Appendix F
Decommissioning Plan

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Gopher State Solar Farm
Renville County, MN

Decommissioning Plan

Prepared for:
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AUGUST 2024

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1.0 Background

On behalf of Gopher State Solar, LLC (Operator/Owner), Verdanterra has prepared this Decommissioning Plan (Plan) for the proposed Gopher State *Solar project* (the Facilities) which is seeking a Site Permit from the Minnesota Public Utilities Commission. The site is located at or near Main Street, Bird Island, MN 55310 and consists of multiple parcels north of 830th Avenue (CR-65), east of 370th Street (CR-69), and west of 405th Street (CR-57). See Attachment A for project location. The overall facility consists of one solar power generation facility producing approximately 200-megawatt (MW) AC surrounded by a perimeter security fence.

The useful life of solar panels is approximately 40 years. At the end of the project's life cycle, the project will be decommissioned or refurbished with current technology.

The intent of this Plan is to provide a general scope of decommission work as well as to act as a mechanism for decommissioning in accordance with the conditions described in the Minnesota Department of Commerce (DOC) Energy Environmental Review and Analysis (EERA) *Recommendations on Review of Solar and Wind Decommissioning Plans* (March 16, 2020). As a result, this decommissioning estimate has been prepared for the current site layout.

1.1 FACILITY DESCRIPTION

The proposed Facilities will be constructed on farmland with existing topography that is well suited for solar array development. Project components are planned to consist of the site features listed below:

- 100,079 linear feet of 7-ft high perimeter chain link fence.
- 74,410 square yards of 16-foot-wide gravel access drive and turn around.
- 448,862 photovoltaic (PV) solar modules (i.e., "panels").
- 32,062 single axis tracker racking frames.
- Seventy-Two (72) Sungrow 4400 Inverters.
- Seventy-Two (72) transformers.
- Seventy-Two (72) concrete equipment pads supporting the electrical equipment; and
- 2,076,000 feet of LV wiring, 186,360 feet of MV wiring.

Attachment B shows the decommissioning estimate breakdown for this project.

2.0 Proposed Future Land Use

The current land use is primarily agricultural production. After all equipment and infrastructure is removed, any holes or voids created by poles concrete pads, and other equipment will be filled with native soil to the surrounding grade, and the site will be restored to preconstruction conditions to the extent practicable. All access roads and other areas compacted by equipment will be decompacted to a depth necessary to ensure drainage of the soil and root penetration prior to fine grading and tilling to a farmable condition to match preconstruction conditions. Reclamation activities are further described in Section 3. Once restoration is complete, the land may return to agricultural production or any other uses as determined by the underlying landowner

3.0 Decommissioning Activities

At the end of the Project's useful life, Gopher State Solar will either take necessary steps to continue operation of the Project (such as re-permitting and retrofitting) or will decommission the Facility and remove all its components.

Gopher State Solar reserves the right to extend operation of the facility by applying for an extension of the Site Permit, if necessary, and continuing operation. The Project can continue with existing equipment or upgrades with newer technologies can be made.

If Decommissioning is chosen, Gopher State Solar will be responsible for removing all the solar arrays and associated facilities.

Decommissioning of the Project would include removing the solar arrays (modules, racking and foundation posts), inverters, fencing, access roads, cables and lines, and the O&M facility. Standard decommissioning practices will be used, including dismantling and repurposing, salvaging / recycling, or disposing of solar energy improvements, and restoration.

Facility decommissioning will take approximately 40 weeks to complete and will consist of the following major steps:

- Dismantle and Demolish;
- Disposal and Recycle; and
- Site Restoration and Stabilization.

3.1 DISMANTLE, DEMOLISH, AND DISPOSAL OR RECYCLE

A significant portion of the photovoltaic system at the Facility will include recyclable or re-saleable components, which include copper, aluminum, galvanized steel, concrete, and PV modules. Due to their resale value, these components will be dismantled and disassembled rather than being demolished and disposed of properly.

Prior to commencing decommissioning, the owner/operator will coordinate with the local utility company to determine the schedule and procedure for disconnecting facility infrastructure from the point of interconnection. Once disconnection is completed, all facility electrical connections will be disconnected and tested to confirm the system is de-energized prior to starting removal.

- PV Modules - All electrical connections to the PV modules will be cut and the modules will be removed from their framework by cutting or dismantling the bolted connections to the supports. Modules will then be removed and sent to another facility for reuse, recycled, or disposed of properly. The interior materials of the PV modules are silicon-based and are not considered hazardous materials. In the event of a total module fracture during removal, these modules may be permissible for disposal at a licensed landfill. The decommissioning contractor will be

responsible for assessing the condition of PV modules and managing for proper disposal throughout removal procedure.

- Module Frames and Racking - The photovoltaic module frame racking system and all other metal project components perimeter fencing, and gates, will be removed from their foundation posts, processed, and sent to a metal recycling facility.
- Steel Foundation Posts – All structural foundation steel posts will be pulled out to full depth and removed from the site for recycling, salvage, or disposal.
- Inverters, Transformers and Ancillary Equipment – All electrical equipment will be disconnected and disassembled. All parts will be removed from the site for recycling, salvage, or disposal at Gopher State's sole discretion, consistent with applicable regulations and industry standards.
- Underground Cables and Lines – All underground cables and conduits will be removed to a depth of 4 feet to not impede the reintroduction of farming. If soil is excavated during decommissioning, topsoil will be segregated and stockpiled for later use prior to any excavation and the subsurface soils will be staged next to the excavation. Topsoil will be redistributed across the disturbed area prior to seeding.
- Concrete Equipment Pads and Foundations - The concrete pads used for mounting electrical equipment will be broken and removed to the concrete base depth. Clean concrete will be crushed and disposed of off-site and/or recycled and reused either on or off-site. Excavations will be filled with subgrade material found on-site of quality and compacted density comparable to the surrounding area.
- Fence – All fence parts and foundations will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Gopher State's sole discretion, consistent with applicable regulations and industry standards. The surrounding areas will be restored to pre-Project conditions to the extent feasible.
- Gravel Access Drives and Pads - Gravel used for access drives and equipment pads will be excavated to a depth that matches adjacent site grades. Removed aggregate will be hauled offsite and to be reused, sold, or disposed of properly. Any geotextile fabric and geogrid will be disposed of at a landfill. If allowed and desired by the owner, some or all the gravel access drives can be left in place. Any ditch crossing connecting an access road to public roads will be removed unless the landowner requests it remain. The subgrade will be de-compacted to a depth of approximately eighteen (18) inches using a chisel plow or other appropriate subsoiling equipment. All rocks larger than four inches will be removed. Topsoil that was stockpiled during the original construction will be distributed across the open area. The access roads and adjacent areas that are compacted by equipment will be de-compacted.
- Substation – Decommissioning of the project substation will be performed with the rest of the Facility. All steel, conductors, switches, transformers, and other components of the substation will be disassembled and taken off site to be recycled or reused. Foundations and underground components will be removed to a depth of four (4) feet below ground surface. The rock base will be removed using bulldozers and backhoes or front loaders. The material will be hauled from the site using dump trucks to be recycled or disposed at an off-site facility. Additionally,

any permanent stormwater treatment facilities (e.g. infiltration ponds and engineered drainage swales) will be removed. Topsoil will be reapplied to match surrounding grade to preserve existing drainage patterns. Topsoil and subsoil will be decompacted to a minimum depth of eighteen (18) inches and the site will be revegetated to match precondition conditions.

- Operations and Maintenance Building – If the building is not retained for another use, decommissioning of it will include disconnection of the utilities and demolition of the building structure, foundation, rock base parking lot, and associated vegetated stormwater facilities. All associated materials will be removed from the site using wheeled loaders or backhoes and bulldozers and hauled off site in dump trucks. All recyclable materials will be taken to appropriate facilities and sold. The remaining materials will be disposed of at an approved landfill facility. Subgrade soils will be decompacted and graded to blend with the adjacent topography. Topsoil will be reapplied to match existing surrounding grade to preserve existing drainage patterns and the site will be tilled to a farmable condition or revegetated, depending upon the location.
- Utility Poles - Any aboveground utility poles owned by Gopher State Solar will be completely removed and disposed of off-site in accordance with utility best practices. All overhead electrical conductors will be removed from the PV equipment and terminated as required by the utility company. Underground conductors and circuits will be removed up to four (4) feet below ground surface.

A final site walkthrough will be conducted to remove debris and/or trash generated within the siteduring the decommissioning process and will include removal and proper disposal of any debris that may have been wind-blown to areas outside the immediate footprint of the facility being removed.

3.2 SITE RESTORATION AND STABILIZATION

Solar facilities are largely pervious, vegetated surfaces. Decommissioning and removal of equipment will not result in excessive earth disturbance; however, some restoration and site stabilization will be required upon completion of work. The areas of the facility that are disturbed will consist of the array areas where construction vehicles travel, the footprint of the access roads, the corridors of the perimeter fencing, equipment pad areas, stormwater management basins, and underground electric lines. The site will be de-compacted pursuant to the Agricultural Impact Mitigation Plan (AIMP) standards by disking and mixing with suitable sub-grade materials selected to support revegetation and to match the existing soil types. Disturbed areas will be seeded with an appropriate local grass seed mix and topsoil per the AIMP and VSP, if needed.

4.0 Permitting Requirements for Decommissioning

In addition to any decommissioning requirements listed in the conditions of the original project approvals, other permits for decommissioning activities may be required by state or local agencies. The decommissioning contractor shall be responsible for obtaining any required permits or approvals, at the time of decommissioning.

Earth disturbance greater than one (1) acre is anticipated during decommissioning; therefore, an erosion control plan should be developed in conjunction with a National Pollutant Discharge Elimination System (NPDES) permit application.

Although not anticipated to be necessary, if environmental impacts are anticipated at the time of decommissioning, any wetlands and waterways permits will be obtained from the USACE or state and county agencies.

A Spill Prevention, Control, and Countermeasure (SPCC) Plan may also be required for decommissioning work.

5.0 Schedule

Decommissioning, demolition, and dismantling of the facility is anticipated to be completed over a duration of approximately forty (40) weeks and is not intended to occur during the winter season or require multiple mobilizations.

6.0 Decommissioning Costs

A decommissioning cost estimate was prepared under the direction and supervision of a Professional Engineer registered in the State of Minnesota and is included as Attachment B. Assumptions and references applicable to each line item are listed as they are used.

The estimated costs for decommissioning are tied to assumptions about the amount of equipment mobilized, crew sizes, weather and climate conditions, and the productivity of the equipment and crews.

Decommissioning costs are calculated using current pricing. In keeping with the DOC EERA requirements, the estimate of net costs should be updated every five (5) years and when ownership changes to recognize price trends for both decommissioning costs and the salvage and resale values of components. The cost estimate uses current pricing for removal of components based on five years of degradation and depreciation of the solar modules. Subsequent revisions of the Plan and cost estimate may be required based on changes in construction techniques and technology and changing material scrap or resale values.

There are currently active markets for scrap steel, aluminum, and copper, used transformers and electrical equipment, and used solar panels. Scrap metal prices have been discounted from posted spot prices found on www.scrapmonster.com. Pricing for used panels has been discounted from prices received We Recycle Solar for a similar project. The pricing of the used panels has incorporated the degradation from five years of use as warrantied by the manufacturer (not more than 0.5% per year).

The total estimated cost of decommissioning the Project is approximately $7,034,025 for the current year. The estimated salvage / scrap value of the modules, racking, transformers, and other materials is approximately $5,593,708 for the current year. The net decommissioning costs after accounting for resale and salvage values is approximately $1,440,317 for the current year.

In an effort to predict the future decommissioning costs and salvage values, an assumed 2.0% annual inflation in the decommissioning costs and 1.5% annual increase for the salvage values were used.

7.0 Financial Resource Plan

Gopher State Solar will be responsible for all costs to decommission the Project and associated facilities. Pursuant to EERA recommendations, Gopher State Solar is required to submit a revised decommissioning estimate every 5 years. Each revised plan will reflect advancements in construction techniques, reclamation equipment, and decommissioning standards. The decommissioning cost estimate will also be reassessed and revised to reflect any identified changes in the costs. The amount of the Financial Assurance will be adjusted accordingly to offset any increase or decreases in decommissioning costs and salvage values determined during each plan reassessment.

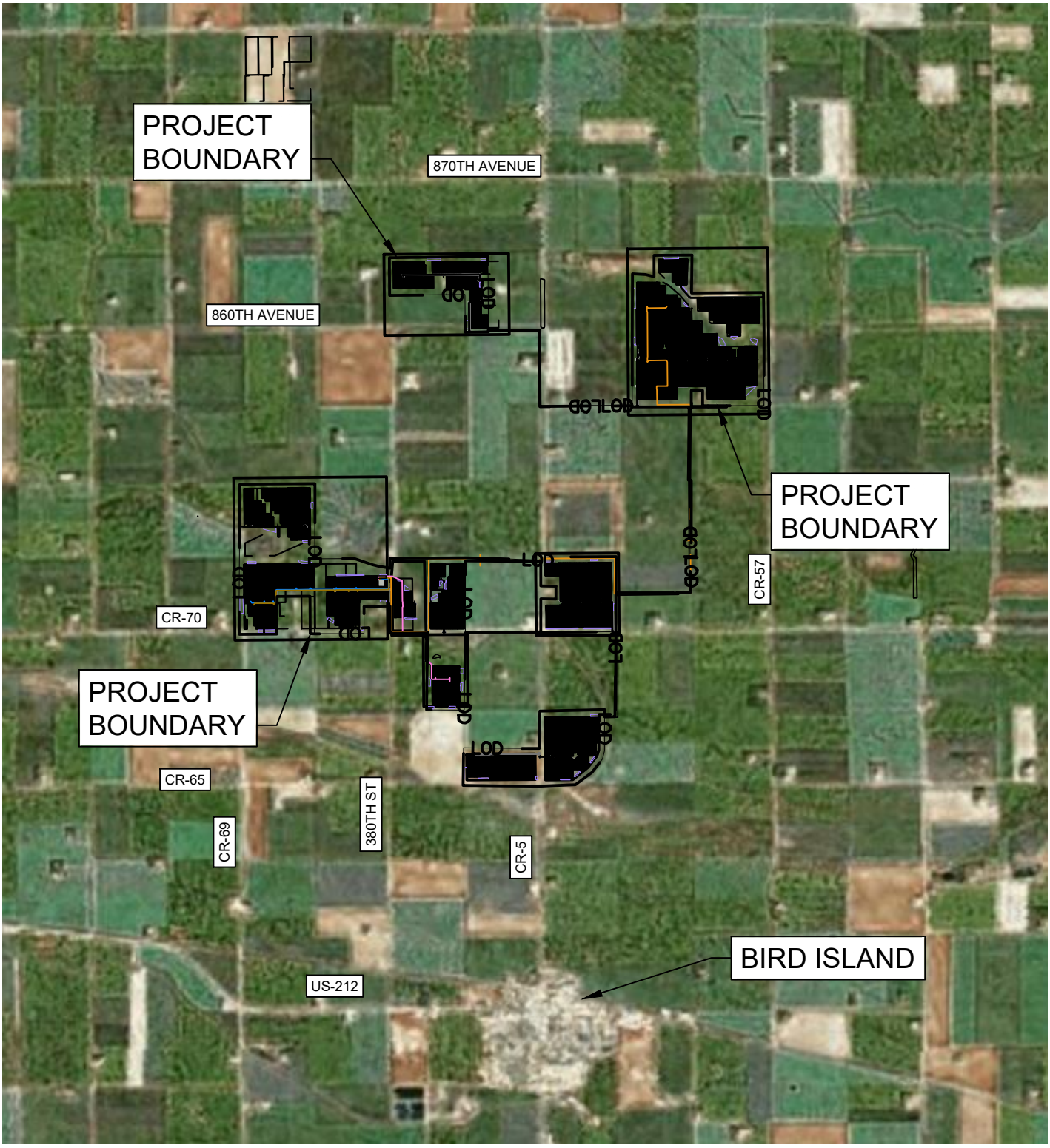
The decommissioning financial assurance will be posted as a bond / letter of credit or some other form of financial assurance prior to the start of construction.

The financial assurance amount will be reconciled based on the latest updated decommissioning plan and estimate at the time of posting the bond.

If decommissioning of the Project is undertaken, the Applicant will, upon satisfactory completion, provide supporting documentation to the MN PUC with a request for the release of a corresponding amount of the Financial Assurance.

Attachment A: Site Location Map

March 2024



Map Data Source: U.S. Geological Survey (USGS; http://www.usgs.gov)

5000 0 5000

SCALE: 1" = 5000'

N W E S

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Project Title

GOPHER STATE SOLAR

Drawing Description

LOCATION MAP

USGS Quadrangle:	OLIVIA, MN
Project Number:	223023
Drawn By:	DLK
Checked By:	SML
Scale:	1" = 5000'
Sheet Number:	FIGURE - 1

Attachment B: Decommissioning Estimate

March 2024

VERDANTERRA

DECOMMISSIONING COST ANALYSIS
GOPHER STATE SOLAR

	DESCRIPTION OF ITEM	QUANTITY	UNIT		UNIT COST		TOTAL COST (2024)	TOTAL COST (After 25 Years)**	LOGIC
	GENERAL								
	Mobilization	1	EA	$	100,000.00	$	100,000.00	164,060.60	
	Permitting	1	EA	$	20,000.00	$	20,000.00	32,812.12	SWPPP Application and SPCC Plan
	Project Management	1	EA	$	200,000.00	$	200,000.00	328,121.20	Project manager, Field personnel, Office personnel
					SUBTOTAL	$	**320,000.00**	**524,993.92**	
	I. DISASSEMBLY & DISPOSAL								
1	Disconnection of Electrical System	1	EA	$	1,200.00	$	1,200.00	1,968.73	* Assumes one 10-hour day for 2 qualified linemen.
2	PV Modules	448,862	EA	$	5.00	$	2,244,310.00	3,682,028.44	* Use Crew A-5 (2 Laborers; .25 Truck Driver; .25 Flatbed Truck) = $1,222/day. Assume 4 crews can remove approximately 1,111 panels/day.
3	Inverter(s)	72	EA	$	169.72	$	12,220.00	20,048.21	* Use Crew A-5 (2 Laborers; .25 Truck Driver; .25 Flatbed Truck) = $1,222/day. Assume crews can remove all in 10 days.
4	Transformer(s)	72	EA	$	169.72	$	12,220.00	20,048.21	* Use Crew A-5 (2 Laborers; .25 Truck Driver; .25 Flatbed Truck) = $1,222/day. Assume crews can remove all in 10 days.
5	Racking Frame (Single Axis Tracker)	32,062	EA	$	24.62	$	789,475.92	1,295,218.93	* Use Crew A-5 (2 Laborers; .25 Truck Driver; .25 Flatbed Truck) = $1,222/day. Assume 4 crews can remove approximately 200/day.
6	Racking Posts	64,123	EA	$	10.77	$	690,791.43	1,133,316.56	* Use Crew A-5 (2 Laborers; .25 Truck Driver; .25 Flatbed Truck) = $1,222/day. Assume 4 crews can remove approximately 454/day.
7	LV Wiring	2,076,000	LF	$	0.40	$	840,678.83	1,379,222.74	* Use Crew A-5 (2 Laborers; .25 Truck Driver; .25 Flatbed Truck) = $1,222/day. Assume 4 crews can remove approximately 12,070 LF/day.
8	MV Wiring	186,360	LF	$	0.42	$	78,528.25	128,833.91	* Use Crew A-5 (2 Laborers; .25 Truck Driver; .25 Flatbed Truck) = $1,222/day. Assume crews can remove all in 60 days.
9	Fence	100,079	LF	$	3.06	$	306,379.64	502,648.27	* Use Crew A-5 (2 Laborers; .25 Truck Driver; .25 Flatbed Truck) = $1,222/day. Assume crews can remove approximately 400 LF/day.
10	Concrete Pads	267	CY	$	480.52	$	128,164.91	210,268.12	* Use Crew B-3B (2 Laborers; 1 Equip Oper; 1 Truck Driver; 1 Backhoe; 1 Dump Truck) = $3,534/day. Assume crews can remove in 35 days.
11	Gravel (Access drives and equipment pads)	17,212	CY	$	18.00	$	309,809.70	508,275.65	* Use Crew B-3B (2 Laborers; 1 Equip Oper; 1 Truck Driver; 1 Backhoe; 1 Dump Truck) = $3,534/day.
12	Asphalt	0	CY	$	15.94	$	0.00	0.00	* Use Crew B-3B (2 Laborers; 1 Equip Oper; 1 Truck Driver; 1 Backhoe; 1 Dump Truck) = $3,534/day.
13	Substation	1	LS	$	200,000.00	$	200,000.00	328,121.20	
14	Overhead Transmission System	1	LS	$	5,000.00	$	5,000.00	8,203.03	
15	O&M Building	1	LS	$	150,000.00	$	150,000.00	246,090.90	
16	Utility Pole Removal	0	EA	$	1,000.00	$	0.00	0.00	Estimate includes labor and all required tools and vehicles.
					SUBTOTAL	$	**5,768,778.67**	**9,464,292.87**	
	II. SITE RESTORATION								
17	Re-Seeding (access drives and 50% of site)	543.3	AC	$	1,500.00	$	814,976.59	1,337,055.48	* Cost includes seed: 4-7 species (native types). Also with estimate is labor, spraying, disking, planting, and mulch (one man & machine).
18	Re-Grading (Includes restoring access drives, gravel pad areas, and filling stormwater BMPs)	46,975	CY	$	2.77	$	130,269.51	213,720.94	* (2 Laborers; 1 Equip Oper; 1 Truck Driver; 1 Backhoe; 1 Dump Truck) = $3,448/day. Assume 35 days.
					SUBTOTAL	$	**945,246.10**	**1,550,776.42**	
	III. SALVAGE								
19	PV Modules	426,419	EA	$	5.00	$	-2,132,094.50	-3,093,552.61	Assumed 95% Salvage
20	Inverter(s)	72	EA	$	20.00	$	-1,440.00	-2,089.36	Rockaway Recycling
21	Transformer(s)	72	EA	$	300.00	$	-21,600.00	-31,340.42	Rockaway Recycling
22	Racking Frame (Single Axis Tracker)	1,603,079	LBS	$	0.15	$	-240,461.79	-348,896.91	Scrapmonster
23	Racking Posts	4,847,710	LBS	$	0.15	$	-727,156.44	-1,055,064.26	Scrapmonster
24	LV Wiring	1,349,400	LBS	$	1.50	$	-2,024,100.00	-2,936,858.49	Scrapmonster
25	MV Wiring	361,538	LBS	$	0.80	$	-289,230.72	-419,657.97	Scrapmonster
26	Fence	315,249	LBS	$	0.50	$	-157,624.43	-228,704.43	Rockaway Recycling and others 3.15 lbs per linear foot. $0.50 per lb.
					SUBTOTAL	$	**-5,593,707.87**	**-8,116,164.45**	
									Legend:
		DEMOLITION COST				**$**	**7,034,024.78**	**11,540,063.21**	* = Costs derived from RS Means Heavy Site estimating manual
		SALVAGE VALUE CREDIT				**$**	**-5,593,707.87**	**-8,116,164.45**	** = Assumes 2% annual increase in labor costs and 1.5% annual increase in salvage value
	AMOUNT OF DECOMMISSIONING ASSURANCE =					**$**	**1,440,316.91**	**3,423,898.77**	