Appendix G

Decommissioning Plan

A REPORT FOR
DECOMMISSIONING PLAN

Northern Crescent Solar & Storage Project

Faribault County, Minnesota

MARCH 2024

MPUC DOCKET NO. IP-7096/GS-22-57

PREPARED FOR:

PRIMERGY

PREPARED BY:

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1.0 INTRODUCTION

Northern Crescent Solar LLC (Northern Crescent Solar), formerly known as Winnebago Solar and Storage LLC, is proposing to construct and operate the Northern Crescent Solar LLC Project (Project), an up to 150 MWac nameplate solar-energy capacity project paired with a 50-MW/1051 MW-hr battery energy storage system (BESS) located within the approximate 1,179-acre Project Area in Faribault County, Minnesota.

Northern Crescent Solar believes that the selected Project location in Faribault County is feasible and prudent for solar development based upon the proximity to existing electric transmission infrastructure, minimal impact to natural resources, sufficient solar resource, available non-prime farmland, and consistency with existing land uses and local zoning.

The following provisions are intended to ensure that facilities are properly removed after their useful life. This Decommissioning Plan (Plan) includes provisions for removal of all structures, foundations, underground cables, unused transformers and foundations; restoration of soil and vegetation; and a plan ensuring financial resources will be available to fully decommission the Project.

The Plan was prepared 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)*, and in accordance with the Minnesota Public Utilities Commission (MPUC or Commission) Site Permit (MPUC Docket No. IP-7096/GS-22-57) to be issued for the Project. The Faribault County Zoning Ordinance Section 35 – Renewable Energy has also been considered in the development of this Plan. The Contractors will comply with requirements of all permits during the decommissioning process, and the affected land will be restored to its pre-construction condition to the extent practicable.

1.1 PROJECT DESCRIPTION

The Project is located in Faribault County, Minnesota, on the east side of State Highway 169, approximately 2 miles south of the town of Winnebago. It is located within Sections 11, 12, and 13 of Township 103N, Range 28W and Sections 7 and 18 of Township 103N, Range 27W. Prior to construction, the Project area and surrounding areas were primarily used for agricultural production.

The Project will consist of approximately 352,300 photovoltaic (PV) solar panels, 43 inverters, 4,636 racking frames, 85,110 linear feet of fencing (around Project facilities), 62,449 linear feet of access roads (including turnarounds), an O&M building, a BESS with 93 containers and 14 inverters, a Project Substation with at least one power transformer, a switchyard, an overhead transmission line (gen-tie), an overhead transmission line tap, and associated equipment. Project facilities are planned to be located within the fenced area of approximately 909 acres.

1.2 DECOMMISSIONING PLAN REVIEW

As part of the Commission's investigation into Solar and Wind Decommissioning Plans (MPUC Docket Number E999/M-17-123, January 2017), the DOC EERA staff have proposed a 5-year review schedule for decommissioning plans.

This Plan includes provisions for: the removal of all solar structures, foundations, underground and overhead collection lines, buildings, and ancillary equipment to a depth of four feet; restoration of soil and vegetation; and a plan ensuring financial resources will be available to fully decommission the site according to the conditions described in the Site Permit to be issued for the Project.

2.0 DECOMMISSIONING OBJECTIVE

The objective of decommissioning is to restore the site to a condition that will facilitate its pre-construction use at the end of operation. Solar panels are expected to have a useful commercial lifespan of approximately 30 years. The system must be decommissioned if: a) it reaches the end of system's serviceable life; or b) the system becomes a discontinued use. After the Site Permit term expires, the Project operation may be extended (upon Commission review and approval) or the Project ceases to operate. The Project Owner will be responsible for removal of all above ground equipment and underground equipment within the Project Area. The Owner will restore and reclaim the site to pre-construction topography and topsoil quality to the extent practical and assumes that most of the site will be returned to farmland and/or pasture after decommissioning.

Decommissioning includes removing the solar panels, solar panel racking, steel foundation posts and beams, inverters, transformers, overhead and shallow underground cables and lines, equipment pads and foundations, equipment cabinets, and ancillary equipment. The civil facilities, access road, security fence, and drainage structures are included in the scope. Standard decommissioning practices would be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements.

After all equipment 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 Project site will be restored to pre-construction conditions, to the extent feasible, and as provided in the Project Agriculture Impact Mitigation Plan (AIMP) and the Vegetation Management Plan (VMP), as applicable. All access roads and other areas compacted by equipment will be de-compacted to a depth necessary to ensure adequate soil drainage and root penetration, then will be fine graded and tilled to a farmable condition.

In accordance with the Site Permit requirements, the AIMP, and VMP, the Project will have been maintained with perennial native vegetation, which is expected to survive decommissioning activities. Consequently, efforts to restore the site under the arrays, if the land is not returned to row crop agriculture, is expected to be limited to over-seeding. Over-seeding would be completed by a qualified native seeding contractor. Restoration efforts may also include temporary seeding as farmland or re-development of the land for other beneficial uses, based on consultation with the landowner.

3.0 USE OF GENERATION OUTPUT

Solar generated energy within the PV arrays will be transmitted to the Project Substation and stepped up to the 161 kV transmission voltage. The planned Project Gen-Tie will connect the Project Substation to the new switchyard located north and adjacent to the Project Substation. The switchyard will connect to an existing overhead 161-kV high voltage transmission line (HVTL) located north of and adjacent to the switchyard. The BESS will be connected to the Project Substation and allow for solar generated energy to be stored temporarily and, as needed, later transmitted to the power grid.

The solar and BESS portions of the Project are planned to operate in tandem as one combined, associated facility. This configuration will reduce the variability of solar energy generation. Northern Crescent Solar is working towards securing a Power Purchase Agreement (PPA) for the Project, Build Transfer Agreement, Development Transfer Agreement, or other enforceable offtake agreements to sell the electricity, Renewable Energy Certificates (RECs) and capacity generated by the Project. The power generated by the Project will be offered to wholesale customers, including Minnesota utilities and cooperatives that have identified a need for additional renewable energy and capacity, and corporate and industrial (C&I) customers that have set clean energy goals.

4.0 PROPOSED FUTURE LAND USE

Prior to the development of the Project, the land use in the areas affected by the development was primarily agricultural land planted with row crops. After affected areas are decommissioned, these areas will be restored to pre-construction conditions of agricultural land to the extent practicable in accordance with Site Permit, AIMP, and VMP requirements.

5.0 NOTIFICATION

Northern Crescent Solar anticipates operating the Project for 30 years after Site Permit issuance. At the end of the anticipated operation, the Project Owner will be responsible for removing the solar facilities as described in this Plan; however, the Project Owner reserves the right to continue to operate the Project, instead of decommissioning, by applying for an extension of required and applicable permits.

After the Project has reached the end of its useful life, and prior to the start of decommissioning activities, the Project Owner will notify the Commission, landowners, affected parties, counties, and other local units of government in writing, of the intended decommissioning activities and schedule. These parties will again be notified once decommissioning activities have been completed.

6.0 DECOMMISSIONING TASKS AND TIMING

6.1 Timeline

Decommissioning is estimated to take approximately 12 months to complete and the decommissioning crew(s) will ensure that all equipment and materials are recycled or disposed of properly.

6.2 Notice to Parties

In accordance with Site Permit conditions, ninety (90) days prior to the start of the decommissioning, a notice will be sent to landowners and local units of government. Applicable permits and approvals will be obtained prior to the start of decommissioning work.

6.3. Removal and Disposal of Site Components

The removal and disposal details of the Project site components are found below. Typical construction equipment to be used during decommissioning will include, but is not limited to, truck-mounted cranes, loaders, bulldozers, dump trucks, and decompaction equipment.

Modules: Modules will be inspected for physical damage, tested for functionality, and disconnected and removed from racking. Functioning modules will be packed and shipped to an offsite

facility for reuse or resale. Non-functioning modules will be packed, palletized, and shipped to the manufacturer or a third party for recycling or disposal.

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

Steel Foundation Posts: All structural foundation steel posts will be pulled out to full depth, removed, processed to appropriate size, and shipped to a metal recycling facility. The posts can be removed using backhoes or similar equipment. 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 to promote plant growth.

Overhead and Underground Cables and Lines: All underground cables and conduits will be removed to a depth of 48 inches as specified in the lease agreements. Facilities deeper than 48 inches may remain in place to limit vegetation and surface disturbance. The underground cables around equipment pads will be completely removed up to a length of 25' around the perimeter of pads. Prior to any excavation, topsoil will be segregated and stockpiled for later use, and the subsurface soils will be staged next to the excavation. The subgrade will be compacted to a density similar to the surrounding soils to promote plant growth and maintain drainage. Topsoil will be redistributed across the disturbed area. Overhead HVTL conductors will be disconnected and removed from the Project and taken to a recycling facility. The steel transmission poles will be felled within the transmission line right-of-way (ROW) and any hardware, bracing, and attachments will be transported along with the poles to a recycling facility. Removed pole locations will be revegetated with a seed mix specified in the approved Stormwater Pollution Prevention Plan (SWPPP) and VMP.

Battery Energy Storage System, BESS: The BESS containers will be disconnected from electric ports prior to removal. The lithium-ion batteries will 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 the Project Owner'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 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.

Inverters, Transformers, 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 Owner's sole discretion, consistent with applicable regulations and industry standards.

Equipment Foundation and Ancillary Foundations: The ancillary foundation for the Project are pile foundations for both equipment skids and meteorological stations. As described for the solar array steel foundation posts, the foundation piles will be pulled out completely. Duct banks will be excavated to a depth of at least 48 inches. All duct banks, up to 50 feet, around the equipment pads will be removed. All unexcavated areas compacted by equipment used for decommissioning will be de-compacted 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 Owner's sole discretion, consistent with applicable regulations and industry standards.

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 the Owner's sole discretion, consistent with applicable regulations and industry standards. Fence posts can be pulled out using skid-steer loaders or other light equipment. The surrounding areas will be restored to pre-Project conditions to the extent feasible.

Access Roads: Facility access roads will be used for decommissioning purposes, after which removal of roads will be discussed with the applicable landowner.

1) After final clean-up, roads may be left intact through mutual agreement of the landowner and the Owner, unless otherwise restricted by federal, state, or local regulations.

2) If a road is removed, aggregate will be excavated and loaded in dump trucks using front loaders, backhoes, or other suitable excavation equipment, and shipped from the site to be reused, sold, or disposed of appropriately at the Owner'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. Another disposal option is to provide the aggregate to local landowners as clean fill. All internal service roads are constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. Any ditch crossing connecting access road to public roads will be removed unless the landowner requests it remain. The subgrade will be de-compacted using a chisel plow or other appropriate subsoiling equipment. All large rocks will be removed. Topsoil that was stockpiled during the original construction will be distributed across the road corridor.

6.4 Reclamation

The Owner will restore and reclaim the site to the pre-Project condition consistent with the site lease agreements, AIMP, and VMP, as applicable. The Owner assumes that most of the Project site will be returned to farmland and/or pasture after decommissioning and will implement appropriate measures to facilitate such uses. If no specific use is identified, the Owner will plant unvegetated portions of the site with a seed mix specified in the approved SWPPP, AIMP and VMP, as applicable. 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 native vegetation or vegetation established during operation of the facility. The decommissioning effort will implement best management practices (BMPs) to minimize erosion and to contain sediment on the Project to the extent practicable, including the following:

1. Minimize new disturbance and removal of native vegetation to the greatest extent practicable.

2. Remove solar equipment and all access roads up to a minimum depth of 48", backfill with subgrade material, and cover with suitable topsoil to allow adequate root penetration for plants, and so that subsurface structures do not substantially disrupt ground water movements.

3. Any topsoil that is removed from the surface for decommissioning will be stockpiled to be reused when restoring plant communities or agricultural land. Once decommissioning

activity is complete, topsoil will be re-spread to assist in establishing and maintaining plant communities.

4. Stabilize soils and return them to agricultural use, according to the landowner direction.

5. During and after decommissioning activities, install erosion and sediment control measures, such as silt fences, bio-rolls, and ditch checks in all disturbance areas where potential for erosion and sediment transport exists, consistent with storm water management objectives and requirements.

6. Remediate any petroleum product leaks and chemical releases from equipment operation and electrical transformers prior to completion of decommissioning.

Decommissioning and restoration activities at each site will be completed within 12 months after the Project is considered a discontinued use.

7.0 PERMITTING

All decommissioning and restoration activities will comply with applicable federal, state, and local permit requirements. Decommissioning activities will likely disturb more than one acre of soil and trigger the need for a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater General Permit. A SWPPP will be developed prior to filing a Notice of Intent.

If necessary for decommissioning activities, wetlands and waters permits will be obtained as needed from the US Army Corps of Engineers (USACE), Minnesota Department of Natural Resources (MNDNR), and the local government unit (LGU) that implements the Minnesota Wetland Conservation Act (WCA) program. A Spill Prevention, Control and Countermeasures (SPCC) Plan for decommissioning will likely be required. A Minnesota Pollution Control Agency (MPCA) form to report Subsurface Sewage Treatment Systems (SSTS) abandonment may need to be submitted to Faribault County within 90 days of removal of the septic system at the O&M building. In addition, a new Minnesota Department of Health (MDH) Well Disclosure Certificate may be required if the number and status of wells within the Project O&M building facility has changed since the last certificate was filed.

8.0 DECOMMISSIONING SCHEDULE

It is anticipated that the decommissioning activities for the Project are likely to be completed in a 30-week period. Because relatively fewer utility-scale solar farms have been fully decommissioned to date, there is limited historical data for durations available for some of the decommissioning activities that can be applied directly.

9.0 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 (**Table 1**). 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.

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. For the modules, Westwood used a value of $0.08 per watt for used modules, as provided in EnergyBin's 2022 Module Price Index document.

The estimated cost for decommissioning is approximately $10,940,500 ($56,400 per MW). The estimated resale and salvage value of the Project facilities is approximately $18,984,300 ($97,867 per MW) resulting in a net surplus of approximately $8,043,800 ($41,467 per MW) for the initial period of operation. The resale and salvage values are necessary for the Owner to account for the long-term assets and liabilities.

See **Table 1** Detailed Cost Estimate on the next page.

Table 1: DETAILED COST ESTIMATE

Northern Crescent Solar and Storage Decommissioning Estimate				
Project Size	193.98	MW-DC	150.00	MW-AC
	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization	1	Lump Sum	$663,600.00	$663,600
Mobilization was estimated to be approximately 7% of total cost of other items.				
Permitting				
State Permits	1	Lump Sum	$10,000.00	$10,000
Subtotal Permitting				**$10,000**
Decommissioning will require a SWPPP and SPCC plan, cost is an estimate of the permit preparation cost				
Civil Infrastructure				
Removal Gravel Surfacing from Road	40,336	Cubic Yards (BV)	$3.04	$122,461
Haul Gravel Removed from Road (Blue Earth, MN)	50,420	Cubic Yards (LV)	$7.71	$388,742
Disposal of Gravel Removal from Road (Use as Daily Cover)	65,345	Tons	$0.00	$0
Removal Geotextile Fabric from Road Area	165,763	Square Yards	$1.40	$232,068
Haul Geotech Fabric Removed from Beneath Access Roads	46	Tons	$5.65	$258
Disposal of Geotech Fabric Removed from Beneath Access Roads	46	Tons	$75.00	$3,419
Remove and Load Culvert from Beneath Access Roads	28	Each	$448.00	$12,544
Haul Culvert Removed from Access Roads	8	Tons	$5.65	$47
Disposal of Culverts (Blue Earth, MN)	8	Tons	$75.00	$630
Removal Low Water Crossing from Road	2	Each	$3,400.00	$6,800
Haul Low Water Crossing Materials Removed from Access Road	80	Ton	$5.65	$452
Disposal of Low Water Crossing Materials	80	Ton	$30.00	$2,400
Grade Road Corridor (Re-spread Topsoil)	69,249	Linear Feet	$2.27	$157,195
Decompaction on Road Area	37.50	Acres	$222.97	$8,362
Removal of Security Fence (Agriculture Fence)	85,110	Linear Feet	$1.61	$137,027
Subtotal Civil Infrastructure				**$1,072,406**
Structural Infrastructure				
Removal Steel Foundation Posts (Arrays, Equipment)	54,719	Each	$16.60	$908,124
Haul Array Steel Post (Elmore Twp, MN)	4,269	Tons	$6.69	$28,575
Removal of Tracker Racking per String	13,089	Each	$102.05	$1,335,766
Haul Tracker Racking (Elmore Twp, MN)	10,002	Tons	$6.69	$66,945
Subtotal Structural Infrastructure				**$2,339,409**
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	352,300	Each	$5.27	$1,856,915
Haul PV 95% of Panels to Reseller (Louisville, KY)	12,064	Tons	$141.47	$1,706,737
Haul 5% of PV Panels for Disposal (Blue Earth, MN)	635	Tons	$22.99	$14,596
Removal of Equipment Skids	43	Each	$1,167.48	$50,202
Haul Equipment to Recycler (Elmore Twp, MN)	43	Each	$254.45	$10,941
Removal of Scada Equipment	1	Each	$2,000.00	$2,000
Removal of DC Collector System Cables (copper)	194	Per MW	$2,000.00	$387,960
Removal of Underground (AC) Collector System Cables	43	Locations	$400.00	$17,200
Load and Haul Cables for Recycling (From removal locations)	1	Tons	$6.69	$4
Subtotal Electrical Collection				**$4,046,554**

Substation				
Disassembly and Removal of Main Power Transformer(s)	1	Each	$4,500.00	$4,500
Freight Transformer(s) Offsite	131	Tons	$10.18	$1,337
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	$22.99	$3,267
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	$5,109.50	$5,110
Load Copper Wire	20,000	Feet	$0.75	$15,036
Haul Copper Wire to Recycling	6.5	Tons	$6.69	$44
Haul - Demolition Materials, Removed Equipment & Structural Steel	10	Tons	$6.69	$67
Disposal of Demolition Materials & Removed Equipment	10	Tons	$75.00	$750
Remove and Load Gravel Surfacing from Substation Site	1,435	Cubic Yards (BV)	$3.04	$4,356
Haul Gravel Removed from Substation Site	1,793	Cubic Yards (LV)	$7.71	$13,828
Disposal of Gravel from Substation Site (Use as Daily Cover)	2,324	Tons	$0.00	$0
Grade Substation Site	1.0	LS	$5,109.50	$5,110
Erosion and Sediment Control at Substation Site	995	LF	$3.61	$3,592
Decompact Substation Site (Subsoiling)	1.3	Acres	$222.97	$297
Permanent Seeding at Substation Site	1.3	Acres	$177.52	$237
Subtotal Substation				**$108,870**
Battery Energy Storage System (50 MW)				
Train Crew in Safety and Hazmat	1	LS	$5,000.00	$5,000
Disconnection of Battery Storage Containers	93	Each	$328.90	$30,588
Remove and Pack Batteries from Container for Recycling	93	Each	$583.74	$54,288
Recycle Li-Ion Batteries	3,580,500	Pounds	$0.30	$1,074,150
Haul Battery Storage Containers (Assume resale of containers)	93	Each	$0.00	$0
Haul Auxiliary Equipment to Metal Recycler	977	Tons	$6.69	$6,536
Remove PCS Equipment	14	Each	$1,167.48	$16,345
Haul PCS Equipment for Recycling	14	Each	$79.63	$1,115
Remove BESS Concrete Foundation(s)	487	Cubic Yards	$19.18	$9,335
Haul Container Concrete Foundations	788	Tons	$22.99	$18,125
Disposal of Concrete from Foundations	788	Tons	$75.00	$59,134
Demolish BESS Site Improvements (fences, etc)	1,362	Linear Feet	6.48	$8,826
Remove and Load Gravel Surfacing from BESS Site	4,054	Cubic Yards(BV)	$3.04	$12,307
Haul Gravel Removed from BESS Site	4,662	Cubic Yards(LV)	$7.71	$35,942
Disposal of Gravel from BESS Site (Use as "Daily Cover")	6,567	Tons	$0.00	$0
Decompact BESS Site	2.5	Acre	$222.97	$560
Grade BESS Site	109,449	SF	$0.07	$7,764
Erosion and Sediment Control at BESS Site	1,362	Linear Feet	$3.61	$4,917
Topsoil and Revegetation on BESS Site	2.5	Acres	$3,500.00	$8,794
Subtotal BESS				**$1,348,725**

O&M Building				
Demolish O&M Building and Foundation	1	Lump Sum	$5,000.00	$5,000
Demolish O&M Site Improvements (fences, etc)	1	Lump Sum	$3,000.00	$3,000
Haul Concrete (O&M Building Foundation)	248	Cubic Yards	$18.00	$4,467
Crush Concrete (O&M Building Foundation)	248	Cubic Yards	$17.00	$4,219
Disposal of Crushed Concrete from O&M Building Foundation	248	Cubic Yards	$10.00	$2,481
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	1,081	Cubic Yards	$2.62	$2,832
Haul Gravel Removed from O&M Site	1,081	Cubic Yards	$16.06	$17,360
Disposal of Gravel from O&M Site	1,081	Cubic Yards	$0.00	$0
Decompact O&M Building Site	1	Lump Sum	$1,048.73	$1,049
Grade O&M Building Site	1	Lump Sum	$11,443.33	$11,443
Erosion and Sediment Control at O&M Building Site	1	Lump Sum	$5,743.00	$5,743
Topsoil and Revegetation at O&M Building Site	0.2	Acres	$13,068.00	$3,000
Subtotal O&M Building				**$67,094**
Site Restoration				
Stabilized Construction Entrance	8	Each	$2,000.00	$16,000
Perimeter Controls (Erosion and Sediment Control)	82,753	Linear Feet	$3.61	$298,738
Till to Farmable Condition on Roadway Areas	38	Acres	$177.52	$6,658
Till to Farmable Condition on Array Areas	936	Acres	$177.52	$166,220
Subtotal Site Restoration				**$487,616**
Project Management				
Project Manager	52	Weeks	$3,749.00	$194,948
Superintendent	52	Weeks	$3,525.00	$183,300
Field Engineer (2)	52	Weeks	$3,269.00	$339,976
Clerk (2)	52	Weeks	$750.00	$78,000
Subtotal Project Management				**$796,224**
Standard industry weekly rates from RSMeans.				
Subtotal Demolition/Removals				**$10,940,500**
Salvage				
Fencing (Agricultural)	132	Tons	$221.13	$29,171
Fencing (Chain Link)	18	Tons	$221.13	$4,018
Steel Posts	4,269	Tons	$221.13	$944,074
Module Racking	10,002	Tons	$221.13	$2,211,770
PV Modules	334,685	Each	$45.60	$15,261,636
Transfomers and Inverters	1,512,611	Pounds	$0.26	$397,060
Substation Transformer (Core and Coils)	157,000	Pounds	$0.26	$41,213
Substation Transformers (Tanks and Fittings)	53	Tons	$221.13	$11,688
Transformers (Oil)	52,820	Gallons	$0.70	$36,974
Substation Ground Grid (Copper)	13,060	Pounds	$2.78	$36,242
DC Collection Lines (Copper)	9,138	Pounds	$0.93	$8,498
AC Collection Lines (Aluminum)	1,075	Pounds	$0.76	$814
Overhead Lines (Aluminum)	1,418	Pounds	$0.76	$1,074
Subtotal Salvage				**$18,984,300**
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				**($8,043,800)**
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.				

10.0 FINANCIAL ASSURANCE

Northern Crescent Solar Project anticipates operating the Project for 30 years or until the Site Permit expires. Northern Crescent Solar reserves the right to continue to operate the Project, instead of decommissioning, by applying for an extension of required permits. Should the Project Owner decide to continue operations, a decision may be made on whether to continue operation.

The Project Owner will be responsible for all costs to decommission the Project and associated facilities. A Financial Assurance in the form of an escrow account or surety bond equal to 125% of the costs to ensure proper decommissioning will be provided, with Faribault County listed as the beneficiary. Under DOC EERA recommendations, a Financial Assurance is not required during the first ten (10) years of operation; however a bond will be posted no earlier than the 10th anniversary from the Commercial Operation Date (COD) of the Project.

According to the EERA recommendations, a revised decommissioning estimate shall be submitted every 5 years or any time there is a change in ownership. 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, including current salvage values of materials and equipment. 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.

Estimated Financial Assurance amounts over the life of the project are listed in **Table 2**. The estimated values were developed assuming a 3% annual inflation rate for all decommissioning costs. Metals salvage values have conservatively been assumed to depreciate at 1% annually, though it is more likely that these values will fluctuate up and down over time. The value of the solar modules is assumed to decline as a factor of both power output and age; the modules are assumed to hold zero value after the end of the power output warranty at Year 25. In accordance with DOC EERA recommendations, and as shown in **Table 2**, the Financial Assurance will be posted in Year 10, at which point construction costs are anticipated to exceed salvage values.

Please note the values in **Table 2** are provided for reference only; the Financial Assurance amounts will be determined by the revised decommissioning estimates that will be prepared and submitted on a five-year basis.

Table 2: PROJECTED DECOMMISSIONING FINANCIAL ASSURANCE AMOUNT BY YEAR

ır of Operation	Estimated Net Decommissioning Costs	Recommended Financial Assurance Amount *(125% Estimated Cost)*
0	$ (8,043,800)	$ -
5	$ (2,097,255)	$ -
10	$ 2,896,858	$ 3,621,072
15	$ 8,455,255	$ 10,569,069
20	$ 13,627,728	$ 17,034,659
25	$ 18,242,463	$ 22,803,079
30	$ 23,801,809	$ 29,752,261

If decommissioning of the Project is undertaken, Northern Crescent Solar will, upon satisfactory completion, provide supporting documentation to the MN PUC and County with a request for the release of a corresponding amount of the Financial Assurance. Northern Crescent Solar commits that if it does not complete decommissioning within the time specified in the Site Permit, then the County may take action as necessary to complete decommissioning, including drawing on the Financial Assurance.

11. DECOMMISSIONING ASSUMPTIONS

To develop a cost estimate for the decommissioning of the Northern Crescent Solar 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 **Table 1** Detailed Cost Estimate spreadsheet (see above). When publicly available bid prices or Minnesota Department of Transportation (MnDOT) bid summaries were not available for particular work items, Westwood developed time-and-material-based estimates considering composition of work crews and equipment and material required using RS Means. When materials have a salvage value at the end of the Project life, the construction activity costs and the hauling/freight cost are separated from the disposal costs or salvage value to make revisions to salvage values more transparent.

1. Decommissioning costs are based on current pricing. As per the EERA recommendations, an initial financial security will be posted after the 10th anniversary of the project start date. The anticipated life of the Project is 30 years.
2. This cost estimate is based on Project preliminary site plan CAD files prepared by Westwood.
3. A project of this size and complexity requires a full-time project manager or support staff.
4. Common labor will be used for the majority of the tasks except for heavy equipment operation. Since MnDOT unit prices are used, for some items, the labor rates will reflect union labor rates.

5. Mobilization was estimated at approximately 7% of total cost of other items.
6. Permit applications required include the preparation of a SWPPP and a SPCC Plan.
7. Road gravel removal was estimated on a time and material basis using 20- or 24-foot width (based on the segment) and an 8-inch thickness for the access roads. Substation aggregate is included in the substation quantities. Since the material will not remain on site, a hauling cost is added to the removal cost. Road aggregate can often be disposed of by giving to landowners for use on driveways and parking areas. Many landfills will accept clean aggregate for use as "daily cover" and do not charge for the disposal.
8. Grade Road Corridor reflects the cost of mobilizing and operating light equipment to spread and smooth the topsoil stockpiled on site to replace the aggregate removed from the road.
9. Erosion and sediment control along road reflects the cost of silt fence on the downhill side of the road and surrounding all on-site wetlands.
10. Topsoil is required to be stockpiled on site during construction, therefore this topsoil is available on site to replace the road aggregate, once removed. Subsoiling costs to de-compact roadway areas is estimated as $222.97 per acre (based on MnDOT bid prices). Tilling to an agriculture ready condition is estimated as $177.52 per acre (based on MnDOT bid prices for Soil Bed Preparation). The vast majority of the Project Area is tilled to agriculture ready condition since the decommissioning activities are not expected to heavily compact the soils. Any array areas, if left as pasture, will require little restoration effort since the arrays will have been planted with native seed mixes, and the soils will have been rejuvenated by being planted as prairie and removed from intense farming.
11. Fence removal includes loading, hauling, and recycling or disposal. Fence and posts weigh approximately 10 pounds per foot.
12. Array support posts are generally lightweight "I" beam sections installed with a piece of specialized tracked equipment. Crew productivity is approximately 240 posts per day, and the same crew and equipment should have a similar productivity removing the posts, resulting in a per post cost of approximately $16.60. When salvage values are not recognized the costs for processing metal to size and the hauling cost to a more distant recycling facility are generally not included, but the minimum decommissioning financial security controls by such a large margin that the lower price for removals and freight are not shown.
13. Based on the review of a manufacturer's details of the array support structures, the structure weigh approximately 15 pounds per linear foot or array. The facility has 352,300 modules, for a total module weight approximately 12,700 tons. The arrays are made of steel pipes so 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 $135 per ton.

14. The selected metal recycling facility (J & J Recycling Scrap Yard) is located in Elmore Township, MN 56027, approximately 17 miles from the project site. Hauling costs to the recycling facility are approximately $0.38 per ton mile, or $6.46 per ton.
15. The selected disposal facility (Dickinson County Landfill) is located in Spirit Lake, IA 51360, approximately 71 miles from the project site. Hauling costs to the landfill are estimated to be $22.99 per ton.
16. The solar panels rated at 570 watts measure approximately 3.72 feet by 7.47 feet and weigh 50.04 pounds so they can easily be disconnected, removed, and packed by a three-person crew at a rate we estimate at 12 panels per hour.
17. It is expected that Power Electronics FS4200M inverters will be used on this Project. Pad mounted inverters are modular medium sized enclosures measuring 12’ x 7’ x 7’ that are mounted on a metal frame. They weigh approximately 30,865 lbs each and can be disconnected by a crew of electricians. They must be lifted by a truck mounted crane for transport to the recycler. They contain copper or aluminum windings.
18. Transformers for this Project will likely be mounted on the same equipment skids as the inverters. The transformers and associated cabinets weigh approximately 20,000 pounds and 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 the metal frames and conduits feeding the equipment.
19. Medium voltage (MV) equipment and Supervisory Control and Data Acquisition (SCADA) equipment are mounted on the same equipment skid as the transformer and enclosed in weatherproof cabinets. Their size requires light equipment to remove them. The costs shown include the removal of the metal frame.
20. The underground collector system cables are placed in trenches, inside of PVC conduits, with a minimum of 38 inches of cover.
21. To reduce tracking of sediment off-site by trucks removing materials, Westwood included a rock construction entrance priced based on state MnDOT bid prices.
22. Perimeter control pricing is based on a sediment fence placed on the downgrade side of the work area perimeters and protecting wetlands and drainage swales within the Project area. Pricing is based on RS Means unit prices.
23. No topsoil will be removed from the landowner’s property or used on other landowners’ property during decommissioning. Most of the site will not have been compacted by heavy truck or equipment traffic so no topsoil will need to be imported, and very few areas will need to be decompacted.
24. Metal salvage prices (steel, aluminum, copper) are based on quotes from www.scrapmonster.com for the U.S. Midwest in November 2023. 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 difficulty of realizing the full spot prices posted. The prices are three months old at the time they are displayed on the website.

25. The steel posts and array racking are priced based on 75 percent of the HMS (high melt steel) 80/20 the price listed on www.scrapmonster.com in November 2023 ($325 per ton).
26. Solar module degradation is estimated at approximately 2.5% in year 1 and 0.6% annually thereafter. There is currently a robust market for used solar panels and pricing can be found on Solar Biz, eBay and other sites. To avoid unconservative pricing for the used modules we used $0.08 per watt, as quoted in EnergyBin's 2022 Module Price Index. Costs include hauling the used modules to a know recycling facility.
27. There is an active market for reselling and recycling electrical transformers and inverters with several national companies specializing in recycling. 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 windings that can be salvaged. Pricing was obtained from scrapmonster.com in November 2023, for used transformer scrap at a price of $0.35 per pound.
28. The collection lines are priced assuming copper conductor wire for the DC circuits, which is typical. The prices used reflect a reduced yield of the copper resulting frgom the insulation and other materials that must be stripped from the wire so that the copper can be recycled. The estimate uses the Midwest prices of #2 insulated copper wire with a 50% recovery rate ($1.24/pound) and E.C. Aluminum Wire ($1.01/pound).
29. The underground collection lines are assumed to be aluminum conductor. The majority of the length of the collection lines will be buried deep enough so that it does not have to be removed. Those sections coming up out of the ground at junction boxes, or otherwise, can be salvaged.
30. 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.
31. All salvage is based on the weights of bulk material or equipment.