Attachment 5

Decommissioning Plan

Creston Solar and Storage Project

Union County, Iowa

FINAL

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Prepared for:
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1 Introduction

Interstate Power and Light Company (IPL) engaged HDR Engineering, Inc. (HDR) to provide a physical plan to complete decommissioning of the planned Creston Solar and Storage Project (Project) and an estimation of the subsequent decommissioning cost. The Project is expected to consist of a solar photovoltaic (PV) system, a battery energy storage system (BESS), and a project collector substation located in Union County, Iowa. This decommissioning plan (Plan) describes the general measures and procedures that should be developed and implemented to decommission the Project and restore the site, and safely dispose of or recycle recovered project materials.

1.1 Decommissioning Requirements

This decommissioning plan outlines a typical program for decommissioning the Project at the end of the project life cycle that satisfies Union County requirements. This Plan describes the general measures and procedures that should be developed and implemented to decommission the site. Before commencing decommissioning activities, the Project's owner (Owner) at the time of decommissioning will verify with the local, state, or federal agencies any additional requirements and submit a revised plan for approval as required.

Union County requires that a solar and BESS project must submit a decommissioning plan that includes a description of the anticipated life of the facility, the manner in which the facility will be decommissioned, an estimate of the decommissioning cost in current U.S. dollars, and the method for ensuring that funds will be available. The Union County Solar Ordinance #74[1] requires that the applicant include the following (in summary):

- Provisions for removal of all structures, debris, foundations, and associated equipment to no less than 4 feet below the ground surface
- Provisions for restoration of the soil, vegetation and disturbed areas
- An estimate of the decommissioning cost by a licensed professional engineer for demolition and removal of the solar energy system. The salvage value of structures and materials is not to be included in the cost estimate. (Note: this estimate is to be updated every five years as noted in the ordinance.)
- Financial assurance to cover the estimated cost of the facility as noted in the ordinance

According to the ordinance, Union County is to have access to the Project and decommissioning funds one (1) year after cessation of operations and that restoration of site is to be completed within twelve (12) months after decommissioning or abandonment of the Project. Therefore, the Owner will complete the decommissioning of the facility within one year of ceasing operations and restore the site within 12 months after completion of decommissioning.

1.2 Project Description

The Project is located in Union County, Iowa, on approximately 380 acres of agricultural zoned property and is currently under development in conceptual design phase. The Project is planned to consist of 50.0 MWac (58.0 MWdc) of single-axis tracker solar PV facility, a 25 MWac/100MWh

[1] Union County Solar Ordinance #74, Board of Supervisors of Union County, Iowa. November 29, 2021.

BESS facility, and a 34.5 kV to 69 kV project collector substation. The project will interconnect to an existing overhead 69 kV transmission line owned by ITC Midwest.

Major features of the Project are outlined below:

- Solar PV array consisting of 58 MWdc of solar power (50 MWac at point of interconnection)
- Single axis steel trackers and racking in a north-south alignment to support the PV panels that allow for east-west rotation
- Steel piles to support panels/racks and miscellaneous equipment
- An above ground cable management system (CAB)
- DC Collection system (removal up to 4 feet below ground surface elevation as required by decommissioning ordinance)
- AC Collection system (removal up to 4 feet below ground surface elevation as required by decommissioning ordinance)
- Thirteen (13) central inverters rated at 4500 kVA, corresponding medium voltage transformers, and associated data collection equipment for metering and monitoring
- Interior gravel access roads
- 25 MW/100MWh BESS facility (35 BESS containers)
- On-site project collector substation (not expected to be decommissioned and removed)

The Project is planned to be designed with a project life of 30 years.

1.3 Decommissioning Plan Description

This Plan has been developed to outline typical procedures and considerations for decommissioning the Project. Decommissioning may occur because the project has fulfilled its intended purpose and term, or because it has been abandoned. The costs for eventual removal of project infrastructure and site restoration, are included in this report.

2 Decommissioning Procedures

2.1 Overview

In accordance with the Union County Ordinance, after cessation of operation, the Owner shall decommission the Project within one year. As part of decommissioning, the site would be restored to substantially the same physical condition as existed prior to the development of the Project. The decommissioning includes removal of project equipment and all site restoration activities noted in this section. All site activities described below will commence after the site has been de-energized and secured. Because decommissioning activities are not anticipated to occur until project end of life, and regulatory requirements may change, any applicable permitting or regulatory requirements would be reviewed with appropriate local and state agencies prior to decommissioning activities to ensure compliance.

2.2 General Environmental Protections

During decommissioning activities, general environmental protection measures and all applicable site safety procedures would be implemented as required. Many activities during decommissioning would be comparable to the construction phase, including the use of heavy equipment on site, preparing staging areas, and restoring disturbed areas around all project infrastructure. The project decommissioning activities shall meet all environmental, stormwater, erosion control and permitting requirements per local, state, and federal regulations.

2.3 Pre-decommissioning Activities

Prior to engaging in decommissioning activities, the Owner will update this decommissioning plan in accordance with appropriate requirements at the time of decommissioning. Decommissioning and restoration activities will be performed in accordance with the latest ordinance in place at the time of decommissioning and in accordance with the Project's other environmental permits. At the end of the Project's useful life, it will first be de-energized and isolated from all external electrical lines prior to initiating dismantling or ground-disturbing decommissioning work. This includes coordination and advanced communication with the interconnection utility (ITC Midwest).

2.4 Decommissioning and Restoration Activities

The major components of the Project are PV modules, steel tracker system and support piles, electrical cabling, inverters, and transformers. Electrical equipment (except when left in place at a depth of four feet below grade as noted herein), will be removed from the project property upon decommissioning.

PV Module and Tracking System Removal
All modules will be disconnected, removed from the trackers, packaged, and transported to a designated location for disposal, recycling, or resale. Module recycling and/or disposal will be performed in accordance with applicable laws and requirements. The connecting cables and the combiner boxes will be de-energized, disconnected, and removed. The steel tracking system supporting the PV modules will be unbolted and disassembled by laborers using standard hand tools, possibly assisted by small portable crane. All steel support structures will be completely removed by mechanical equipment and transported off site for salvage or reuse. Any demolition debris that is not salvageable will be transported to an approved disposal area. Other salvageable equipment and/or material will be removed from the site for resale, scrap value or disposal.

The modules and tracking systems are supported via driven steel piles. Any cabling and related equipment (e.g., combiner boxes) are also supported via steel piles. Piles will be removed and salvaged.

Electrical Equipment Removal
All decommissioning of electrical devices, equipment, and wiring/cabling will be in accordance with local, State and Federal laws. Any electrical decommissioning will include obtaining required permits, and following applicable safety procedures before de-energizing, isolating, and disconnecting electrical devices, equipment, and cabling. The decommissioning contractor (Contractor) is responsible for complying with all applicable site safety and procedures. All electrical equipment will

be removed from the project property upon decommissioning. The equipment will be disconnected and transported off site.

The following is the sequence for removal:

- De-energize inverters, transformers, and other energized equipment and disconnect from the project substation by means of irreversible isolation
- De-energize each DC collection circuit by means of irreversible isolation
- Disconnect DC and AC collection circuits
- Dismantle and removal of inverters, transformers, and combiner boxes
- Remove and recover aboveground cables. Underground cables will be removed and recovered to 4 feet below grade.

The concrete foundations and support pads will be broken up by mechanical equipment (e.g., backhoe-hydraulic hammer/shovel, jackhammer), loaded in to dump trucks and removed from the site. Smaller pre-cast concrete support pads will be removed intact by cranes and loaded onto trucks for reuse or will be broken up and hauled away by dump trucks. Prior to removal of any transformers, any oil will be pumped out into a separate industry approved disposal container and sealed to prevent any spillage during storage and/or transportation. Salvaged oil from transformers will be transported to the nearest oil recycling or disposal center. Equipment and material may be salvaged for resale or scrap value depending on the market conditions.

Project BESS

The BESS containers (29 ft by 7 ft each) and associated equipment will be located in the BESS facility yard (500 ft by 475 ft). They are planned to be comprised of containerized modules consisting of lithium-ion batteries and an air conditioning / HVAC system to provide cooling and heating. Lithium-ion batteries will require routine continuous maintenance and care in their use and handling. Batteries reaching end of life will be recycled and disposed of in accordance with the relevant local, state or federal regulations. Replacements will be made with new or appropriately refurbished batteries. This periodic replacement would have no effect on decommissioning processes.

The following steps are required for BESS removal at decommissioning:

- Disconnect BESS from sectionalizing equipment, inverters, transformers and auxiliary power
- Remove battery racks for disposal or recycling as well as other easily non-secured components.
- Containers to be removed and remaining components disassembled after transporting to appropriate recycling facility.
- Remove foundation pad and/or pile supports as previously noted.
- Remove grounding grid, perimeter fence and cables to 4 feet below grade
- Re-grade surfaces, add topsoil and seed according to "Site Restoration" below.

Project Substation

As requested by IPL, the planned project collector substation and any interconnection transmission line (or generator tie-in) is currently not included in the decommissioning plan.

Road Rehabilitation and Removal

At the time of decommissioning, the Owner will coordinate with the landowners and easement holders (if applicable) to determine if any internal access roads should remain. If any of these roads serve no future purpose (or as agreed upon by landowner agreement), they will be decommissioned and restored to preconstruction conditions. The decommissioning will involve the removal of the gravel or aggregate and filling the remaining voids with on-site surface materials by grading. Where on-site surface materials are not sufficiently available for filling the remaining voids, suitable earthen fill will be provided from an off-site source. Removed materials will be taken to an appropriate recycling area (possibly on site) where the gravel or aggregate materials can be processed for salvage value or future use. Remaining ground surfaces will be rough graded to merge with the surrounding elevations and returned to near preconstruction conditions by means of grading and discing, using a tractor and disc attachment to restore the soil structure and to aerate the soil.

Additionally, if any of the existing roads (previous to project development) are damaged during decommissioning, they shall be repaired back to the same condition they were previous to decommissioning.

Site Restoration

Following decommissioning, the Project shall be stabilized to prevent adverse environmental effects. The site shall be restored to a clean, safe, and environmentally stable condition to substantially the same physical condition as existed prior to the development of the Project. Site restoration will commence once all above ground and below ground structures and materials have been removed and disposed of appropriately. Also, site restoration will consist of re-seeding of disturbed areas with an appropriate perennial vegetation mixture as required (or as agreed upon with landowner). The site is to be restored to preconstruction conditions or as directed by applicable local, state, federal regulations, or landowner agreement at the time of decommissioning as appropriate.

Fences and Gates

The site security fence will be dismantled, removed, and recycled offsite only after all other ground-disturbing decommissioning and site restoration work has been completed. Most line posts will be direct embedded. Line posts encased in concrete will be removed including concrete. The Project will be accessed through manually operated swing gates located at multiple permanent access points. It is anticipated that the fence, gates, wire, and hardware would be removed and recycled at decommissioning (or as agreed upon with landowner).

2.5 Waste Management Procedures

During decommissioning, debris and waste generated will be recycled to the extent feasible and as required by local, state, and federal regulations. The Contractor will facilitate recycling of all construction waste through coordination with licensed contractors, local waste haulers, and/or other facilities that recycle construction/demolition wastes. The Contractor will also be responsible for ensuring that wastes requiring special disposal (e.g., electrical equipment) are handled according to regulations that are in effect at the time of disposal. Although hazardous waste is not anticipated on the site, any hazardous waste would be removed and disposed of in accordance with applicable laws and regulations.

2.6 Emergency Response and Communications Plans

During decommissioning, the Owner and decommissioning Contractor will coordinate with local authorities, the public, and others as required to provide information about the ongoing activities. Besides regular direct/indirect communication, signs will be posted at the Project facility to inform the

local public and visitors. The Owner and Contractor's project representatives contact information (such as telephone number) will be made public for those seeking more information about the decommissioning activities and/or for reporting emergencies and complaints. All inquiries will be directed to the project representative.

In the event of an emergency, the Owner will mobilize its resources to the site to respond to the event. Personnel involved in decommissioning will be trained in the emergency response and communications procedures. Emergency response procedures will be prepared prior to decommissioning.

3 Material and Salvage Plan

This section identifies major material and equipment quantities on the Project. Any bids from decommissioning contractors will be responsible for verification of quantities (per record drawings), construction costs and salvage rates.

The salvageable material quantities were estimated, but the salvageable value of structures and materials is not included in the cost estimate (as specified by the county ordinance). Salvageable material quantities are derived from the estimated makeup of the materials of the tracking system, piles, inverters, transformers, and power cabling material to be removed and the corresponding steel, aluminum, copper, etc. Copper/Aluminum salvage quantity estimates were derived from cable quantities, lengths, and approximate weights.

The following notes and assumptions are applicable regarding salvage recovery rates:

- Depending on the component, equipment, and anticipated decommissioning activity, various material recovery percentages ranging from 75% to 100% were assumed. Salvage rate accounts for imperfect removal or intentional partial removal of salvageable material.
- The current and future market is not clear on the usability or value of recently deployed solar panels after the approximate component lifecycle of 25 to 30 years. There are multiple options for PV panel end of life:
  - Solar panels may be recycled by a panel recycler at a cost of $25 per panel (about $0.50/lb.) as reported by PV Magazine[2] . This can be further impacted by transportation costs for the recycler or the Owner. Panel recycling is not currently a widespread service in the U.S., is generally considered to be in early commercial development, and as related to this Project, there are currently no local regulations that require this option.
  - Solar panels may also be disposed of at certain landfills at a cost of approximately $5 per panel (about $0.08/lb.) assuming that the panels would be categorized as hazardous waste as reported by the National Renewable Energy Laboratory[3].

[2] "PV Magazine: Aware but unprepared". https://www.pv-magazine.com/magazine-archive/aware-but-unprepared/; accessed April 20, 2021.
[3] Curtis, Taylor L., Heather Buchanan, Garvin Heath, Ligia Smith, and Stephanie Shaw. March 2021. Solar Photovoltaic Module Recycling: A Survey of U.S. Policies and Initiatives. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-74124.

- Solar panel salvage, recycling and reuse is likely to remain dynamic; alternatives should be evaluated for and reassessed periodically. Due to lower overall cost, this Plan assumes that the panels will be disposed of at the landfill cost described above.

- The current and future market is not clear on the usability or value of recently deployed lithium-ion battery modules after the approximate component lifecycle of 15 to 20 years.
  - Battery modules are technically recyclable and disposing of them in a landfill is an option.
  - The cost of recycling of lithium-ion battery modules varied widely from $25 to $75 per kWh of storage capacity and the industry is not well established.
  - The cost of disposing of the battery modules is assumed to be equal to hazardous waste at approximately $780 per ton ($0.38/lb.) including pickup fee, transport cost, and disposal fee[4].
  - Battery module salvage/reuse is likely to remain dynamic; alternatives should be evaluated and reassessed at the next decommissioning plan update. Due to lower overall cost, this Plan assumes that the modules will be disposed of as hazardous waste at the disposal cost described above.
- All excess material that is not salvageable is anticipated to be removed off-site and transported to approved landfill locations.

3.1 Material Quantities

Major materials on the Project are listed in the table below based on conceptual design documents and other design information provided by IPL. Quantities listed below may not reflect final installed quantities and should be updated to reflect final designs. Detailed material breakdowns are listed in Appendix A and the preliminary Project layout is included in Appendix B.

Solar Material Quantity Summary*				
Item	**Description/Details**	**Unit**	**Estimated Quantity**	**Notes**
PV Modules/Panels	Canadian Solar 660 W	Each	87,957	83.6 lbs each
Inverters	4,500 kVA	Each	13	
MV Step Up Transformers	4,500 kVA	Each	13	
Tracker Assembly	ATI Trackers*	Each	1,025	2000 lbs each
Tracker Motors	ATI Tracker Motors*	Each	1,025	50 lbs each
Steel Piles	Various 'W' Pile Sizes and Lengths	Each	18,569	Majority W8x10x20.5*
LV Cable/Wiring	Various Copper and Aluminum wire (above grade)	LF	399,540	2kV, #10 AWG Copper 2kV, 750 kcmil Aluminum
MV Cable/Wiring	Various Aluminum wire (below grade)	LF	69,930	35kV, Aluminum, Concentric Neutral, 100% insulation
CAB Messenger Wire	1/4" EHS Steel Wire (above grade)	LF	25,835	Steel

[4] RSMeans Data Online from Gordian®. www.rsmeans.com/online. Accessed June 22, 2022

Solar Material Quantity Summary*				
Item	**Description/Details**	**Unit**	**Estimated Quantity**	**Notes**
Interior Roads	12 ft width	LF	17,000	Gravel
Fencing	8 ft height, agricultural/deer fence	LF	22,819	Mostly direct buried corner posts in poured concrete, 4 gates
O&M Building	Container	Sq ft.	320	

*Current Solar PV project design is 30-60%, most quantities in table are based on as-bid quantities

BESS Material Quantity Summary*				
Item	**Description/Details**	**Unit**	**Estimated Quantity**	**Notes**
Battery Site Area	500 ft x 475 ft	Sq ft.	237,500	
Battery Container	LG ES "B-link": 28'7" x 6'9" 715 kW/2860 kWh per container	Each	35	59,800 lbs. per container
Battery Modules	LG JH4-4P	Each	6,720	195 lbs. (included in battery container)
Inverters	Sungrow	Each	8	35,000 lbs.
Auxiliary Power Transformer	TBD	Each	1	
Grounding Cable	Around container, PCS, and perimeter of fencings	LF	7,800	Copper
LV Cable/Wiring	750 kcmil	LF	16,000	
MV Cable/Wiring	500 kcmil 750 kcmil	LF	1780	
Fencing	8 ft height, chain link	LF	1950	

*Current BESS project design is conceptual, most quantities in table are assumed for estimating purposes

4 Decommissioning Cost Estimates

It is anticipated that there will be costs associated with the decommissioning of the Project. These current estimates of costs for the Project presented in this plan are based on design quantities and are to be updated as the project design is finalized. Table 1 shows the summary of the estimated decommissioning costs for the Project not including the salvage value.

Decommissioning Cost

The estimated decommissioning costs are associated with construction costs of a contractor decommissioning the site. This includes but is not limited to activities listed in Section 2. Decommissioning costs consisting of labor, equipment, and materials are based on labor activities from RSMeans[5], a construction cost estimating database. Labor activities most closely associated

[5] RSMeans Data Online from Gordian®. www.rsmeans.com/online. Accessed June 22, 2022

with each step in the decommissioning process were selected to build up the decommissioning cost estimate. Because the PV modules and battery modules are planned to be disposed of at end of life a disposal cost is included the cost estimate. Further breakdown of these costs can be found in Appendix A.

Table 1. Summary of Estimated Decommissioning Costs

Decommissioning Activity/Cost	Amount (USD)	Solar Basis Amount ($/kWac)	BESS Basis Amount* ($/MWh)
Solar Array Facility	$3,538,000	$70.76	-
PV Module Disposal Fee	$440,000	$8.80	-
Subtotal Decommissioning Cost – Solar	**$4,082,000**	**$79.56**	**-**
BESS Facility	$627,000	-	$6,270
Battery Disposal Fee	$513,000	-	$5,130
Subtotal Decommissioning Cost - BESS	**$1,140,000**	**-**	**$11,400**
Estimated Total Decommissioning Cost	**$5,222,000**	**-**	**-**

*BESS basis amount is based on installed battery nameplate energy.

The following assumptions apply to the tabulation of quantities and costs associated with this decommissioning.

- All decommissioning costs are in 2023 dollars.
- The labor costs are based on average labor cost for the Creston, Iowa area for Quarter 1, 2023.
- All material quantities are tabulated via available preliminary design information and may not reflect final installed quantities.
- Cost estimates are for budgetary purposes only and do not represent guaranteed costs.
- Total cost does not include any salvage credits, only the cost to decommission and restore the site, and any recycling or disposal fees as noted.
- PV panels and other major equipment may have resale value on a secondary market depending on the market and the condition of the equipment. This value depends on such market at the time of decommissioning.
- No biological, environmental monitoring or testing is included or anticipated per current requirements.
- This cost estimate does not include contingency.

5 Financial Assurance

Alliant Energy Corporation, parent corporation of its wholly owned subsidiary Interstate Power and Light, will provide a parental guarantee based on the estimated decommissioning cost as financial surety for the benefit of Union County Board of Supervisors for the removal and appropriate recycling, reuse and/or disposal of the Project as described in this Decommissioning Plan. The financial surety shall be in place at the time of commencement of operation of the Project.

6 Remarks and Signatures

This plan and cost estimate is an accurate representation of the estimated decommissioning costs at this preliminary stage of development and was prepared in accordance with industry standards of care for engineering evaluations of this type and contains no intentional false statements or misrepresentations. The costs presented in this report are estimated based on current knowledge and prices quoted or developed from construction estimating guides and pricing references. The estimates are anticipated to be subject to adjustment per updates as required by the County, and at the time decommissioning is initiated.

This plan was prepared by HDR's Ryan Swanson and Jessica York and reviewed by HDR's Will Kirby and Ryan Essex (ryan.essex@hdrinc.com).

Ryan W. Essex, P.E. MI

Date: 6/26/2023
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APPENDIX A:
DECOMISSIONING COST BREAKDOWN

Decommissioning Cost - Solar

Solar Array

Decommissioning	Cost Basis	Estimated Quantity	Unit	Estimated Unit Cost ($/Unit)	Total Cost ($)	Remarks / Assumptions
Mobilization / Demobilization / Manag	*per project*	1	project	$152,370.00	$152,000	Single mobilization and establishment of necessary services, labor & material. Percent of decommissioning total.
PV Module removal	*per module*	87,957	module	$8.90	$783,000	Dismantle, palletize and load on flatbed truck for disposal or sale; assume 25% of reported module installation cost
Racking/Tracking Assembly Removal	*per ton*	1,051	ton	$354.67	$373,000	Dismantle, load on flatbed truck for disposal or sale; assume removed to average 30 lb sizes
Tracker Motor/Drive Removal	*per motor*	1,025	each	$51.38	$53,000	Disconnect, electrical demolition, remove, incl accessories
Steel Pile Removal	*per VLF*	351,979	LF	$3.21	$1,130,000	Remove all and load on flatbed, assume 33% of the RSMeans unit cost due to smaller crew size and smaller pile size/length
Above ground Cable Removal	*per LF*	399,540	LF	$0.48	$194,000	Disconnect, remove all above ground DC cabling (total DC cable quantity less DC trenching length)
Underground Cable Removal and Excav	*per volume*	19,684	BCY	$8.36	$165,000	Excavate, remove all cable, and backfill; assume 95% of UG cable is recovered due to small amounts buried deeper than 4ft
Central Inverter Removal	*per inverter*	13	each	$4,018.65	$52,000	Disconnect, electrical demolition, remove, load on truck for disposal
Combiner Box Removal	*per box*	234	each	$201.48	$47,000	Disconnect, electrical demolition, remove, load on truck for disposal (50% of installation cost)
Load Break Disconnect (LBD) Removal	*per lbd*	0	each	$305.46	$0	Disconnect, electrical demolition, remove, load on truck for disposal (50% of installation cost)
Step-up Transformer Removal	*per transformer*	13	each	$1,348.32	$18,000	Assume equal to the cost of labor and equipment to install.
Road and Aggregate Removal	*per CY*	8,185	CY	$8.48	$69,000	Excavation, 50' haul to dump truck, gravel removed to local storage at 4 mile haul
Fence Removal	*per LF*	22,819	LF	$3.62	$83,000	8' height Ag/Deer Fence; 5-Wire Barbed fence, 10' post spacing, includes gate and direct embeded posts
Corner Fence Post Removal	*per post*	616	each	$20.14	$12,000	Selective demolition, fences & gates, fence, posts, steel in concrete
Rough Grade Site (as required by distur	*per acre*	38	acre	$2,104.11	$80,000	Return to smooth contours where needed; not all acres will need to be graded. Converted unit cost from $ per 100,000 sq. ft to $ per acre
Site restoration / Seeding	*per acre*	95	acre	$1,126.21	$107,000	Assume seeding only disturbed areas as percentage of developed site; Native seed mix/species and no fertilizer.
O&M Building, demolish	*per CF*	3,840	CF	$0.37	$1,000	Dismantling and haul of small building, assume wood construction.
O&M Building, foundation removal	*per SF*	320	SF	$0.98	$0	Assume 6" concrete foundation
Salvaged Material Hauling	*per CY*	6,609	CY	$33.20	$219,000	Assume 40 mile haul for all steel, recovered cable, fencing, and electical equipment are hauled to material handling location for purchase
Total Decommissioning					**$3,538,000**	

Decommissioning Cost - BESS

BESS

Decommissioning	Cost Basis	Estimated Quantity	Unit	Estimated Unit Cost ($/Unit)	Total Cost ($)	Remarks / Assumptions
Mobilization / Demobilization	*per project*	1	project	$26,991.00	$27,000	Single mobilization and establishment of necessary services, labor & material. 4.5% of project total.
Container Dismantling & Removal	*per container*	35	each	$1,423.96	$49,800	Assume each battery rack is equivalent to electrical panel board removal
BESS Container Foundation Removal	*per CY*	901	CY	$264.61	$238,400	Demolished to 4 ft below grade; loaded & hauled to repurpose off site
Inverter/Transformer disconnection a	*per transformer*	8	each	$4,018.65	$32,100	Assume equivalent to disconnection and dismantling of medium size generator
Inverter/Transformer Foundation Rer	*per CY*	171	CY	$264.61	$45,200	Demolished to 4 ft below grade; loaded & hauled to repurpose off site
Aux Power Transformer Removal	*per transformer*	1	each	$1,348.32	$1,300	Assume equal to the cost of labor and equipment to install.
Aux Power Transformer Foundation R	*per CY*	8.0	CY	$264.61	$2,100	Demolished to 4 ft below grade; loaded & hauled to repurpose off site
Underground Cable Removal and Exc	*per volume*	5,796	BCY	$8.36	$48,500	Excavate, remove all cable, and backfill
Ground Cable Removal and Excavatir	*per LF*	7,800	LF	$0.33	$2,600	Demolition and removal of ground wire, bare copper or aluminum
Fence Removal	*per LF*	1,950	LF	$3.62	$7,100	8' height Ag/Deer Fence; 5-Wire Barbed fence, 10' post spacing, includes gate and direct embeded posts
Site Surface Aggregate Removal	*per CY*	13,194	CY	$8.48	$111,900	Excavation, 50' haul to dump truck, gravel removed to local storage at 4 mile haul
Rough Grade Site (as required by dist	*per acre*	5.5	acre	$2,104.11	$11,500	Return to smooth contours where needed; not all acres will need to be graded. Converted unit cost from $ per 100,000 sq. ft to $ per acre
Site restoration / Seeding	*per acre*	5.5	acre	$1,126.21	$6,100	Assume seeding only disturbed areas as percentage of developed site; Native seed mix/species and no fertilizer.
Salvaged Material Hauling	*per CY*	1,300	CY	$33.20	$43,200	Assume 40 mile haul for all steel, recovered cable, fencing, and electical equipment are hauled to material handling location
Total Decommissioning					**$627,000**	

Disposal Cost - Solar

Solar Array

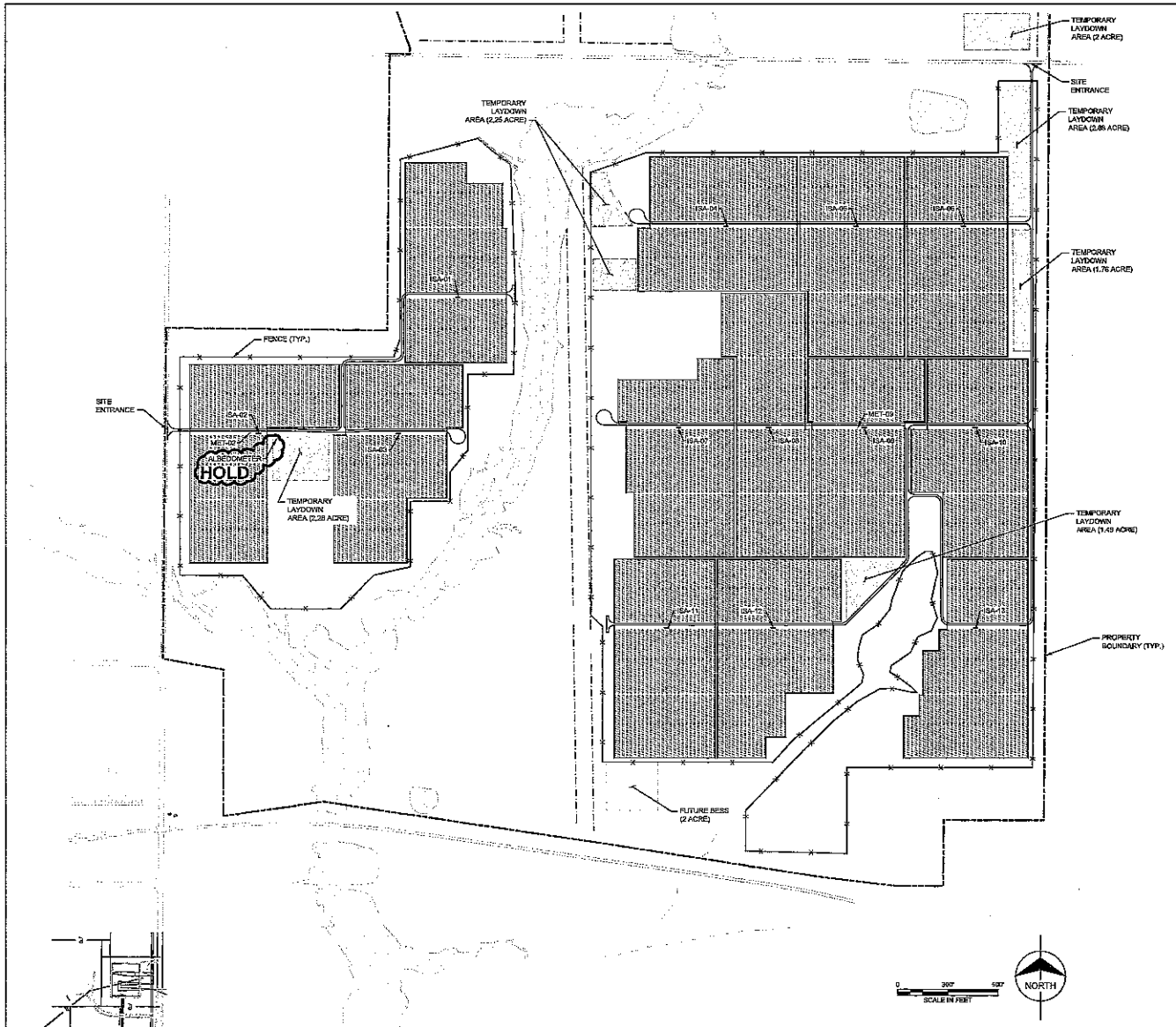
Disposal Value	Potential Disposal Quantity	Unit	Estimated Unit Value / Cost ($/Unit)	Total Cost ($)	Reference	Remarks
PV Module Disposal	7,353,205	lbs	$0.060	$440,000	NREL	Cost based on panel disposal from National Renewable Energy Laboratory, not included in mobilization cost
Total PV Module Fee				**$440,000**		

Disposal Cost - BESS

BESS

Disposal Value	Unit	Disposal Quantity	Estimated Unit Cost ($/Unit)	Total Cost ($)	Remarks
Battery Modules	lbs	1,312,839	$0.39	$513,300	Assume battery module disposal as hazardous waste; includes: pickup fee, transport cost, and disposal fee (Source: RSMeans)
Total Battery Disposal				**$513,000**	

APPENDIX B:
PROJECT LAYOUT



LEGEND:

- PROPERTY LINE
- PROPOSED FENCE
- SOLAR SETBACK

NOTES:

1. THIS DRAWING IS CONCEPTUAL IN NATURE AND FOR PLANNING PURPOSES ONLY.
2. THIS DRAWING REPRESENTS ONE PROPOSED LAYOUT AND IS SUBJECT TO CHANGE BASED ON DETAILED DESIGN, AS WELL AS ACTUAL SITE CONDITIONS.

SYSTEM DESCRIPTION (SITE TOTAL)	
POI CAPACITY (AC)	50 MW
TOTAL INVERTER CAPACITY (40°C)	58.8 MVA
SOLAR CAPACITY (DC)	68.01 MW
DC:AC RATIO (@ POI)	1.16
AC COLLECTION SYSTEM VOLTAGE	34.5 kV
DC SYSTEM VOLTAGE	1500 V
TOTAL MODULES	97,857
MODULES PER STRING	29
STRINGS PER INVERTER	222 - 227
TOTAL INVERTERS SKIDS	13
TOTAL INVERTERS	13
1ST YEAR EXPECTED ENERGY (PV ONLY)	- MWh

DESIGN PARAMETERS	
GROUND COVER RATIO	32.9%
RACKING	SINGLE AXIS TRACKER
ROW TO ROW SPACING	23.75'
NO. OF 3-STRING TRACKERS	983
NO. OF 2-STRING TRACKERS	42
FENCE SETBACKS	10' FROM PROPERTY LINE
SOLAR EQUIPMENT SETBACKS	20' MIN. FROM FENCE

MODULE PARAMETERS	
MANUFACTURER	CANADIAN SOLAR
MODEL NUMBER	CS7N-680MB-AG
MODULE WATTAGE	658.57 W (AVG.)

PV INVERTER PARAMETERS	
MANUFACTURER	SIEMENS GAMESA
MODEL NUMBER	PROTEUS PV4560
INVERTER RATING (40°C)	4560 kVA

PRELIMINARY - NOT FOR CONSTRUCTION

FOR CLIENT REVIEW
Date: 03-31-2023

BURNS McDONNELL

9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
LICENSEE NO: 000165

BMCD 154992

CONTRACT 8410

NO.	DATE	REVISION
5	03-31-2023	CONSIDER REVIEW
4	03-31-2023	CONSIDER REVIEW

CONFIDENTIAL

Alliant Energy

INTERSTATE POWER AND LIGHT
UNION COUNTY, IOWA

CRESTON SOLAR
OVERALL SITE PLAN

SCALE: AS NOTED

154992-EC-003

$DATE$
$FILE$