

**U.S. DEPARTMENT OF ENERGY  
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY  
NEPA DETERMINATION**



**RECIPIENT:** Silicon Ranch Corporation

**STATE:** TN

**PROJECT TITLE:** Integrated PV System Design and Management Platform for the Co-Optimization of Regenerative Cattle Grazing and PV Solar Generation

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002243	DE-EE0009373	GFO-0009373-002	G09373

**Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:**

**CX, EA, EIS APPENDIX AND NUMBER:**

Description:

- |   |  |
|---|--|
| <b>A9 Information gathering, analysis, and dissemination</b>                                | Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)   |
| <b>A11 Technical advice and assistance to organizations</b>                                 | Technical advice and planning assistance to international, national, state, and local organizations.   |
| <b>B3.1 Site characterization and environmental monitoring</b>                              | Site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix for such activities.) Specific activities include, but are not limited to: (a) Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; (b) Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools); (c) Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; (d) Aquifer and underground reservoir response testing; (e) Installation and operation of ambient air monitoring equipment; (f) Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck- or mobile-scale equipment, and modification, use, and plugging of boreholes); (g) Sampling and characterization of water effluents, air emissions, or solid waste streams; (h) Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources); (i) Sampling of flora or fauna; and (j) Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7. |
| <b>B3.6 Small-scale research and development, laboratory operations, and pilot projects</b> | Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.   |
| <b>B3.8 Outdoor terrestrial ecological and environmental research</b>                       | Outdoor terrestrial ecological and environmental research in a small area (generally less than 5 acres), including, but not limited to, siting, construction, and operation of a smallscale laboratory building or renovation of a room in an existing building for associated analysis. Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance.   |

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Silicon Ranch Corporation (SR) to expand and accelerate the development of dual-use solar energy projects that combine energy generation and agricultural production. The project would develop commercial and demonstration-scale energy and financial models for "CattleTracker," an optimized system to co-locate photovoltaic (PV) energy production and regeneratively grazed cattle. Ultimately, the recipient would field test the integration of cattle grazing alongside an operating solar array and develop associated ecosystem service measurements and methods.

A previous NEPA Determination (ND; GFO-0009373-001; A9, A11, B3.1, B3.6, B3.8; 08/13/2021) was completed for all award activities taking place in Budget Period (BP) 1 and BP2. BP3 was not previously reviewed because the field test site was unknown at the time of writing the original ND. Since that time, two different field sites have been identified for BP3 activities. This ND reviews BP3 activities and the two newly chosen sites, as well as including a time extension for BP2 and BP3 activities, from 12- to 18-months and 12- to 42-months, respectively.

Proposed BP3 award activities would include computer modeling, soil and plant sampling, installation of ecosystem monitoring equipment, CattleTracker demonstration, stakeholder engagement, and field testing of cattle grazing integration and associated ecosystem service measurements and methods. SR would oversee the project, and would carry out program management, technical and financial analysis, carbon protocol development, stakeholder engagement, and workshops.

The two new proposed sites for BP3 would be SR Christiana (Christiana, TN), with SR Monroe (Monroe, TN) as a backup site. SR Christiana is expected to be the site of the new outdoor test lab to be built. This would include the design and installation of an outdoor test lab solar plant, necessary access roads, security fencing, and electrical system to connect to the grid. These activities would not be carried out as part of this DOE award, but as activities taking place separately, regardless of whether DOE administers funds to the recipient (SR) or not. DOE would administer funds for the CattleTracker research and equipment modifications to increase the height of the PV panels in order to allow livestock to graze underneath. This research would involve grazing events run in parallel with the pasture reference site, SR Arlington II (Bancroft Station; Blakely, GA) and would involve taking ecosystem and field measurements as well.

SR Christiana is an existing livestock pasture where a 4.5 Megawatt (MW) outdoor solar test lab may be installed if selected as the primary location of the test site. The following consultations have been completed for the site:

1. A Phase I Environmental Site Assessment (ESA) was completed to evaluate the potential presence of recognized environmental conditions (RECs) that may adversely affect the subject property and corresponding project activities. No RECs were identified at this site.
2. A threatened and endangered species habitat assessment was conducted by HDR. HDR consulted the U.S. Fish and Wildlife (USFWS) Information for Planning and Consultation (IPaC) database for federally listed species with potential to occur on or in the vicinity of the Project Site. The eight federally listed species on the IPaC Resources List include the gray bat, Indiana bat, northern long-eared bat (NLEB), littlewing pearlymussel, monarch butterfly Braun's rockcress, Guthrie's ground-plum, and leafy prairie-clover are identified in the area. In addition, three migratory birds were listed on the IPaC Resources List as Birds of Conservation Concern (BCC): the Kentucky warbler, prairie warbler, and the wood thrush. According to the USFWS IPaC Resources List, no USFWS-designated Critical Habitat is located within the Project Site. Suitable habitat was not observed for the leafy prairie-clover, gray bat, Kentucky warbler, littlewing pearlymussel, or monarch butterfly. As such, the proposed development of SR Christiana would not affect these species. Suitable habitat was observed for Guthrie's ground-plum and Suitable breeding habitat was observed for the wood thrush and prairie warbler. Suitable summer habitat was observed for the federally listed Indiana bat and NLEB. Based on the proposed award activities, stream impacts will be avoided, or stream impacts would be minimized with the adherence to the conditions of the Clean Water Act Section 401 and 404 permits. Activities carried out at the project site may affect but is unlikely to adversely affect the wood thrush and prairie warbler due to their ability to move offsite into nearby suitable habitat. The Guthrie's ground-plum may be affected by the Project. However, if the Project will have no impacts to wetland or waters and will not trigger federal or state permitting, formal coordination with the USFWS is not required. If the plan development evolves, coordination with the USFWS for federally listed species and coordination with state agencies for state listed species may be required, as well as reaching out to the DOE Program Point of Contact. Suitable summer habitat for the Indiana bat and NLEB would be affected by clearing for array construction and shading effects; however, clearing would be limited to the months (October 14-April 1 for the Indiana bats and August 15-May 14 for NLEBs) when the bats would not occupy forest habitats. Therefore, the proposed development of the project site may affect, but is unlikely to adversely affect the federally listed bat species.
3. The US Army Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and recipient has been advised of the option to request and obtain an approved Jurisdictional Determination for the review area. The recipient is aware of this and will apply for a permit if needed.
4. A small portion of the site is located in a Federal Emergency Management Agency Flood Zone AE. These are areas subject to inundation by the 1-percent annual-chance flood event determined by detailed methods with Base Flood Elevations (BFEs) determined. The recipient has been advised to contact the local floodplain administrator for regulatory requirements.

SR Monroe is currently used as cropland, and if SR Monroe is selected as the test site, a 6.6 MW outdoor solar test lab would be installed. The following consultations have been completed for the site:

1. A Phase I ESA was completed to evaluate the potential presence of recognized environmental conditions (RECs) that may adversely affect the subject property and corresponding project activities. No RECs were identified at this site.

2. S&ME completed a review of the project area in January 2021 and did not identify appropriate habitat for any federally listed species within the project area, except for NLEB. The U.S. Fish and Wildlife Service's Information for Planning and Consultation database (IPaC) shows five threatened or endangered species, including the gray bat, NLEB, tricolored bat, whooping crane, and monarch butterfly. There are also four migratory birds listed, the chimney swift, field sparrow, Kentucky warbler, and red-headed woodpecker.

However, minimal, if any, tree clearing is proposed for the project. The site is not located within 150 feet of a known NLEB maternity roost tree or within 0.25 miles of a known NLEB hibernaculum. Clearing would be limited to the months (August 15-May 14 for NLEBs) when the bats would not occupy forest habitats. Therefore, the proposed development of the project site may affect, but is unlikely to adversely affect the federally listed bat species.

3. Based on the USACE review of the JD Report, it has been determined that the review area contains no waters of the United States subject to USACE jurisdiction.

The U.S. Department of Agriculture Natural Resource Conservation Services Web Soil Survey database shows that both SR Christiana and SR Monroe contain prime farmland. As there will be no change to the use of land at these sites because agricultural practices would continue, DOE has determined the proposed project will have no effect on prime farmland.

If outdoor solar test labs may be built in a floodplain, the US Army Corps of Engineers will verify the environmental surveying and permits would be applied for as needed. Storm water retention features would also be designed to mitigate floodplain effects.

Project activities would involve the grazing management of cattle, soil sampling, and other ecosystem measurement techniques within an operating solar power plant. Cattle management and mechanical and electrical management of the solar plant would take place by trained and qualified staff. Any risks associated with these activities would be mitigated through adherence to established health and safety policies and procedures. Protocols would include employee training, the use of personal protective equipment, monitoring, engineering controls, and internal assessments. All waste products would be disposed of by licensed waste management service providers. SR and its project partners would observe all applicable federal, state, and local health, safety, and environmental regulations.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

## **NEPA PROVISION**

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

If the Project will have no impacts to wetland or waters and will not trigger federal or state permitting, formal coordination with the USFWS is not required. If the plan development evolves, coordination with the USFWS for federally listed species and coordination with state agencies for state listed species may be required, as well as reaching out to the DOE Program Point of Contact.

Any tree clearing would be limited to the months (October 14-April 1 for the Indiana bats and August 15-May 14 for NLEBs) when the bats would not occupy forest habitats.

Notes:

Solar Energy Technologies Office (SETO)  
This NEPA determination requires a tailored NEPA provision.  
Review completed by Alex Colling on 7/15/2024.

## **FOR CATEGORICAL EXCLUSION DETERMINATIONS**

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

The proposed action is categorically excluded from further NEPA review.

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature:  \_\_\_\_\_ Date: 7/17/2024  
NEPA Compliance Officer

**FIELD OFFICE MANAGER DETERMINATION**

- Field Office Manager review not required
- Field Office Manager review required

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Field Office Manager