



CASS COUNTY SOLAR & BESS DUE DILIGENCE

Cass County



September 9th, 2024

OBJECTIVE

1898 & Co. was retained by Cass County to perform a due diligence review of Cass County Solar & BESS (Battery Energy Storage System) (the “Project”) from NextEra Energy Resources (the “Developer”), which Cass County is considering for a conditional use permit (CUP). As part of this support, 1898 & Co. performed a review of Developer-provided information, including Site Plan, Manufacturing Specifications, Environmental Compliance, Decommissioning Plan, Vegetation Management Plan, Single Line Diagrams, O&M Plan, and Glint & Glare Study.

The objective of 1898 & Co.’s document review was to identify abnormalities in the CUP application and verify that local ordinances are being followed appropriately.



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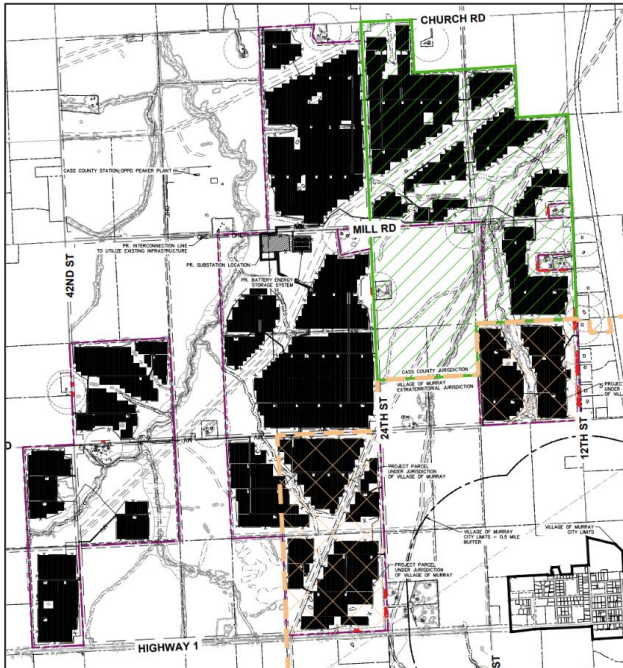


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PROJECT OVERVIEW

Cass County Solar & BESS

TECHNOLOGY Solar + BESS	SOLAR NAMEPLATE 205.6 MW _{AC}	BESS NAMEPLATE 88.2 MW _{AC} @ 4hrs
LOCATION West of Murray, Nebraska (Cass County)		
INTERCONNECTION 345 kV Gen-Tie to OPPD Cass Peaking Station		



Section	Rating	1898 & Co. Commentary
Site Plan	●	Setbacks and county ordinances are generally followed, though there is a school located within 350' of the array in the southwest portion of the site which is in violation of county ordinance for residential setback. It is unclear how site capacity metrics were determined as neither a module wattage nor an inverter model were stated.
Manufacturing Specifications	●	The solar equipment (modules and inverters) manufacturers are known in the industry and do not pose major concerns. Datasheets for the tracker manufacturer and the BESS equipment (battery containers and inverters) were not provided. Without the datasheets, compliance with relevant fire safety standards cannot be confirmed. The ordinance does not require this, but it is recommended to request BESS equipment datasheets.
Environmental Compliance	●	The exhibit is in line with what would generally be expected for a CUP based on the experiences of 1898 & Co., though there are points of concern regarding the absence of notes on bats and cultural resources.
Decommissioning Plan	●	There are several points of concern regarding the decommissioning estimate including the resale/recycling credit of panels and inverters, the total quantity of piles and supporting structures included in the estimate, and the lack of equipment for BESS.
Vegetation Management Plan	●	The vegetation management plan is sufficient to meet Cass County's ordinance regarding screening. Establishing details and frequency for inspections would help to ensure that this is executed appropriately, particularly for the establishment period of the vegetation.
Single Line Diagrams	●	The provided single line diagram does not match what is shown in the Site Plan. Several ratings are incorrect, including the grid voltage and MPT 1 rating, and most are entirely absent.
O&M Plan	●	The PV Solar O&M plan is generally sufficient as a preliminary plan, though it does not include module washing or procedures for inspecting modules for damage/degradation. The provided O&M plan excludes BESS.
Glint & Glare Study	●	Cass County does not have any glare-specific requirements. The provided glare study showed no instances of glare on any nearby houses or roads. 1898 & Co. suggests conservatively modeling the glare at the middle of the panel and including the Conestoga High School.

● Minimal concern

● Meets ordinance, potential areas of concern

● Does not meet ordinance

SCOPE OF WORK

EXHIBITS REVIEWED

- The table to the right covers the scope of work reviewed by 1898 & Co.
- The remaining exhibits and/or sections should be reviewed by Cass County to confirm compliance with existing ordinance requirements.

CASS COUNTY ZONING REQUIREMENTS

- The CUP application covers one (1) solar photovoltaic (“PV” or “solar”) facility and one (1) battery energy storage system (BESS).
- The latest issuance of Cass County Zoning Regulations was in April 2023.
- **The existing ordinance does not address energy storage systems of any technology.**

	Included in 1898 & Co. SOW?	Addresses Solar PV?	Addresses BESS?
Exhibit A: CUP Application	No		
Exhibit B: Site Plan	Yes	x	x
Exhibit C: Manufacturing Specifications	Yes	x	No
Exhibit D:	No		
Exhibit E:	No		
Exhibit F: Environmental Compliance	Yes	x	x
Exhibit G: Decommissioning Plan	Yes	x	No
Exhibit H: Sightline Study	No		
Exhibit I: Vegetation Management Plan	Yes	x	No
Exhibit J: Single Line Diagrams	Yes	x	x
Exhibit K: O&M Plan	Yes	x	No
Exhibit L: Notice Requirements	No		
Exhibit M: Economic Impact Study	No		
Glare Study	Yes	x	N/A

EXHIBIT REVIEW



EXHIBIT B - SITE PLAN (SOLAR)

DESIGN

- The Site Plan displays a high-level view of planned equipment, infrastructure, applied setbacks, and the project’s substation.
- Locations for solar modules, inverters, access roads, MV collection, and the substation are present. Tables listing the applied setbacks are also included.
- Solar projects operate by solar modules generating electricity from the sun as DC power. This power is converted into AC power with inverters, which is then stepped up to grid levels to allow for interconnection.
- Constraints such as existing wetlands, floodplains, structures, pipelines, and transmission lines appear to be avoided.

LOCAL ORDINANCES

- The maximum height of any solar panel shall not exceed 25 feet.
- All components must be installed a minimum of two feet above flood elevation.
- Setbacks required by ordinance are shown in the image to the right.

APPLIED SETBACKS

- Village of Murray City Limits Buffer - 0.5 miles
- Occupied Residence Setback - 500 feet
- Road Intersection Setback - 250 feet
- Overhead Electrical Line Easement - 100 feet
- Property Line Setback - 50 feet
- Fence to Solar Structure Setback - 20 feet
- County Road ROW Setback - 70 feet

	Criteria	AG	TA
CSCS Setbacks & Screening Requirements	CSCS Setbacks		
	Occupied Residence Setback - from the approximate center of a residence. *	500 feet	500 feet
	Yard Setbacks - from the Side & Rear Property Lines *	50/50 feet	50/50 feet
	Right-of-Way Setback - from the Center Line of a County Road *	70 feet	70 feet
	Right-of-Way Setback - from the ROW Line of a State Highway.*	75 feet	75 feet
	Right-of-Way Intersection Setback - from the Center Line of a County Road & ROW Line of a State Highway / from Intersection.*	120 ft / 250 ft	120 ft / 250 ft
	* Refer to Site Development Standards		
	Screening		
	Screening applies to lot lines that abuts a occupied residence of a non-participating landowners. Measurement is from the closest exterior wall. **	500 feet	500 feet
** Refer to Site Development Standards			

EXHIBIT B - SITE PLAN (BESS)

DESIGN

- Locations for battery containers, transformers, fencing, and MV collection are present.
- BESS projects operate similarly to solar facilities, with DC power being fed into inverters from battery containers rather than from solar modules. The primary electrical difference being that battery containers can also absorb power from the grid and discharge it at a later time.
- Constraints such as existing wetlands, floodplains, structures, pipelines, and transmission lines appear to be avoided.
- Laydown yard(s) and drainage structure(s) should be indicated for the BESS site plan.

LOCAL ORDINANCES

- As the existing ordinance does not address BESS, the setbacks and screening requirements for a Commercial Solar Conversion System (CSCS) were assumed.

APPLIED SETBACKS

- Village of Murray City Limits Buffer - 0.5 miles
- Occupied Residence Setback - 500 feet
- Road Intersection Setback - 250 feet
- Overhead Electrical Line Easement - 100 feet
- Property Line Setback - 50 feet
- Fence to Solar Structure Setback - 20 feet
- County Road ROW Setback - 70 feet

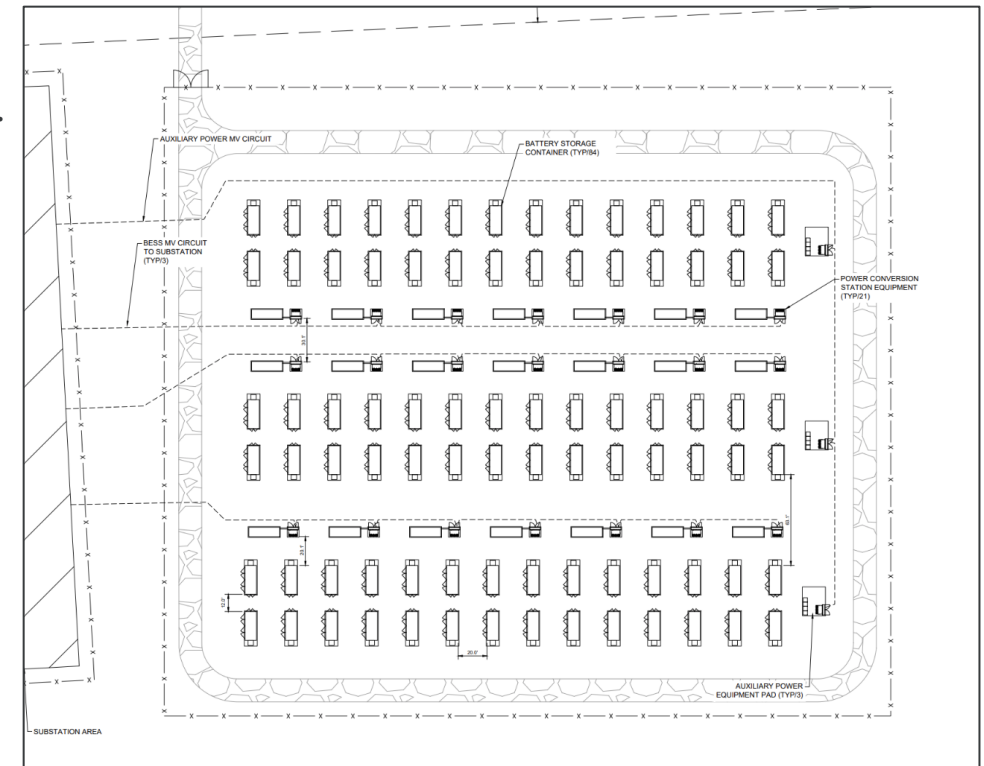


EXHIBIT B - SITE PLAN

OVERVIEW

1898 & Co. reviewed the provided site plans for the Project. The objective of this review was to check that industry-standard methods and assumptions were utilized in the development of the preliminary design. 1898 & Co. also opined on the design's adherence to local ordinances and the requirements for a CUP.

		Data	BMcD Commentary	
Total Parcel Area (ac)		1,961	<ul style="list-style-type: none"> A GCR of 38.0% is higher than what is typical in the industry, 30.0% to 34.0% is more common. Although this results in increased shading effects leading to reduced annual energy production, this does not affect the county or impede the applicant's ability to comply with ordinance requirements. A module bin class and inverter MVA rating are not provided. It is unclear how values for DC and AC capacity are being determined at the time of this report. A school is located SW of the intersection at Highway 1 and 42nd Street. Modules are planned to be installed within 350' of this school, which would violate the 500' residence setback. Wetland disturbances during construction are very likely due to the presence of streams throughout the site. Laydown yards and stormwater retention ponds are not shown in the provided site plan. 	
Utilized Land (ac)		1,114		
Nameplate Capacity		Solar: 205.6 MW _{AC} BESS: 88.2 MW _{AC}		
Acres / MW _{AC}		1,961ac / 205.6MW _{AC} = 8.81 acres/MW _{AC}		
Solar Equipment		Panel → BYD Solar BYDxxxMLTK-36* Inverter → Power Electronics FREESUN HEMK FSxxxxK*		
BESS Equipment		Battery → CATL 10P416S Inverter → Power Electronics FREEMAQ MULTI PCSM FP4200M4		
GCR	DC/AC	38.0%		1.35
Setbacks		Setbacks appear to generally be employed in line with typical industry standards and with Cass County ordinance requirements.		
Ordinances		Vegetative buffers appear to be employed in line with Cass County ordinance requirements.		

* A size for the equipment was not specified at the time of this report

EXHIBIT C - MANUFACTURING SPECIFICATIONS

EQUIPMENT

- Typical equipment used in the construction of a solar and BESS facility are transformers, inverters, solar modules, solar trackers, and battery storage units
- Equipment datasheets are concise forms listing all of the major technical characteristics of each piece of equipment, including but not limited to the following:
 - Operating Voltage (V)
 - Efficiency (%)
 - Operating Current (A)
 - Weight
 - Rated Power (W)
 - Dimensions

SUPPLIERS

- The CUP application lists the following equipment and associated original equipment manufacturers (OEM's):
 - Solar Inverters by Power Electronics - FREESUN HEMK FSxxxxK
 - Modules by BYD Solar - BYDxxxMLTK-36
 - BESS Inverters by Power Electronics - FREEMAQ MULTI PCSM FP4200M4
 - Batteries by CATL - 10P416S
- Datasheets for the trackers, BESS inverters, and batteries were not included at the time of this review.

1898 & CO. COMMENTARY

- The indicated OEMs are recognized in the industry and do not raise concern regarding their ability to provide usable equipment for the project.
- BESS units must be shown to comply with UL9450, UL9450A, and NFPA to ensure they meet fire safety requirements. Without the datasheets, compliance with these standards cannot be confirmed.

BYD SOLAR
Made in China

Electrical Data(STC*)

Module Type: BYDxxxMLTK-36	BYD520MLTK-36	BYD525MLTK-36	BYD530MLTK-36	BYD535MLTK-36	BYD540MLTK-36	BYD545MLTK-36
Rate Maximum Power(Pmax)(W)	520±5%	525±5%	530±5%	535±5%	540±5%	545±5%
Open Circuit Voltage(Voc) (V)	48.52	48.82	49.12	49.42	49.72	50.02
Short Circuit Current(Isc) (A)	13.37	13.41	13.45	13.49	13.53	13.57
Maximum Power Voltage(Vmp)(V)	41.17	41.39	41.61	41.83	42.05	42.27
Maximum Power Current (Imp) (A)	12.64	12.69	12.74	12.79	12.84	12.89
Module Efficiency (%)	20.13	20.32	20.52	20.71	20.90	21.10

* Standard Test Conditions (STC) : irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

Electrical Data(NMOT*)

Module Type: BYDxxxMLTK-36	BYD520MLTK-36	BYD525MLTK-36	BYD530MLTK-36	BYD535MLTK-36	BYD540MLTK-36	BYD545MLTK-36
Rate Maximum Power(Pmax)(W)	387.4±5%	390.9±5%	395.3±5%	398.9±5%	402.5±5%	406.2±5%
Open Circuit Voltage(Voc) (V)	45.3	45.6	45.9	46.2	46.5	46.7
Short Circuit Current(Isc) (A)	10.8	10.84	10.87	10.9	10.93	10.96
Maximum Power Voltage(Vmp)(V)	37.9	38.2	38.4	38.6	38.9	39.1
Maximum Power Current (Imp) (A)	10.21	10.24	10.29	10.32	10.35	10.38

* Nominal Module Operating Temperature (NMOT): irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

Operational Parameter

Operating Temperature	-40°C~+85°C
NMOT (Nominal Module Operating Temperature)	45°C±2°C
Maximum System Voltage(V)	1500 (VDC)
Maximum Fuse Current Rating(A)	25A
Fire Safety	Class C
Power Binning Tolerance	±5W
Bifacial Factor	65±5%
PG: 530W	5% 10% 15% 20% 25%
Rate Maximum Power(Pmax)(W)	557 583 610 636 663
Open Circuit Voltage(Voc) (V)	49.12 49.12 49.12 49.12 49.12
Short Circuit Current (Isc) (A)	14.12 14.80 15.47 16.14 16.81
Maximum Power Voltage(Vmp)(V)	41.61 41.61 41.61 41.61 41.61
Maximum Power Current(Imp) (A)	13.377 14.014 14.651 15.288 15.925

Mechanical Properties

Cell Type	182mm*91mm
Number of Cells	144
Dimension of Module	2278*1134*35mm
Weight	29.0kg ± 5%
Front Glass	3.2mm tempered glass with AR Coating
Frame	Anodized aluminum alloy
Junction Box	IP68(3 Diodes)
Cable Length	+320mm, -260mm(4.0mm [±])
Connector	PV-T302, JiangpuTiansheng, PV-ZH2028 Zhonghuan, BYD-L30 GuangdongBYD
Packing Information	620/31*20(pcs per 40'HQ)

Temperature Coefficient

Peak Power Temperature Coefficient	-0.331%/°C
Open-Circuit Voltage Temperature Coefficient	-0.253%/°C
Short-Circuit Current Temperature Coefficient	0.0502%/°C

Drawing

I-V curve

Current-Voltage Curve (540W)

Cells temp: +25°C

Power-Voltage Curve (540W)

Cells temp: +25°C

Declaration: With the technical progress and product updates, there exists a deviation between the technical parameter of the BYD Solar's future products and the technical parameter in this specification. The BYD Solar reserves the right to adjust the technical parameter at any time without notifying the customer. BYD Solar reserves the final right of interpretation. (V202203C)

1898 CO.

Confidential Information

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EXHIBIT F - ENVIRONMENTAL COMPLIANCE

BACKGROUND

- Environmental compliance encompasses a variety of measures which help to ensure that a project complies with local, state, and federal environmental regulations.
- The table to the right lists potential environmental issues along with the offices which govern them and required action(s), though this is not a comprehensive list.
- 1898 & Co. did not review or opine on potential risks associated with pending or draft legislation.

LOCAL ORDINANCES

- The project shall comply with all applicable state and local stormwater construction regulations.
- The project shall be located only on Agricultural (AG) or Transitional Agricultural (TA) land.

Environmental Item	Governing Agency	Required Action
Wetlands Disturbance	United States Environmental Protection Agency (USEPA)	Obtain Section 404 Permit
Notice of Proposed Construction or Alteration	Federal Aviation Administration (FAA)	May need to submit Form 7460-1 and/or 7460-2
Historic/Cultural Resources	State Historical Preservation Office (SHPO)	Obtain Agency Approval
Construction Stormwater	United States Environmental Protection Agency (USEPA)	Obtain NPDES Stormwater Permit
Construction Stormwater & Pollution	United States Environmental Protection Agency (USEPA)	Develop Stormwater and Pollution Prevention Plan
Migratory Bird Treaty Act	United States Fish and Wildlife Service (USFWS)	Obtain Agency Approval
Equipment Sound	County/State	Complete Sound Study

EXHIBIT F - ENVIRONMENTAL COMPLIANCE

OVERVIEW

1898 & Co. reviewed the provided environmental compliance documentation for the Project. The objective of this review was to check that typical environmental concerns are being addressed appropriately and to draw attention to any which are of particular concern to the county. 1898 & Co. also reviewed the design's adherence to local ordinances and the requirements for a CUP.

	Relevant Items	BMCD Commentary
Zoning	Cass County Zoning Ordinance	Cass County's zoning ordinances are generally followed based on the provided Site Plan. Appropriate setbacks are implemented and vegetative screening is depicted. The school not being setback from appropriately seems to be the only instance of these setbacks and ordinances not being applied.
Species / Wildlife	Migratory Bird Treaty Act	Bats are not mentioned, though NextEra has confirmed that no bats covered under this Act could be impacted by the project.
Waters of the US / Wetlands	Wetland Delineation Reports, Section 404 Permit	Wetlands appear to be avoided in the Site Plan provided in Exhibit B, a Section 404 Permit will likely still be needed due to potential construction impacts on wetlands.
Cultural Resources	No mention of cultural resources or State Historical Preservation Office (SHPO)	As the site is primarily located on agricultural land, any artifacts or other items of cultural significance have likely already been disturbed in some way. However, the project site should be analyzed and approved regardless.
Construction Permits	Construction Stormwater Permit	A Construction Stormwater Permit will be required to mitigate runoff impacts to local waters.
Federal Permits	Federal Aviation Administration (FAA) Notice, Form 7460	With two (2) airports located within 10 miles of the project, the FAA (Form 7460) may need to provide determination of no hazard (DNH) for the Project if the Project infringes on FAA airspace.

EXHIBIT G - DECOMMISSIONING PLAN

BACKGROUND

- Decommissioning plan estimates the total cost to decommission the facility at the end of its useful life, typically including the following:
 - Labor and equipment rates based on a nearby city
 - Transportation and disposal fees of all equipment
 - Site restoration to return the land to its previous state
 - Salvage or scrap value for recyclable material

LOCAL ORDINANCES

- A cost estimate for the decommissioning of a commercial solar conversion system to ensure the facilities are properly removed after their useful life
- Plan shall include provisions for removal of all structures and foundations, restoration of soil and vegetation and a plan ensuring financial resources will be available to fully decommission the site
- Applicant shall provide a revised decommissioning cost estimate every 5 years
- Upon the 5-year interval when the decommissioning cost estimate shows a positive net decommissioning cost, the county may require the posting of a surety
- The facility will be considered abandoned after 12 consecutive months without energy production, provided that there is no ongoing maintenance, repairs, or replacement of the system or damage cost by an event outside of the control of the owner.
- The owner shall removal all equipment and appurtenances within 180 days of abandonment
- A National Pollutant Discharge Elimination System Permit from the Nebraska Department of Environment and Energy may be required

EXHIBIT G - DECOMMISSIONING PLAN

OVERVIEW

1898 & Co. reviewed the Project’s decommissioning plan present in the data room. The decommissioning plan completed by Kimley Horn shows that decommissioning the Project in a year will result in \$48 million positive return for the Project. The following inputs were included as part of this review:

	Data	1898 Commentary
PV Equipment Removal	Above ground portions of the PV module supports shall be removed. Below ground portions of the PV module supports shall be removed to a depth of five feet at a minimum. No hazardous materials or waste will be used during operation of the Project.	1898 & Co. recommends confirming that the estimate includes the cost to remove all piles from the ground, regardless of the depth. Transformer oil is considered hazardous materials and should be properly drained and disposed. 1898 & Co. recommends confirming that the cost of properly disposing the transformer oil is included in the decommissioning estimate.
PV Piles and Support Assemblies	The estimate assumes 77,162 pounds of support assemblies per 1 MW of the Project. Removing and recycling piles assumes 4 piles per string.	The BYD Solar modules are larger than typical, and it is expected they would require higher costs of removal as well as more robust support assemblies than were assumed in the Decommissioning Plan. At the time of this review enough information is known about the Project to develop more accurate cost estimations for the PV piles and support assemblies. 1898 & Co. would recommend updating the cost estimates to reflect preliminary Project design; however, it is reasonable to assume these details may change prior to finalizing project design.
Collection and Substation Removal	All above and below-ground cables, inverters, and transformers shall be dismantled. All overhead conductors, poles, and foundations shall be removed. All components of the Project substation shall be removed.	The plan includes the cost to remove all substation, transmission line, and collection equipment.
BESS Removal	Removal of BESS shells were included in the decommissioning estimate, but the plan did not include any additional information of the other key equipment for a BESS. The plan also did not mention where the battery cells would be properly disposed of or recycled.	1898 & Co. recommends including the cost of removal and proper disposal or recycling of the BESS equipment, including the battery cells, racks, foundations, collection, and other key equipment.
Site Restoration and Seeding	All unvegetated or disturbed areas will be restored during the decommissioning process. Restoration shall consist of additional topsoil, seed, and necessary fertilizer to ensure adequate vegetation is established. The estimate assumes 56 acres will require seeding.	The plan utilizes a typical site restoration process. The seeding is lower than expected based on similar project experience. 1898 & Co. would recommend 25% site restoration and seeding for the site.

EXHIBIT G - DECOMMISSIONING PLAN



	Data	1898 Commentary
Salvage Credit	Material salvage values were based off current US salvage exchange rates.	1898 & Co. finds it appropriate to include the credit received from the salvage value of these materials in the cost estimate. Since scrap pricing can be volatile, 1898 & Co. recommends taking an average of the US salvage exchange rates over the last 12 months.
Panel and Inverter Resale/Recycling Credit	PV module material salvage rate is based on straight-line depreciation of modules (-0.5% per year). Inverter resale value is dependent on the assumption that all inverters will be decommissioned and resold halfway through their useful life (every 5 years).	1898 & Co. recommends confirming that the sale of the inverters every 5 years is specified in the Operations and Maintenance plan for the site. The decommissioning plan states that panels will be recycled at Cleanlites, but the cost estimate assumes a \$51 million credit for resale. 1898 & Co. recommends confirming if the panel salvage credit is calculated from recycling the panels at Cleanlites or reselling the panels. To conservatively estimate the decommissioning cost, 1898 & Co. recommends removing the associated resale/recycling credits for the panels and inverters and modeling more conservative disposal costs for the weight of the panels and salvage costs for the inverters.
Labor and Equipment Rates	Labor, material, and equipment rates are based on the RSMeans Heavy Construction rates and adjusted using the City Cost Index for Omaha, Nebraska.	The plan utilizes typical labor and equipment rates.
Transportation Rates	In the “PV Equipment Removal and Recycling” section, the plan mentions that the debris will be processed for transportation.	1898 & Co. recommends confirming that the transportation fee was included to properly transport all material to the landfill, scrap yard, or recycling facility for all major components of the Project.
Lifetime of Project	The decommissioning estimate assumes the Project will be decommissioned at year 1.	Assuming the Project will be decommissioned at year 1 provides optimistic assumptions for resale of the inverters and panels. 1898 & Co. recommends the decommissioning estimate assume a typical life span of 25 to 30 years.
Contingency	The decommissioning estimate does not include contingency.	1898 & Co. recommends including 20% contingency on direct project costs to account for unspecified but reasonably expected additional costs.

EXHIBIT I - VEGETATION MANAGEMENT PLAN

BACKGROUND

- Vegetation management plans dictate how plant life within the overall boundary of the project is established and maintained.
- This plan also includes any vegetative buffers used to mitigate the visual impact of the project on surrounding areas.
- Any necessary tree clearing should be covered under this plan.
- 1898 & Co. did not review or opine on potential risks associated with pending or draft legislation.

SEEDING

- Within the solar array, a mixture of seeds from plants native to the area will be used for revegetation.
- The vegetative buffers will be composed of a mixture of native seeds and native trees.

LOCAL ORDINANCES

- Screening applies to lot lines that abut an occupied residence of a non-participating landowner when the closest exterior wall of the residence is within 500 feet of any panels or equipment. For AG land, screening must be provided for a distance equal to the parallel wall of the residence. For TA land, screening must be provided for a distance equal to the parallel wall of the residence plus 75 feet in both directions.

EXHIBIT I - VEGETATION MANAGEMENT PLAN

OVERVIEW

1898 & Co. reviewed the Project’s vegetation management plan present in the data room. The objective of this review was to verify the reasonableness of the Project’s diagram and consistency with generally accepted industry practices for the design and construction of utility-scale solar projects. The following areas were included as part of this review:

	Data	BMcD Commentary
Maximum Height Within Solar Area	18 inches to 20 inches	<ul style="list-style-type: none"> The current Plan does not indicate requirements for vegetation inspections or their frequency. An inspection schedule and associated activities should be established to ensure that vegetation is properly established and maintained.
Inspections	Requirements for inspections and their frequency are not indicated within the current Vegetation Management Plan.	
Solar Area Seeding	Wetland Delineation Reports, Approved Jurisdictional Determination Request, Constraints Analysis	
Vegetative Buffer	Cultural Resources Desktop Review, Phase I Cultural Resources Survey	
Invasive Species and Weeds	Recommended mowing is expected to eliminate most invasive species and weeds. Additional spot mowing and selective use of herbicides may be needed.	
Mowing	Year 1: Mow at 12-18in. Year 2: Mow at 18-24in.	

EXHIBIT J - SINGLE LINE DIAGRAMS

PURPOSE

- Single line diagrams display the major electrical equipment necessary for a project to operate, along with their arrangement within the substation.
- Lines within the diagram represent an electrical connection between pieces of equipment.
- Reviewing the equipment shown in this diagram helps to ensure the project will operate safely and will be able to output its expected power.

MAJOR EQUIPMENT

- Main Power Transformers (MPT): MPT's step up the voltage of the facility to match the voltage of the grid.
- Inverters: An inverter converts DC power to AC power. This is essential for solar and BESS as both technologies output in DC.
- Breakers: All breakers will be connected to a protection and controls network which identifies critical issues in the system. When told to by this network, the breaker will open, breaking the flow of power and limiting the impact of the issue.
- Surge Arrester: Major overvoltage events, such as a lightning strike, can severely damage electrical equipment. Surge arrestors limit these overvoltage events by providing a path to ground for surge currents.

POINTS OF FOCUS

- Major equipment necessary to interconnect into the electrical grid (inverters, breakers, MPT's, etc.)
- Electrical ratings (voltage, current, power, etc.)
- Overall nameplate rating of the depicted power generating equipment

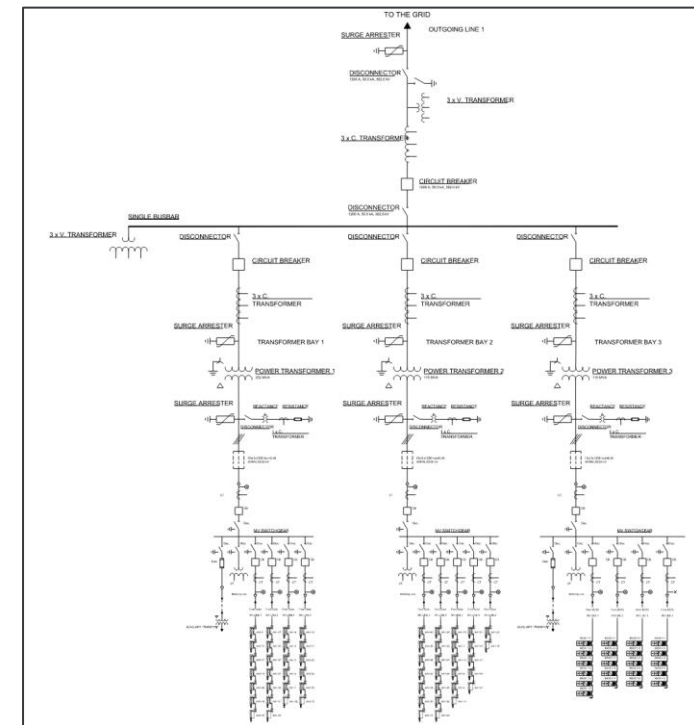


EXHIBIT J - SINGLE LINE DIAGRAMS

OVERVIEW

1898 & Co. reviewed the Project’s single line diagram present in the data room. The objective of this review was to verify the reasonableness of the Project’s diagram and consistency with generally accepted industry practices for the design and construction of utility-scale solar projects. The following areas were included as part of this review:

	Data	BMcD Commentary
Calculated Capacity	Solar: 222.6 MVA BESS: 88.2 MVA @ 4 hours	<ul style="list-style-type: none"> • Many necessary ratings for equipment are absent from the single line diagram. • Several of the ratings present in the single line diagram are inaccurate or entirely incorrect, including the MVA rating for MPT 1 and the grid voltage. This diagram does not appear to be an accurate representation of the project as depicted in the Site Plan.
Voltage Levels	35.0kV : 354.0kV	
Arrangement	Two (2) main power transformers (MPT's) for solar, one (1) MPT for BESS. No main-tie switch between the solar switchgears will prevent redundancy.	
Equipment	Transformers, inverters, bus bars, and switches are present where expected. Revenue meter(s) are absent, grounding transformers are absent though these may not be necessary.	
Ratings	HV rating and MVA rating of MPT's are incorrect. Voltage and current ratings are missing for MPT, bus bars, switches, and most breakers.	
Protection & Controls	Breakers, voltage transformers (VT's) and current transformers (CT's) are present where expected. Relays are excluded from the current SLD.	

EXHIBIT K - O&M PLAN

PURPOSE

- The Operations & Maintenance (O&M) Plan details the activities and equipment necessary to maintain the project and its associated equipment throughout its lifespan.

MAJOR ACTIVITIES

- The following is a list of activities which are typical to be completed and maintained throughout the life of the project, though this is not a comprehensive list.
 - Inspection and maintenance on MPT and other transformers
 - Mowing/vegetation management
 - Access road upkeep
 - Inverter inspection and maintenance
 - Meteorological (MET) station calibration and inspection
 - Emergency action plan review and update (as needed)

1898 & CO. COMMENTARY

- A BESS O&M Plan was not provided as part of this CUP application and it is not indicated if this is planned to be completed. The following slide states activities which would be typical to include in a BESS O&M Plan.
- It is not specified what activities are included as part of the PV Module Inspection. Module washing is not called out, and it is not specified if/how modules will be inspected for damage/degradation.

EXHIBIT K - O&M PLAN (BESS)

MAJOR ACTIVITIES

- The following is a list of activities which are typical to be completed and maintained throughout the life of the BESS project.
 - Fire Safety Plan: Interacting with the fire chief or the alternative authority-having jurisdiction
 - NFPA requires mention of chemical, electrical, and explosive potential
 - Fire prevention measures and associated maintenance
 - Ensure system isolation and maintain shutdown procedures
 - Establishing and maintaining hazard containment
 - Install and maintain warning signage (arc flash, high-voltage, fire/chemical/etc. hazards)
 - 24-hr monitoring by NextEra or contractor
- Maintenance of the BESS containers is typically performed by the vendor, though this will need to be confirmed.

OTHER BESS CONSIDERATIONS

- Augmentation and/or overbuild is a common practice in BESS facilities to offset battery degradation. This is achieved by either providing space for future battery installations (augmentation), or by installing more than the stated capacity so the project can still meet its nameplate near its end-of-life.

SOLAR GLARE STUDY

BACKGROUND

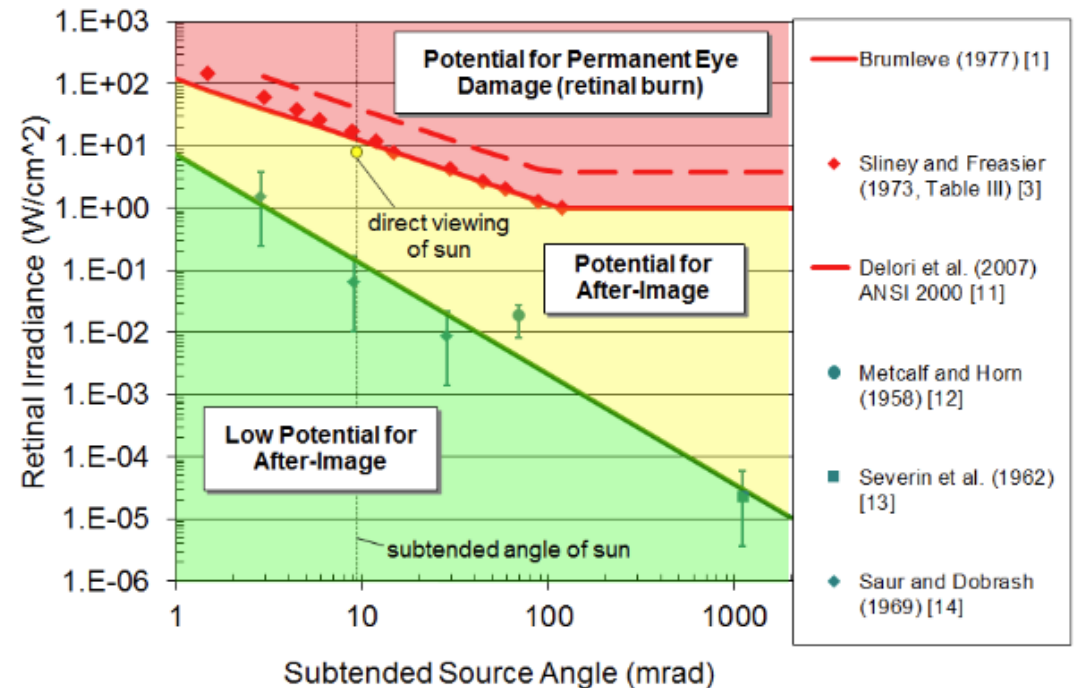
- Glare is caused by the sun reflecting or refracting off a surface of the solar panel and hitting an observer's eyes. Glare is typically evaluated at nearby residences, roadways, railroads, and airports.
- Glare study estimates the intensity and size of glare at various locations across the Project. Glare is measured and categorized by its intensity and size from an observer's viewpoint.
 - This Project utilizes photovoltaic (PV) solar panels, not concentrated solar panels. The potential for permanent eye damage (i.e. red glare) is only caused by concentrated solar projects, and therefore, will not be caused by this Project.
 - Glare studies are typically required by state or local county zoning ordinances or when the project is proposed on federally-obligated airport property.

LOCAL ORDINANCES

- Cass County does not currently have any regulations for glare.
- The following review and recommendations provided by 1898 & Co. should be considered as technical commentary only. Glare study quality does not currently have any bearing on the CUP application's ability to comply with the ordinance.

TYPICAL GLARE MITIGATION

- Planting vegetation buffer
- Stowing panels in a horizontal position to mitigate impact of glare



SOLAR GLARE STUDY

OVERVIEW

1898 & Co. reviewed the Project’s solar glare study present in the data room. The solar glare study completed by Capitol Airspace shows that was no glare found on any of the modeled observation points, routes, or airports. The following inputs were included as part of this review:

	Data	1898 Commentary
Resting Angle / Backtracking Limit	At the request of NextEra, a range of resting angles at 5°, 6°, 7°, 8°, and 9° was applied to various arrays to mitigate glare.	1898 & Co. recommends a conservative 5° resting angle applied to all arrays to accurately represent the potential for glare. 1898 & Co. recommends clarifying the backtracking limits in the Operations and Maintenance plan.
Rotation Axis Height	All arrays were modeled with a rotation axis height of 3 feet.	The maximum height of a panel at full tilt is typically between 8 to 12 feet. 1898 & Co. recommends conservatively modeling the array height as the height from the ground to the middle of the panel, typically between 4 to 6 feet.
Observation Points	Fifty-five discrete observation points were assessed at an 8-foot first story and 16-foot second story viewing height.	The solar glare study assumes a conservative approach for assessing residences. Capitol Airspace reports evaluating both 55 and 154 observation points in the report. 1898 recommends confirming how many observation points were evaluated. 1898 & Co. also recommends evaluating the glare impact on Conestoga High School.
Routes & Railroads	Eight route receptors were assessed, representing 7 roadways and 1 railroad. The roadways were assessed at a 4-foot car viewing height and an 8-foot truck viewing height, and the railroad was assessed at a 12-foot locomotive cab viewing height.	The solar glare study assumes a conservative approach for assessing routes and railroads.
Airports	An azimuthal view restriction of 100° total field-of-view and a vertical view restriction of 30° was used to assess all approach paths at the two nearby airports.	The solar glare study assumes a conservative approach for assessing airport approach paths.
Elevation	USGS 1/3 arc-second DEM elevation data was used to assess the Project.	The solar glare study utilizes a standard elevation data set.
Maximum Tracking Angle	A maximum tracking angle of ±52° was recorded for each array.	The solar glare study assumes a typical maximum tracking angle.

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