Blossom Solar Decommissioning Plan

Blossom Solar, LLC

Blossom Solar Project
Project No. 133219

5/6/2022

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prepared for

Blossom Solar, LLC
Blossom Solar Project
Morrow County, Ohio

Project No. 133219

5/6/2022

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
Blossom Solar	Blossom Solar, LLC
BMP	Best management practices
BOP	Balance-of-plant
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
kV	Kilovolt
kW	Kilowatt
Assumed Requirements	Assumed requirements for Project decommissioning
m	Meter
MWac	Megawatt, alternating current
MWdc	Megawatt, direct current
Project	Blossom Solar Project
Project Site	Location of the Project in Morrow County, Ohio
Study	Decommissioning Plan / Decommissioning Obligation Cost Evaluation

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1.0 INTRODUCTION

1.1 Study Overview

Burns & McDonnell Engineering Company, Inc. (“Burns & McDonnell”) was retained by Blossom Solar, LLC (“Developer”) to conduct a decommissioning cost evaluation (the “Study”) for the proposed Blossom Solar Project (the “Project”). The objective of the Study was to review the Project and to make a recommendation regarding the decommissioning plan for retiring the facility at the end of its useful life.

1.2 Project Overview

The proposed Project will be located in Morrow County, Ohio, approximately 4 miles south of the town of Galion (the “Project Site”). The total nameplate capacity of the Project is approximately 144 megawatts direct current (“MWdc”) and approximately 159.5 megawatts alternating current (“MWac”). The facility is expected to achieve commercial operation in 2022.

1.3 Applicable Regulations

The Ohio Power Siting Board (“OPSB”) as well as recent Ohio law passed as HB 52 requires that a solar facility provide a decommissioning plan prepared by a professional engineer for the solar facility at the end of its useful life. The law further requires that scrap value of any material from the decommissioning process *not* be included in the total cost of removal.

Ohio further allows counties/townships additional requirements regarding the contents and parameters of such plan. Burns & McDonnell is not aware of any requirements specific to decommissioning that are imposed by Morrow County. As such, based on Burns & McDonnell’s experience and typical industry benchmarks, this report assumes that (i) all above-grade structures associated with the Project will be removed and (ii) all Project equipment, structures, and supporting facilities will be removed to a depth of 36 inches below grade (collectively, the "Assumed Requirements").

1.4 Site Visit

Burns & McDonnell did not visit the Project as part of this Study. The contents of this evaluation are based exclusively upon desktop analysis by Burns & McDonnell.

2.0 PROJECT OVERVIEW

2.1 Modeling Inputs

The decommissioning cost evaluation for the Study was prepared by Burns & McDonnell based on the following assumptions regarding the Project facilities. The overall Project configuration that was used as the basis for this Study is shown in Appendix A.

2.2 Solar Array System

The Project is expected to utilize approximately 319,176 mono-crystalline solar modules from LONGI (LR5-72HPH-540M bifacial). Each solar module with frame included was estimated to weigh approximately 71 pounds and have approximate dimensions of 89 inches by 45 inches.

The fenced area of the Project encompasses approximately 1,100 acres; approximately 158,400 linear feet of fence was assumed to be installed. The land within the perimeter fencing is predominantly agricultural. Approximately 75% of this area was assumed to be disturbed and require surface grading and reseeding as part of restoration activities for decommissioning.

All above-grade equipment within the perimeter fence of the array will be removed as part of decommissioning, including the modules, trackers, and fencing. All salvageable materials will be loaded onto trucks and hauled to a scrap yard for recycling. All other materials will be loaded onto trucks and hauled to a local landfill for disposal.

All below-grade equipment and foundations associated with the array will be removed to a depth of 36 inches below grade in accordance with the Assumed Requirements. Voids left from the removal of the below-grade foundations will be backfilled with surrounding soils and fine graded to provide suitable drainage.

2.3 Tracking System and Supports

Solar tracking systems are used to maximize the system's electricity production by moving the solar panels to follow the sun through the day. These type of tracking systems are configured to operate automatically and optimizes the angle at which the solar panels receive solar energy (radiation). A total of 2,840 trackers (4-string configuration) were assumed to be installed.

All above-grade equipment associated with the tracking system will be removed as part of decommissioning, including the trackers and posts. All salvageable materials will be loaded onto trucks

and hauled to a scrap yard for recycling. All other materials will be loaded onto trucks and hauled to a local landfill for disposal.

All below-grade equipment and foundations associated with the trackers will be removed to a depth of 36 inches below grade in accordance with the Assumed Requirements. Voids left from the removal of the below-grade foundations will be backfilled with surrounding soils and fine graded to provide suitable drainage.

2.4 Power Conversion Stations

The combined inverters and transformers, also known as power conversion stations ("PCS"), generally sit on small concrete footings or concrete ballasts on steel piles within the array. A quantity of 40 SMA Sunny Central 4000 UP-US 4,000 kVA PCS were assumed to be removed as part of decommissioning.

All above-grade equipment associated with the PCS will be removed as part of decommissioning. All salvageable materials will be loaded onto trucks and hauled to a scrap yard for recycling. All other materials will be loaded onto trucks and hauled to a local landfill for disposal.

All below-grade equipment and foundations associated with the PCS will be removed to a depth of 36 inches in accordance with the Assumed Requirements. Voids left from the removal of the below-grade foundations will be backfilled with surrounding soils and fine graded to provide suitable drainage.

2.5 Electrical Cabling

Below-grade cabling was assumed to be buried at a minimum depth of 36 inches below grade. At this depth, all cables are assumed to remain in place after the Project is decommissioned. However, if the demolition contractor deems the salvageable value of the cabling to be greater than the cost for removal, the contractor may elect to remove the cabling at its own cost.

Above-grade cabling will be removed as part of decommissioning. All salvageable materials will be loaded onto trucks and hauled to a scrap yard for recycling. All other materials will be loaded onto trucks and hauled to a local landfill for disposal.

2.6 Access Roads

The Project will utilize access roads to support construction and allow for vehicle access to facilitate inspections and maintenance of the solar panels and associated equipment during operation. Access roads were assumed to be 16-feet wide and be surfaced with 6 inches of crushed rock. A total of 54,050 linear feet of access roads was assumed to be installed, including for entry roads and substation roads.

All crushed rock surfacing will be removed from the Project's access roads. The removed crushed rock will be loaded into dump trucks and hauled offsite. Crushed rock can be recycled and reused and typically has a salvage value as a commodity equal to or greater than the cost to haul to an end user. However, for the purpose of this Study, the cost to remove the crushed rock, load it into dump trucks, and haul it offsite was assumed to be at the expense of the Project.

Areas where crushed rock surfacing has been removed will be fine graded to provide suitable drainage. In right-of-way and non-agricultural areas, the ground will be seeded to prevent erosion.

2.7 Project Substation

Power from the solar project is delivered via power cables to an on-site collector substation where it is transformed to a higher voltage. No design information was available for this substation at the time this Study was written, so it was assumed to consist of one main power transformer, one high-voltage breaker, and other typical equipment, including disconnect switches, lightning masts, control building, and other ancillary equipment. Weights, dimensions, and specifications for this equipment were each assumed by Burns & McDonnell for purposes of this Study.

All above-grade equipment within the perimeter fence of the substation will be removed as part of decommissioning, including transformers, breakers, buildings, crushed rock surfacing, and fencing. All salvageable materials will be loaded onto trucks and hauled to a scrap yard for recycling. All other materials will be loaded onto trucks and hauled to a local landfill for disposal.

All below-grade equipment and foundations associated with the substation will be removed to a depth of 36 inches below grade in accordance with the Assumed Requirements. Voids left from the removal of the below-grade foundations will be backfilled with surrounding soils and fine graded to provide suitable drainage.

2.8 Transmission Line

The Project is expected to be interconnected to the regional electric transmission grid through a high-voltage underground transmission line. Below-grade cabling was assumed to be buried at a minimum depth of 36 inches below grade. At this depth, all cables are assumed to remain in place after the Project is decommissioned. However, if the demolition contractor deems the salvageable value of the cabling to be greater than the cost for removal, the contractor may elect to remove the cabling at its own cost.

2.9 Maintenance Facility

The Project is expected to include an off-site operations and maintenance facility (the "O&M Building") in an existing building in a nearby town. As part of this Study, it is assumed that the decommissioning of the O&M Building was not applicable.

2.10 Meteorological Equipment

Solar data is assumed to be measured on-site using meteorological ("MET") stations located around the Project Site. A total of eight (8) MET stations were assumed to be installed. Each station was assumed to be a permanent, free-standing 15-foot steel lattice tower on a concrete foundation.

All above-grade equipment associated with the MET stations will be removed as part of decommissioning, including the tower structure, crushed rock surfacing, and fencing. All salvageable materials will be loaded onto trucks and hauled to a scrap yard for recycling. All other materials will be loaded onto trucks and hauled to a local landfill for disposal.

All below-grade equipment and foundations associated with the weather stations will be removed to a depth of 36 inches below grade in accordance with the Assumed Requirements. Voids left from the removal of the below-grade foundations will be backfilled with surrounding soils and fine graded to provide suitable drainage.

3.0 DECOMMISSIONING PLAN

3.1 Decommissioning Plan

When it is determined that the Project should be retired, the Project equipment will be removed as noted herein. It was assumed that the Project will incur costs for removal and disposal of the solar farm components, foundations, and other Project facilities, as well as for the restoration of the site following the removal of equipment. However, the above-grade steel, aluminum, and copper equipment is expected to have significant scrap value to a salvage contractor that will offset a portion of the decommissioning costs. All recyclable materials will be recycled to the extent possible, while all other non-recyclable waste materials will be disposed of in accordance with state and federal law.

Prior to commencing activities associated with foundation removal, crushed rock surfacing removal, or any other earthwork, an approved erosion control plan will need to be developed by the demolition contractor. Best management practices ("BMPs") applicable at the time that decommissioning activities occur will need to be implemented by the contractor for control of storm water runoff. Since decommissioning activities are not anticipated to occur for 20 years or more, BMPs may differ from current standards, although if decommissioning takes place in the near future, Burns & McDonnell would anticipate BMPs such as silt fencing, proper compaction, seeding, and mulching practices to be implemented. BMPs will need to be reviewed by the contractor prior to commencing decommissioning activities to determine the appropriate BMPs at that time. To the extent necessary, permits relating to decommissioning activities will need to be obtained, including permits from the Environmental Protection Agency. The costs included in this Study are expected to be sufficient for a demolition contractor to develop suitable plans for the control of surface water drainage and water accumulation as well as for backfilling, soil stabilization, compacting, and grading prior to commencing demolition activities.

As part of decommissioning, all disturbed areas at the site will be returned to as close to predevelopment conditions as practicable. The cost estimates provided herein include activities and costs to return the land to a condition suitable for agricultural use subsequent to decommissioning of the Project.

The activities associated with the decommissioning plan described above are anticipated to be completed within a 6-month timeframe, including approximately two months for planning, and permitting activities; approximately three months for demolition; and approximately one month for site restoration. Additional time may be required for post-decommissioning activities, including monitoring of new vegetation. However, this timetable and the cost estimates below should provide sufficient time and budget to comply with any applicable health and safety regulations.

3.2 General Decommissioning Assumptions

In addition to other assumptions noted herein, the following general assumptions were utilized for the Study's decommissioning cost estimates:

1. All costs are presented in current (2022) dollars using a site cost index of 88.3% for Marion, Ohio.
2. The estimate is based on preliminary design performed by Burns & McDonnell on behalf of by Blossom Solar, LLC. Other Project-related information was assumed by Burns & McDonnell.
3. An offsite landfill (Mid-Ohio Sanitation and Recycling LLC) is used for disposal of demolition waste. The hauling distance to this landfill is approximately 12 miles from the Project and the cost for disposal of debris and concrete is $57.03 per ton at this landfill.
4. All containers and chemical storage tanks owned by the Project were assumed to be drained and the contents disposed of prior to demolition; these costs are excluded from the estimate. No allowances are included for unforeseen environmental remediation activities.
5. All underground equipment will be removed to a depth of 36 inches below grade in accordance with the Assumed Requirements. All non-hazardous structures or foundations greater than 36 inches below grade will remain and are excluded from the decommissioning estimate.
6. It was assumed that all disturbed areas will be restored to original grade, reclaimed with native soils, seeded, and replanted with native vegetation consistent with the surrounding land use.
7. Transformers will be removed and processed on-site. The cost to drain and dispose of transformer oil off-site is included in the decommissioning cost estimate.
8. The Project laydown yards utilized during construction of the Project were assumed to have been previously reclaimed and restored; no further grading, seeding, or other restoration of these areas is included in this estimate.
9. Cost estimates include 5 percent indirect and 20 percent contingency.
10. Market conditions may result in cost variations at the time of contract execution.
11. Valuation and sale of land, as well as replacement generation costs, are excluded from this scope.

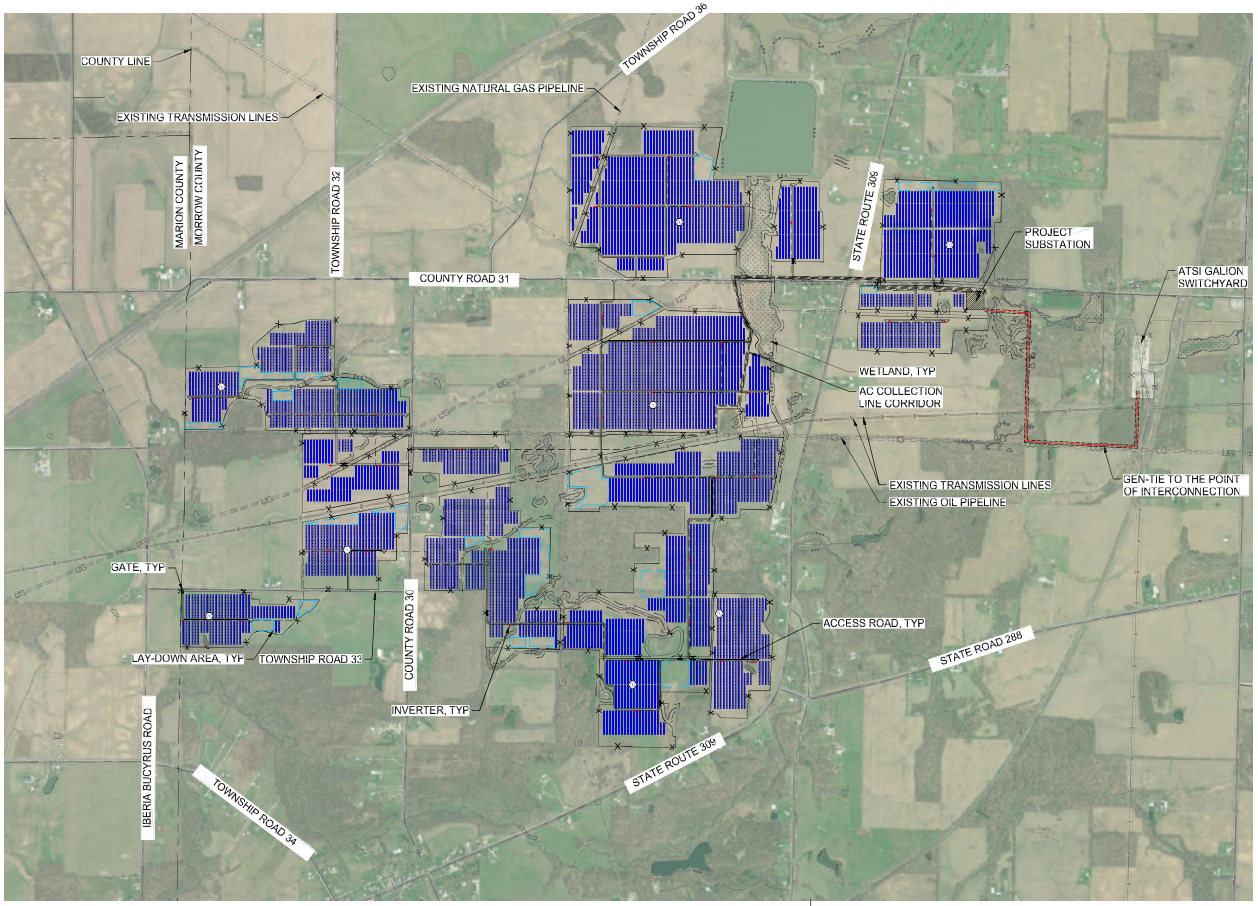
4.0 RESULTS

The total gross cost to decommission the Project at the end of its useful life, based on the assumptions noted herein, is estimated to be approximately $14,926,000; a detailed breakdown of these costs is included in Table 4-1 below.

Table 4-1: Estimated Decommissioning Costs (2022$)

Project Facilities	Removal Cost
Solar Array	$6,303,000
Roads	$230,000
Perimeter Fencing	$1,162,000
Concrete / Debris	$49,000
Weather Stations	$3,000
Project Substation	$141,000
Transmission Line	$0
O&M Building	$0
Site Restoration	$4,053,000
Total Estimated Cost	**$11,941,000**
Owner Indirects (5%)	$597,000
Contingency (20%)	$2,388,000
Total Gross Cost	**$14,926,000**

APPENDIX A – PROJECT SITE LAYOUT



GENERAL ARRANGEMENT
0 1000 2000
SCALE IN FEET

NORTH

LEGEND:

- PROPOSED FENCE
- ACCESS ROAD
- LAY-DOWN AREA
- WETLAND
- STREAM
- EXISTING TRANSMISSION/DISTRIBUTION LINE
- PROPOSED COLLECTION SYSTEM LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING OIL PIPELINE
- EXISTING NATURAL GAS PIPELINE
- INVERTER
- COUNTY LINE

SETBACKS	
PROPERTY LINE TO FENCELINE	25' MIN.
NEIGHBORING RESIDENCE TO FENCELINE	250' MIN.
JURISDICTIONAL WATERWAY OR WETLAND TO FENCELINE	25' MIN.
EXISTING ROAD R-O-W TO FENCELINE	25' MIN.
NEIGHBORING RESIDENCES TO INVERTERS	500' MIN.

SYSTEM DESCRIPTION (SITE TOTAL)	
POI CAPACITY (AC)	144.0 MW
INVERTER NAMEPLATE CAPACITY	160.0 MW
SOLAR CAPACITY (DC)	159.5 MW
DC:AC RATIO (@ POI)	1.11
AC COLLECTION SYSTEM VOLTAGE	34.5 kV
DC SYSTEM VOLTAGE	1,500 V
TOTAL MODULES	295,360
MODULES PER STRING	26
AVERAGE STRINGS PER INVERTER	284
TOTAL INVERTER SKIDS	40

DESIGN PARAMETERS	
GROUND COVER RATIO	31%
RACKING	SINGLE AXIS TRACKER
ROW TO ROW SPACING	50.98'
NO. OF 4-STRING TRACKERS	2,840

MODULE PARAMETERS	
MANUFACTURER	LONGI
MODEL NUMBER	LR5-72HPH-540M
MODULE WATTAGE	540W

PV INVERTER PARAMETERS	
MANUFACTURER	SMA
MODEL NUMBER	SUNNY CENTRAL 4000 UP-US
INVERTER NAMEPLATE RATING	4,000 kVA

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.
3. SITE TO INCLUDE 16' ACCESS RCADS.
4. TURNING RADIUS ON ROADS TO BE 35' TYPICAL.

⊙ KEYED NOTES:

1. SOLAR MEASUREMENT STATION

FOR PERMITTING PURPOSES ONLY

no.	date	by	ckd	description
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BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.

designed P. DURKEE | detailed D. KOPER

MORROW COUNTY, OH

BLOSSOM SOLAR PROJECT
OVERALL GENERAL ARRANGEMENT

project 132219 | contract -
drawing CS100 | rev. 0
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Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com