Appendix F

Decommissioning Plan

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A DECOMMISSIONING PLAN FOR

Coneflower Energy, LLC

Lyon County, Minnesota

AUGUST 6, 2024

MPUC DOCKET NO. IP7132/GS-24-215

PREPARED FOR:

CONEFLOWER SOLAR

PREPARED BY:

Westwood

Westwood

Decommissioning Plan

Coneflower Energy, LLC

Lyon County, Minnesota

Prepared for:

Coneflower Energy, LLC

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Lake Elmo, Minnesota 55042

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Project Number: 0042396.00

Date: August 6, 2024

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Attachments

Professional Engineer Certification

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the state of Minnesota.

Signature: 

Typed Name: Caroline Boecher

Date: August 6, 2024 License Number: 56715

Acronym List

AIMP	Agriculture Impact Mitigation Plan
Apex	Apex Clean Energy Holdings, LLC
Applicant	Coneflower Energy, LLC
BMP	best management practice
COD	Commercial Operation Date
Coneflower	Coneflower Energy, LLC
Coneflower Solar	Coneflower Energy, LLC
C&I	Commercial & Industrial
DC	direct current
DOC	Minnesota Department of Commerce
EERA	Energy Environmental Review and Analysis
Garvin Scenario	Xcel Energy's proposed Garvin Substation
IPP	independent power producer
kV	kilovolt
LGU	local government unit
MDH	Minnesota Department of Health
MISO	Midcontinent Independent System Operator
MISO Scenario	The Project would interconnect to the Lyon County to Lake Yankton 115 kV transmission line that bisects the northern portion of the Site.
MNDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MV	Medium voltage
MWac	Megawatt alternating current
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
Owner	Coneflower Energy, LLC
Plan	Decommissioning Plan
PPA	power purchase agreements
Project	Coneflower Solar Project
Project Area	2,299 acres under lease or easement agreement for the Coneflower Solar Project
Project Footprint	1,723 acres designed for use by project facilities as part of the Coneflower Solar Project
Project Owner	Coneflower Energy, LLC
PV	photovoltaic
SCADA	Supervisory Control and Data Acquisition
SDS	State Disposal System
Solar Project	Coneflower Solar Project
SPCC	Spill Prevention, Control and Countermeasures Plan
SSTS	Subsurface Sewage Treatment System
SWPPP	Stormwater Pollution Prevention Plan

USACE	US Army Corps of Engineers
VMP	Vegetation Management Plan
VPPA	virtual power purchase agreement
WCA	Minnesota Wetland Conservation Act

1.0 Introduction

Coneflower Energy, LLC (Coneflower, Coneflower Solar, Project Owner, or Applicant) is an independent power producer (IPP) and an indirect wholly owned subsidiary of Apex Clean Energy Holdings, LLC (Apex). Coneflower Solar proposes to construct the Coneflower Solar Project ("Solar Project" or "Project"), an up to 235 megawatt alternating current (MWac) nameplate solar-energy capacity project located in Lyon County, Minnesota. The Project is situated on approximately 2,299 acres of privately-owned land under lease or easement agreement with Coneflower Solar (with the exception of public road rights-of-way) ("Project Area"). Of the 2,299-acre Project Area, approximately 1,723 acres are currently designated to host Project facilities ("Project Footprint").

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 Department of Commerce's (DOC's) Energy Environmental Review and Analysis (EERA) *Recommendations on Review of Solar and Wind Decommissioning Plans (March 16, 2020)*, the EERA *Application Guidance for Site Permitting of Solar Farms (January 2024)*, and in support of the Minnesota Public Utilities Commission (MPUC) Site Permit Application (MPUC Docket No. IP7132/GS-24-215). The Lyon County Zoning Ordinance has also been considered in the development of this Plan.

1.1 Project Description

The Project is located in Lyon County, Minnesota, northwest of the town of Garvin, all west of US Highway 59 as well as north and south of US Highway 14. It is located within portions of Sections 7, 16-22, and 27 of Township 109 North, Range 41 West, Lyon County, Minnesota. Prior to construction, the Project Area and surrounding areas were primarily used for agricultural production.

The Project will consist of 547,560 solar panels, 60 power conversion units, approximately 2,200,000 feet of panel racking frames, approximately 181,000 linear feet of fencing (around Project facilities), approximately 76,000 linear feet of access roads (including turnarounds), an operations and maintenance (O&M) building, a Project Substation with two main power transformers, an overhead transmission line tap, and associated equipment.

This Plan has been prepared to consider two design scenarios: one where the Project would use its Midcontinent Independent System Operator (MISO) queue position and interconnect with the Lake Yankton 115 kV transmission line in the northern part of the project area ("MISO Scenario"), and one where it would connect with Xcel Energy's proposed Garvin Substation ("Garvin Scenario"). In the MISO Scenario, the interconnection utility, Xcel Energy, will permit, construct, own, and operate a switching station immediately adjacent to the Project Substation and up to 500 feet (a single span) of 115 kilovolt (kV) transmission line to interconnect into the existing Lyon County to Lake Yankton 115 kV transmission line. In the Garvin Scenario, a short (up to one mile, depending on final location of the Garvin Substation) 345 kV transmission line will be needed. As the route and length of a future gen-tie transmission line are unknown at this time, it is not included in the decom plan and cost estimate.

Should the Garvin Scenario receive interest and approvals at a future date, Coneflower will update this Plan to reflect interconnection changes and associated decommissioning costs. This Plan addresses both scenarios; separate cost estimates have been prepared for each scenario to reflect the respective costs of decommissioning.

Aside from the differences in the interconnect locations, which will affect the length of the gen-tie and some of the access roads, the facility design will be the same between the two design scenarios. As such, the decommissioning approach, methodology, and duration will be very similar in either scenario.

2.0 Decommissioning Objective

The objective of decommissioning is to restore the Project Area to a condition that will facilitate its pre-construction use at the end of operation. The Project is anticipated to be operational for at least thirty (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 MPUC 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 Project Area to pre-construction topography and topsoil quality to the extent practical and assumes that most of the Project Area 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, hanging and 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 Area 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 Project Area 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

As described above there are two possible interconnection options for the project: the MISO Scenario, in which the Project would interconnect with the Lake Yankton 115 kV transmission line in the northern

part of the Project Area, and the Garvin Scenario, where it would connect with Xcel Energy's proposed Garvin Substation. In either scenario, solar generated energy within the photovoltaic (PV) arrays will be transmitted to the Project Substation, which in turn would connect to either an adjacent utility-owned switching station (MISO Scenario) or the proposed Garvin Substation (Garvin Scenario).

Coneflower Solar has not yet executed any power purchase agreements (PPAs) or any other off-take agreements. However, given the various interconnection scenarios, Coneflower could enter into an agreement with the interconnection utility or with a Commercial & Industrial (C&I) customer. The Garvin Scenario could also result in a different type of agreement with Xcel Energy. In either case, Coneflower is proposing to construct this Project to sell energy, capacity and renewable energy credits, either bundled or unbundled, to one or more electric utilities and/or commercial customers. Coneflower Solar plans to sell the power from the Project to off-takes through a PPA, virtual power purchase agreement (VPPA), or similar contractual agreement.

4.0 Proposed Future Land Use

Prior to the development of the Project/Facility, the land use of the Project Area was primarily agricultural production. 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

The Applicant anticipates operating the Project for thirty (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 at least ninety (90) days prior to the start of decommissioning activities, the Project Owner will notify the MPUC, landowners, affected parties, counties, and other local units of government in writing, of the intended decommissioning activities and schedule. Applicable permits and approvals will be obtained prior to the start of decommissioning work. These parties will again be notified once decommissioning activities have been completed.

6.0 Decommissioning Tasks and Timing

Decommissioning will include the removal and transportation of all project components from the Project Area. 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.

During decommissioning, the landowners will be consulted to identify the extent and type of work to be completed. Some Facility infrastructure, such as the access roads, and fencing, may be removed at the

discretion of the landowner(s). Underground utility lines, if deeper than forty-eight (48) inches below ground surface elevation, may be left in place to minimize land disturbance and associated impacts to future land use.

6.1 Decommissioning of Project Components

The decommissioning process will be generally the same for both the MISO and Garvin scenarios, due to only minor differences between the project designs. It is assumed that components from either scenario will be managed as summarized below.

6.1.1 Solar Modules

Solar 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. Non-functioning modules will be shipped to the manufacturer or a third party for recycling or disposal.

6.1.2 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.

6.1.3 Steel Foundation Posts

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.

6.1.4 Hanging and Underground Cables and Lines

The hanging direct current (DC) collection system will be removed with the modules and racking. All underground cables and conduits (AC collection system) will be removed to a depth of forty-eight (48) inches. Facilities deeper than forty-eight (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 twenty-five (25) feet around the perimeter of pads. 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 standards. Topsoil will be redistributed across the disturbed area.

6.1.5 Inverters, Transformers, and Ancillary Equipment

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

6.1.6 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 to a

depth of at least forty-eight (48) inches. All unexcavated areas compacted by equipment used in decommissioning will be decompacted 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 Project Area 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.

6.1.7 Fence

Fence parts and foundations will be removed from the Project Area 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. The surrounding areas will be restored to pre-solar farm conditions to the extent feasible.

6.1.8 Access Roads

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

1. After final clean-up, roads may be left intact through mutual written agreement of the landowner and the Owner 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 Project Area 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 a reduced disposal cost. Internal service roads are 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 in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming. Topsoil that was stockpiled during the original construction will be distributed across the open area. Finally, the access road corridors will be tilled to an agricultural condition.

6.1.9 Substation

Decommissioning of the Project substation will be performed with the rest of the Project. 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 forty-eight (48) inches. The rock base will be removed using bulldozers and backhoes or front loaders. The material will be hauled from the Project Area 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 in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming.

6.1.10 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 Project Area 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 in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming. 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 revegetated using an approved seed mix, depending upon location and pre-construction land cover.

6.2 Component Disposal

Project components removed from the Project Area will be resold, reused, recycled, or scrapped to the greatest extent possible. The components generated for recycling/disposal will be generally the same for both the MISO and Garvin scenarios. It is assumed that components from either scenario will be managed as summarized below.

- Metal components will be processed to size, sorted, and hauled to a recycling facility (Alter Metal Recycling - Marshall in Marshall, Minnesota, approximately seventeen (17) miles from the Project Area) to be processed as scrap. This includes:
    - Steel components, including steel piles and trackers, chain-link fencing, structural steel from the substation, steel from the O&M Facility, and smaller components from recycled equipment.
    - Underground and hanging collection, typically composed of aluminum and copper.
    - Copper windings from transformers and inverters, and the copper ground grid from the substation.
- Other electrical equipment may be assessed for its condition and either sold for reuse or scrapped from its components.
- Fluids, such as transformer oils, will be drained and shipped off-site to an approved recycling facility.
- Solar panels will be resold or recycled to the greatest extent possible, based on their age and condition, as well as market conditions around resale of solar panels and advancements in recycling technologies. For the purposes of this cost estimate, we have assumed that 95% of panels will be resold to another party for reuse or recycling. The estimate conservatively assumes that 5% will be damaged beyond repair in the decommissioning process and will be hauled to a landfill authorized to accept potentially hazardous components of the damaged solar modules.
- If possible, clean gravel removed from the Project Area may be re-used to improve public roads or used by local landowners to improve driveways or be used as clean fill. For the purposes of this cost estimate, it's assumed that the gravel will be hauled to a landfill, where it may be accepted as "daily cover" at a reduced charge.

Project components that are not recyclable may include items composed of mixed materials, certain plastic components, materials that have been contaminated, and certain general municipal wastes. For the purposes of this Plan, it is assumed that these materials will be hauled to Lyon County Landfill, located in Lynd, Minnesota, approximately twelve (12) miles from the Project Area. The landfill currently has a permitted capacity that will allow projected operation for thirty-three (33) years, through 2057.

Additionally, the landfill anticipates requesting a permitted expansion within the next ten (10) years, which would provide enough capacity to last sixty (60) years from the present (through 2084). As such, it is anticipated that the landfill will have sufficient capacity to accept the Project's disposal materials at the end of the Project life.

6.3 Reclamation

The Owner will restore and reclaim the Project Area to the pre-Project condition consistent with the Project Area lease agreements, AIMP, and VMP, as applicable. The Applicant assumes that most of the Project Area will be returned to farmland and/or pasture after decommissioning and will implement appropriate measures to facilitate such uses. Areas that consisted of non-agricultural vegetation prior to construction of the Project will be restored and reseeded to match pre-construction conditions to the greatest extent possible. If no specific use is identified, the Owner will plant unvegetated portions of the Project Area with a seed mix specified in the approved Stormwater Pollution Prevention Plan (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 construction stormwater 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 forty-eight (48) inches, 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.

7.0 Permitting

All decommissioning and restoration activities will comply with applicable federal, state, and local permit requirements. It is assumed that the required permits will be the same for either the MISO or the Garvin scenario. 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 Lyon County within ninety (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 can be completed in sixty (60) week period. Because the project design between the two design scenarios are substantially similar, it is anticipated that the decommissioning schedule will be approximately the same for either scenario. 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. It is anticipated that approximately the same size crews and equipment will be used for decommissioning as will be used in construction of the project. The decommissioning costs are calculated using current pricing. In keeping with the DOC EERA recommendations, the estimate of net costs should be updated every five (5) years to recognize price trends for both decommissioning costs and the salvage and resale values of the components.

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 the average price of used panels, as published in EnergyBin's 2023 "Module Price Index."

The total estimated costs for each scenario to decommission the Project are summarized below:

	Est. Cost of Decommissioning *per MW-DC*	**Est. Salvage Value** *per MW-DC*	**Net Decommissioning Costs** *per MW-DC*
MISO Scenario	**$21,503,689** *$67,915*	**$42,364,265** *$133,395*	**($20,860,600)** *($65,480)*
Garvin Scenario	**$21,659,398** *$68,384*	**$42,580,880** *$134,077*	**($20,921,500)** *($65,693)*

10.0 Financial Surety

The Project anticipates operating the Project for thirty (30) years or until the Site Permit expires. The Applicant 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 the costs to ensure proper decommissioning will be provided. The MPUC or its designee will be named as the beneficiary of the Financial Assurance. 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 tenth (10^{th}) anniversary from the Commercial Operation Date (COD) of the Project.

According to the EERA recommendations, a revised decommissioning estimate shall be submitted every five (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.

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Attachment A

Decommissioning Cost Estimate

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Coneflower Solar Decommissioning Cost Estimate
MISO Scenario (page 1 of 3)

	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization	1	Lump Sum	$1,344,700.00	$1,344,700
Mobilization was estimated to be approximately 7% of total cost of other items.				
Permitting				
County Permits	1	Lump Sum	$10,000.00	$10,000
State Permits	1	Lump Sum	$20,000.00	$20,000
Subtotal Permitting				**$30,000**
Decommissioning will require SWPPP and SPCC Plans. Cost is an estimate of the permit preparation cost.				
Civil Infrastructure				
Remove Gravel Surfacing from Road	26,418	Cubic Yards (BV)	$3.08	$81,367
Haul Gravel Removed from Road to Landfill (Lynd, MN)	33,023	Cubic Yards (LV)	$7.84	$258,900
Dispose of Gravel Removed from Road (Landfill uses as Daily Cover)	42,798	Tons	$18.00	$770,364
Remove Geotextile Fabric from Beneath Access Roads	152,845	Square Yards	$1.40	$213,983
Haul Geotech Fabric to Landfill (Lynd, MN)	42.0	Tons	$7.08	$297
Dispose of Geotech Fabric	42.0	Tons	$33.00	$1,386
Remove and Load Culvert from Beneath Access Roads	26	Each	$420.00	$10,920
Haul Culvert Removed from Access Roads to Landfill (Lynd, MN)	7.8	Tons	$7.08	$55
Dispose of Culvert	7.8	Tons	$33.00	$257
Remove Low Water Crossing from Access Road	10	Each	$3,400.00	$34,000
Haul Low Water Crossing Materials to Landfill (Lynd, MN)	400.0	Ton	$7.08	$2,831
Dispose of Low Water Crossing Materials	400.0	Ton	$30.00	$12,000
Grade Road Corridor (Re-spread Topsoil)	76,423	Linear Feet	$1.60	$122,277
Decompact Road Area	31.6	Acres	$222.97	$7,046
Remove Agricultural Fence	181,099	Linear Feet	$2.71	$490,778
Haul Agricultural Fence to Metal Recycling (Marshall, MN)	281	Tons	$8.78	$2,466
Subtotal Civil Infrastructure				**$2,008,929**
Civil removal costs are a combination of MNDOT unit costs where applicable, RSMeans cost for Windom, MN, and industry standards provided to Westwood.				
Structural Infrastructure				
Remove Steel Foundation Posts (Arrays)	88,389	Each	$16.60	$1,467,257
Remove Steel Foundation Posts (Equipment Skids)	480	Each	$16.60	$7,968
Haul Steel Post to Metal Recycling (Marshall, MN)	6,364	Tons	$7.15	$45,503
Remove Tracker Racking per String	20,280	Each	$219.23	$4,445,984
Haul Tracker Racking to Metal Recycling (Marshall, MN)	15,993	Tons	$7.15	$114,350
Subtotal Structural Infrastructure				**$6,081,062**
Steel removal costs were calculated by using RSMeans information for demolition of steel members. Hauling calculations are based on the locations of metals recyclers.				
Electrical Collection System				
Remove PV Panels	547,560	Each	$10.29	$5,634,392
Haul PV 95% of Panels to Reseller (Louisville, KY)	17,775	Tons	$161.99	$2,879,372
Haul 5% of PV Panels to Landfill (Lynd, MN)	936	Tons	$5.28	$4,942
Dispose of PV Panels	936	Tons	$52.00	$48,672
Remove Combiner Boxes	60	Each	$60.00	$3,600
Remove Equipment Skids	60	Each	$1,167.48	$70,049
Remove Equipment Pad Frames and Foundations	60	Each	$4,596.93	$275,816
Haul Concrete Foundations	68	Tons	$7.08	$481
Dispose of Concrete from Foundations	68	Tons	$33.00	$2,244
Haul Equipment to Transformer Disposal (Marshall, MN)	60	Each	$160.98	$9,659
Remove SCADA Equipment	1	Each	$2,000.00	$2,000
Remove DC Collector System Cables (copper)	317.59	Per MW	$2,000.00	$635,180
Remove Underground (AC) Collector System Cables	145,622	Linear Feet	$2.62	$381,530
Load and Haul Cables for Recycling	2,518	Tons	$7.15	$18,004
Subtotal Electrical Collection				**$9,965,941**
Electrical removal costs of PV Panels and Combiner Boxes were based industry standard installation rates. Equipment pads, MV Equipment, and SCADA Equipment removal cost are based on removal of equipment, concrete pads, and conduits using a truck mounted crane and RSMeans information on crew production rates.				

Coneflower Solar Decommissioning Cost Estimate
MISO Scenario (page 2 of 3)

Substation				
Disassemble and Remove Main Power Transformer(s)	2	Each	$4,500.00	$9,000
Haul Transformer(s) Offsite	263	Tons	$6.44	$1,694
Haul Transformer Oil Offsite	25,660	Gallons	$0.09	$2,309
Dispose of Transformer (Including Oil) (Salvage Value)	2	Each	$0.00	$0
Excavate Around Transformer Foundation(s)	2	Each	$1,965.00	$3,930
Remove Complete Transformer Foundation(s)	167	Cubic Yards	$119.92	$20,027
Backfill Excavation Area from Transformer Foundation Removal	169	Cubic Yards	$43.22	$7,304
Haul Concrete (Foundations Transformer, Switch Gear, etc.)	339	Tons	$7.08	$2,399
Dispose of Concrete from Transformer Foundation	339	Tons	$33.00	$11,187
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	$15,463.00	$15,463
Load Copper Wire	20,000	Feet	$0.79	$15,800
Haul Copper Wire to Recycling	6.5	Tons	$7.15	$46
Haul - Demolition Materials, Removed Equipment & Structural Steel	20	Tons	$7.15	$143
Dispose of Demolition Materials & Removed Equipment	20	Tons	$33.00	$660
Remove and Load Gravel Surfacing from Substation Site	5,454	Cubic Yards (BV)	$3.08	$16,798
Haul Gravel Removed from Substation Site	6,818	Cubic Yards (LV)	$9.65	$65,801
Dispose of Gravel from Substation Site (Use as Daily Cover)	8,836	Tons	$18.00	$159,048
Grade Substation Site	220,900	SF	$0.07	$15,463
Erosion and Sediment Control at Substation Site	940	LF	$3.83	$3,600
Decompact Substation Site (Subsoiling)	5.1	Acres	$222.97	$1,137
Till Substation Site to a Farmable Condition	5.1	Acres	$4,259.20	$21,722
Subtotal Substation				**$396,032**
O&M Building				
Demolish O&M Building	15,000	Cubic Feet	$0.52	$7,800
Demolish O&M Building Foundation	111	Cubic Yards	$12.97	$1,440
Demolish O&M Site Improvements (fences, etc)	1,480	Linear Feet	$7.71	$11,411
Haul Concrete (O&M Building Foundation)	111	Cubic Yards	$9.65	$1,071
Dispose of Concrete from O&M Building Foundation	225	Tons	$33.00	$7,425
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
Dispose 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	74	Cubic Yards (BV)	$3.08	$228
Haul Gravel Removed from O&M Site	93	Cubic Yards (LV)	$7.84	$729
Dispose of Gravel from O&M Site	121	Tons	$18.00	$2,178
Decompact O&M Building Site	0.1	Acres	$350.00	$35
Grade O&M Building Site	1	LS	$7,280.70	$7,281
Erosion and Sediment Control at O&M Building Site	740	Linear Feet	$3.83	$2,834
Till O&M Site to a Farmable Condition	0.1	Acres	$177.52	$18
Subtotal O&M Building				**$48,949**
Site Restoration				
Stabilized Construction Entrance	26	Each	$2,000.00	$52,000
Perimeter Controls (Erosion and Sediment Control)	90,549	Linear Feet	$3.83	$346,803
Till to Farmable Condition on Roadway Areas	31.6	Acres	$177.52	$5,610
Till to Farmable Condition on Array Areas	1,718	Acres	$177.52	$304,944
Subtotal Site Restoration				**$709,356**

Coneflower Solar Decommissioning Cost Estimate
MISO Scenario (page 3 of 3)

Project Management				
Project Manager	60	Weeks	$3,749.00	$224,940
Superintendent	60	Weeks	$3,525.00	$211,500
Field Engineer (2)	60	Weeks	$6,538.00	$392,280
Clerk (2)	60	Weeks	$1,500.00	$90,000
Subtotal Project Management				**$918,720**

Standard industry weekly rates from RSMeans.

Subtotal Demolition/Removals	**$21,503,689**

Salvage				
Fencing (Wire/Agricultural)	281	Tons	$248.34	$69,784
Steel Posts	6,364	Tons	$248.34	$1,580,436
Module Racking	15,993	Tons	$248.34	$3,971,702
PV Modules	520,182	Each	$60.90	$31,679,084
Transformers and Inverters	859,920	Pounds	$0.27	$232,178
Substation Transformers (Core and Coils)	314,000	Pounds	$0.27	$84,780
Substation Transformers (Tanks and Fittings)	106	Tons	$248.34	$26,324
Transformers (Oil)	71,260	Gallons	$0.70	$49,882
Substation Ground Grid (Copper)	13,000	Pounds	$2.73	$35,490
DC Collection Lines (Copper)	3,944,744	Pounds	$0.97	$3,826,402
AC Collection Lines (Aluminum)	1,092,168	Pounds	$0.74	$808,204
Subtotal Salvage				**$42,364,265**

Salvage values are a combination of the following factors; current market metal salvage prices, current secondary market for solar panel

Total Demolition Minus Salvage	**($20,860,600)**

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.

Coneflower Solar Decommissioning Cost Estimate
Garvin Scenario (page 1 of 3)

	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization	1	Lump Sum	$1,354,900.00	$1,354,900
Mobilization was estimated to be approximately 7% of total cost of other items.				
Permitting				
County Permits	1	Lump Sum	$10,000.00	$10,000
State Permits	1	Lump Sum	$20,000.00	$20,000
Subtotal Permitting				**$30,000**
Decommissioning will require SWPPP and SPCC Plans. Cost is an estimate of the permit preparation cost.				
Civil Infrastructure				
Remove Gravel Surfacing from Road	26,352	Cubic Yards (BV)	$3.08	$81,164
Haul Gravel Removed from Road to Landfill (Lynd, MN)	32,940	Cubic Yards (LV)	$7.84	$258,250
Dispose of Gravel Removed from Road (Landfill uses as Daily Cover)	42,690	Tons	$18.00	$768,420
Remove Geotextile Fabric from Beneath Access Roads	152,465	Square Yards	$1.40	$213,451
Haul Geotech Fabric to Landfill (Lynd, MN)	42	Tons	$7.08	$297
Dispose of Geotech Fabric	42	Tons	$33.00	$1,386
Remove and Load Culvert from Beneath Access Roads	23	Each	$420.00	$9,660
Haul Culvert Removed from Access Roads to Landfill (Lynd, MN)	6.9	Tons	$7.08	$49
Dispose of Culvert	6.9	Tons	$33.00	$228
Remove Low Water Crossing from Access Road	10	Each	$3,400.00	$34,000
Haul Low Water Crossing Materials to Landfill (Lynd, MN)	400.0	Ton	$7.08	$2,831
Dispose of Low Water Crossing Materials	400.0	Ton	$30.00	$12,000
Grade Road Corridor (Re-spread Topsoil)	76,233	Linear Feet	$1.60	$121,973
Decompact Road Area	31.5	Acres	$222.97	$7,024
Remove Agricultural Fence	181,099	Linear Feet	$2.71	$490,778
Haul Agricultural Fence to Metal Recycling (Marshall, MN)	281	Tons	$8.78	$2,466
Subtotal Civil Infrastructure				**$2,003,976**
Civil removal costs are a combination of MNDOT unit costs where applicable, RSMeans cost for Windom, MN, and industry standards provided to Westwood.				
Structural Infrastructure				
Remove Steel Foundation Posts (Arrays)	88,389	Each	$16.60	$1,467,257
Remove Steel Foundation Posts (Equipment Skids)	480	Each	$16.60	$7,968
Haul Steel Post to Metal Recycling (Marshall, MN)	6,364	Tons	$7.15	$45,503
Remove Tracker Racking per String	20,280	Each	$219.23	$4,445,984
Haul Tracker Racking to Metal Recycling (Marshall, MN)	15,993	Tons	$7.15	$114,350
Subtotal Structural Infrastructure				**$6,081,062**
Steel removal costs were calculated by using RSMeans information for demolition of steel members.				
Hauling calculations are based on the locations of metals recyclers.				
Electrical Collection System				
Remove PV Panels	547,560	Each	$10.29	$5,634,392
Haul PV 95% of Panels to Reseller (Louisville, KY)	17,775	Tons	$161.99	$2,879,372
Haul 5% of PV Panels to Landfill (Lynd, MN)	936	Tons	$5.28	$4,942
Dispose of PV Panels	936	Tons	$52.00	$48,672
Remove Combiner Boxes	60	Each	$60.00	$3,600
Remove Equipment Skids	60	Each	$1,167.48	$70,049
Remove Equipment Pad Frames and Foundations	60	Each	$4,596.93	$275,816
Haul Concrete Foundations	68	Tons	$7.08	$481
Dispose of Concrete from Foundations	68	Tons	$33.00	$2,244
Haul Equipment to Transformer Disposal (Marshall, MN)	60	Each	$160.98	$9,659
Remove SCADA Equipment	1	Each	$2,000.00	$2,000
Remove DC Collector System Cables (copper)	317.59	Per MW	$2,000.00	$635,180
Remove Underground (AC) Collector System Cables	184,652	Linear Feet	$2.62	$483,788
Load and Haul Cables for Recycling	2,665	Tons	$7.15	$19,055
Subtotal Electrical Collection				**$10,069,250**
Electrical removal costs of PV Panels and Combiner Boxes were based industry standard installation rates. Equipment pads, MV Equipment, and SCADA Equipment removal cost are based on removal of equipment, concrete pads, and conduits using a truck mounted crane and RSMeans information on crew production rates.				

Coneflower Solar Decommissioning Cost Estimate
Garvin Scenario (page 2 of 3)

Substation				
Disassemble and Remove Main Power Transformer(s)	2	Each	$4,500.00	$9,000
Haul Transformer(s) Offsite	263	Tons	$6.44	$1,694
Haul Transformer Oil Offsite	25,660	Gallons	$0.09	$2,309
Dispose of Transformer (Including Oil) (Salvage Value)	2	Each	$0.00	$0
Excavate Around Transformer Foundation(s)	2	Each	$1,965.00	$3,930
Remove Complete Transformer Foundation(s)	167	Cubic Yards	$119.92	$20,027
Backfill Excavation Area from Transformer Foundation Removal	169	Cubic Yards	$43.22	$7,304
Haul Concrete (Foundations Transformer, Switch Gear, etc.)	339	Tons	$7.08	$2,399
Dispose of Concrete from Transformer Foundation	339	Tons	$33.00	$11,187
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	$15,463.00	$15,463
Load Copper Wire	20,000	Feet	$0.79	$15,800
Haul Copper Wire to Recycling	6.5	Tons	$7.15	$46
Haul - Demolition Materials, Removed Equipment & Structural Steel	20	Tons	$7.15	$143
Dispose of Demolition Materials & Removed Equipment	20	Tons	$33.00	$660
Remove and Load Gravel Surfacing from Substation Site	5,454	Cubic Yards (BV)	$3.08	$16,798
Haul Gravel Removed from Substation Site	6,818	Cubic Yards (LV)	$9.65	$65,801
Dispose of Gravel from Substation Site (Use as Daily Cover)	8,836	Tons	$18.00	$159,048
Grade Substation Site	220,900	SF	$0.07	$15,463
Erosion and Sediment Control at Substation Site	940	LF	$3.83	$3,600
Decompact Substation Site (Subsoiling)	5.1	Acres	$222.97	$1,137
Till Substation Site to a Farmable Condition	5.1	Acres	$4,259.20	$21,722
Subtotal Substation				**$396,032**
O&M Building				
Demolish O&M Building	15,000	Cubic Feet	$0.52	$7,800
Demolish O&M Building Foundation	111	Cubic Yards	$12.97	$1,440
Demolish O&M Site Improvements (fences, etc)	1,480	Linear Feet	$7.71	$11,411
Haul Concrete (O&M Building Foundation)	111	Cubic Yards	$9.65	$1,071
Dispose of Concrete from O&M Building Foundation	225	Tons	$33.00	$7,425
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
Dispose 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	74	Cubic Yards (BV)	$3.08	$228
Haul Gravel Removed from O&M Site	93	Cubic Yards (LV)	$7.84	$729
Dispose of Gravel from O&M Site	121	Tons	$18.00	$2,178
Decompact O&M Building Site	0.1	Acres	$350.00	$35
Grade O&M Building Site	1	LS	$7,280.70	$7,281
Erosion and Sediment Control at O&M Building Site	740	Linear Feet	$3.83	$2,834
Till O&M Site to a Farmable Condition	0.1	Acres	$177.52	$18
Subtotal O&M Building				**$48,949**
Site Restoration				
Stabilized Construction Entrance	23	Each	$2,000.00	$46,000
Perimeter Controls (Erosion and Sediment Control)	90,549	Linear Feet	$3.83	$346,803
Till to Farmable Condition on Roadway Areas	31.5	Acres	$177.52	$5,592
Till to Farmable Condition on Array Areas	1,718	Acres	$177.52	$304,944
Subtotal Site Restoration				**$703,338**

Coneflower Solar Decommissioning Cost Estimate
Garvin Scenario (page 3 of 3)

Project Management				
Project Manager	60	Weeks	$3,749.00	$224,940
Superintendent	60	Weeks	$3,525.00	$211,500
Field Engineer (2)	60	Weeks	$6,538.00	$392,280
Clerk (2)	60	Weeks	$1,500.00	$90,000
Subtotal Project Management				**$918,720**

Standard industry weekly rates from RSMeans.

Subtotal Demolition/Removals	**$21,659,398**

Salvage				
Fencing (Wire/Agricultural)	281	Tons	$248.34	$69,784
Steel Posts	6,364	Tons	$248.34	$1,580,436
Module Racking	15,993	Tons	$248.34	$3,971,702
PV Modules	520,182	Each	$60.90	$31,679,084
Transformers and Inverters	859,920	Pounds	$0.27	$232,178
Substation Transformers (Core and Coils)	314,000	Pounds	$0.27	$84,780
Substation Transformers (Tanks and Fittings)	106	Tons	$248.34	$26,324
Transformers (Oil)	71,260	Gallons	$0.70	$49,882
Substation Ground Grid (Copper)	13,000	Pounds	$2.73	$35,490
DC Collection Lines (Copper)	3,944,744	Pounds	$0.97	$3,826,402
AC Collection Lines (Aluminum)	1,384,891	Pounds	$0.74	$1,024,819
Subtotal Salvage				**$42,580,880**

Salvage values are a combination of the following factors; current market metal salvage prices, current secondary market for solar panel

Total Demolition Minus Salvage	**($20,921,500)**

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 State Department of Transportation 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. Project quantities are based on Coneflower Solar Design Docs, dated May 23, 2024.
2. A project of this size and complexity requires a full-time project manager with full-time support staff.
3. Common labor will be used for the majority of tasks, supplemented by electricians, steel workers, and equipment operators where labor rules may require. The labor rates reflect union labor rates.
4. Mobilization was estimated at approximately 7% of total cost of other items.
5. Permit applications will require the preparation of a SWPPP and a SPCC Plan.
6. 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.
7. The selected disposal facility (Lyon County Landfill) is located in Lynd, Minnesota, approximately twelve (12) miles from the Project Area. Hauling costs to the landfill are estimated to be $7.08 per ton.
8. Erosion and sediment control along road reflects the cost of silt fence on the downgradient side of the proposed roads. As such, the length of controls has been estimated to be approximately 50% of the road length.
9. 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 $222.97 per acre, and tilling to an agriculture-ready condition is estimated as $177.52 per acre.
10. The selected metal recycling facility (Alter Metal Recycling - Marshall) is located in Marshall, Minnesota, approximately seventeen (17) miles from the Project Area. Hauling costs to the recycling facility are approximately $0.42 per ton mile, or $7.15 per ton.
11. Tracker foundation 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 $16.60. The posts weigh approximately 150 pounds each.
12. It is assumed that the racking structures weigh approximately fifteen (15) pounds per linear foot of array. Each solar panel has a width of 44.65 inches. The facility will have approximately 547,560 modules and approximately 2,132,000 feet of array. 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 1,800 pounds

per person per hour, or about $278 per ton.

13. The solar panels for this project measure approximately 3.72 feet by 7.47 feet and weigh 68.34 pounds. They can easily be disconnected, removed, and packed by a three-person crew at a rate we estimate at thirty-six (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 8 feet wide by 8 feet 6 inches tall. The skids weigh approximately 62,900 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 copper 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 (Supervisory Control and Data Acquisition) 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 eighteen (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. Perimeter control pricing is based on silt fence installation around downgradient sides of the project perimeter.
19. Metal salvage prices (steel, aluminum, copper) are based on May 2024 quotes from www.scrapmonster.com for the Midwest. 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.
20. A reduction of 25% has been taken from all pricing obtained from www.scrapmonster.com to reflect the processing by the contractor to meet the specifications.
21. The salvage value for steel uses pricing from the Midwest United States at $365 per metric ton, or $331.12 for U.S. ton.
22. Solar module salvage values are shown in current values, assuming near-new conditions for the first few years of operations. Pricing for used panels has been discounted from the average resale price of used panels, as published in EnergyBin's 2023 "Module Price Index." Module values will decline over time as a function of loss of output and age.
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 copper windings that can be salvaged. Pricing was used for Copper Transformer Scrap for the Midwest United States, at $0.36 per pound.
24. The collection lines are priced assuming copper conductor wire for the DC circuits and aluminum wire for the AC circuits. The prices reflect a reduced yield of copper or aluminum resulting from the stripping of insulation and other materials from the wire prior to recycling. The estimate uses the Midwest prices of #2 insulated copper wire with a 50% recovery rate ($1.29 /pound) and E.C. Aluminum Wire ($0.99 /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.