

sPower Group  
Conceptual Cost Estimate  
for  
Decommissioning Highlander  
a  
647,735.1kW (STC) PV System

May 15, 2018

Prepared for: Daniel Menahem  
Senior Project Manager

Documents include: ❖ Executive Summary  
❖ Summary  
❖ Basis of Estimate  
❖ Crew Wage Detail

Pricing within this probable cost is  
only valid for 30 days from 9/19/2018.

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**SWINERTON**  
RENEWABLE ENERGY



sPower Group  
Decommissioning Highlander  
Executive Summary

Conceptual Cost Estimate  
May 15, 2018

Description	Duration (weeks)	Labor/ Equip/Mat	Net Recycling	Total Cost
SWPPP & Dust Control Measures	30.6	\$428,328	\$0	\$428,328
Removal of Equipment	26.8	\$16,499,447	(\$21,981,586)	(\$5,482,139)
Site Demolition	8.2	\$985,535	(\$944,867)	\$40,668
Site Reclamation	7.6	\$5,316,857	\$0	\$5,316,857
Contingency, Escalation, PM, Insurance, Fee		\$8,096,834	(\$3,356,468)	\$4,740,366
<b>Opinion of Probable Gross Decommissioning Cost</b>		<b>\$31,327,001</b>	<b>(\$26,282,921)</b>	<b>\$5,044,080</b>

sPower Group  
Decommissioning Highlander  
Summary

Conceptual Cost Estimate  
May 15, 2018

Item Description	Qty	Unit	Labor/ Equip/Mat	Net Recycling	Total Cost
<u>SWPPP &amp; Dust Control Measures</u>					
1 Stabilized Construction Entrances	1	EA	\$3,266		\$3,266
2 Perimeter Silt Fencing	52,040	LF	\$25,293		\$25,293
3 Spill Kits (Emergency Equipment Cleanup)	1	EA	\$305		\$305
4 Street Wash Down (Water Truck)	195	DA	\$129,652		\$129,652
5 Dust Control Watering (Water Truck)	195	DA	\$129,652		\$129,652
6 Mobilization/DeMobilization	1	EA	\$140,160		\$140,160
Subtotal SWPPP & Dust Control Measures			\$428,328		\$428,328
<u>Removal of Equipment</u>					
7 Remove & Recycle Substation Step Up Transformer	6	EA	\$39,251	\$1,800	\$41,051
8 Remove & Recycle Substation Disconnect Switches	12	EA	\$19,347	\$720	\$20,067
9 Remove & Recycle Substation Circuit Breakers	12	EA	\$19,179	\$3,600	\$22,779
10 Remove & Recycle Substation Pedestals	18	EA	\$114,251	(\$441)	\$113,810
11 Remove & Recycle AC Conductor	518,189	LF	\$212,725	(\$652,918)	(\$440,193)
12 Remove & Recycle Conduit	77,730	LF	\$22,582	(\$97,940)	(\$75,358)
13 Remove & Recycle Switchgear Assemblies	1	LS	\$24,126	\$12	\$24,137
14 Remove & Recycle Inverters & Xfmrs	169	LS	\$110,293	\$15,654	\$125,946
15 Remove & Recycle DC Conductor	9,694,572	LF	\$1,136,098	(\$446,340)	\$689,758
16 Remove & Recycle Photovoltaic Modules	1,615,762	EA	\$11,016,129	(\$8,175,756)	\$2,840,373
17 Remove & Recycle Support Assemblies	23,588	EA	\$1,560,052	(\$9,075,893)	(\$7,515,841)
18 Remove & Recycle W6 x 7 x 11' Foundations	214,585	EA	\$1,550,959	(\$2,284,311)	(\$733,352)
19 Remove & Recycle W6 x 9 x 11.5' Foundations	45,148	EA	\$326,317	(\$646,017)	(\$319,700)
20 Remove & Recycle W6 x 12 x 9' Foundations	22,574	EA	\$163,158	(\$337,052)	(\$173,894)
21 Remove & Recycle W6 x 20 x 11' Foundations	2,704	EA	\$19,544	(\$82,242)	(\$62,698)
22 Remove & Recycle W6 x 7 x 11' Foundations	19,235	EA	\$147,595	(\$204,761)	(\$57,166)
23 Remove SCADA and Met Stations	25	EA	\$17,841	\$300	\$18,141
Subtotal Removal of Equipment			\$16,499,447	(\$21,981,586)	(\$5,482,139)
<u>Site Demolition</u>					
24 Remove & Recycle 6' Chain Link Fence	349,570	LF	\$601,640	(\$393,354)	\$208,286
25 Remove & Recycle Gates	1196	LF	\$4,190	(\$1,511)	\$2,679
26 Remove & Salvage 4" Gravel Access Aisles	3,012,514	SF	\$308,111	(\$446,298)	(\$138,187)
27 Remove & Salvage 4" Gravel Staging Area	700,000	SF	\$71,594	(\$103,704)	(\$32,110)
Subtotal Site Demolition			\$985,535	(\$944,867)	\$40,668
<u>Site Reclamation</u>					
28 Apply Manure Compost (@ 24 CY/AC)	29,520	CY	\$1,329,186		\$1,329,186
29 Scarify & Blend ~40% of Site (Depth = 6")	1,230	AC	\$1,429,651		\$1,429,651
30 Seed Mixture across ~40% of Site (@ 25 LB/AC)	1,230	AC	\$2,558,020		\$2,558,020
Subtotal Site Reclamation			\$5,316,857		\$5,316,857
<u>Contingency, Escalation, PM, Insurance, Fee</u>					
31 Subcontractor Bonding	0.75%		\$170,101		\$170,101
32 General Contingency (% of Labor/Equip/Mat)	2.00%		\$453,603		\$453,603
33 Labor & Equip. Escalation (0.75% per Year for 25 Years)	18.8%		\$4,252,531		\$4,252,531
34 Recycled Material Escalation (0.6% per Year for 25 Years)	15.0%			(\$3,356,468)	(\$3,356,468)
35 Construction Management (% of Labor/Equip/Mat)	5.10%		\$1,156,688		\$1,156,688
36 Permits, Inspection & Fees (% of Labor/Equip/Mat)	3.25%		\$737,105		\$737,105
37 Liability Insurance (% of Labor/Equip/Mat)	0.97%		\$219,998		\$219,998
38 Overhead & Profit (% of Labor/Equip/Mat)	4.75%		\$1,077,308		\$1,077,308
39 County Administration Costs (Full-time for Contract Duration)			\$29,499		\$29,499
Subtotal Contingency, Escalation, PM, Insurance, Fee			\$8,096,834	(\$3,356,468)	\$4,740,366
Opinion of Probable Decommissioning Cost			\$31,327,001	(\$26,282,921)	\$5,044,080

Basis of Estimate  
Assumptions ❖ Exclusions ❖ Qualifications  
for Decommissioning a  
647,735.1kW (STC) PV System

This Opinion of Probable Cost is based on professional experience and interpretation of project documents, and is based on Swinerton resource data, current in-house information and estimators' judgment regarding this type of product.

Please notify Swinerton of any errors or omissions in this estimate within ten (10) days of receipt.

General Assumptions

- 1 - Permitting NTP: 09/24/44
- 2 - Mobilization: 11/23/44
- 3 - Total Decommission Duration: 34.5 weeks.
- 4 - Completion Date: 07/22/45
- 5 - This estimate includes zero days of weather delay contingency.
- 6 - Overall Permit, Demolition & Close-out: 9.9 months
- 7 - This PV array is assumed de-energized and ready for demolition.
- 8 - Pricing valid for (60) sixty days from date of release. [07/14/18]
- 9 - Swinerton cannot control the actual conditions of the Project or the market, and as such, this Opinion of Probable Cost is not a guarantee of pricing, but a reasonable estimating tool based upon the assumptions, exclusions, and qualifications contained herein.
- 10 - Labor rates based on Spotsylvania, VA prevailing wages per the Wage Determinations website.  
*WDOL.gov is part of the Integrated Acquisition Environment, one of the E-Government initiatives in the President's Management Agenda. It is a collaborative effort of the Office of Management and Budget, Department of Labor, Department of Defense, General Services Administration, Department of Energy, and Department of Commerce.*
- 11 - Labor productivity metrics have been based on RSMeans Construction Cost Databases.
- 12 - We have escalated labor, equipment and material by 0.75% APR for the assumed (25) year life of this PV power plant.
- 13 - Material and salvage unit costs have been based on historical data for this type and size of project, and RSMeans Construction Cost Databases modified for scale and location.
- 14 - N.B., No attempt has been made to predict the breadth of the recycling/salvaging industry in 2044, and therefore all recycling and salvage rates are based on current knowledge.

Estimating Methodology

This Opinion of Probable Cost was developed based on material take-off quantities generated from current project data. Customized Excel workbooks were the primary estimating tools used to generate this cost estimate.

Basis of Estimate  
Assumptions ❖ Exclusions ❖ Qualifications  
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Site Assumptions

Modules

(1,615,762) - 427.5w FirstSolar S-6 & 360w Jinko

Inverters

(169) -Power Electronics FS3000MU

DAS & Extras

Inverter-level monitoring and (25) weather stations

Racking Systems

ATI v3

Foundations

W6 x 7 x 11'

W6 x 9 x 11.5'

W6 x 12 x 9'

W6 x 20 x 11'

W6 x 7 x 11'

Interconnection

Allowance for Substation decommissioning and demolition has been included.

Sitework

Demolish all fencing, foundations, housekeeping pads, structures of any kind.

Remove and salvage gravel access aisles.

Restoration after decommission and demolition:

Apply Manure Compost (@ 24 CY/AC)

Scarify & Blend ~40% of Site (Depth = 6")

Seed Mixture across ~40% of Site (@ 25 LB/AC)

General Requirements

Included are SWPPP/Erosion control, dust control, safety equipment, dumpsters, chemical toilets & hand / eye wash stations, and lift equipment.

General Conditions represent costs for job-site staff and direct support are calculated against project scope and duration.

N.B., General Requirements and Conditions have been captured in the Construction Management line.

Basis of Estimate  
Assumptions ❖ Exclusions ❖ Qualifications  
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Labor Rate Assumptions

Fully burdened prevailing wages for demolition and electrical demolition crews based on www.wdol.gov rates from General Decision Number: VA180176 01/05/2018 VA176.

County Administration wage based on Spotsylvania, VA County Administrative Analyst.

Indirect Costs

Sales Tax

Sales Tax at the rate of 5.30% has been included for all material and equipment.

Building Permits, Inspection and Fees

Building or construction permits are documents that grant the holder approval to construct their project in accordance with the permit and construction documents approved by the appropriate government agency. One or more permits may be required depending the type of project and the government agency's established requirements. Fees may include testing & inspection (soils, etc). This Conceptual Cost Estimate includes 3.25% against labor, equipment & material costs for building permits, inspection and fees.

Subcontractor Bonding

This Opinion of Probable Cost includes Contractor Default Insurance against loss incurred as the direct result of a subcontractor or supplier default.

Public Liability and/or Property Damage:

This estimate includes Public Liability and Property Damage. This insurance provides protection against the financial risk of being found liable for death or injury, loss or damage of property or pure economic loss, and is factored against the non-residential portions of the project.

Contractor Contingency:

This Opinion of Probable Cost includes Contractor Contingency of 2.00% against labor, equipment & material costs.

Contractor's Overhead & Profit:

This Opinion of Probable Cost includes Contractor's Overhead & Profit Overhead of 4.75% against labor, equipment & material costs.

Exclusions

- 1 Premium for off-hours work or accelerated schedule.

Basis of Estimate  
Assumptions ❖ Exclusions ❖ Qualifications  
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Qualifications

- 1 Costs for waste management/recycling verification programs are unknown at this time and may need to be added if required by the Authority Having Jurisdiction.
- 2 A direct cost allowance of \$3,410,488 has been included for E-waste handling, abatement and disposal (including escalation). Any costs incurred in excess of this allowance shall be deemed a compensable change order.
- 3 Production rates based on 8 hour shifts.
- 4 Timeline is based on a (5) day work week.
- 5 Recycle definition: material will be reconstituted into a new product.
- 6 Salvage definition: material will be reused in its current configuration or format.
- 7 Disposal definition: material will be disposed of at licensed waste dispose facility. Material still may be recycled or salvaged at the sole discretion of the waste disposal facility.
- 8 Estimate is based on a current recycled steel value of \$276.5 per ton.
- 9 Estimate is based on a current 'clean' recycled aluminum value of \$0.455 per pound.  
Clean aluminum is free of fasteners, insulation, and other minor debris.
- 10 Estimate is based on a current 'dirty' recycled aluminum value of \$0.32 per pound.  
Dirty aluminum includes fasteners, insulation, and other minor debris.
- 11 Estimate is based on a current recycled copper value of \$1.465 per pound.
- 12 Estimate is based on a recycled glass value of \$0.07 per pound.
- 13 Estimate is based on a electronic disposal waste fee of \$0.30 per pound.

Blended Crew Rates

Based on [www.wdol.gov](http://www.wdol.gov) rates for Spotsylvania, VA

General Decision Number: VA180176 01/05/2018 VA176

DEMO, non-Electrical	Crew	Rate*	Total	Designation No.
Laborers	4	\$20.62	\$82.48	SUVA2013-050 01/11/2016
Operators	2	\$32.20	\$64.40	SUVA2013-050 01/11/2016
Foremen	1	\$40.25	\$40.25	RSMeans Metric
Weighted Average		\$26.73	\$187.13	

DEMO, Electrical	Crew	Rate*	Total	Designation No.
Electricians	4	\$47.52	\$190.07	SUVA2013-050 01/11/2016
Operators	2	\$32.20	\$64.40	SUVA2013-050 01/11/2016
Foremen	1	\$40.25	\$40.25	RSMeans
Weighted Average		\$42.10	\$294.72	

\* Fully burdened