Decommissioning Plan
Lone Tree Solar Project
Johnson County, Iowa

Prepared for:
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1.0 INTRODUCTION

PCR Investments SP2, LLC (PCR) is proposing to construct the Lone Tree Solar Project in Johnson County, Iowa. The proposed Lone Tree Solar Project (Lone Tree or "the Project") is to be located northwest of the city of Lone Tree, Iowa. Major components of the Project include bi-facial solar modules, a tracking system, inverter/transformer stations, access roads, and below ground interconnection cable. The Project will occupy approximately 50 acres of land (within perimeter fencing) and will have a maximum nameplate generating capacity of up to 8.0 megawatts (MW) alternating current (AC).

This Decommissioning Plan (Plan) provides a description of the decommissioning and restoration phase of the Project. Construction is anticipated to begin in early 2023 with the Commercial Operation Date (COD) projected in late 2023. The decommissioning phase is assumed to include the removal of Project facilities as listed in Section 1.1 and shown in Figure 1.

This Plan includes an overview of the primary decommissioning Project activities, including the dismantling and removal of facilities, and subsequent restoration of land. A summary of estimated costs and revenues associated with decommissioning the Project are included in Section 4.0. The summary statistics and estimates provided are based on an 8.0-$MW_{[AC]}$ Project array design.

1.1 SOLAR FARM COMPONENTS

The main components of the Project include:

- Solar modules and associated above ground cabling
- Tracking system and steel piles
- In-string inverters
- Transformers stations
- Site access and internal roads
- Perimeter fencing
- Below ground electrical cabling and conduits
- Operations and maintenance (O&M) structure and switchgear room
- Below ground cabling to point of interconnection (POI)

1.2 TRIGGERING EVENTS AND EXPECTED LIFETIME OF PROJECT

Project decommissioning may be triggered by events such as the end of a power purchase agreement or when the Project reaches the end of its operational life. Per Johnson County (County) Zoning Ordinance No. 05-19-22-01 (amendments), Article 8:1.23.BB.10 - following a continuous one-year period in which no electricity is generated, or if substantial action on construction or repairs to the project is discontinued for a period of one year, the permit holder will have one year to complete decommissioning of the

utility scale solar installation. At the discretion of the County Zoning Administrator, the continuous one-year period that triggers decommissioning may be extended if the applicant demonstrates ongoing commitment to the project through activities such as but not limited to making lease payments or documentation of ongoing maintenance or repairs. Decommissioning shall be completed in accordance with the approved decommissioning plan. The landowner or tenant must notify the County Zoning Administrator when the project is discontinued and when decommissioning is complete.

If properly maintained, the expected lifetime of a utility-scale solar panel is approximately 30 to 35 years with an opportunity for a project lifetime of 50 years or more with equipment replacement and repowering. Depending on market conditions and project viability, solar arrays may be retrofitted with updated components (e.g., panels, frame, tracking system, etc.) to extend the life of a project. In the event that the modules are not retrofitted, or at the end of the Project's useful life, the panels and associated components will be decommissioned and removed from the Project site.

The value of the individual components of the solar facility will vary with time. In general, the highest component value would be expected at the time of construction with declining value over the life of the Project. Over most of the life of the Project, components such as the solar panels could be sold in the wholesale market for reuse or refurbishment. As efficiency and power production of the panels decrease due to aging and/or weathering, the resale value will decline accordingly. Secondary markets for used solar components include other utility scale solar facilities with similar designs that may require replacement equipment due to damage or normal wear over time; or other buyers (e.g., developers, consumers) that are willing to accept a slightly lower power output in return for a significantly lower price point when compared to new equipment.

Components of the solar facility that have resale value may be sold in the wholesale market. Components with no wholesale value will be salvaged and sold as scrap for recycling or disposed of at an approved offsite licensed solid waste disposal facility (landfill). Decommissioning activities will include removal of the arrays and associated components as listed in Section 1.1 and described in Section 2.

1.3 DECOMMISSIONING SEQUENCE

Decommissioning activities will begin within 12 months of the Project ceasing operation and will be completed within approximately 6 to 12 months from the start of decommissioning. Monitoring and site restoration may extend beyond this period to ensure successful revegetation and rehabilitation. The anticipated sequence of decommissioning and removal is described below; however, overlap of activities is expected.

- Reinforce access roads, if needed, and prepare site for component removal
- Install temporary fencing and erosion control best management practices (BMPs) to protect sensitive resources
- De-energize solar arrays

- Dismantle panels and above ground wiring
- Remove module trackers and piles
- Remove inverters
- Remove transformers and skids
- Remove below-ground medium voltage and interconnection electrical cables and conduit (less than 48 inches in depth)
- Remove O&M structure and switchgear room
- Remove access and internal roads and complete minor grading as required to re-establish overall drainage patterns similar to pre-development conditions
- De-compact subsoils (if required), restore and revegetate disturbed land to allow for pre-construction land use to the extent practicable

2.0 PROJECT COMPONENTS AND DECOMMISSIONING ACTIVITIES

The solar facility components and decommissioning activities necessary to restore the Project area, as near as practicable, to pre-construction conditions are described within this section.

2.1 OVERVIEW OF SOLAR FACILITY SYSTEM

PCR anticipates utilizing approximately 20,496 solar modules, with a total nameplate generating capacity of up to 11.38 MW direct current (DC) converting to approximately 8.00 $MW_{[AC]}$ on the approximately 50-acre site. Statistics and cost estimates provided in this Plan are based on a bifacial solar module although the final panel manufacturer has not been selected at the time of this report.

Above ground facilities, such as modules, trackers, foundations, steel piles, electrical cabling and conduit will be removed from the site. Electrical cabling greater than 48 inches in depth may be abandoned in place. Access roads may be left in place if requested and/or agreed to by the landowner. Public roads damaged or modified during the decommissioning and reclamation process will be repaired to the pre-decommissioning condition at PCR's expense.

Estimated quantities of materials to be removed and salvaged or disposed of are included in this section. Most of the materials described have salvage value, although there are some components that will likely have none at the time of decommissioning. All recyclable materials, salvaged and non-salvage, will be recycled to the extent possible. All other non-recyclable waste materials will be disposed of in accordance with state and federal law in a licensed solid waste facility. Table 1 presents a summary of the primary components of the Project included in this decommissioning plan.

Table 1 Primary Components of Solar Farm to be Decommissioned

Component	Quantity	Unit of Measure
Solar Modules (approximate)	20,496	Each
Tracking System (equivalent trackers – 56 modules)	366	Equivalent Trackers
Steel Piles	3,358	Each
Inverters (within arrays)	64	Each
Transformer Stations (on skids and piles)	2	Each
Electrical Cables and Conduits (greater than 48-inches below ground abandoned in place)	677	Lineal Foot (estimated)
Perimeter Fencing	5,950	Lineal Foot (estimated)
Internal Access Roads (approximate)	7,000	Lineal Foot (estimated)
O&M and Switchgear Structures (one each)	2	Each

Component	Quantity	Unit of Measure
Below Ground Interconnection Cable (greater than 48-inches below ground abandoned in place)	0.13	Lineal Mile (estimated)

2.2 SOLAR MODULES

PCR is considering a 555-watt bi-facial module, such as those manufactured by Sunpower-Maxeon or similar type of model for the Project. The Sunpower-Maxeon module has been used as a representative module for the calculations in this Plan. Each module assembly (with frame) has a total weight of approximately 71.4 pounds. The modules are approximately 93.9 inches long and 43.0 inches in width and are mainly comprised of non-metallic materials such as silicon, mono- or poly-crystalline glass, composite film, plastic, and epoxies, with an anodized aluminum frame.

At the time of decommissioning, module components in working condition may be refurbished and sold in a secondary market yielding greater revenue than selling as salvage material.

2.3 TRACKING SYSTEM AND SUPPORT

The solar modules will be mounted on a one-in-portrait tracking system, such as the Omco Origin tracker manufactured by Omco Solar or a similar manufacturer. Each tracker is approximately 62.5 meters (205 feet) in length and will support 56 solar modules. Smaller trackers may be employed at the edges of the layout to efficiently utilize available space. The tracking system is mainly comprised of galvanized and stainless steel; steel piles that support the system are comprised of structural steel.

The solar arrays will be deactivated from the surrounding electrical system and made safe for disassembly. Electronic components, and internal electrical wiring will be removed and salvaged. The steel piles will be completely removed.

The supports, tracking system, and piles contain salvageable materials which will be sold to provide revenue to offset decommissioning costs.

2.4 INVERTERS AND TRANSFORMER STATIONS

PCR is proposing to use the SMA Solar Sunny Highpower PEAK3 or similar inverters, which will be mounted on a racking system located with transformers in two central locations within the solar array. The transformers typically sit on a skid assembly mounted on steel pile foundations within the array. The inverters, transformers, and associated equipment will be deactivated, disassembled, and removed. Depending on condition, the equipment may be sold for refurbishment and re-use. If not re-used, they will be salvaged or disposed of at an approved solid waste management facility. All oils and lubricants will be collected and disposed of at a licensed facility.

2.5 ELECTRICAL CABLING AND CONDUITS

The Project's underground electrical collection system will be placed at a minimum depth of approximately four (4) feet (48 inches) unless a greater depth is required by a landowner. Cabling installed below four feet will not interfere with future land use and can be abandoned in place. For purposes of this Plan, it is assumed that all cabling and conduit located at a depth greater than four feet below the surface will be abandoned in place.

2.6 PROJECT BELOW GROUND INTERCONNECTION LINE

No project-specific substation will be needed for the Project. The Project will utilize approximately 0.13 mile of 12.5kV below ground cable to connect to the POI. The interconnection cable will be placed at a minimum depth of approximately four (4) feet (48 inches) unless a greater depth is required by a landowner or jurisdiction.

Cabling installed below four feet will not interfere with future land use and can be abandoned in place. For purposes of this Plan, it is assumed that interconnection line located at a depth greater than four feet below the surface will be abandoned in place.

2.7 OPERATIONS AND MAINTENANCE AND SWITCHGEAR STURCTURES

PCR will utilize one small operations and maintenance (O&M) structure within the Project site. The structure will be of self-contained modular steel container-type construction (Conex) and installed on a gravel pad with connections to electrical or other services, as needed. A switchgear room will also be located in the south-central portion of the Project area. The structures will be in conformance with all local and state building codes and will be removed during the decommissioning process.

2.8 PERIMETER FENCING, SITE ACCESS AND INTERNAL ROADS

The Project site will include an approximately seven-foot-high chain-link or agricultural style fence surrounding the perimeter of each array site.

A network of access roads will allow access to solar facility equipment. The internal access roads will be composed of gravel approximately 12 feet wide and totaling approximately 7,000 feet (1.3 miles) in length. The internal access road lengths may change with final Project design. To be conservative, the decommissioning estimate assumes that all internal access roads will be completely removed.

Access roads located around the perimeter and/or within the array will be comprised of an eight-inch-thick gravel layer placed on compacted native soils. The estimated quantity of the material is provided in Table 2.

Table 2 Typical Access Road Construction Materials

Item	Quantity	Unit
Gravel or granular fill; eight-inch thick	2,074	Cubic Yards

Decommissioning activities include the removal and stockpiling of aggregate materials on site for salvage preparation. It is conservatively assumed that all aggregate materials will be removed from the Project site and hauled up to five (5) miles from the Project area. Following removal of aggregate, the access road areas will be graded, de-compacted with deep ripper or chisel plow (ripped to 18 inches), backfilled with native subsoil and topsoil, as needed, and graded as required to re-establish overall drainage patterns similar to pre-development conditions.

3.0 LAND USE AND ENVIRONMENT

3.1 LAND USE

Land use prior to proposed development is primarily agricultural. The areas of the Project that have been disturbed will be restored, as near as practicable, to their pre-construction condition and allow for similar land use. Topsoil, reserved during construction and stored in long-term berms, will be used if available and supplemented with comparable soils. Restored areas will be revegetated in compliance with regulations in place at the time of decommissioning.

3.2 RESTORATION AND REVEGETATION

Portions of the Project site that have been excavated and backfilled will be restored, as near as practicable, to pre-construction conditions. Soils compacted during de-construction activities will be de-compacted, as necessary, to restore the land to a condition suitable for pre-construction land use. Topsoil will be placed on disturbed areas, as needed, and seeded with appropriate vegetation in coordination with landowners.

3.3 SURFACE WATER DRAINAGE AND CONTROL

As previously described, the proposed Project area is predominantly located on agricultural land. The terrain is relatively flat. The Project facilities are being sited to avoid wetlands, waterways, and drainage features to the extent practicable.

Surface water conditions at the Project site will be reassessed prior to the decommissioning phase. PCR will obtain the required water quality permits from the Iowa Department of Natural Resources (IDNR) and the U.S. Army Corps of Engineers (USACE), as needed, prior to decommissioning the Project. Required construction stormwater permits will also be obtained, and a Stormwater Pollution Prevention Plan (SWPPP) prepared describing the protection needed to reflect conditions present at the time of decommissioning. Erosion control best management practices may include: construction entrances, temporary seeding, permanent seeding, mulching (in non-agricultural areas), erosion control matting, silt fence, filter berms, and filter socks.

3.4 MAJOR EQUIPMENT REQUIRED FOR DECOMMISSIONING

The activities involved in decommissioning the Project include removal of the Project components: solar modules, tracking system, foundations and piles, inverters, transformers, access roads, and electrical cabling and conduits (unless abandoned below ground). Restoration activities include back-filling of pile and foundation sites; de-compaction of subsoils; grading of surfaces to pre-construction land contours and revegetation of the disturbed areas.

Equipment required for the decommissioning activities is similar to what is needed to construct the solar facility and may include, but is not limited to: small cranes, low ground pressure (LGP) track mounted excavators, backhoes, LGP track bulldozers, LGP off-road end-dump trucks, front-end loaders, deep rippers, water trucks, disc plows and tractors to restore subgrade conditions, and ancillary equipment. Standard dump trucks may be used to transport material removed from the site to disposal facilities and to import clean fill and topsoil if necessary.

4.0 DECOMMISSIONING COST ESTIMATE SUMMARY

Expenses associated with decommissioning the Project will be dependent on labor costs at the time of decommissioning. For the purposes of this report, 2022 average market values were used to estimate labor expenses. Fluctuation and inflation of the labor costs were not factored into the estimates.

4.1 DECOMMISSIONING EXPENSES

During decommissioning, the Project will incur costs associated with disposal of components not sold for salvage, including materials which will be disposed of at a licensed facility, as required. Decommissioning costs also include backfilling, grading, and restoration of the proposed Project site as described in Section 2. Table 3 summarizes the estimated costs for activities associated with the major components of the Project.

Table 3 Estimated Decommissioning Expenses

Activity	Unit	Number	Cost per Unit	Total
Overhead and management (includes estimated permitting required)	Lump Sum	1	$42,000	$42,000
Solar modules; disassembly and removal	Each	20,496	$4.60	$94,282
Tracking system disassembly and removal (equivalent tracker)	Each	366	$400	$146,400
Steel pile/post removal	Each	3,358	$9.70	$32,573
Inverters (in-string)	Each	64	$300	$19,200
Transformer stations	Each	2	$1,100	$2,200
Access road excavation and removal	Lump Sum	1	$9,150	$9,150
Perimeter fence removal	Lineal Foot	5,950	$2.80	$16,660
Topsoil replacement and rehabilitation of site	Lump Sum	1	$88,400	$88,400
O&M structure	Lump Sum	2	$5,000	$10,000
Total Estimated Decommissioning Cost				**$460,865**

4.2 POTENTIAL DECOMMISSIONING REVENUES

A summary of potential revenue to be realized from resale or salvage of the facilities is included in this report. PCR acknowledges that Johnson County does not allow the

recognition of revenue due to salvage value to be considered in the final financial security for decommissioning. The estimated resale or salvage value is described in this report to provide information regarding the potential revenue available upon decommissioning.

As previously described, the value of the decommissioned components will be higher in the early stages of the Project and decline over time. Resale of components such as solar panels is expected to be greater than salvage (i.e., scrap) value for most of the life of the Project, as described below. For purposes of this report, only estimated salvage values were considered in net revenue calculations, as this is the more conservative estimate strategy.

Modules and other solar plant components can be sold within a secondary market for re-use. A current sampling of reused solar panels indicates a wide range of pricing depending on age and condition ($0.10 to $0.30 per watt). Future pricing of solar panels is difficult to predict at this time, due to the relatively young age of the market, changes to solar panel technology, and the ever-increasing product demand. A conservative estimation of the value of solar panels at $0.10 per watt would yield approximately $1,138,000. Increased costs of removal, for resale versus salvage, would be expected in order to preserve the integrity of the panels; however, the net revenue would be substantially higher than the estimated salvage value.

The resale value of components such as trackers, may decline more quickly; however, the salvage value of the steel that makes up a large portion of the trackers is expected to stay at or above the value used in this report.

The market value of steel and other materials fluctuates daily and has varied widely over the past five (5) years. Salvage value estimates were based on an approximate five-year-average price of steel and copper derived from sources including on-line recycling companies and United States Geological Survey (USGS) commodity summaries. The price used to value the steel used in this report is $241 per metric ton; aluminum at $0.40 per pound; silicon at $0.40 per pound and glass at $0.05 per pound.

The main material of the tracking system and piles is assumed to be salvageable steel. The main components of the solar modules are glass and silicon with aluminum framing. A 50 percent recovery rate was assumed for all panel components, due to the processing required to separate the panel components. Alternative and more efficient methods of recycling solar panels are anticipated before this Project is decommissioned, given the large number of solar facilities that are currently being developed. Table 4 summarizes the potential salvage value for the solar array components and construction materials.

Table 4 Estimated Decommissioning Revenues

Item	Unit of Measure-ment	Quantity per Unit	Salvage Price per Unit	Total Salvage Price per Item	Number of Items	Total
Panels – Silicon	Pounds per Panel	1.8	$0.40	$0.72	20,496	$14,757
Panels – Aluminum	Pounds per Panel	2.9	$0.40	$1.16	20,496	$23,775
Panels – Glass	Pounds per Panel	26.8	$0.05	$1.34	20,496	$27,465
Tracking System and Posts	Metric tons per $MW_{[DC]}$	32.0	$241	$7,712	11.38	$87,763
Total Potential Revenue						**$153,760**

* Revenue based on salvage value only. Revenue from used panels at $0.10 per watt could raise $1,138,000 as resale versus the estimated salvage revenue.

4.3 DECOMMISSIONING COST SUMMARY AND FINANCIAL ASSURANCE

Table 5 provides a summary of the estimated net cost to decommission the Project, using the information detailed in Section 4.1. Estimates are based on 2022 prices, with no market fluctuations or inflation considered. Table 5 provides the total estimated decommissioning cost without reductions based on salvage value.

Table 5 Decommissioning Summary

Item	Cost
Decommissioning Expenses	$460,865
Potential Revenue – salvage value of panel components and recoverable materials *(PCR acknowledges that Johnson County will not consider the revenue from resale or salvage of facilities in the final financial surety amount)*.	*$153,760*
Gross Decommissioning Cost with 10 Percent Contingency, per Ordinance (i.e., $460,865 X 110%)	$506,952

PCR has indicated that, in compliance with the Johnson County Zoning Ordinance, Article 8:1.23.BB.10, they shall provide to the County a Performance Agreement and accompanying financial surety instrument to cover the cost of decommissioning in accordance with the following as stated in the ordinance:

- The applicant shall provide estimates for the total cost for decommissioning the site as determined by a Licensed Engineer. Decommissioning costs shall not take salvage value into account.
- Decommissioning funds shall be an amount equal to the total costs for decommissioning the site, plus a ten percent (10%) contingency.
- Decommissioning funds shall be maintained in the form of cash, certificate of deposit, performance bond, escrow account, surety bond, letter of credit, or other form of financial assurance as agreed to by the approving authority. Any financial document evidencing the maintenance of the decommissioning funds shall include provisions for releasing the funds to the County in the event decommissioning is not completed in a timely manner.
- Prior to any ground disturbance, grading or construction activity on the site, fifty percent (50%) of total estimated decommissioning costs shall be provided by any of the means listed above. An additional twenty five percent (25%) shall be provided within five (5) years of the date of initial approval, and the remaining twenty five percent (25%) of the total re-estimated decommissioning costs shall be provided within eleven (11) years of the date of initial approval. From that point forward, 100% of the total estimated decommissioning costs as determined by the most recent re-estimation shall be maintained in the decommissioning fund until the end of the functional life of the project.
- Financial surety shall be maintained for the life of the project.
- Proof of recertification of the financial surety instrument must be submitted to the County annually.
- Every ten (10) years, the facility owner or operator shall retain an independent Licensed Engineer to re-estimate the total cost of decommissioning and attest that the value of the financial surety instrument is appropriate. This report shall be filed with the County.
    - The required amount of the decommissioning fund shall match the re-estimated cost of decommissioning. Within ninety (90) days of filing the re-estimation report with the County, the facility owner or operator shall cause the fund balance of the financial surety instrument to be adjusted to ensure that it matches the re-estimated decommissioning cost.

PCR will be responsible for decommissioning the Project facilities.

FIGURES

Figure 1 Project Layout

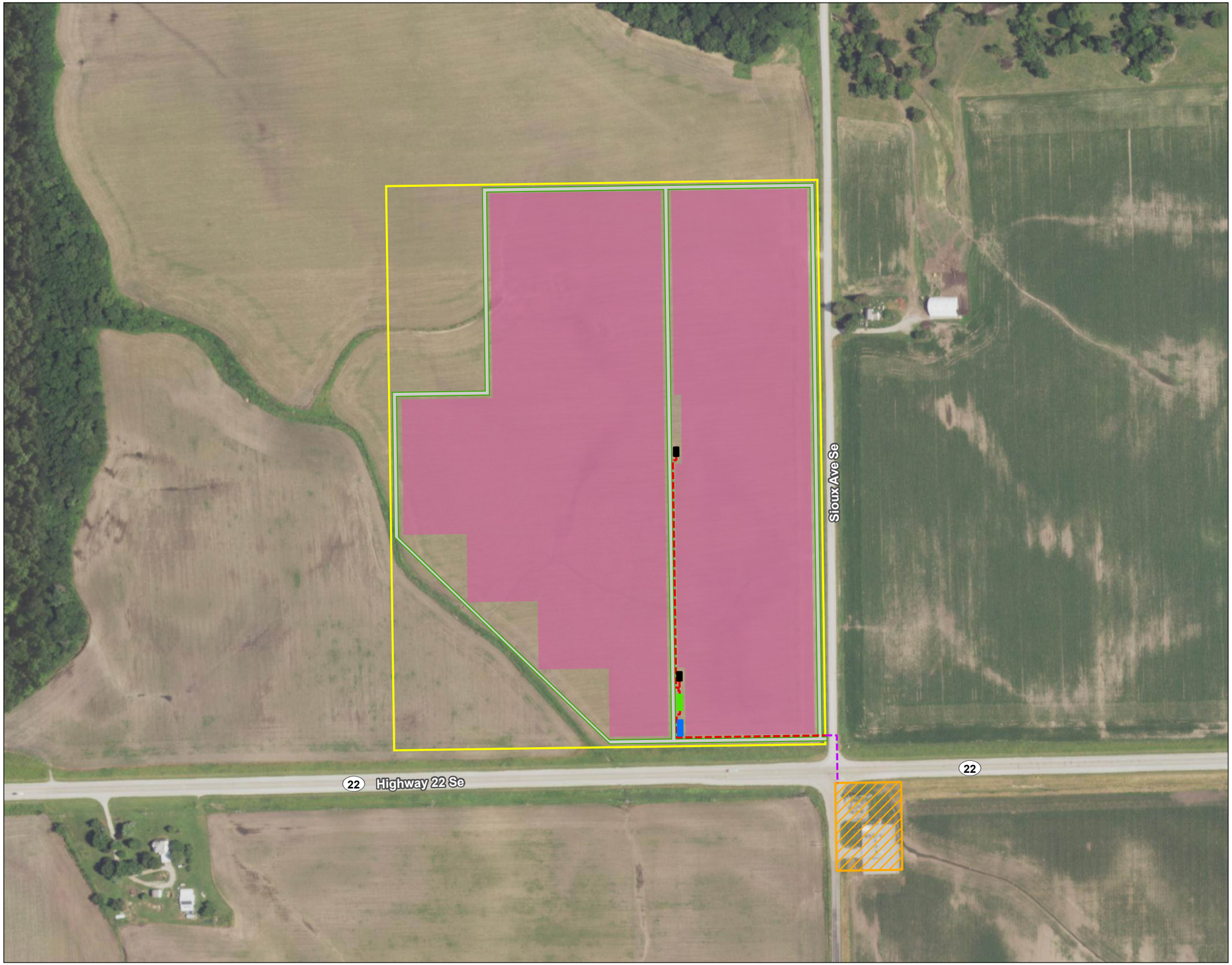

Figure No.
1

Title
Project Location

Client/Project 193709077
PCR Investments LLC
Lone Tree Substation Solar Project

Project Location
Township of Freemont
Johnson County, IA

Prepared by JDS on 2022-08-03
TR by MZ on 2022-08-04
IR by SP on 2022-08-18

N

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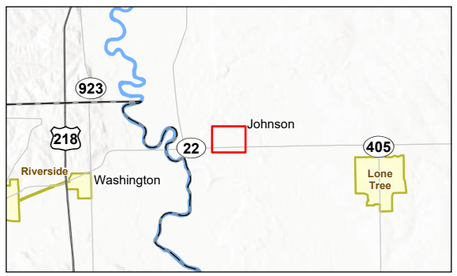
(At original document size of 11x17)
1:3,600

Legend
- Project Boundary
- Electrical Collection System
- Generator Tie Line
- Access Roads
- Solar Array
- O&M Room
- MV Power Station
- Switchgear Room
- Substation



Notes
1. Coordinate System: NAD 1983 StatePlane Iowa South FIPS 1402 Feet
2. Data Sources: Stantec, PCR Investments LLC, USGS, NADS
3. Background: NAIP 2019

Stantec