercotradingco.com/usa-solar-panel-recycling/>

<https://silrec.com/>

<http://www.solarsilicon.com/>

c. Electric Wire Removal

The copper and aluminum electric wires have a value for recycling. The DC wiring can be removed manually from the panels to the inverter. Underground wire in the project will be pulled and removed from the ground. Overhead cabling for the interconnection will be removed from poles. All wire will be sent to an approved recycling facility.

d. Racking and Fencing removal

All racking and fencing material like posts that were driven into the ground will be pulled, broken down into manageable units, removed from the facility and sent to an approved recycler.

e. Concrete Slab Removal

Concrete slabs used as equipment pads will be broken and removed to a depth of two feet below grade. Clean concrete will be crushed and disposed of off-site and/or recycled and reused either on or off-site. The excavation will be filled with subgrade material of quality and compacted density comparable to the surrounding area.

f. Access Road

The last structure to be removed is the access roads. They will be stripped exposing the geotextile beneath. The geotextile will then be removed and disposed of revealing the original soil surface. The compacted soil beneath the road fill might require ripping with a subsoiler plow to loosen it before it can be returned to crop production. Some of the access road might be retained by the landowner as it will be an improvement for their farm access.

g. Site Restoration Process

The site consists of 65.2 acres of agricultural land. Following the decommissioning activities, the sub-grade material, and topsoil from affected areas will be de-compacted and restored to a density and depth consistent with the surrounding areas. All unexcavated areas compacted by equipment used in decommissioning shall be de-compacted in a manner to adequately restore the topsoil and sub-grade material to the proper density consistent and compatible with the surrounding area.

If the subsequent use for the Project site will involve agriculture, a deep till of the project site will be undertaken. The affected areas will be inspected, thoroughly cleaned, and all construction-related debris removed. Disturbed areas will be reseeded to promote the re-vegetation of the area unless the area is to be immediately redeveloped. In all areas restoration shall include, as reasonably required, leveling, terracing, mulching, and other necessary steps to prevent soil erosion, to ensure the establishment of suitable grasses and forbs, and to control noxious weeds and pests. The future use of the land for agricultural purposes would not be prejudiced.



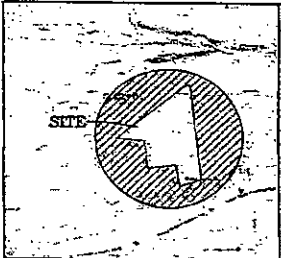
ORIGINAL

Appendix 1
Site Location Plan

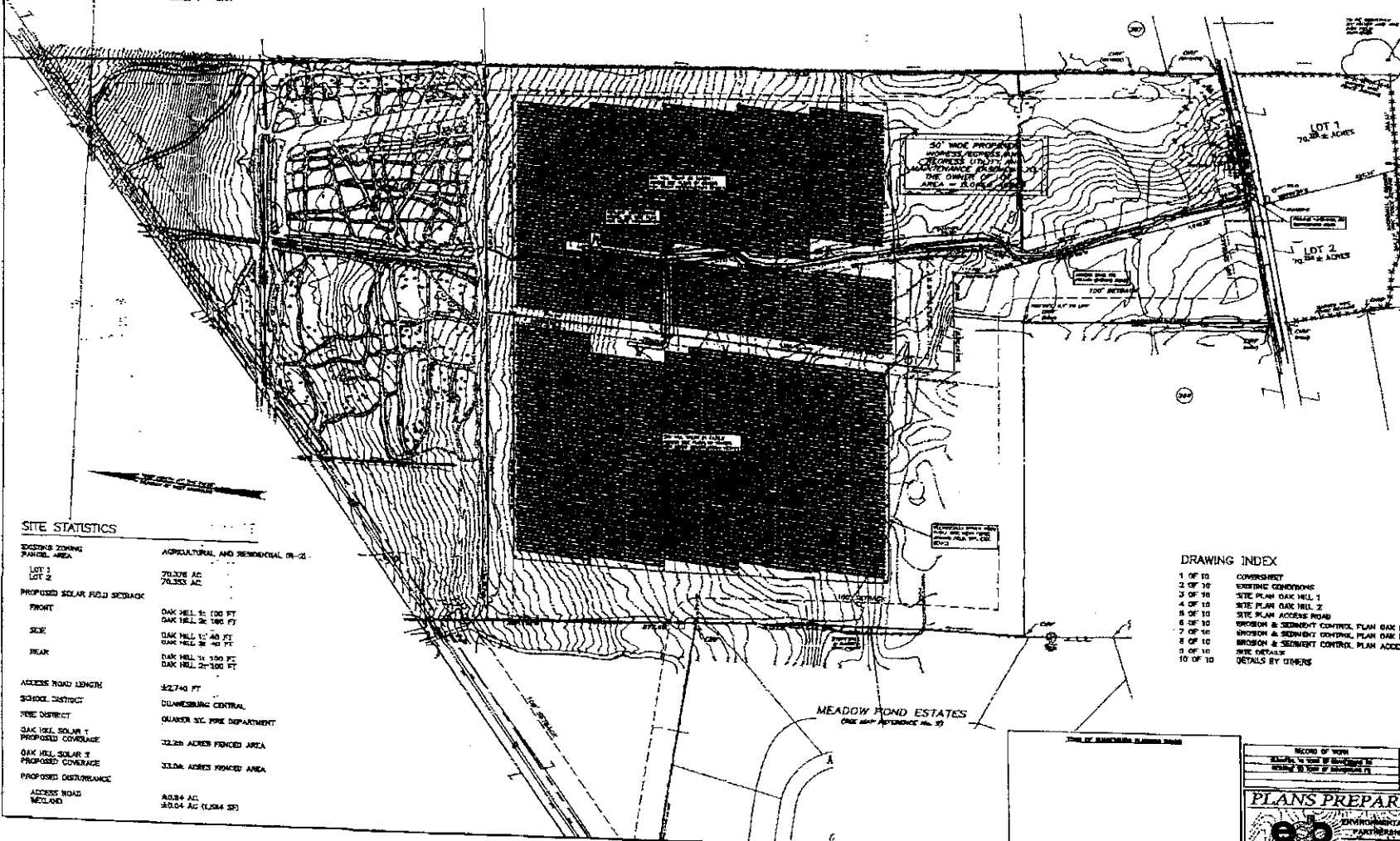
ENTERED ON: 9/5/19
BY: DW 3:55

PROPOSED SITE PLAN FOR
OAK HILL SOLAR 1&2

APPLICANT:
OAK HILL SOLAR 1, LLC & OAK HILL SOLAR 2, LLC
 13950 DUANESBURG ROAD
 TOWN OF DUANESBURG, SCHENECTADY COUNTY, NEW YORK



SITE LOCATION MAP
 SCALE 1" = 200'



SITE STATISTICS

EXISTING ZONING	AGRICULTURAL AND RESIDENTIAL (R-2)
PARCEL AREA	
LOT 1	70.50± AC
LOT 2	70.50± AC
PROPOSED SOLAR FIELD SETBACK	
FRONT	OAK HILL 1: 100 FT OAK HILL 2: 100 FT
SIDE	OAK HILL 1: 40 FT OAK HILL 2: 40 FT
REAR	OAK HILL 1: 100 FT OAK HILL 2: 100 FT
ACCESS ROAD LENGTH	82,740 FT
SCHOOL DISTRICT	DUANESBURG CENTRAL
TOWN DISTRICT	DUANESBURG FIRE DEPARTMENT
OAK HILL SOLAR 1 PROPOSED COVERAGE	12.00 ACRES FENCED AREA
OAK HILL SOLAR 2 PROPOSED COVERAGE	12.00 ACRES FENCED AREA
PROPOSED DISTURBANCE	
ACCESS ROAD METHOD	AS284 AC AS284 AC (1,004 35')

DRAWING INDEX

- 1 OF 10 COVER SHEET
- 2 OF 10 EXISTING CONDITIONS
- 3 OF 10 SITE PLAN OAK HILL 1
- 4 OF 10 SITE PLAN OAK HILL 2
- 5 OF 10 SITE PLAN ACCESS ROAD
- 6 OF 10 EROSION & SEDIMENT CONTROL PLAN OAK HILL 1
- 7 OF 10 EROSION & SEDIMENT CONTROL PLAN OAK HILL 2
- 8 OF 10 EROSION & SEDIMENT CONTROL PLAN ACCESS ROAD
- 9 OF 10 SITE DETAILS
- 10 OF 10 DETAILS BY OTHERS

RECORD NO.	DATE	BY

PLANS PREPARED BY:

 ENVIRONMENTAL DESIGN PARTNERS, INC.
 13950 DUANESBURG ROAD
 TOWN OF DUANESBURG, SCHENECTADY COUNTY, NEW YORK

epi
 ENVIRONMENTAL DESIGN PARTNERS, INC.
 13950 DUANESBURG ROAD
 TOWN OF DUANESBURG, SCHENECTADY COUNTY, NEW YORK
 TAX MAP No. 118008
 February 4, 2015

PROPOSED SITE PLAN FOR
OAK HILL SOLAR 1&2
 APPLICANT: OAK HILL SOLAR 1, LLC / OAK HILL SOLAR 2, LLC
 13950 DUANESBURG ROAD
 TOWN OF DUANESBURG, SCHENECTADY COUNTY, NEW YORK

NO FOR CONSTRUCTION
 COVER SHEET

1 of 10

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Appendix 2
Breakdown of Decommissioning Costs

Handwritten notes:
 10/19/19
 ENTERED ON 10/19/19

Applicant submits this breakdown of the Estimated Decommissioning Cost to support the proposed decommissioning fund of \$211,381 for each project based on 2019 cost of work estimates following the NYSEDA guidance which is based on the estimating practices followed by the State of Massachusetts and New York Southeast scrap value prices

It should be further noted that while the Decommissioning Fund is established in the amount equal to the gross decommissioning costs of \$211,381.00, there will likely be significant salvage value that would make the net system decommissioning cost lower than the proposed Decommissioning Fund amount.

To better explain the potential salvage value for this project we have completed a more detailed analysis of the current value of the main project components: solar panels, racking system aluminum/steel content and the electric cabling copper/aluminum content. The current published values for these materials can have a fairly large spread. For each item we choose the use the most conservative pricing available to assume current worst case scenario. As you can see from the summary analysis the current salvage value is 3 times higher than the proposed decommission cost.

Estimated Decommissioning Cost				
	Type	Quantity	Cost Per Item	Total
Fence Removal with Gate and CCTV	LF	7,618	\$4.50	\$34,281.00
Remove Transformers & Concrete Pads	Each	2	\$5,000.00	\$10,000.00
Remove Major Switch Gear & Concrete Pad	Each	1	\$5,000.00	\$5,000.00
Remove Modules and Racking	\$/MWac	5	\$9,000.00	\$45,000.00
Removal of Posts	Each	1,975	\$20.00	\$39,500.00
Remove & Dispose String Inverters, Storage and DC Converters	Each	60	\$300.00	\$18,000.00
Removal of Underground Wires and Backfill	LF	3,500	\$10.00	\$35,000.00
Site Restoration, Grade and Seed	Acre	10	\$900.00	\$9,000.00
Removal of Gravel Access Road	Cubic Yards	624	\$25.00	\$15,600.00
Current Total:				\$211,381.00
Total after 25 years of Inflation (2.5% Inflation rate)				\$346,372.38
Detailed Salvage Value				
	Solar Panels	45,455	\$6.60	\$300,003.00
	Racking Steel (lbs)	1,168,100.00	\$0.05	\$58,405.00
	Racking Aluminum (lbs)	1,760,000.00	\$0.15	\$264,000.00
	Protect Cabling (lbs)	75,931.00	\$0.73	\$55,429.63
Total Salvage Value				\$677,837.63
Proposed decommissioning fund				\$211,381.00

Appendix 3

NYSERDA Fact Sheet

FACT SHEET

DECOMMISSIONING SOLAR
PANEL SYSTEMS



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This fact sheet provides information to local governments and landowners on decommissioning of large-scale solar panel systems.

As local governments develop solar regulations and landowners negotiate land leases, it is important to understand the options for decommissioning solar panel systems and restoring project sites to their original status.

From a land use perspective, solar panel systems are generally considered large-scale when they constitute the primary use of the land, and can range from less than one acre in urban areas to 10 or more acres in rural areas. Depending on where they are sited, large-scale solar projects can have habitat, farmland, and aesthetic impacts. As a result, large-scale systems must often adhere to specific development standards.

Abandonment and decommissioning defined

Abandonment occurs when a solar array is inactive for a certain period of time.

- Abandonment requires that solar panel systems be removed after a specified period of time if they are no longer in use. Local governments establish timeframes for the removal of abandoned systems based on aesthetics, system size and complexity, and location. For example, the Town of Geneva, NY, defines a solar panel system as abandoned if construction has not started within 18 months of site plan approval, or if the completed system has been nonoperational for more than one year.¹
- Once a local government determines a solar panel system is abandoned, and has provided thirty (30) days prior written notice to the owner it can take enforcement actions, including imposing civil penalties/fines, and removing the system and imposing a lien on the property to recover associated costs.

Decommissioning is the process for removing an abandoned solar panel system and remediating the land.

- When describing requirements for decommissioning sites, it is possible to specifically require the removal of infrastructure, disposal of any components, and the stabilization and re-vegetation of the site.

What is a decommissioning plan?

Local governments may require to have a plan in place to remove solar panel systems at the end of their lifecycle, which is typically 20-40 years. A decommissioning plan outlines required steps to remove the system, dispose of or recycle its components, and restore the land to its original state. Plans may also include an estimated cost schedule and a form of decommissioning security (see Table 1).

What is the estimated cost of decommissioning?

Given the potential costs of decommissioning and land reclamation, it is reasonable for landowners and local governments to proactively consider system removal guarantees. A licensed professional engineer, preferably with solar development experience, can estimate decommissioning costs, which vary across the United States. Decommissioning costs will vary depending upon project size, location, and complexity. Table 1 provides an estimate of potential decommissioning costs for a ground-mounted 2-MW solar panel system. Figures are based on estimates from the Massachusetts solar market. Decommissioning costs for a New York solar installation may differ. Some materials from solar installations may be recycled, reused, or even sold resulting in no costs or compensation. Consider allowing a periodic reevaluation of decommissioning costs during the project's lifetime by a licensed professional engineer, as costs could decrease and the required payment should be reduced accordingly.

Table 1: Sample list of decommissioning tasks and estimated costs

Tasks	Estimated Cost (\$)
Remove Rack Wiring	\$2,450
Remove Panels	\$2,450
Dismantle Racks	\$12,350
Remove Electrical Equipment	\$1,850
Breakup and Remove Concrete Pads or Ballasts	\$1,500
Remove Racks	\$7,900
Remove Cable	\$8,500
Remove Ground Screws and Power Poles	\$13,850
Remove Fence	\$4,950
Grading	\$4,000
Seed Disturbed Areas	\$250
Track to Recycling Center	\$2,250
Current Total	\$60,200
Total After 20 Years (2.5% Inflation Rate)	\$68,000

¹ Town of Geneva, N.Y. CODE § 130-4(D)(5) (2018);



NYSERDA