Appendix H

Decommissioning Plan

Byron Solar Project

Dodge and Olmsted counties, Minnesota

This page is intentionally blank

Byron Solar Project

Dodge County, Minnesota

Decommissioning Plan

Prepared for:

EDF Renewables
10 Second Street NE, Suite 400
Minneapolis, MN 55413

Prepared by:

Westwood Professional Services
12701 Whitewater Drive, Suite 300
Minnetonka, MN 55343

August 10, 2021

Table of Contents

1.0 Decommissioning Plan

1.1 General

The Byron Solar Project (the "Project") is a proposed 200 Megawatt alternating current (200 MW-ac) solar electric generating facility and associated 3-mile, 345 kilovolt (kV) High Voltage Transmission Line (HVTL) operated by Byron Solar/ EDF Renewables (the "Owner") using ground mounted photo voltaic panels, located on approximately 1800 acres of land in Dodge County, Minnesota. The facilities will be located in a fenced area of approximately 1600 acres. Byron Solar has secured lease agreements for 100 percent of land for the proposed Solar Facility. The Project's anticipated commercial operation date (COD) is Q4 2024. Byron Solar, an independent power producer (IPP), is actively marketing the Project to a number of potential off-takers and may sell the power in the form of a Power Purchase Agreement (PPA), or the Project could be owned directly by a utility.

The Project is located in a sparsely populated rural area in between the cities of Byron and Kasson, Minnesota. Residences are scattered throughout the rural area where the land use is dominated by agricultural fields, predominately corn and soy. With the exception of U.S. Highway 14, roads that surround the Project are county or township roads. The Solar Facility is bordered on the north by U.S. Highway 14, on the south by County Road 6 (670th Street), and by County Road 15 (270th Ave) and 280th Avenue to the east. Agricultural fields border the Solar Facility to the west. The High Voltage Transmission Line (HVTL) is generally north of U.S. Highway 14 and west of Byron. The Project is located on relatively flat agricultural land that is conducive to solar and transmission line development. The development area will include approximately 594,048 solar panels, 23 miles of gravel access roads, 35 miles of buried electrical collection line, 64 inverters, a 2.6-acre O&M Facility, 6.8-acre Project Substation, stormwater basins (~17 acres), a 3-mile 345 kV HVTL, and a laydown yard (~12 acres).

The following provisions are intended to ensure that facilities are properly removed after their useful life. The 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 site according to 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, and in accordance with Section 9 of the Minnesota Public Utilities Commission (MPUC) Site Permit (MPUC Docket No. IP-7041). The Contractors will comply with requirements of all permits during the decommissioning process, and the land will be restored to its pre-construction condition to the extent practicable.

1.2 Decommissioning and Reclamation Objective

Solar panels are expected to have a useful commercial lifespan of approximately 35 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. The Site Permit will be for a term of 30 years, upon which the Project operation may be extended (upon Commission review and approval) or the Project ceases to operate. The 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 and sedimentation basins 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 site will be restored to pre-construction conditions, to the extent feasible. All access roads and other areas compacted by equipment will be de-compacted to a depth necessary to ensure drainage of the soil and root penetration prior to fine grading and tilling to a farmable condition or maintaining the existing vegetation. In accordance with Site Permit requirements, 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.

1.3 List of Decommissioning Activities

1.3.1 Timeline

Decommissioning is estimated to take approximately 40 weeks to complete and the decommissioning crew(s) will ensure that all equipment and materials are recycled or disposed of properly.

1.3.2 Notice to Parties

Within ninety (90) days of the start of the decommissioning, a notice will be sent to landowners and local units of government. Permits will be obtained prior to the start of any work (see Section 1.4).

1.3.3 Removal and Disposal of Site Components

The removal and disposal details of the 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 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 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. 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 to a density similar to the surrounding soils to promote plant growth and maintain drainage. Topsoil will be redistributed across the disturbed area. Overhead High Voltage Transmission Line (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, 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 Vegetation Management Plan (VMP).

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 Byron Solar are pile foundations for both equipment skids and met 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 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 extent feasible.

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

1.3.4 Restoration/Reclamation of Site

The Owner will restore and reclaim the site to the pre-Project condition consistent with the site lease agreement. The Owner assumes that most of the 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 mixes specified in the approved Stormwater Pollution Prevention Plan (SWPPP) and Vegetation Management Plan (VMP). 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 and vegetation established during operation of the facility. The decommissioning effort will implement best management practices (BMP's) to minimize erosion and to contain sediment on the Project to the extent practicable with the intent of meeting this goal include:

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

2. Removal of 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 returning 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 nine (9) months after the solar energy farm is considered a discontinued use.

1.4 Permitting and Post-Restoration Monitoring

It is anticipated that the following permits may be needed prior to or during decommissioning:

- U.S. Army Corps of Engineers (USACE): Section 404 Permit
- U.S. Environmental Protection Agency (EPA): Spill Prevention, Control, and Countermeasures Plan (SPCC)
- Minnesota Pollution Control Agency (PCA): Section 401 Water Quality Certification
- Minnesota Pollution Control Agency (PCA): National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS)
- Minnesota Pollution Control Agency (PCA): Stormwater Pollution Prevention Plan (SWPPP)
- Minnesota Wetland Conservation Act Approval or No Loss Determination
- County work in right-of-way, utility, and moving permits

Decommissioning of the site will comply with permits listed above if grading activities are necessary and/or exceed permit thresholds. Byron Solar will coordinate with applicable agencies and permitting staff to acquire needed permits prior to initiating decommissioning activities as well as notifying and coordinating with local governments and landowners. Decommissioning may include post-restoration monitoring as required by the NPDES/SDS CSW Permit and SWPPP, AIMP, VMP and other applicable requirements. In addition, the Owner's Field Representative assigned to decommissioning monitoring will stay in contact with the landowner, including onsite check-ins until the NPDES/ SDS CSW permit is closed.

1.5 Financial Assurance Plan

Byron Solar will be financially responsible to decommission the Project, which will include removal of all equipment, improvements, and facilities. The original decommissioning plan approved by the Commission will be updated and reviewed by a Professional Engineer licensed in the State of Minnesota every five years from the start of operation to account for uncertainties in future salvage values, and decommissioning costs.

Consistent with the Solar and Wind Decommissioning Working Group recommendation, EERA recommends that the financial assurance begin in year 10 and that the surety provide for full decommissioning costs prior to the expiration of any PPA. During the 10th year of operation, Byron Solar will enter into a surety bond agreement, create an escrow account, create a reserve fund, or provide another form of security that will ultimately fund decommissioning and site restoration costs after Project operations cease, to the extent that the salvage value does not cover decommissioning costs. Byron Solar will decommission the Project in accordance with the conditions outlined in the PUC Site Permit. Byron Solar

will notify the appropriate landowners and local governing bodies of the decommissioning schedule and has included an obligation to decommission the Project components in applicable real estate agreements.

1.6 Estimated Net Decommissioning Costs

The decommissioning costs are calculated using current pricing. In keeping with the 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 decommissioning 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 the manufacturer (not more than 0.5 percent per year). We used a pricing of 80 percent of the $0.0875 per watt price quoted by We Recycle Solar, a renowned PV disposal provider, for a similar project within the last two months. The price is based on the buyer transporting panels placed on pallets from the Project site to a We Recycle Solar facility. The total anticipated salvage value from recycling solar modules alone is estimated at $19,596,984, accounts for about 75% of the total salvage value of $26,100,700.

The estimated cost for decommissioning is approximately $12,888,300 ($42,400 per MW). The resale and salvage value of the Project facilities is approximately $26,100,700 ($85,500 per MW) resulting in a net surplus of approximately $13,212,400 ($43,130 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, and value as a going concern. Under EERA recommendations a Financial Assurance is not required during the first ten (10) years of operation. A bond will be posted no earlier than the 10th anniversary from the date of Operation with the County. The cost of decommissioning will be updated every five years after the tenth year of operation in accordance with the EERA recommendations.

For additional detail on the assumptions made see Section 1.6.

Cost estimate on next page.

Cost estimate:

Byron Solar Project				
Project Size	304.20	MW-DC	200.00	MW-AC
	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization	1	Lump Sum	$796,200.00	$796,200
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	47,056	Cubic Yards (BV)	$2.47	$116,345
Haul Gravel Removed from Road (Kasson, MN)	58,820	Cubic Yards (LV)	$6.38	$375,258
Disposal of Gravel Removal from Road (Use as Daily Cover)	76,230	Tons	$0.00	$0
Removal Geotextile Fabric from Road Area	211,751	Square Yards	$1.40	$296,452
Haul Geotech Fabric Removed from Beneath Access Roads	58	Tons	$4.68	$272
Disposal of Geotech Fabric Removed from Beneath Access Roads	58	Tons	$75.00	$4,367
Remove and Load Culvert from Beneath Access Roads	8	Each	$448.00	$3,584
Haul Culvert Removed from Access Roads	2	Tons	$4.68	$11
Disposal of Culverts (Kasson, MN)	2	Tons	$75.00	$180
Removal Low Water Crossing from Road	10	Each	$3,400.00	$34,000
Haul Low Water Crossing Materials Removed from Access Road	400	Ton	$4.68	$1,871
Disposal of Low Water Crossing Materials	400	Ton	$30.00	$12,000
Grade Road Corridor (Re-spread Topsoil)	119,110	Linear Feet	$1.55	$184,604
Decompaction on Road Area	65.63	Acres	$252.39	$16,563
Removal of Security Fence (Agriculture Fence)	97,623	Linear Feet	$3.49	$340,900
Subtotal Civil Infrastructure				**$1,386,408**
Structural Infrastructure				
Removal Steel Foundation Posts (Arrays, Equipment, Met Towers)	100,237	Each	$13.38	$1,340,795
Haul Array Steel Post (Dodge Center, MN)	5,544	Tons	$4.92	$27,261
Removal of Tracker Racking per String	22,941	Each	$91.00	$2,087,729
Haul Tracker Racking (Dodge Center, MN)	16,934	Tons	$4.92	$83,272
Subtotal Structural Infrastructure				**$3,539,058**
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	596,466	Each	$5.27	$3,143,873
Haul PV 95% of Panels to Reseller (Louisville, KY)	17,802	Tons	$125.60	$2,235,820
Haul 5% of PV Panels for Disposal (Rochester, MN)	937	Tons	$5.38	$5,041
Removal of Equipment Skids	64	Each	$1,048.34	$67,093
Haul Equipment to Recycler (Owatonna, MN)	64	Each	$207.45	$13,277
Removal of Scada Equipment	1	Each	$2,000.00	$2,000
Removal of DC Collector System Cables (copper)	200	Per MW	$2,000.00	$400,000
Removal of Underground (AC) Collector System Cables	64	Locations	$400.00	$25,600
Load and Haul Cables for Recycling	231.3	Tons	$4.92	$1,137
Subtotal Electrical Collection				**$5,893,841**

Transmission System				
Removal of Overhead Cables (345 kV)	15,232	Feet	$7.90	$120,333
Loadout Overhead Cables	69	Tons	$37.00	$2,561
Haul Overhead Cables (345 kV)	69	Tons	$4.92	$340
Disposal of Overhead Cables (345 kV) (See Salvage Value)	69	Tons	$0.00	$0
Remove and Load Steel Transmission Poles	18	Each	$931.86	$16,773
Haul Steel Poles for Recycling	18	Each	$47.85	$861
Haul Hardware, Bracing, and Attachments for Disposal	18	Each	$6.52	$117
Transmission Pole Component Disposal	18	Each	$75.00	$1,350
Topsoil and Revegetation at Removed Pole	18	Each	$26.22	$472
Subtotal Transmission System				**$142,808**
Substation				
Disassembly and Removal of Main Power Transformer(s)	1	Each	$4,500.00	$4,500
Freight Transformer(s) Offsite	175	Tons	$8.30	$1,450
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)	140	Cubic Yards	$140.54	$19,676
Backfill Excavation Area from Transformer Foundation Removal	120	Cubic Yards	$42.04	$5,045
Haul Concrete (Foundations Transformer, Switch Gear, etc.)	284	Tons	$5.38	$1,529
Disposal of Concrete from Transformer Foundation	284	Tons	$75.00	$21,315
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	$12,915.50	$12,916
Load Copper Wire	20,000	Feet	$0.62	$12,382
Haul Copper Wire to Recycling	6.5	Tons	$4.92	$32
Haul - Demolition Materials, Removed Equipment & Structural Steel	10	Tons	$4.92	$49
Disposal of Demolition Materials & Removed Equipment	10	Tons	$75.00	$750
Remove and Load Gravel Surfacing from Substation Site	4,938	Cubic Yards (BV)	$2.47	$12,210
Haul Gravel Removed from Substation Site	6,173	Cubic Yards (LV)	$6.38	$39,381
Disposal of Gravel from Substation Site (Use as Daily Cover)	8,000	Tons	$0.00	$0
Grade Substation Site	200,000	SF	$0.06	$12,916
Erosion and Sediment Control at Substation Site	1,800	LF	$1.92	$3,456
Decompact Substation Site (Subsoiling)	4.6	Acres	$252.39	$1,159
Permanent Seeding at Substation Site	4.6	Acres	$150.48	$691
Subtotal Substation				**$175,257**
Site Restoration				
Stabilized Construction Entrance	2	Each	$2,000.00	$4,000
Perimeter Controls (Erosion and Sediment Control)	75,000	Linear Feet	$1.92	$144,000
Till to Farmable Condition on roadway areas	66	Acres	$150.48	$9,875
Till to Farmable Condition on array areas	1,407	Acres	$150.48	$211,775
Subtotal Site Restoration				**$369,650**

Project Management					
Project Manager	40	Weeks	$3,800.00	$152,000	$500
Superintendent	40	Weeks	$3,525.00	$141,000	$464
Field Engineer (2)	40	Weeks	$2,775.00	$222,000	$730
Clerk (2)	40	Weeks	$750.00	$60,000	$197
Subtotal Project Management				**$575,000**	
Subtotal Demolition/Removals				**$12,888,300**	**$42,368**
Salvage					
Fencing (Agricultural)	151	Tons	$243.75	$36,883	$121
Fencing (Chain Link)	10	Tons	$243.75	$2,336	$8
Steel Posts	5,544	Tons	$243.75	$1,351,321	$4,442
Module Racking	16,934	Tons	$243.75	$4,127,779	$13,569
PV Modules	566,643	Each	$34.58	$19,596,984	$64,422
Transfomers and Inverters	2,606,016	Pounds	$0.28	$723,169	$2,377
Substation Transformers (Core and Coils)	208,916	Pounds	$0.28	$57,974	$191
Substation Transformers (Tanks and Fittings)	70	Tons	$243.75	$17,144	$56
Transformers (Oil)	72,350	Gallons	$0.70	$50,645	$166
Substation Ground Grid (Copper)	13,060	Pounds	$3.34	$43,620	$143
DC Collection Lines (Copper)	208	Pounds	$1.22	$253	$1
AC Collection Lines (Aluminum)	23	Pounds	$0.68	$16	$0
Steel Transmission Poles	112	Tons	$243.75	$27,300	$90
Transmissions Line (Steel)	26	Tons	$266.25	$6,937	$23
Transmission Lines (Aluminum)	86,383	Pounds	$0.68	$58,308	$192
Subtotal Salvage				**$26,100,700**	**$85,497**
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				**($13,212,400)**	**($43,130)**
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.					

1.7 Decommissioning Assumptions

To develop a cost estimate for the decommissioning of the Byron 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 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 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. The initial financial security covers the first 10 years of operation, and at year 10 the cost estimate will be revised. The anticipated life of the Project is 35 years.
2. This Cost Estimate is based on preliminary drawings dated 03/18/21 and site plan data provided by EDF.
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 Storm Water Pollution Protection Plan (SWPPP) and a Spill Prevention Control and Countermeasure (SPCC) Plan.
7. Road gravel removal was estimated on a time and material basis using a 16-foot width 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 top soil is available on site to replace the road aggregate, once removed. Subsoiling costs to decompact roadway areas is estimated as $252.39 per acre (based on MnDOT bid prices). Tilling to an agriculture ready condition is estimated as $150.48 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 $13.38. 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. A metal recycling facility (McNelius Recycling) is located in Dodge Center, MN is 11 miles from the Project site. Pricing was acquired from www.scrapmonster.com. The posts weigh approximately 150 pounds each, and we estimate the hauling costs at approximately $0.45 per ton mile. The pricing from Scrapmonster is adjusted to 75 percent of the published price to reflect the processing required for the posts to fit recycling requirements and McNelius Recycling’s margin.
14. 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 596,466 modules, for a total module weight of 18,738 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 $100 per ton.
15. Hauling the steel to Dodge Center, MN at $0.45 per ton mile costs about $4.92 per ton.

16. The solar panels rated at 510 watts measure approximately 3.68 feet by 7.44 feet and weigh 62.8 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. Based on preliminary design information, it is expected that 4200 kVA inverters will be used on this Project. Pad mounted Inverters are modular medium sized enclosures (9'-2" long, 7'-7" tall, and 5'-3" deep (SC 4200 UP-US 4200 kVA US 1500 V) that are mounted on a metal frame. They weigh 8,800 pounds 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 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 3 feet of cover.
21. To reduce tracking of sediment off-site by trucks removing materials, we have 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 March 2021. 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 March, 2021. ($325 per ton)
26. Solar module degradation is approximately 0.50% per year, or 96% of capacity remaining after 5 years, and 83 percent capacity remaining after 30 years. The manufacturer guarantees that panels will have 98 percent the rated capacity when new, so combining the guaranteed capacity and the degradation, the estimate uses 96 percent capacity after five years. There is currently a robust market for used solar panels and pricing can be found on Solar Biz, eBay and other sites. New entrants in the market include We Recycle Solar, which markets used panels in Asia, Africa, and South America. We have assumed that as long as the modules are producing power they will have economic value. To avoid unconservative pricing for the used modules we used a pricing of 80 percent of the $0.0875 per watt price quoted by We Recycle Solar for a similar project within the last two months. The price is based on the buyer transporting panels placed on pallets from the Project site to a We Recycle Solar 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 March 2021, for used transformer scrap at a price of $0.37 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 from the insulation and other materials that must be stripped from the wire so that the copper can be recycled. The estimate uses the Midwest price of #2 copper wire with an 85 percent recovery rate as found on www.scrapmonster.com in March 2021, which is $1.62 per pound. For the salvage value we have assumed 75 percent of the published price.
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. The salvage value is based on the Midwest price of E.C. Aluminum Wire as found on www.scrapmonster.com in March 2021, which is $0.90 per pound. We have reduced the price to 50 percent of the quoted price to reflect the complications of stripping insulation and separating the materials.
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.