Appendix G -Decommissioning Plan

A DECOMMISSIONING PLAN FOR

Lake Wilson Solar Energy

Murray County, Minnesota

NOVEMBER 17, 2022

PREPARED FOR:

Lake Wilson Solar Energy LLC

PREPARED BY:

Westwood

Westwood

Decommissioning Plan

Lake Wilson Solar Project Energy Center

Murray County, Minnesota

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Project Number: 0012861.02

Date: November 17, 2022

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Attachments

1.0 Introduction / Project Description

This Decommissioning Plan ("Plan") has been prepared for the Lake Wilson Solar Project (Project) proposed by Lake Wilson Solar Energy LLC (Lake Wilson Solar or Applicant) 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)*. Although not required, this Plan also takes into account, when practicable, Section 1002 - Abandonment and Decommissioning of the Murray County Renewable Ordinance. The purpose of the Plan is to describe the means and methods that can be used to remove all structures, foundations, underground cables, and equipment and to reclaim and restore the land altered during the construction and operation of the solar project to its predevelopment condition to the extent feasible.

The Project is a 150-Megawatt (MW) alternating current solar power generation project proposed by Lake Wilson Solar in Murray County, Minnesota. The Project is anticipated to consist of approximately 352,000 photovoltaic (PV) solar panels, 55 inverters, 7,400 racking frames, 117,000 linear feet of fencing (around Project facilities), 61,100 linear feet of access roads (including turnarounds), an operations and maintenance (O&M) building, a battery energy storage system (BESS) facility with approximately 210 containers, 40 inverter/transformer pads, 12 auxiliary transformers, and 3 emergency generators, a substation with one or more main power transformers, a 200-400 foot overhead 115 kV transmission line (Project Gen-tie Line), and associated equipment. Project facilities are planned to be located within fenced area of approximately 1,476 acres (Project Area). Please refer to the Site Map in Attachment A for a layout diagram of the facility.

The useful life of solar panels is generally considered to be 35 years. Lake Wilson Solar anticipates operating the Project for 35 years or until Site Permit expiration. Lake Wilson Solar reserves the right to continue to operate the Project beyond this point by applying for an extension of required permits. Should Lake Wilson Solar decide to continue operations, a determination will be made whether to continue operation with existing equipment or to replace existing components with upgrades based on newer technologies. Should Lake Wilson Solar decide to not continue operations, the Project will be decommissioned in accordance with this Plan. Lake Wilson Solar will be responsible for all costs to decommission the Project and associated facilities.

This Plan provides costs and activities for decommissioning the Project once it is no longer in use. The Plan accounts for removal of all structures, foundations, underground cables, transformers and foundations up to a depth of at least four feet below ground surface; restoration of soil and vegetation; and steps for ensuring financial resources will be available to fully decommission the Project.

2.0 Proposed Future Land Use

The current land use of the Project Area 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 in with native soil to the surrounding grade, and the site will be restored

to pre-construction 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. Please refer to Section 3.2 for a detailed description of reclamation activities. 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

Decommissioning of the solar facility will include removing the solar panels, solar panel racking, steel foundation posts and beams, inverters, transformers, overhead and underground cables and lines, equipment pads and foundations, equipment cabinets, and ancillary equipment. The civil facilities, access roads, and security fence are included in the scope. Standard decommissioning practices will be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements, as summarized in Section 3.1 of this Plan.

During decommissioning, the landowners will be consulted to identify the extent to which roads or other infrastructure may remain in place. Some Facility infrastructure, such as the access roads, may be left in place at the landowners' requests. Underground utility lines and foundations, if deeper than four feet below ground surface elevation, may be left in place, in Lake Wilson Solar's discretion, to minimize land disturbance and associated impacts to future land use.

Decommissioning will include the removal and transportation of all project components from the Facility site. All dismantling, removal, recycling, and disposal of materials generated during decommissioning will comply with rules, regulations, and prevailing Federal, State, and local laws at the time decommissioning is initiated and will use approved local or regional disposal or recycling sites as available. Recyclable materials will be recycled to the furthest extent practicable. Non-recyclable materials will be disposed of in accordance with State and Federal law.

3.1 Decommissioning of Project Components

3.1.1 Modules

Modules will be inspected for physical damage, tested for functionality, and disconnected and removed from racking. Functioning modules will be packed, palletized, and shipped to an offsite facility for reuse or resale. For this estimate, it has been assumed that non-functioning modules will be shipped to the manufacturer or a third party for recycling or disposal. The decommissioning estimate has been prepared to show the estimated costs for the current year

3.1.2 Racking

Racking and racking components will be disassembled and removed from the steel foundation posts, processed to appropriate size, and sent to a metal recycling facility.

3.1.3 Steel Foundation Posts

All structural foundation steel posts will be pulled out to full depth, removed, processed to appropriate size, and shipped to a recycling facility. The posts can be removed using back hoes or similar equipment. During decommissioning, the area around the foundation posts may be compacted by equipment and, if compacted, the area will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for vegetation.

3.1.4 Overhead and Underground Cables and Lines

All underground cables and conduits will be removed to a depth of four feet so as 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. The subgrade will be compacted per Agricultural Impact Mitigation Plan (AIMP) standards. Topsoil will be redistributed across the disturbed area.

3.1.5 Inverters, Transformers, HVAC, and Ancillary Equipment

All electrical equipment will be disconnected and disassembled. All parts will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Lake Wilson Solar's sole discretion, consistent with applicable regulations and industry standards.

3.1.6 Equipment Foundations and Ancillary Foundations

The ancillary foundations are pile foundations for the equipment pads. As with the solar array steel foundation posts, the foundation piles will be pulled out completely. Duct banks will be excavated up to four feet below ground surface. All unexcavated areas compacted by equipment used in decommissioning will be decompacted pursuant to the AIMP in a manner to adequately restore the topsoil and sub-grade material to a density similar to the surrounding soils. All materials will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Lake Wilson Solar's sole discretion, consistent with applicable regulations and industry standards.

3.1.7 Battery Energy Storage System (BESS):

The BESS containers will be disconnected from electric ports prior to removal. The lithium-ion batteries will be prepared and packaged to be transported to a recycling facility. The containers can be resold, reused, or recycled. Gravel aggregate will be removed and shipped from the Project site to be reused, sold, or disposed of appropriately, at Lake Wilson Solar's sole discretion, consistent with applicable regulations and industry standards. Clean aggregate can often be used as "daily cover" at landfills for no disposal cost. All internal service roads are currently anticipated to be constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. All pile foundations will be pulled out completely. Underground cables and duct banks will be removed to a depth of four feet. Topsoil will be reapplied to the disturbed area. Soil and topsoil will be de-compacted, and the site will be restored to the pre-construction condition and re-vegetated, unless the area will be used for row-crop agriculture, in which event the area will not be re-vegetated.

3.1.8 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 Lake Wilson Solar's sole discretion, consistent with applicable regulations and industry standards. The surrounding areas will be restored to pre-Project conditions to the extent feasible.

3.1.9 Access Roads

Facility access roads will be used for decommissioning purposes, after which removal of roads will be discussed with the respective landowner and one of the following options will be pursued:

1. After final clean-up, roads may be left intact through mutual agreement of the landowner and Lake Wilson Solar unless otherwise restricted by federal, state, or local regulations.
2. If a road is to be removed, aggregate will be removed and shipped from the site to be reused, sold, or disposed of appropriately, at Lake Wilson Solar's sole discretion, consistent with applicable regulations and industry standards. Clean aggregate can often be used as "daily cover" at landfills for no disposal cost. All internal service roads are currently anticipated to be constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. Any ditch crossing connecting access roads to public roads will be removed unless the landowner requests it remains. The subgrade will be decompacted 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 decompacted.

3.1.10 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 feet. 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 on 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 18 inches and the site will be revegetated to match pre-construction conditions.

3.1.11 Operations and Maintenance Building

The O&M Building is a sturdy, general purpose steel building. If the building is not repurposed, decommissioning will include disconnection of the utilities and demolition of the building structure, foundation, rock base parking lot, and associated vegetated/stormwater handling 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 brought 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 either to a farmable condition or re-vegetated, depending upon location.

3.2 Reclamation

The site will be restored and reclaimed to the pre-solar farm condition consistent with the site lease agreement(s). Most of the site is expected to be returned to farmland and/or pasture after decommissioning through implementation of appropriate measures to facilitate such uses. If no specific use is identified, the site will be vegetated with a seed mix approved by the local soil and water conservation district or similar agency. The goal of restoration will be to restore natural hydrology and plant communities to the greatest extent practicable while minimizing new disturbance and removal of perennial vegetation. In addition to the reclamation activities described above for each decommissioning activity, all unexcavated areas compacted by equipment and activity during the decommissioning will be decompacted to a depth of 18 inches, or to a different depth as needed, to ensure proper density of topsoil consistent and compatible with the surrounding area and associated land use. All materials and debris associated with the Facility decommissioning will be removed and properly recycled or disposed of at off-site facilities.

4.0 Best Management Practices (BMPs)

During decommissioning, perennial vegetation growing throughout the project area will remain in place wherever possible to serve as a soil stabilization mechanism. As such, significant soil disturbance is not anticipated for most of the project components. When necessary, erosion and sediment control BMPs will be implemented to minimize potential for erosion of disturbed site soils and sedimentation of surface waters and waters of the state. Because decommissioning will entail disturbance of areas occupied by access roads, and the BESS, which will be more than one acre in area, Lake Wilson Solar will prepare a Stormwater Pollution Prevention Plan (SWPPP) and obtain coverage under the state-specific National Pollutant Discharge Elimination System (NPDES) permit prior to initiating soil disturbing activities. Potential BMPs to be implemented during decommissioning activities are described below and will be subject to refinement in the SWPPP. The decommissioning team will review the permitting requirements at the time of decommissioning and obtain any other necessary permits.

4.1 Erosion Control

Erosion control measures will be refined based on the standard of practice current at the time the SWPPP is developed for decommissioning. All disturbed areas without permanent impermeable or gravel surfaces, or planned for use as cropland, will be vegetated for final stabilization. Unless planned for use as crop land, all disturbed slopes steeper than 4:1 should be protected with erosion control blankets. Restoration of these particularly disturbed areas will include seed application prior to the application of the blanket. Disturbed areas that will not be used for cropland or retained access roads that have slopes 4:1 or flatter will be restored with seed and mulch, which will be disc anchored.

Project Phasing/Design BMP: Time periods during which disturbed soils are exposed will be minimized to the degree possible. Stabilization of disturbed soils will generally be accomplished immediately following decommissioning and removal of the access roads, fencing, modules and racking, equipment, electrical and fiber optic cables, substation, switchyard, BESS, and O&M

facilities. Where this is not possible, temporarily exposed soils will be temporarily stabilized in accordance with the SWPPP for decommissioning.

Erosion Control Blankets and Seed BMP: Erosion control blanket (double-sided netting with wood fiber or weed-free straw fiber blanket) will be used as temporary stabilization for disturbed areas of slopes steeper than 4:1 and for areas of concentrated flow, such as ditches, swales, and similar areas around culverts. Additionally, seed will be applied in these areas as prescribed by the SWPPP for temporary and/or permanent vegetative growth. The SWPPP developed for decommissioning will provide detailed specifications for erosion control blankets to be used under various slope and drainage conditions.

Ditch/Channel Protection: Where new channels are formed, as in the case of culverts removed from access roads and the removal of low water crossings, the resulting channel will be protected with erosion control blankets as described in the section above.

Surface Roughening: Surface roughening, or slope tracking, is the act of running a dozer or other heavy tracked equipment perpendicular to the grade of disturbed slopes. The tracks will provide a rough surface to decrease erosion potential during an interim period until a smooth grade, seed, and erosion control blanket can be applied.

Temporary Mulch Cover and Seed BMP: Temporary mulch cover (wood fiber to resist loss from grazing by wildlife or domestic animals) will be applied at a rate of two tons per acre on disturbed areas to provide temporary erosion protection of exposed soils on slopes flatter than or equal to 3:1. Seed will be applied with the mulch for temporary and/or permanent vegetative growth as called for in the SWPPP. Mulch will be used for all soil types where slopes are flatter than 3:1 and no significant concentrated flows are present. The mulch will be disc-anchored to the soil to keep it from blowing away. The mulch prohibits raindrop impact from dislodging soil and subsequently carrying the soil away during sheet drainage. If there is a challenge securing mulch to sandy soils, tackifier may be used to assist in disc anchoring.

Soil Stockpiles: Topsoil and subsoils that are stripped from the construction site will be stockpiled separately on site. Stockpiles will be located in areas that will not interfere with the decommissioning activities nor encroach upon pavement, site drainage routes, or other areas of concentrated flow. Stockpiles should also be located away from wetlands and surface waters. Perimeter controls, such as silt fence, will be installed around all stockpiles that are not placed within existing silt fences or other sediment control, where the potential exists for material to be eroded and transported to sensitive natural resources. Soils that are stockpiled for longer durations will be temporarily seeded and mulched or stabilized with a bonded fiber polymer emulsion.

Permanent Seed and Temporary Mulch and/or Erosion Control Blanket BMP: In disturbed areas at final grade that will not be used for agriculture or for retained access roads, permanent seed will be applied to promote vegetative cover for permanent erosion control. Temporary mulch and/or erosion control blanket will be applied to disturbed areas where appropriate to provide temporary erosion protection until the permanent seed or long-term land use is established.

4.2 Sediment Control

Removal of Ditch Crossing BMP: Temporary ditch crossings may be needed to accommodate the movements of cranes or other heavy equipment. Perimeter controls such as silt fence will be

used at crossing locations to minimize runoff from exposed soils. Crossings will occur during dry conditions, if possible. If a stream is wet at the time of the crossing, alternative BMPs may be used, such as installing a temporary dam or using a bypass pump to create dry conditions at the proposed crossing location. Timber construction mats will be used as needed to prevent compaction and rutting at crossing locations. All temporary fills and construction mats will be removed immediately after the crossing is successfully completed and the temporarily disturbed area is restored using the appropriate BMPs as described above.

Dewatering: A temporary sump and rock base will be used if a temporary pump is used to dewater an area of accumulated water. If a rock base cannot be used, the pump intake will be elevated to draw water from the top of the water column to avoid the intake and discharge of turbid water. Energy dissipating riprap will be applied to the discharge area of the pump hose. The water will be discharged to a large flat vegetated area for filtration/infiltration prior to draining into receiving waters of conveyances/ditches. If discharge water is unavoidably turbid, dewatering bags, temporary traps, rock weepers, or other adequate BMP will be used to control sediment discharge.

Silt Fence BMP or Fiber Logs: Silt fences or fiber logs will be used as perimeter controls downgradient of exposed soils during construction to capture suspended sediment particles on site, to the extent possible. The standard silt fence or fiber logs will also be used in smaller watershed areas where the contributing areas are typically less than 1/4 acre of drainage per 100 feet of standard silt fence or fiber logs. Standard silt fence or fiber logs will also be used for stockpiles eight feet high or higher which have slopes of 3:1 or steeper. Standard silt fence or fiber logs should not be used in areas of highly erodible soils which are found within streams, slopes, or banks of creeks and streams within the Facility's site.

Rock Entrance/Exit Tracking Control BMP: Rock construction entrances will be installed where access to a construction area from adjacent paved surfaces is needed.

Street Scraping/Sweeping BMP: Street scraping and sweeping will be used to retrieve sediment tracked or washed onto paved surfaces at the end of each working day, or as needed.

4.3 Controlling Stormwater Flowing On and Through the Project

Given the low gradient of the slopes in the Project Area, controlling stormwater flow that enters the Project Area will likely require minimal effort during decommissioning activities. Only newly disturbed areas may require new, temporary stormwater control.

Diversion Berms/Swales/Ditches: It may be necessary to direct diverted flow toward temporary settling basins via berms, swales, or ditches. If diversion controls are deemed necessary for decommissioning activities, these must be stabilized by temporary mulch and seeding, erosion control blankets, or by installing riprap to protect the channel from erosive forces.

Rock Check Dams: It may be necessary to install temporary check dams within swales or ditches that convey stormwater from areas disturbed by decommissioning activities. Rock check dams effectively control flow velocity and sediment, augmenting temporary stabilization of channels. Filter fabric can help filter the flow, minimize the scour of the soil under the rock, and facilitate removal of the check dams once permanent stabilization is achieved. The height of check dams should be at least two feet. Spacing depends upon slope. Downgradient rock checks should have a top elevation equal to the bottom elevation of the previous (upgradient) rock check.

Temporary Sedimentation Basins: Sedimentation basins serve to remove sediment from runoff from disturbed areas of the site. The basins detain runoff long enough to allow the majority of the sediment to settle out prior to discharge. The location and dimensions of temporary sedimentation basins, if any are necessary, will be verified in accordance with the state and county agencies responsible for construction stormwater permits requirements at the time of decommissioning.

4.4 Permitting

All decommissioning and reclamation activities will comply with Federal and State permit requirements. Decommissioning activities that will disturb more than one acre of soil will require coverage under the state-specific NPDES permit for construction stormwater. The permits will be applied for and received prior to decommissioning construction activities commencing. A SWPPP will be developed prior to filing for construction stormwater permit coverage.

Although not anticipated to be necessary, wetlands and waters permits will be obtained from the USACE or the state and county agencies, if wetland impacts are anticipated at the time of decommissioning. A Spill Prevention, Control, and Countermeasure (SPCC) Plan may also be required for decommissioning work.

4.5 Health and Safety Standards

Work will be conducted in strict accordance with the Applicant's health and safety plan. The construction contractor hired to perform the decommissioning will also be required to prepare a site-specific health and safety plan. All site workers, including subcontractors, will be required to read, understand, and abide by these plans. A site safety office will be designated by the construction contractor to ensure compliance. This official will have stop-work authority over all activities on the site should unsafe conditions or lapses in the safety plan be observed.

5.0 Timeline

It is anticipated that the decommissioning activities for the project can be completed in a 40-week period. Lake Wilson Solar will notify landowners, the local government and the DOC prior to beginning decommissioning activities and when restoration is complete.

6.0 Decommissioning Costs

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

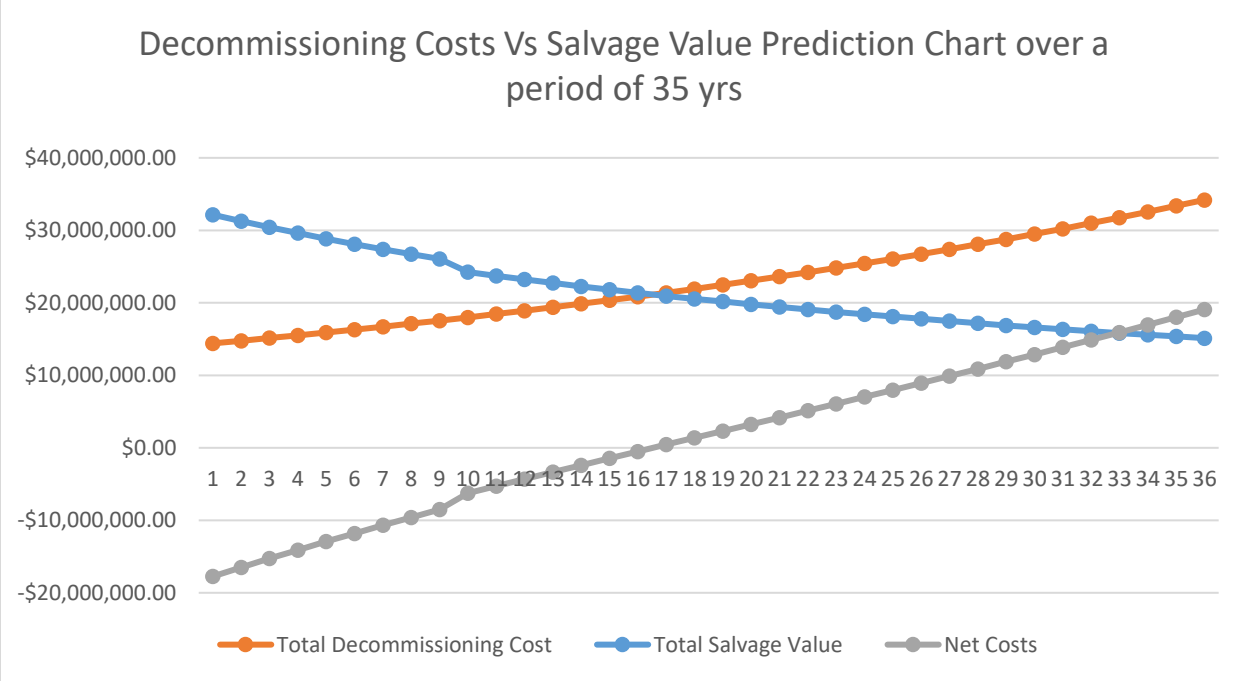
The decommissioning costs are calculated using current pricing. In keeping with the DOC EERA requirements, the estimate of net costs should be updated every 5 years and when ownership changes to recognize price trends for both decommissioning costs and the salvage

and resale values of the 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 to 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 from 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 $14,443,400 for the current year. Estimated salvage/scrap value of the modules, racking, transformers, BESS, and other materials is approximately $32,197,500 for the current year. The net decommissioning costs after accounting for resale and salvage values is approximately $17,754,100 in surplus for the current year.

In an effort to predict the possible future decommissioning costs and salvage values, Westwood has assumed a 2.5% annual inflation in the decommissioning costs and 1.0% annual deflation for the salvage value. Although the current industry trend for the salvage value has been on an upward graph, we have used the deflation rate as a conservative approach. In addition, the solar panel value for the future years is set in a way such that the capacity of panels reduces by 0.5% and the salvage value per watt reduces by 5% each year until the solar panel warranty expires. At the end of warranty, the panel capacity is set to be reduced by 20% and salvage value per watt depreciates by 10% yearly. Based on the analysis, decommissioning costs are anticipated to exceed salvage values in year 10. A graphical representation of the predictions is shown below.



7.0 Financial Assurance

Pursuant to the EERA recommendations, Lake Wilson Solar is required to submit a revised decommissioning estimate every 5 years, which is also consistent with the Murray County Renewable Energy Ordinance. 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 increases or decreases in decommissioning costs and salvage values determined during each plan reassessment.

The decommissioning financial assurance will be posted, consistent with the Murray County Renewable Energy Ordinance as a bond/letter of credit or some other form of financial assurance in the following format:

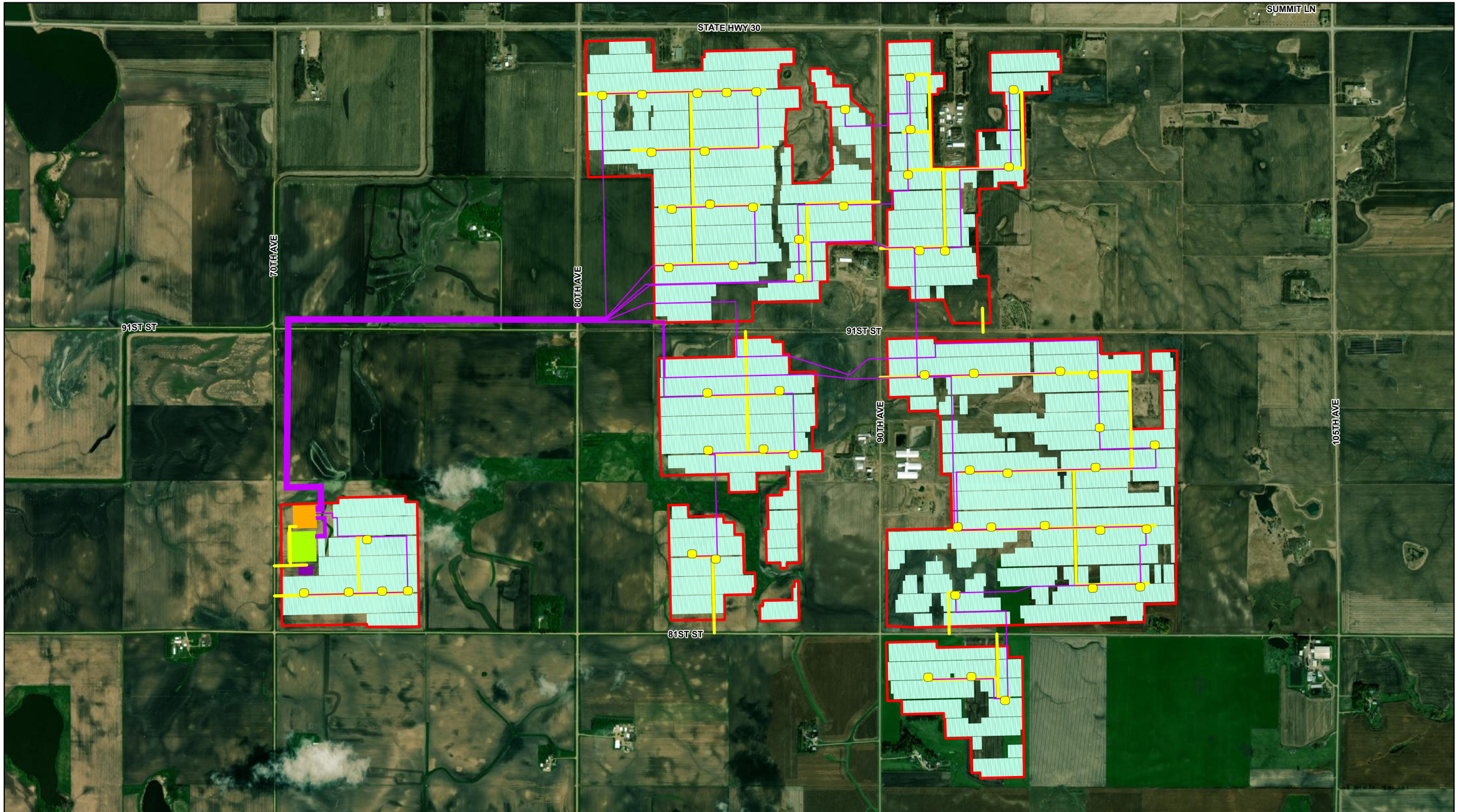
- 25% of the net decommissioning estimate will be posted in year 10;
- 25% of the net decommissioning estimate will be posted in year 15;
- 25% of the net decommissioning estimate will be posted in year 20; and
- 25% of the net decommissioning estimate will be posted in year 25.

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. The Applicant commits that if it does not complete decommissioning within the time specified in the Site Permit, then Murray County may take action as necessary to complete decommissioning, including drawing from the Financial Assurance.

Attachment A

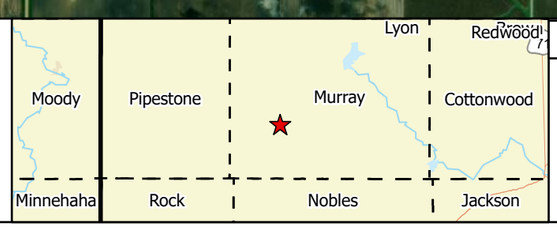
Site Map



Data Source(s): Westwood (2022); Esri WMS Basemap Imagery (Accessed 2022); USGS (2022); FEMA (2022); USDA (2022)

Legend

- Array
- Substation
- BESS
- O&M Facility
- Inverter
- Collection
- Access Road
- Fence
- County Boundaries
- State Boundary



★ -Project Location

Lake Wilson Solar Project

Murray County, MN

Site Map

November 17, 2022

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0 Feet 2,200

Westwood
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Vicinity Map - Vicinity Map | 11/17/2022 3:54 PM | SKSteglund

Attachment B

Decommissioning Cost Estimate

Lake Wilson Solar Project				
Project Size	195.00	MW-DC	150.00	MW-AC
	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization	1	Lump Sum	$929,400.00	**$929,400**
Mobilization was estimated to be approximately 7% of total cost of other items.				
Permitting				
State Permits	1	Lump Sum	$20,000.00	$20,000
Subtotal Permitting				**$20,000**
Decommissioning will require a SWPPP and SPCC plan, cost is an estimate of the permit preparation cost				
Civil Infrastructure				
Removal Gravel Surfacing from Road	18,104	Cubic Yards (BV)	$2.69	$48,717
Haul Gravel Removed from Road (Slayton, MN)	22,630	Cubic Yards (LV)	$6.61	$149,582
Disposal of Gravel Removal from Road (Use as Daily Cover)	29,328	Tons	$0.00	$0
Removal Geotextile Fabric from Road Area	108,622	Square Yards	$1.40	$152,071
Haul Geotech Fabric Removed from Beneath Access Roads	29.9	Tons	$4.85	$145
Disposal of Geotech Fabric Removed from Beneath Access Roads	29.9	Tons	$92.08	$2,751
Remove and Load Culvert from Beneath Access Roads	11	Each	$448.00	$4,928
Haul Culvert Removed from Access Roads	0.3	Tons	$4.85	$1
Disposal of Culvert (Slayton, MN)	0.3	Tons	$92.08	$28
Removal Low Water Crossing from Road	15.0	Each	$3,400.00	$51,000
Haul Low Water Crossing Materials Removed from Access Road	600	Ton	$4.85	$2,908
Disposal of Low Water Crossing Materials	600	Ton	$30.00	$18,000
Grade Road Corridor (Re-spread Topsoil)	61,100	Linear Feet	$1.42	$86,991
Decompaction on Road Area	33.66	Acres	$252.39	$8,496
Removal of Agricultural Fence	117,000	Linear Feet	$1.68	$196,560
Subtotal Civil Infrastructure				**$722,178**
Structural Infrastructure				
Removal Steel Foundation Posts (Arrays, Equipment, Met Towers)	96,695	Each	$13.38	$1,293,416
Haul Array Steel Post (Slayton, MN)	3,554	Tons	$7.07	$25,141
Removal of Tracker Racking per String	13,533	Each	$99.34	$1,344,434
Haul Tracker Racking (Slayton, MN)	9,813	Tons	$7.07	$69,423
Subtotal Structural Infrastructure				**$2,732,414**
Steel removal costs were calculated by using RS Means information for demolition of steel members.				
Hauling calculations are based on the locations of metals recyclers.				
Electrical Collection System				
Removal of PV Panels	352,000	Each	$5.27	$1,855,333
Haul PV 95% of Panels to Reseller (We Recycle Solar, KY)	10,026	Tons	$292.07	$2,928,352
Haul 5% of PV Panels for Disposal (Slayton, MN)	528	Tons	$5.12	$2,699
Disposal of PV Panels	528	Tons	$74.00	$39,050
Removal of Equipment Skids	55	Each	$1,087.25	$59,798
Haul Equipment to Recycler (Slayton, MN)	55	Each	$386.56	$21,261
Removal of Scada Equipment	1	Each	$2,000.00	$2,000
Removal of DC Collector System Cables (copper)	150	Per MW	$2,000.00	$300,000
Removal of Underground (AC) Collector System Cables	56	Locations	$400.00	$22,400
Load and Haul Cables for Recycling	2,000.0	Tons	$7.07	$14,149
Subtotal Electrical Collection				**$5,245,042**

Transmission System				
Removal of Overhead Cables	400	Feet	$7.90	$3,160
Loadout Overhead Cables	1.8	Tons	$37.00	$67
Haul Overhead Cables	1.8	Tons	$7.07	$13
Disposal of Overhead Cables	1.8	Tons	$92.08	$167
Remove and Load Timber Transmission Poles	2	Each	$465.93	$932
Remove and Load Steel Transmission Poles	0	Each	$931.86	$0
Haul Timber Poles for Disposal	2	Each	$21.25	$42
Haul Steel Poles for Recycling	0	Each	$148.73	$0
Haul Hardware, Bracing, and Attachments for Disposal	2	Each	$6.76	$14
Transmission Timber Pole and Component Disposal	2	Each	$276.24	$552
Transmission Pole Component Disposal	2	Each	$92.08	$184
Topsoil and Revegetation at Removed Pole	2	Each	$7.61	$15
Subtotal Transmission System				**$5,147**
Substation				
Disassembly and Removal of Main Power Transformer(s)	1	Each	$4,500.00	$4,500
Freight Transformer(s) Offsite	90	Tons	$15.46	$1,399
Freight Transformer Oil Offsite	12,830	Gallons	$0.09	$1,155
Disposal of Transformer (Including Oil) (Salvage Value)	1	Each	$0.00	$0
Excavate Around Transformer Foundation(s)	1	Each	$2,146.32	$2,146
Remove Complete Transformer Foundation(s)	70	Cubic Yards	$140.54	$9,838
Backfill Excavation Area from Transformer Foundation Removal	120	Cubic Yards	$42.04	$5,045
Haul Concrete (Foundations Transformer, Switch Gear, etc.)	142	Tons	$5.12	$727
Disposal of Concrete from Transformer Foundation	142	Tons	$75.00	$10,658
Demolish Substation Site Improvements (fences, etc)	1	LS	$3,500.00	$3,500
Demolish Control Building and Foundation	1	LS	$12,000.00	$12,000
Remove Medium/High Voltage Equipment	1	LS	$3,500.00	$3,500
Remove Structural Steel Substation Frame	1	LS	$3,500.00	$3,500
Remove Copper Ground Grid	1	LS	$9,476.89	$9,477
Load Copper Wire	20,000	Feet	$0.73	$14,514
Haul Copper Wire to Recycling	6.5	Tons	$7.07	$46
Haul - Demolition Materials, Removed Equipment & Structural Steel	10	Tons	$7.07	$71
Disposal of Demolition Materials & Removed Equipment	10	Tons	$75.00	$750
Remove and Load Gravel Surfacing from Substation	3,944	Cubic Yards (BV)	$2.69	$10,615
Haul Removed Gravel	4,931	Cubic Yards (LV)	$6.61	$32,591
Disposal of Gravel from Substation Site (Use as Daily Cover)	6,390	Tons	$0.00	$0
Grade Substation Site	159,752	SF	$0.06	$9,477
Erosion and Sediment Control	1,600	LF	$3.53	$5,649
Decompact Substation Site (Subsoiling)	3.7	Acres	$252.39	$926
Permanent Seeding at Substation Site	3.7	Acres	$13,261.60	$48,636
Subtotal Substation				**$190,718**

Battery Energy Storage System				
Safety & Hazmat Training to the Crew handling BESS Removal	1	LS	$5,000.00	$5,000
Disconnection of Battery Storage Containers	210	Units	$82.23	$17,267
Haul Storage Containers for Recycling (assumed no cost due to salvage value)	840	Tons	$7.07	$5,942
Remove Equipment Skids Supporting Inverters and HVAC Equipment	40	Each	$1,087.25	$43,490
Remove Auxiliary Transformers	12	Each	$1,087.25	$13,047
Haul Auxiliary Transformers to Recycler (Slayton, MN)	70	Tons	$7.07	$492
Removal and Packing the Batteries for Recycling	210	Units	$2,030.00	$426,300
Removal of Emergency Generators	3	Each	$1,087.25	$3,262
Haul batteries to recycling facility, We Recycle Solar, Louisville, KY	4,903	Tons	$6.98	$34,224
Recycling Costs for the Li-ION Batteries	9,806,400	lbs	$0.25	$2,451,600
Remove BESS, Generator, & Transformer Concrete Foundations	1,194	Cubic Yards	$19.18	$22,893
Haul Container Concrete Foundations	1,934	Tons	$4.85	$9,373
Disposal of Concrete from Foundations	1,934	Tons	$92.08	$178,048
Demolish BESS Site Improvements (fences, etc)	1,707	Linear Feet	$1.68	$2,867
Remove and Load Gravel Surfacing from BESS Site	6,721	Cubic Yards(BV)	$2.69	$18,088
Haul Gravel Removed from BESS Site	7,730	Cubic Yards(LV)	$6.61	$51,093
Disposal of Gravel from BESS Site (Use as "Daily Cover")	10,889	Tons	$0.00	$0
Decompact BESS Site	4.17	Acre	$150.48	$627
Grade BESS Site	181,480	SF	$0.06	$10,766
Erosion and Sediment Control at BESS Site	1,707	Linear Feet	$2.69	$4,592
Permanent Seeding on BESS Site	4.17	Acre	$13,261.60	$55,251
Subtotal BESS				**$3,354,222**
O&M Building				
Demolish O&M Building	261,456	Cubic Feet	$0.39	$101,968
Demolish O&M Building Foundation	0	Cubic Yards	$12.11	$0
Demolish O&M Site Improvements (fences, etc)	0	Linear Feet	$7.36	$0
Haul Concrete (O&M Building Foundation)	0	Cubic Yards	$4.85	$0
Disposal of Concrete from O&M Building Foundation	0	Tons	$5.12	$0
Cap and Abandon Well	1	Lump Sum	$1,000.00	$1,000
Remove & Restore Septic and Drainfield area	1	Lump Sum	$3,000.00	$3,000
Disposal of O&M Building Demolition and Removed Site Improvements	1	Lump Sum	$2,500.00	$2,500
Remove and Load Gravel Surfacing of O&M Site	807	Cubic Yards (BV)	$2.69	$2,172
Haul Gravel Removed from O&M Site	1,009	Cubic Yards (LV)	$6.61	$6,668
Disposal of Gravel from O&M Site	1,307	Tons	$0.00	$0
Decompact O&M Building Site	0.75	Acres	$350.00	$263
Grade O&M Building Site	32,682	SF	$0.06	$1,939
Erosion and Sediment Control at O&M Building Site	748	Linear Feet	$3.53	$2,640
Permanent Seeding O&M Building Site	0.8	Acres	$13,261.60	$9,950
Subtotal O&M Building				**$132,098**
Site Restoration				
Stabilized Construction Entrance	11	Each	$2,000.00	$22,000
Perimeter Controls (Erosion and Sediment Control)	58,500	Linear Feet	$3.53	$206,505
Permanent Seeding on roadway areas	33.7	Acres	$13,261.60	$446,437
Till to Farmable Condition on array areas	1,463	Acres	$150.48	$220,202
Subtotal Site Restoration				**$895,145**

Project Management				
Project Manager (half-time)	40	Weeks	$3,800.00	$76,000
Superintendent (half-time)	40	Weeks	$3,525.00	$70,500
Field Engineer (half-time)	40	Weeks	$2,775.00	$55,500
Clerk (half-time)	40	Weeks	$750.00	$15,000
Subtotal Project Management				**$217,000**
Standard industry weekly rates from RS Means. 8 week schedule used.				
Subtotal Demolition/Removals				**$14,443,400**
Salvage				
Fencing (Agricultural)	181	Tons	$341.25	$61,886
Fencing (Chain Link)	25	Tons	$341.25	$8,645
Steel Posts	3,554	Tons	$341.25	$1,212,733
Module Racking	9,813	Tons	$341.25	$3,348,818
PV Modules	334,400	Each	$37.64	$12,585,458
Transformers and Inverters	1,423,450	Pounds	$0.35	$491,090
Substation Transformers (Core and Coils)	108,114	Pounds	$0.35	$37,299
Substation Transformers (Tanks and Fittings)	36	Tons	$341.25	$12,421
Transformers and Generator (Oil)	55,595	Gallons	$0.70	$38,917
Substation Ground Grid (Copper)	13,060	Pounds	$4.15	$54,199
DC Collection Lines (Copper)	3,600,000	Pounds	$1.11	$3,996,000
AC Collection Lines (Aluminum)	400,000	Pounds	$0.87	$348,000
Steel Transmission Poles	0	Tons	$341.25	$0
Transmissions Line (Steel)	0.7	Tons	$472.50	$323
Transmission Lines (Aluminum)	2,268	Pounds	$0.87	$1,974
Li Batteries	9,806,400	Pounds	$0.98	$9,561,240
Battery Containers	210	Each	$2,050.00	$430,500
Emergency Generators (Casing)	10	Tons	$341.25	$3,346
Emergency Generators (Engine)	13,200	Pounds	$0.35	$4,554
Subtotal Salvage				**$32,197,500**
Salvage values are a combination of the following factors; current market metal salvage prices, current secondary market for solar panel module recycling, discussions with national companies that specialize in recycling and reselling electrical transformers and inverters, and the assumption that care is taken to prevent any damage or breakage of equipment.				
Total Demolition Minus Salvage				**($17,754,100)**
Notes:				
1. Prices used in analysis are estimated based on research of current average costs and salvage values.				
2. Prices provided are estimates and may fluctuate over the life of the project.				
3. Contractor means and methods may vary and price will be affected by these.				

Cost Estimate Assumptions

To develop a cost estimate for the decommissioning of the Project, Westwood engineers made the following assumptions and used the following pricing references. Costs were estimated based on current pricing, technology, and regulatory requirements. The assumptions are listed in order from top to bottom of the estimate spreadsheet. When publicly available bid prices or Minnesota Department of Transportation (MnDOT) bid summaries were not available for particular work items, we developed time- and material-based estimates considering composition of work crews and equipment and material required. While materials may have a salvage value at the end of the project life, the construction activity costs and the hauling/freight costs are separated from the disposal costs or salvage value to make revisions to salvage values more transparent.

1. A project of this size and complexity requires a half-time project manager with half-time support staff.
2. Common labor will be used for the majority of tasks, supplemented by electricians, steel workers, and equipment operators where labor rules may require. Since MnDOT unit prices are used, where possible, and the other costs are based on RSMeans Construction Costs, the labor rates will reflect union labor rates.
3. Mobilization was estimated at approximately 7% of total cost of other items.
4. Permit applications will require the preparation of a Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention, Control, and Countermeasure (SPCC) Plan. The cost for these documents was split between the two phases.
5. Road gravel removal was estimated on a time and material basis. Since the material will not remain on site, a hauling cost is added to the removal cost. Clean aggregate can typically be used as "daily cover" at landfills without incurring a disposal cost. The road gravel may also be used to fortify local driveways and roads, lowering hauling costs but incurring placing and compaction costs. The hauling costs to a landfill represents an upper limit to costs for disposal of the road gravel.
6. Grade Road Corridor reflects the cost of mobilizing and operating light equipment to spread and smooth the topsoil stockpiled on site during construction to replace the aggregate removed from the road.
7. Erosion and sediment control along road reflects the cost of silt fence on the downhill side of the road adjacent to wetlands and drainage swales.
8. Topsoil is required to be stockpiled on site during construction, so no topsoil replacement is expected to replace the road aggregate. Subsoiling cost to decompact roadway areas is estimated as $252.39 per acre, and tilling to an agriculture-ready condition is estimated as $150.48.
9. Tracker array posts are lightweight "I" beam sections installed with a specialized piece of equipment and can be removed with a standard backhoe with an attachment for gripping the piles. We estimate crew productivity at 240 posts per day, resulting in a per post cost of approximately $13.38.
10. A metal recycling facility (Murray County Recycling Center) is located in Slayton, MN, approximately 9.5 miles from the project site. Pricing was acquired from both facilities and from www.scrapmonster.com. The posts weigh approximately 150 pounds each, and we estimate the hauling costs at approximately $0.74 per ton mile. The pricing from ScrapMonster was reduced to reflect the processing required for the posts to fit recycling requirements.
11. It is assumed that the racking structures weigh approximately 15 pounds per linear foot of array. Each solar panel has a width of 44.61 inches. The facility has 351,858 modules, 2,604,304 feet of array, weighing 10,549 tons. The arrays are made of steel pipes; a crew with hand tools can disassemble and cut the pieces to sizes for recycling at a rate of about 1800 pounds per person per hour, or about $100 per ton.
12. Hauling the steel to Slayton, MN costs about $0.74 per ton mile.
13. The solar panels for this project measure approximately 3.72 feet by 7.46 feet and weigh 59.6 pounds. They can easily be disconnected, removed, and packed by a three-person crew at a rate we estimate at 36 panels per hour.
14. The equipment skids will consist of inverter(s), a transformer, and a panel on a metal frame approximately 19 feet long by eight feet wide by eight feet six inches tall. The skids weigh approximately 36,000 pounds and can be disconnected by a crew of electricians. They must

be lifted by a mobile crane for transport to the recycler. They contain copper or aluminum windings.

15. The transformers contain either copper or, more commonly, aluminum windings that have significant salvage value. They are typically oil filled, but most transformer recyclers will accept the transformers with oil. The estimated costs include removal of metal frame and conduits feeding the equipment.
16. Medium voltage (MV) equipment and SCADA equipment are mounted on the same equipment skids as the inverters and transformers, and they are enclosed in weatherproof cabinets. Their size requires light equipment to remove them. The costs for the removal of the pile foundations are included in the "Remove Steel Foundation Posts" estimate.
17. The underground collector system cables are placed in trenches with a minimum of 18 inches of cover. Several cables/circuits are placed side by side in each trench. The conduits and cables can be removed by trenching.
18. Rock construction entrances will be added at all the entrances to project sites.
19. Perimeter control pricing is based on silt fence installation around downgradient sides of the project perimeter.
20. Metal salvage prices (steel, aluminum, copper) are based on August 2022 quotes from www.scrapmonster.com for the US East. Posted prices are three months old. These prices are based on delivery to the recycling facility with the material prepared to meet size, thickness, cleanliness, and other specifications. A reduction of 25% has been taken from this price to reflect the processing by the contractor to meet the specifications.
21. The steel posts and array racking are priced at $341.25 based on #1 HMS (heavy melting steel).
22. Solar module degradation is approximately 0.50% per year, and the panel value reduces by 5% per year until the end of the manufacturer's warranty. At the end of warranty, the module degradation is set as 20% and 1% thereafter per year. There is currently a robust market for used solar panels and pricing can be found on eBay and other sites. We have assumed that as long as the modules are producing power, they will have economic value. To avoid overestimating the used modules' value, we used the minimum pricing of approximately $0.07 per watt based on a We Recycle Solar quote prepared on October 22, 2020. Pricing is based on delivery to their facility. For interim decommissioning, resale of used modules will be most cost effective.
23. There is an active market for reselling and recycling electrical transformers and inverters with several national companies specializing in recycling. However, we have assumed that the electrical equipment will be obsolete at the time of decommissioning, so we have based the pricing on a percentage of the weight that reflects the aluminum or copper windings that can be salvaged. Pricing was obtained from www.scrapmonster.com. We have assumed a 25% recovery of the weight of the transformers and inverters for aluminum windings.
24. The collection lines are priced assuming copper conductor wire for the direct current circuits, which is typical. The prices reflect a reduced yield of copper resulting from the stripping of insulation and other materials from the wire prior to recycling. The estimate uses the East price of copper with an 85% recovery rate as found on www.scrapmonster.com in August 2022 (but representative of three months prior), which is $4.15 per pound.
25. Care to prevent damage and breakage of equipment, PV modules, inverters, capacitors, and SCADA must be exercised, but removal assumes unskilled common labor under supervision.