Appendix G

Decommissioning Plan

Decommissioning Plan

Boswell Solar Project, Itasca County, Minnesota

Minnesota Power

December 2024

Decommissioning Plan
Minnesota Power LLC

December 2024

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Abbreviations

IRP	Integrated Resource Plan
kV	Kilovolt
MWs	Megawatts
MWac	megawatt alternating current
PV	Photovoltaic
SWPPP	Stormwater Pollution Prevention Plan

1 Introduction

1.1 Project Description

Minnesota Power (Minnesota Power) is proposing to construct, own, and operate the Boswell Solar Project (Project). The Project is an up to 85-megawatt alternating current (MWac) photovoltaic (PV) solar energy generating facility, a 230 kilovolt (kV) transmission line (Gen-Tie Line) and associated infrastructure in Itasca County, Minnesota (Attachment 1). Minnesota Power proposes to build the Project within an area of approximately 1,344.5 acres of private land (Site), of which 498.6 acres will be for the operation of the Project (Anticipated Development Area). The Gen-Tie Line route will be approximately 2.45 miles and will directly interconnect solar energy generating systems to the existing Boswell Energy Center Substation.

Table 1 Project Components

Component	Measurement or Count
Solar arrays	177,675 panels; 127.8 acres
Power conversion station	27 inverter skids
Electrical collection lines	9.4 miles
Project substation	4.8 acres
230 kV generation tie line (Gen-Tie Line)	2.45 miles
Laydown yard (temporary and some permanent)	13.2 acres
Gravel access roads	9.6 acres
Stormwater management system	22.1 acres
Undeveloped areas (e.g., delineated wetland avoidance, setback areas)	944.6 acres

1.2 Use of Generation Output

The purpose of the Project is to fulfill Minnesota Power's 15-year Integrated Resource Plan (IRP) and to work toward the recent carbon-free energy generation standard of delivering 100 percent carbon-free energy by 2040. The IRP calls for adding up to 300 megawatts (MWs) of regional/in-service territory or net-zero solar. This Project will facilitate Minnesota Power's compliance with State of Minnesota's renewable energy and carbon-free standards under the Minn. Stat. § 216B.1691. Since 2020, Minnesota Power has been delivering 50 percent renewable energy to customers and is the first Minnesota utility to achieve this milestone. This Project will continue this path to meeting both Minnesota Power's sustainability goals and compliance with Minnesota clean energy policy requirements. While delivering increasingly clean energy to customers, Minnesota Power also aims to deliver safe, reliable, and affordable energy to customers across a smarter grid that is increasingly resilient.

1.3 Decommissioning Objective

The purpose of decommissioning is to restore the site to its prior agricultural use or to another use if the economic conditions and landowner intentions indicate another use is appropriate for the site.

2 Time & Notification

2.1 Anticipated Project Timeline

Minnesota Power anticipates construction of the Project will commence in the first quarter of 2026. The anticipated life is 35 years from the date of construction. Minnesota Power will update the decommissioning plan every five years or on an as-needed basis.

Depending on market conditions and Project viability, Minnesota Power may repower the Project with updated components to extend its life. Potential triggers for initiating a repower may be aging or faulty equipment, maintenance costs, extending the useful life of the solar panels, or increasing the generation output. If deemed a worthwhile investment, repowering of the Project will abide by local, state, and federal regulations. A new or amended Site and/or Route Permits may be necessary and will be sought if required.

2.2 Decommissioning Period

Minnesota Power anticipates decommissioning would be complete within 12 months after abandonment or the end of its useful life.

2.3 Notification

Minnesota Power will provide written notification of intent to decommission to landowners, the Commission, Itasca County, Deer Lake Township, Leech Lake Band of Ojibwe Reservation, and city of Cohasset prior to commencing decommissioning activities. Minnesota Power will also confirm applicable local permitting requirements (e.g., regarding road restrictions or permits required prior to ground disturbance) with Itasca County and the city of Cohasset. Minnesota Power will provide written notification to landowners, the Commission, Itasca County, Deer Lake Township, Leech Lake Band of Ojibwe Reservation, and city of Cohasset upon completion of decommissioning and restoration activities.

3 Permitting Requirements

Minnesota Power will confirm permitting requirements prior to decommissioning activities and will obtain applicable approvals prior to ground-disturbing activities. Minnesota Power anticipates a Stormwater Pollution Prevention Plan (SWPPP) will be necessary for greater than one acre of disturbance. Local permits from Itasca County, townships, and the city of Cohasset will also be considered, including potential permits required for work in road rights-of-way. If applicable, Minnesota Power will work with the Minnesota Pollution Control Agency to obtain prior approval to limit the removal of below ground structures to a depth of 4 feet.

4 Decommissioning Tasks

4.1 Modules

Minnesota Power intends to use approximately 178,000 bifacial PV modules (640 watt (W)) for the Project. This Plan uses the Q.TRON 640 W module. Each module assembly (with frame) will have a total weight of approximately 78 pounds. The modules will be approximately 97 inches by 45 inches in width. The modules are mainly comprised of non-metallic materials such as silicon, glass, composite film, plastic, and epoxies, with an anodized aluminum frame.

Once deenergized, the panels will be disassembled and prepared for shipment. At the time of decommissioning, module components in working condition may be refurbished and sold in a secondary market yielding greater revenue than selling as salvage material. Modules that are not in working condition or are not marketable for resale will be recycled.

4.2 Racking Systems and Supports

Cabling, wiring and electrical components will be removed from racking. Racking and racking components will be disassembled and removed from the steel foundation posts, processed to appropriate size, and sent to a metal scrap facility to be recycled.

4.3 Module Piles and Foundations

Module foundations are assumed to be comprised of steel driven piles. Steel piles will be fully removed from the ground, processed to an appropriate size, and sent to a metal scrap facility to be recycled. Concrete foundations or slabs will be demolished and hauled to a licensed facility. Remaining excavations and voids will be backfilled with soils. During decommissioning, the area around the foundation posts may be compacted by equipment and, if compacted, the area will be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for vegetation.

4.4 Removal of Overhead and Underground cables

Underground cables and conduits will be removed per the landowner agreement stipulations. Some facilities deeper than 4 feet may remain in place to limit vegetation and surface disturbance. Where facilities are removed, topsoil will be segregated and stockpiled for later use prior to any excavation and the subsurface soils will be staged next to the excavation. Overhead lines and posts will be removed from the Project. Cabling will be scrapped or recycled based on current market rates.

The existing Gen-Tie line is to remain in place as it will have use outside of the Boswell Solar site.

4.5 Removal of Power Conversion Stations and Substation Components

Power conversion station equipment will be disconnected and disassembled. Parts will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at Minnesota Power's sole discretion, consistent with applicable regulations and industry standards.

Foundations will be demolished and remove to a depth of 4 feet below grade. Remaining excavations and voids will be backfilled with soils. Minnesota Power will work with the Minnesota Pollution Control Agency to obtain prior approval to limit the removal of below ground structures to a depth of 4 feet.

The substation is to remain in place as it will have use outside of the Boswell Solar site.

4.6 Site Roads and Fencing

The Project will include a perimeter security fence around the Anticipated Development Area. The perimeter fence and foundations will be removed from the site to 4 feet below grade, and then scrapped or hauled to a landfill.

Access roads will be removed from the Project unless written communication is received from the landowner requesting that the road be retained. Decommissioning activities include the removal and stockpiling of aggregate materials onsite for salvage preparation. Local residents may accept the material prior to processing for use on local roads or field access roads.

Following removal of aggregate, the access road areas will be graded, de-compacted, backfilled with native soils, as needed, and land contours restored as near as practicable to pre-construction conditions.

4.7 Site Restoration & Topsoil

Erosion control measures will be installed during decommissioning per the site requirements, the SWPPP, and the Project's Vegetation Management Plan and Agricultural Impact Mitigation Plan. Excavated and backfilled areas will be graded as previously described to restore land contours as near as practicable to pre-construction conditions. Topsoil will be placed on disturbed areas and seeding will be applied according to the SWPPP. After topsoil has been replaced, all areas that were traversed by vehicles and decommissioning equipment will be decompacted to restore soil conditions.

5 Cost Estimate

5.1 Decommissioning Cost Estimate

Costs and salvage values associated with decommissioning the Project depend on labor costs and market value of salvageable materials at the time of decommissioning. The cost estimate below was estimated using 2024 dollars. No escalation or future value has been calculated for the cost estimate.

This concept-level (Class IV, per *AACEI 17R-97: Cost Estimate Classification System*) cost estimate is based on partial design and is meant for feasibility uses. Costs will change with further design changes. Class IV estimates are typically used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. The estimated accuracy range for the total cost is -30% to +50%. The accuracy range is based on professional judgment considering the level of design completed, the complexity of the Project, and the uncertainties in the Project as scoped.

Table 2 summarizes decommissioning costs of the Project. Additional detail is provided in Attachment 2.

Table 2 Estimated Decommissioning Costs

Item	Total
General Conditions	$2,397,000
PV Panel	$5,309,000
Inverter Skids and Controller Stations	$153,000
Collection Circuit Line	$324,000
Site Restoration	$2,356,000
Fencing	$697,000
O & M Removal	$0
Met Station Removal	$9,000
Contingency	$2,811,000
Total Estimated Decommissioning Cost	**$14,056,000**
Total Estimated Decommissioning Cost (Low Range -30%)	**$9,839,200**
Total Estimated Decommissioning Cost (High Range +50%)	**$19,678,400**

5.2 Salvage Value

Based on current markets, used PV panels possess an inherent value. Solar components may be sold as scrap, sold within a secondary market or as salvage. The value of solar components such as PV panels, power conversion stations and batteries, will decrease throughout the life of the Project.

The market value of scrap materials fluctuates daily. Salvage value estimates were based on the five-year average price of steel, copper and aluminum and derived from the online resource scrapmonster.com. Table 2 summarizes the estimated decommissioning cost, estimated salvage value for the solar components, steel structures and construction materials and net estimated decommissioning cost of the Project. Additional detail is provided in Attachment 3.

Table 3 Estimated Net Decommissioning Costs

Activity	Total
Total Estimated Decommissioning Cost	$14,056,000
Total Estimated Salvage Value	$6,947,000
Net Estimated Decommissioning Cost	**$7,109,000**
Net Estimated Decommissioning Cost (Low Range - 30%)	**$4,976,300**
Net Estimated Decommissioning Cost (High Range +50%)	**$9,952,600**

6 Financial Assurance

Minnesota Power will provide financial assurance in the form of asset depreciation within its decommissioning and site restoration plan as required under the site permit. Financial Assurance will begin on the tenth anniversary of the commercial operation date, unless there is abandonment or decommissioning of the Project prior to that time and secured by Minnesota Power. The amount of the Financial Assurance will be adjusted accordingly to offset any increases or decreases in decommissioning costs and salvage values determined during each plan reassessment. Minnesota Power proposes to post financial assurance in the following format:

- 25% of the net decommissioning estimate will be posted in year 10.
- 25% of the net decommissioning estimate will be posted in year 15.
- 25% of the net decommissioning estimate will be posted in year 20; and
- 25% of the net decommissioning estimate will be posted in year 25.

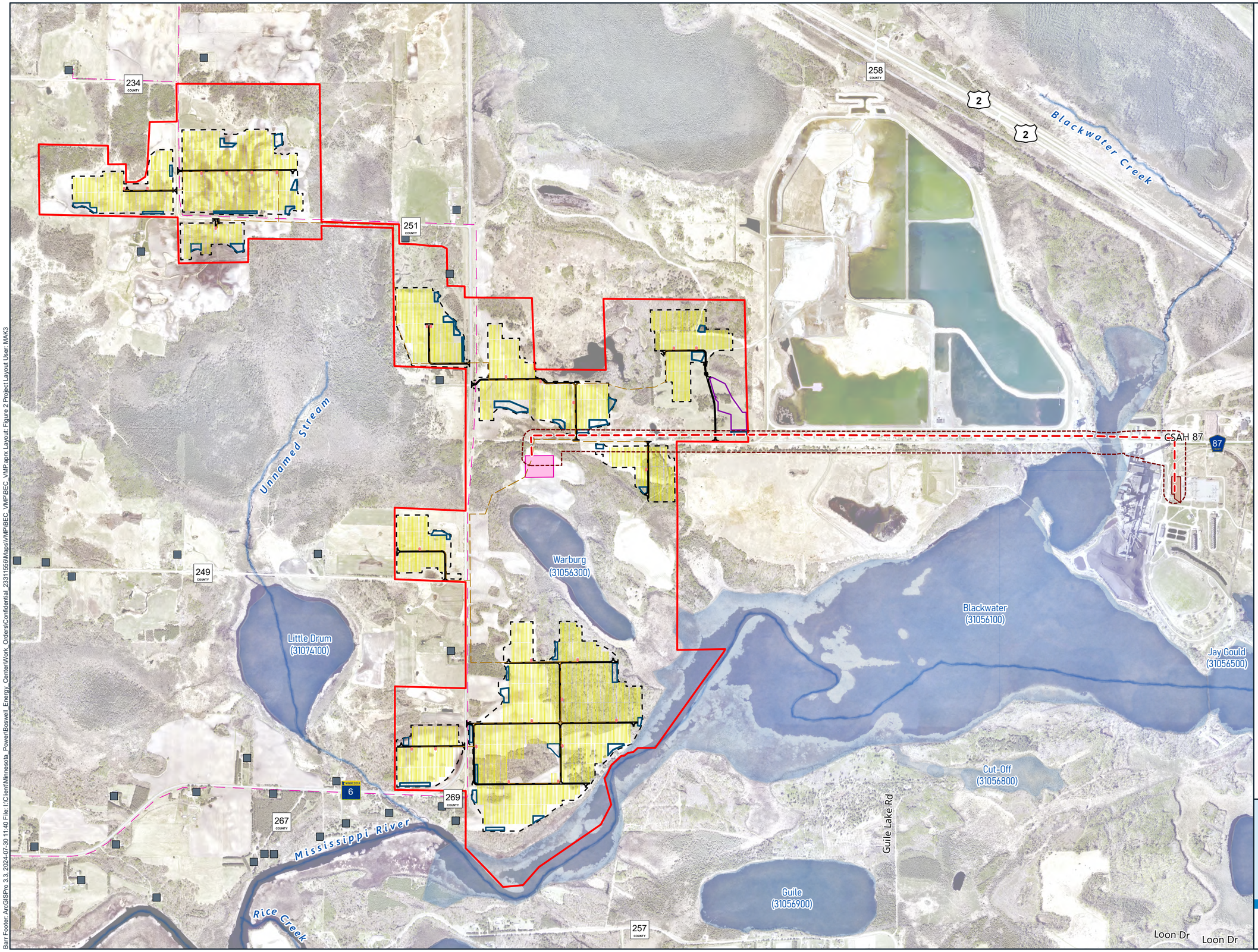
Minnesota Power will update the decommissioning plan every five years, or on an as-needed basis, and adjust the financial assurance according to the latest net decommissioning cost estimate.

Attachments

Attachment 1

Project Layout Map

Attachment 1 Project Layout Map



Site
Route Width
Gen-Tie Line
Dwelllings
Access Roads
Laydown Yard
Inverters
Overhead Powerlines
Security Fence
Stormwater Basin
Underground Collection
Proposed Solar Array
Warberg Lake Substation Area
BEC 2030kV Expanson Substation

Public Watercourses

Public Water Watercourse
Public Ditch/Altered Natural Watercourse
Public Waters Basins

0 1,500 3,000
Feet

Imagery: 2023 Itasca County

PROJECT LAYOUT
Decommissiong Plan
Minnesota Power

Figure 1

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Attachment 2

Decommissioning Cost Estimate

Attachment 2 Decommissioning Cost Estimate

October 21, 2024

Boswell Solar Decommissioning Cost Estimate

85 MW

Q.TRON 640W - PV Panels

Item	Description	Qty	Unit	Unit Cost ($)	Total Cost ($)
1	**General Conditions**				
	Mobilization/Bond/Insurance	1	LS	1,062,000	1,062,000
	Project Management / Overhead	1	LS	885,000	885,000
	Public Road Maintenance	1	LS	200,000	200,000
	Erosion Control	1	LS	250,000	250,000
					2,397,000
2	**PV Panel**				
	PV Panel Removal	177,675	EA	10.00	1,776,750
	PV Panel Hauling	179	EA	1,050.00	188,063
	PV Panel Recycling	17,768	EA	15.00	266,513
	Racking/Tracker Frame Removal	7,725	EA	325.00	2,510,625
	Racking/Tracker Frame Hauling	386	EA	112.50	43,453
	Pile Removal	29,613	EA	15.00	444,188
	Pile Hauling	705	EA	112.50	79,319
					5,308,911
3	**Inverter Skids and Controller Stations**				
	Inverter Skid and Controller Station Removal	27	EA	2,166.67	58,500
	Inverter Skid and Controller Station Hauling	27	EA	1,050.00	28,350
	Inverter Skid and Controller Station Disposal	81	TON	45.00	3,645
	Inverter Skid and Controller Station Foundation Removal	270	CY	200.00	54,000
	Inverter Skid and Controller Station Foundation Hauling	34	EA	142.50	4,809
	Inverter Skid and Controller Station Foundation Disposal	520	TON	8.00	4,158
					153,462
4	**Collection Circuit Line**				
	Buried DC Circuit Line Removal	49,527	LF	3.25	160,963
	MV Circuit Line Removal	49,527	LF	3.25	160,963
	Circuit Line Hauling	17	EA	112.50	1,857
					323,783
5	**Site Restoration**				
	Interior Road Removal	25,508	SY	4.00	102,031
	Laydown Area Removal	63,888	SY	4.00	255,552
	Interior Gravel Hauling	2,483	EA	112.50	279,362
	Site Grading	18	AC	2,775.00	51,255
	Soil Decompaction	249	AC	2,500.00	623,250
	Topsoil Import and Placement	89,396	SY	7.00	625,770
	Seeding	100	AC	4,200.00	418,824
					2,356,043
6	**Fencing**				
	Fencing Removal	67,630	LF	10.00	676,300
	Fencing Hauling	19	EA	112.50	2,113
	Fencing Disposal	423	TON	45.00	19,021
					697,434
6	**O & M Removal**				
	Demo Maintenance building	-	CF	-	-
	Demo Building Slabs	-	CY	-	-
	Demo Foundation	-	CY	-	-
	Debris Hauling 30 Mile Round Trip	-	CY	-	-
	Dump Fees	-	TON	-	-
					-
7	**Substation Removal**				
	Substation Removal	-	DAY	-	-
	Substation Hauling	-	EA	-	-
	Substation Disposal	-	TON	-	-
					-
8	**Met Station Removal**				
	Met Station Removal	2	DAY	4,080.20	8,160
	Met Station Hauling	2	EA	142.50	285
	Met Station Disposal	2	TON	45.00	90
					8,535
9	**Gen Tie**				
	Gen Tie Removal	-	LF	-	-
	Gen Tie Hauling	-	EA	-	-
	Gen Tie Disposal	-	TON	-	-
					-
	TOTAL Construction Cost				11,245,168
	Contingency (25%)				2,811,292
	TOTAL Construction Cost w/Contingency			**$**	**14,056,460**

Attachment 3

Salvage Value Cost Estimate

Attachment 3 Salvage Value Cost Estimate

October 21, 2024

Boswell Solar Decommissioning Cost Estimate

85 MW
Q.TRON 640W - PV Panels

Item	Salvage Weight (TN)	Scrap Value (TN)	Scrap Value (Ea)	Qty	Total Scrap Value ($)
PV Panels			29.00	159908	4,637,318
Racking	**1931**	**200**	386,250	1	386,250
Piles	**7107**	**200**	1,421,400	1	1,421,400
				Solar Salvage Subtotal	6,444,968
Inverter Skid			8,400	27	226,800
Inverter Steel	**97.2**	**200**	19,440	1	19,440
Substation Steel			-	1	-
Substation Transformer			-	1	-
Transmission Towers Steel	**0.0**	**200**	-	1	-
Transmission Line	**0.0**	**450**		1	
MET Station	**2.0**	**200**	400	1	400
Collection Cable	**54**	**450**	24,516	1	24,516
Aggregate	**35711**	**5**	178,554	1	178,554
Fencing	**518.5**	**100**	51,850	1	51,850
				Total Salvage Value $	6,946,527