SUPPLEMENTAL INFORMATION REPORT

Esmeralda 7 Project Programmatic Environmental Impact Statement/Resource Management Plan Amendment

US Department of the Interior
Bureau of Land Management
Battle Mountain District
Tonopah Field Office
50 Bastian Road
Battle Mountain, Nevada 89820

July 2024

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The Bureau of Land Management's mission is to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
BESS	battery energy storage system
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
PEIS	programmatic environmental impact statement
gen-tie	generation interconnect
GW	gigawatt
MW	megawatt
NEPA	National Environmental Policy Act of 1969
POD	plan of development
PV	photovoltaic
RFDS	reasonably foreseeable development scenario
RMP	resource management plan
RMPA	resource management plan amendment
ROW	right-of-way
SER	supplemental environmental report
US	United States

Applicant Names (Parent Company Names)	Project Names
335ES 8me LLC (Avantus)	Red Ridge 1 Solar Project
336SP 8me LLC (Avantus)	Red Ridge 2 Solar Project
Boulevard Associates LLC (NextEra)	Esmeralda Energy Center Project
CG Western Renewables III LLC (ConnectGen)	Smoky Valley Solar Project
Gold Dust Solar LLC (Arevia)	Gold Dust Solar LLC Solar Project
Nivloc Solar Energy LLC (Invenergy)	Nivloc Solar Energy Project
US Solar Assets LLC (Leeward)	Lone Mountain Solar Project

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Chapter 1. Introduction

1.1 Introduction and General Information

The United States (US) Department of the Interior, Bureau of Land Management (BLM), Battle Mountain District Office is preparing a programmatic environmental impact statement (PEIS) and resource management plan amendment (RMPA) to support the BLM's decision-making on the development of seven utility-scale photovoltaic (PV) solar facilities (Esmeralda 7) with battery energy storage systems (BESS) on BLM-administered lands in Esmeralda County, Nevada. The seven proposed facilities would be geographically contiguous and encompass approximately 62,300 acres of BLM-administered lands approximately 30 miles west of Tonopah, Nevada (**Figure 1-1**, Planning Area).

The PEIS will analyze the potential impacts associated with the construction, operations and maintenance, and decommissioning of the seven utility-scale PV solar facilities with BESS proposed by US Solar Assets LLC, Nivloc Solar Energy LLC, CG Western Renewables III LLC, 335ES 8me LLC, 336SP 8me LLC, and Boulevard Associates LLC. Portions of the proposed Esmeralda 7 operations would not be in conformance with certain planning decisions in the Tonopah Resource Management Plan (RMP; BLM 1997). Potential amendments to the RMP would modify the visual resources management class objectives. Additionally, portions of the Esmeralda 7 operations would not be in conformance with the Approved Resource Management Plan Amendments/Record of Decision for Solar Energy Development in Six Southwestern States (BLM 2012), which amended the Tonopah RMP and Record of Decision (ROD; BLM 1997) and limits the siting of solar panels to lands with slopes that are 5 percent or less. Therefore, the requisite amendments to the Tonopah RMP would be analyzed in the PEIS.

The PEIS would not approve any individual right-of-way (ROW) grants. Rather, a site-specific analysis for individual projects would be conducted through subsequent tiered National Environmental Policy Act (NEPA) documentation.

This supplemental information report outlines the descriptions of the Proposed Action (**Chapter 2**), the Limited Workforce Alternative, the Soils and Vegetation Conservation Alternative, and the No Action Alternative, and alternatives considered and eliminated from detailed analysis (**Chapter 3**). The PEIS for the combined projects calls for a reasonably foreseeable development scenario (RFDS) to illustrate the potential future effects of the seven developments. The RFDS is included as **Appendix A**.

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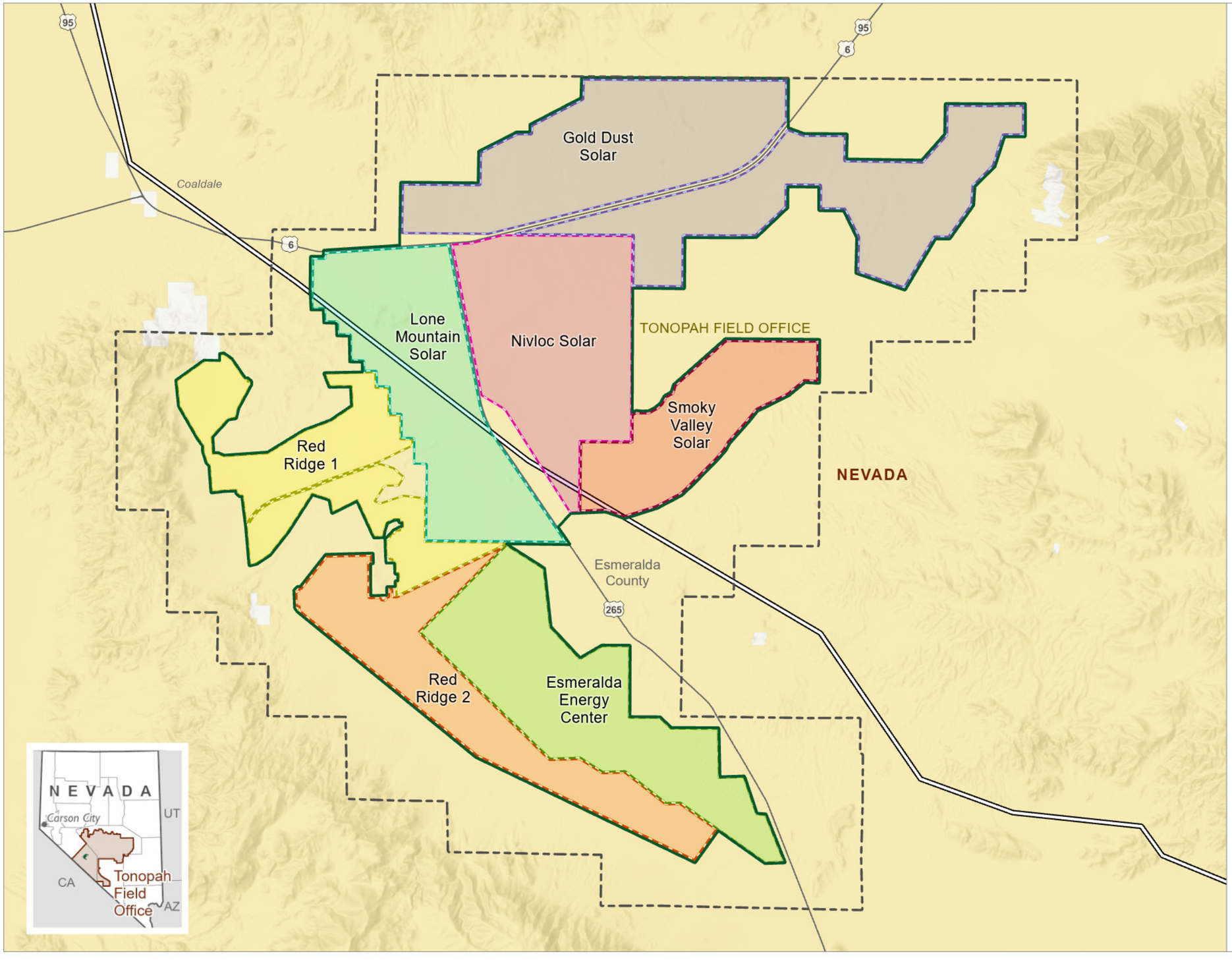

Figure 1-1
Planning Area

- Lone Mountain Solar
- Esmeralda Energy Center
- Smoky Valley Solar
- Gold Dust Solar
- Nivloc Solar
- Red Ridge 1
- Red Ridge 2
- Planning area
- Segregation of public land
- Greenlink West Transmission Project, Final EIS proposed action
- Bureau of Land Management
- Private

0 1 2
Miles

Source: BLM GIS 2023, Department of the Interior, Bureau of Land Management, Battle Mountain District Office
June 27, 2024,
Esmeralda7_Intro.aprx
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Chapter 2. Proposed Action

2.1 BACKGROUND

Seven projects have pending ROW applications before the BLM: Lone Mountain Solar, Nivloc Solar, Smoky Valley Solar, Red Ridge 1 Solar, Red Ridge 2 Solar, Esmeralda Energy Center, and Gold Dust Solar. These solar energy–generation and battery energy storage projects, and the associated components, would help meet Nevada's growing demand for power and help fulfill national and State renewable energy and greenhouse gas (GHG) emissions goals. Solar energy provides a sustainable, renewable source of power that helps reduce fossil fuel dependence and GHG emissions. If approved and authorized for construction, all seven facilities would connect to the proposed 525-kilovolt (kV) Esmeralda Substation that would be constructed as part of the Greenlink West transmission project.

Through the PEIS/RMPA, the BLM can establish programmatic design features and mitigation measures for the planning area. The RMPA would not approve or deny any individual applications for ROW grants. Rather, the BLM would conduct additional environmental analysis in a separate decision-making process regarding whether to approve, approve with modifications, or deny these applications. Anticipated programmatic design features are outlined in each of the project's resource-specific supplemental environmental reports (SERs), including SERs for air quality and climate change; cultural resources; biological resources; Native American concerns; social values, economics conditions, and environmental justice; water resources; and visual resources.

2.2 ALTERNATIVE A. PROPOSED ACTION

Under Alternative A, the Proposed Action, there would be the potential for up to 62,300 acres of solar development within the seven projects currently proposed within the planning area (**Figure 1-1**, Planning Area). The proposed projects include the development of PV solar facilities, including solar arrays, energy storage, roads, and electric generation intertie (gen-tie) lines, within the seven solar ROWs, as outlined in each project's plan of development (POD).

Table 2-1 provides a summary overview of each project. Because the project designs vary and will be refined prior to individual project approval, the Proposed Action is based on standard PV facility designs, construction, operations and maintenance, and decommissioning. The description of standard methods are outlined in **Appendix A**, Section A.2.1.

Table 2-1. Summary of Each Project in the Planning Area

Applicant	Project	Description
US Solar Assets LLC	Lone Mountain Solar	1-gigawatt (GW) PV facility and 500-megawatt (MW) battery storage system; 8,350 acres
Nivloc Solar Energy LLC	Nivloc Solar	500 MW PV facility and battery storage system; 8,280 acres
CG Western Renewables III LLC	Smoky Valley Solar	1 GW PV facility and battery storage system; 4,890 acres
335ES 8me LLC 336SP 8me LLC	Red Ridge 1 Solar Red Ridge 2 Solar	600 MW PV facility and battery storage system for each; 6,190 acres for Red Ridge 1 Solar and 6,860 acres for Red Ridge 2 Solar
Boulevard Associates LLC	Esmeralda Energy Center	1 GW PV facility and battery storage system; 8,360 acres

Applicant	Project	Description
Gold Dust Solar LLC	Gold Dust Solar	1.5 GW PV facility and 1 GW battery storage system; 16,720 acres

Sources: Transcon Environmental Inc 2021a, 2021b; Boulevard Associates LLC 2021; CG Western Renewables III LLC 2021; Gold Dust Solar LLC 2021; Nivloc Solar Energy LLC 2021; US Solar Assets 2021. Additional/updated estimates were submitted to the BLM by project applicants in July 2023.
Source for project area/ROW acres: BLM GIS 2023
Note: Some of the ROW acres were adjusted to deduct areas that overlap the Greenlink West corridor.

2.3 PROPOSED DISTURBANCE

Based on available existing information regarding the proposed solar facilities, the total amount of disturbance and resources associated with the combined developments are summarized in **Appendix A**, Section A.4.2.

2.4 CONSTRUCTION

Construction of the facilities would include site preparation and stabilization, temporary use areas, gravel and aggregate materials, water sources and storage, dust and stormwater control, and reclamation in temporary disturbance areas. These are described in **Appendix A**, Section A.2.2. Workforce sizes and schedules, typical construction equipment, and construction sequencing and methods for the PV solar arrays, electrical collection and transmission systems, and substations are also described in **Appendix A**, Section A.2.2.

The timelines for construction would vary by project with estimates of 18 to 36 months. The timing of project approvals and availability of construction contractors and workforce would also differ by project. It is assumed that full buildout of all projects could be completed within 5 years from the ROD for the PEIS/RMPA. Based on the 5-year buildout, 845 workforce personnel could be anticipated within the planning area at any given time.

2.5 OPERATIONS AND MAINTENANCE

Operations and maintenance, including inspections, water use, workforce, and hazardous materials and emergency response, are described in **Appendix A**, Section A.2.3.

2.6 DECOMMISSIONING AND RECLAMATION

Decommissioning of a facility after its life and reclamation are described in **Appendix A**, Section A.2.4.

2.7 ANTICIPATED PROGRAMMATIC DESIGN FEATURES

Programmatic design features would be applied to protect other resources from possible impacts associated with solar development. The SERs detail commonly applied programmatic design features and assess how each design feature would protect the resource.

2.8 PROPOSED APPLICANT-COMMITTED ENVIRONMENTAL PROTECTION MEASURES

The PODs for the seven proposed solar developments vary with regard to proposed applicant-committed environmental protection measures. The environmental protection measures will be refined during the

project-specific NEPA analysis. A list of typical environmental protection measures taken from the PODs includes the following:

- Standard best management practices to minimize impacts on soil resources, air, water quality, and vegetation would be implemented.
- Standard best management practices and weed control measures would be implemented.
- Standard dust control, such as watering access roads, and fire protection measures would be implemented.
- Class III cultural resources surveys and reporting would be completed.
- Cultural resources or historic properties treatment plans would be developed.
- If construction occurs in proximity to a cultural resource site that is eligible for the National Register of Historic Places, an authorized cultural monitor would be on-site during the activity.
- Migratory bird surveys would be conducted. Construction in or near migratory bird habitat would be avoided during the breeding season; or, an authorized biologist would identify and flag nests, and construction would avoid the nest and buffer zone.
- During decommissioning and reclamation of the project, all disturbed lands would be regraded to the approximate original contour, topsoil would be placed, and the areas would be revegetated.

Management plans that may also be developed including the following:

- Avian protection plan
- Decommissioning and site restoration plan
- Dust control plan
- Emergency response plan
- Environmental compliance plan
- Fire prevention and management plan
- Hazardous materials plan
- Health and safety plan
- Integrated weed management plan
- Lighting management plan
- Pesticide use plan
- Site drainage plan
- Spill prevention and emergency response plan
- Stormwater pollution prevention plan
- Erosion and sediment control plan/water quality control plan
- Transportation and traffic management plan
- Worker environmental awareness program

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Chapter 3. Alternatives to the Proposed Action

3.1 Alternative B. Soils and Vegetation Conservation Alternative

This alternative would be the same as the Proposed Action, but there would be no amendment to the Tonopah RMP to change the slope requirement for the planning area to a maximum of 10 percent. Development on slopes greater than 5 percent would be based on the additional slope criteria outlined in the Solar RMPA (BLM 2012; see below). In addition, applicants would limit traditional construction grading methods, which remove all vegetation and compact the soil, to a maximum of 35 percent of the proposed development area. Applicants would use mowing in the rest of the development area to leave vegetation intact. In mowed areas, vegetation would be mowed to a height of 24 inches (61 centimeters) but no less than 18 inches (46 centimeters), where justified.

According to the Solar RMPA, applications may include some lands with up to 10 percent slope where higher slope inclusions meet all of the following: (1) they are proximate to variance lands in the application, (2) they are not otherwise excluded from development, (3) they allow for the avoidance or minimization of resource conflicts, and (4) they do not create any significant new or additional conflicts. In such cases, a land use plan amendment would not have to be adopted as part of the project-specific analysis to permit the slope exception.

3.2 Alternative C. No Action Alternative

Under Alternative C, the No Action Alternative, the BLM would not amend the Tonopah RMP. Future development could be constrained by the existing VRM classifications or slope requirements.

3.3 Alternatives Considered but Eliminated from Detailed Analysis

In accordance with 40 CFR 1502.14(a), agencies are required to describe the alternatives considered but eliminated from detailed study and to provide a brief rationale for eliminating the alternatives. Alternatives should be explored and objectively evaluated in the environmental impacts statement (EIS). For alternatives that are eliminated from detailed study, the EIS should briefly discuss the reasons for eliminating them (40 CFR 1502.14(a)). Per 40 CFR 1508.1, "reasonable alternatives means a reasonable range of alternatives that are technically and economically feasible and meet the purpose and need for the proposed action."

The BLM NEPA handbook (H-1790-1) indicates that the range of alternatives should explore alternative means of meeting the purpose of and need for the action (BLM 2008a). The purpose and need statement helps to define the range of alternatives. Within the range of alternatives evaluated, the EIS must at least consider the proposed action and no-action alternative and provide a description of alternatives eliminated from further analysis (if any exist), with the rationale for elimination. The BLM must analyze those alternatives that are necessary to permit a reasoned choice.

The BLM NEPA handbook also indicates that the CEQ regulations direct that an EIS ". . . include reasonable alternatives not within the jurisdiction of the lead agency" (40 CFR 1502.14). The BLM reviewed potential alternatives to determine whether they were consistent with the following criteria: (1) they were consistent with the purpose and need, (2) they were technically practical and feasible, (3) they were

economically practical and feasible, and (4) they were environmentally reasonable. As required by regulation, in addition to the Proposed Action, the No Action Alternative is included in this document (40 CFR 1502.14(c)) as an alternative carried through for full analysis.

The BLM considered seven other alternatives but dismissed them from detailed analysis. **Table 3-1** summarizes these alternatives. Additional details regarding the alternatives considered but dismissed, as well as the rationale for dismissal, are provided in the table.

Table 3-1. Alternatives Considered but Not Analyzed in Detail

Alternative Considered but Not Analyzed in Detail	Rationale For Elimination of Alternative
Limited Workforce Alternative: This alternative would have an upper limit on workforce personnel that would be allowed within the planning area at any given time.	The details for each project's design and siting would be finalized during the next phase of project-specific NEPA analysis. During the NEPA analysis for specific projects, the BLM may identify additional design features to lessen social and economic impacts, as warranted. This alternative meets the elimination criteria of being technically infeasible due to unknown site-specific information during this programmatic review.
Conservation-Focused Alternative: This alternative would designate the region as the Esmeralda/Fish Lake ACEC, as proposed in the August 2023 nomination from Friends of Nevada Wilderness.	The BLM has conducted a review of the relevance and importance criteria for the nominated Esmeralda/Fish Lake ACEC. Based on the evaluation of the resources within the nominated ACEC, relevance and importance criteria have been met for some cultural resources and plant resources. These resources are located in various areas throughout the nominated ACEC and, in some cases, are limited in their occurrence. However, no special management attention has been identified for these resources. Existing management and statutory responsibilities would be sufficient to protect these resources. Therefore, designating the 850,000-acre nominated Esmeralda/Fish Lake ACEC was not recommended.
Development Siting and Resource Avoidance Alternative: Under this alternative, development would be prioritized in areas with lower resource values to avoid sensitive resources and resource conflicts.	The details for each project's design and siting would be finalized during the next phase of each project and the site-specific NEPA analysis for each project. This PEIS/RMPA incorporates design features that include avoidance and buffer areas for sensitive resources. During the NEPA analysis for specific projects, the BLM may identify specific areas of avoidance, as warranted. This alternative meets the elimination criteria of being technically infeasible due to unknown site-specific information during this programmatic review.

Alternative Considered but Not Analyzed in Detail	Rationale For Elimination of Alternative
Evaluate the Esmeralda 7 Projects in the Updated Solar PEIS: This alternative would rely on the Utility-Scale Solar Energy Development Programmatic Environmental Impact Statement (Draft 2023) to address the Esmeralda 7 projects.	The Draft Utility-Scale Solar Energy Development PEIS has already been published. Its intent is to evaluate and identify reasonable areas available to solar development proposals in 11 western states. It is not intended to evaluate specific ROW applications for solar development. The Battle Mountain District Office must review and consider the Esmeralda 7 ROW permit applications. This NEPA analysis includes a review of the proposed projects to ensure they are consistent with the 2012 Solar PEIS and incorporate the relevant design features. An NOI to update the Solar PEIS was published in the *Federal Register* on December 8, 2022. This alternative meets the elimination criteria of being technically infeasible due to the updates to the Solar PEIS not being complete at this time, and no decision has been made.
Relocate the Greenlink West Transmission Line Corridor: This alternative would include moving the Greenlink West transmission line closer to the highway.	Any alternative locations for the Greenlink West transmission line are analyzed in that specific EIS and are outside the scope of this PEIS/RMPA. This alternative meets the elimination criteria of not being effective (it would not respond to the purpose and need).
Substation Capacity: This alternative would limit ROW permits and development based on the anticipated Esmeralda Substation capacity.	The BLM must review and consider all ROW permit applications. The BLM has no discretion over power purchase agreements and cannot assume which projects will be able to tie into the substation for the Greenlink West transmission line. ROW applicants will also be required to comply with the regulations outlined under 43 CFR 2805.12 regarding power purchase agreements. This alternative meets the elimination criteria of not being effective (it would not respond to the purpose and need).
Develop Solar Projects in the Millers SEZ: This alternative would relocate the solar project proposals to be within the Millers SEZ northeast of the planning area.	The BLM must review and consider all ROW permit applications as submitted by the applicants. This alternative meets the elimination criteria of not being effective (it would not respond to the purpose and need).

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Chapter 4. References

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Appendix A

Reasonably Foreseeable Development Scenario

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
AC	alternating electrical current
BESS	battery energy storage system
BLM	United States Department of the Interior, Bureau of Land Management
BMPs	best management practices
CFR	Code of Federal Regulations
DC	direct electrical current
EIS	environmental impact statement
EPA	Environmental Protection Agency
gen-tie	generation interconnect
GW	gigawatt
IM	Instruction Memorandum
kV	kilovolt
MW	megawatt
O&M	operations and maintenance
PV	photovoltaic
RFDS	reasonably foreseeable development scenario
ROW	right-of-way
SCADA	supervisory control and data acquisition
US	United States

Appendix A. Reasonably Foreseeable Development Scenario for the Esmeralda 7 Solar Projects

A.1 Introduction and Background

This reasonably foreseeable development scenario (RFDS) is intended to provide a conceptual description of utility-scale photovoltaic (PV) solar facilities, including their design, construction, operations and maintenance (O&M), and decommissioning. It also provides preliminary details for each of the seven proposed projects; these details were gathered from the plans of development for each project. The RFDS describes the total potential disturbance from the solar facilities and associated features. **Appendix B** identifies preliminary programmatic design features that could be applied to protect other resources from possible impacts associated with future development of the seven projects. These programmatic design features will be refined through development of the resource-specific supplemental environmental reports and the environmental impact statement process, including cooperating agency and stakeholder input during the process.

This RFDS recognizes there is a wide range of options in project design and in how construction and operations are conducted; additionally, it recognizes that solar energy development is an advancing field, and technologies and practices are changing rapidly. It attempts to describe the range of the development scenario, but it is not intended to be exhaustive of all possibilities. The purpose of the RFDS is to assist in considering and analyzing potential impacts related to the proposed solar developments.

A.1.1 Solar Energy-Related Bureau of Land Management (BLM) Policies and Regulations

The BLM considered the following policies and regulations in developing the:

- **The 2012 Western Solar Plan** (BLM 2012). This document created a comprehensive Solar Energy Program to allow the permitting of future solar energy development projects to proceed in a more efficient, standardized, and environmentally responsible manner. It identified locations best suited for utility-scale solar energy development on BLM-administered lands. It also designated solar energy zones where solar energy development was to be prioritized; the seven Esmeralda projects are not within a solar energy zone. The BLM is in the process of updating the 2012 Western Solar Plan.[1]
- **43 Code of Federal Regulations (CFR) 2800**. This rule sets out how right-of-way (ROW) grants are managed under the Federal Land Policy and Management Act. Solar projects are authorized under ROW leases within designated leasing areas and are authorized under ROW grants in areas outside designated leasing areas.
- **The Energy Act of 2020**. This act directed the Secretary of the Interior to seek to permit at least 25 gigawatts (GW) of solar, wind, and geothermal energy production on BLM-administered lands by not later than 2025.

[1] https://www.blm.gov/2023-solar-programmatic-environmental-impact-statement

- **Executive Order 14008, Tackling the Climate Crisis at Home and Abroad**. This executive order, issued on January 27, 2021, directed the Secretary of the Interior and others to identify steps to increase renewable energy production on BLM-administered lands and achieve a power sector that is free of carbon pollution by 2035.
- **Instruction Memorandum (IM) IM NV-2023-003**. This IM, issued May 20, 2023, establishes guidance and direction for state office, district office, and field office managers, program leads, planning and environmental coordinators, project managers, interdisciplinary teams, communications staff, and others to execute the requirements for briefings with BLM headquarters, the Assistant Secretary for Land and Minerals Management, and the Secretary of the Interior's office for environmental impact statement (EIS)-level project review. This guidance outlines timelines, review processes, office-level responsibilities, briefing procedures, guidance, and best practices and tools for National Environmental Policy Act documents.
- **IM 2021-026**. This IM, issued on April 15, 2021, provides guidance as to when the BLM may or may not use competitive processes to offer BLM-administered land for solar and wind energy development outside designated leasing areas.
- **IM 2021-005**. This IM, issued on November 10, 2020, implements rental schedule zone reassignments for calculating bills related to linear ROWs, as well as solar and wind development authorizations.
- **IM 2017-096**. This IM, issued on September 14, 2017, provides guidance on implementing the solar energy ROW acreage rent and megawatt (MW) capacity fee schedules.
- **IM 2019-013**. This IM, issued on November 15, 2018, conveys policy and direction for requiring bonding determinations and bonding, where appropriate, on BLM ROW grants for authorized activities. The IM also includes templates, forms, and documentation requirements.
- **IM 2017-099**. This IM, issued on September 14, 2017, provides guidance on implementing requirements to evaluate the technical and financial capabilities of an applicant or holder of a solar energy ROW grant or lease.
- **IM 2017-040**. This IM, issued on January 19, 2017, provides guidance on the processing of ROW applications for wind and solar energy development projects that have the potential to result in eagle take. At the first preliminary application meeting for wind and solar energy proposals, the BLM will inform applicants of potential eagle issues using information the BLM has readily available. The United States (US) Fish and Wildlife Service has the responsibility for determining whether the proposed project will likely result in take of eagles.
- **IM 2011-181**. This IM, issued on September 21, 2011, provides guidance to solar energy applicants and potentially affected permittee(s)/lessee(s) with allotment(s) that may be impacted by energy proposals. The IM clarifies 43 CFR 4110 (requirements for solar energy development applications that may affect livestock grazing operations). It also addresses potential mitigation and compensation strategies and the relationship of energy application steps and decisions with grazing administrative steps and decisions.
- **Department of the Interior Secretarial Order 3285A1**. This secretarial order, issued on February 22, 2010, establishes the development of renewable energy as a priority for the Department of the Interior and establishes the Departmental Task Force on Energy and Climate Change.

A.1.2 Description of the Planning Area

The seven proposed facilities would be geographically contiguous and encompass approximately 62,300 acres of BLM-administered lands located approximately 30 miles west of Tonopah, Nevada (**Figure A-1**, Planning Area). The proposed solar facilities would be adjacent to the proposed corridor for NV Energy's Greenlink West 525-kilovolt (kV) transmission project. NV Energy has proposed approximately 472 miles for a new transmission line and associated facilities between Las Vegas and Reno, Nevada. All seven proposed facilities would connect to the proposed Esmeralda Substation. Descriptions of the facilities can be found below in **Section A.4.1**, Proposed Facilities.

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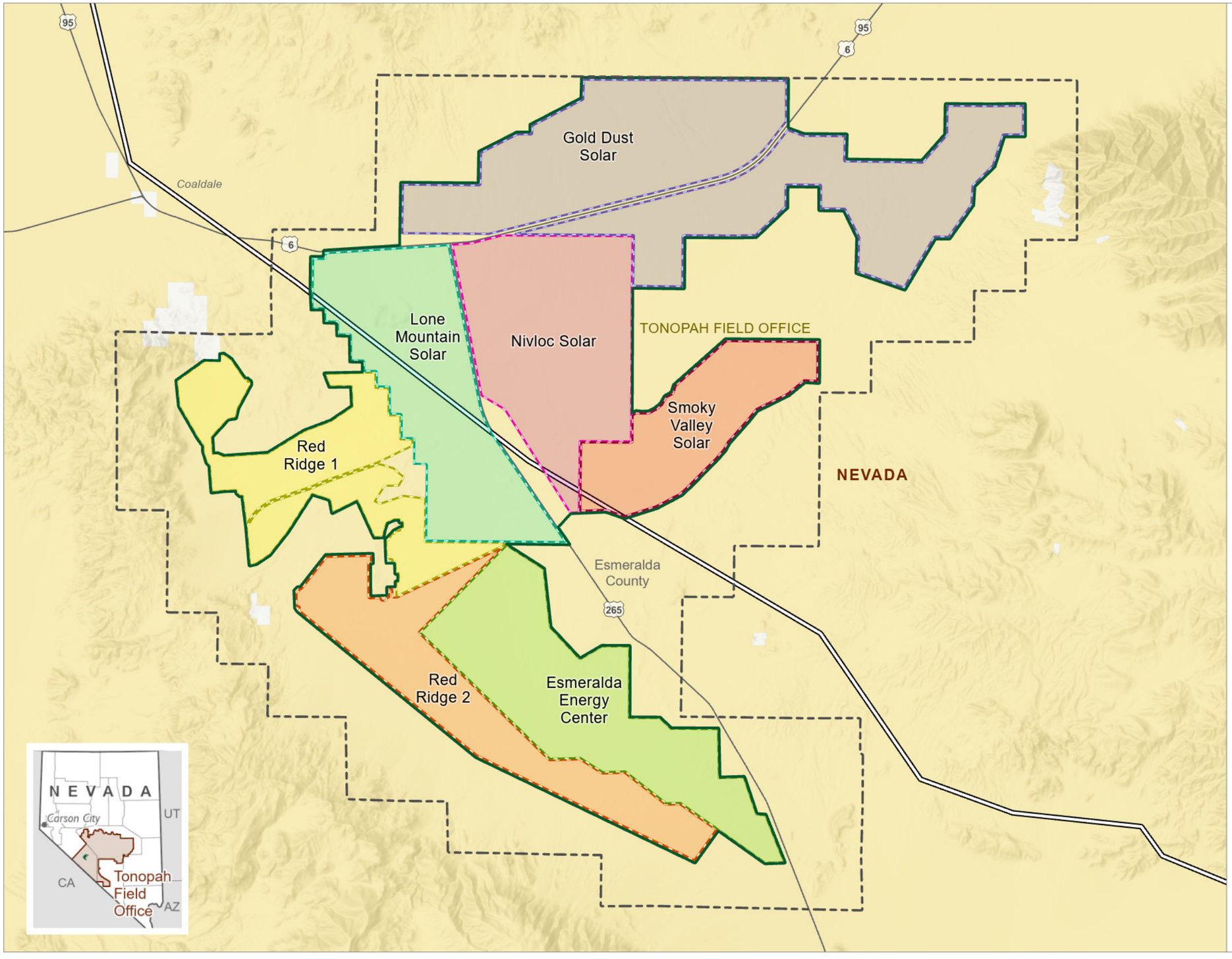

Figure A-1
Planning Area

- Lone Mountain Solar
- Esmeralda Energy Center
- Smoky Valley Solar
- Gold Dust Solar
- Nivloc Solar
- Red Ridge 1
- Red Ridge 2
- Planning area
- Segregation of public land
- Greenlink West Transmission Project, Final EIS proposed action
- Bureau of Land Management
- Private

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Miles

Source: BLM GIS 2023, Department of the Interior, Bureau of Land Management, Battle Mountain District Office
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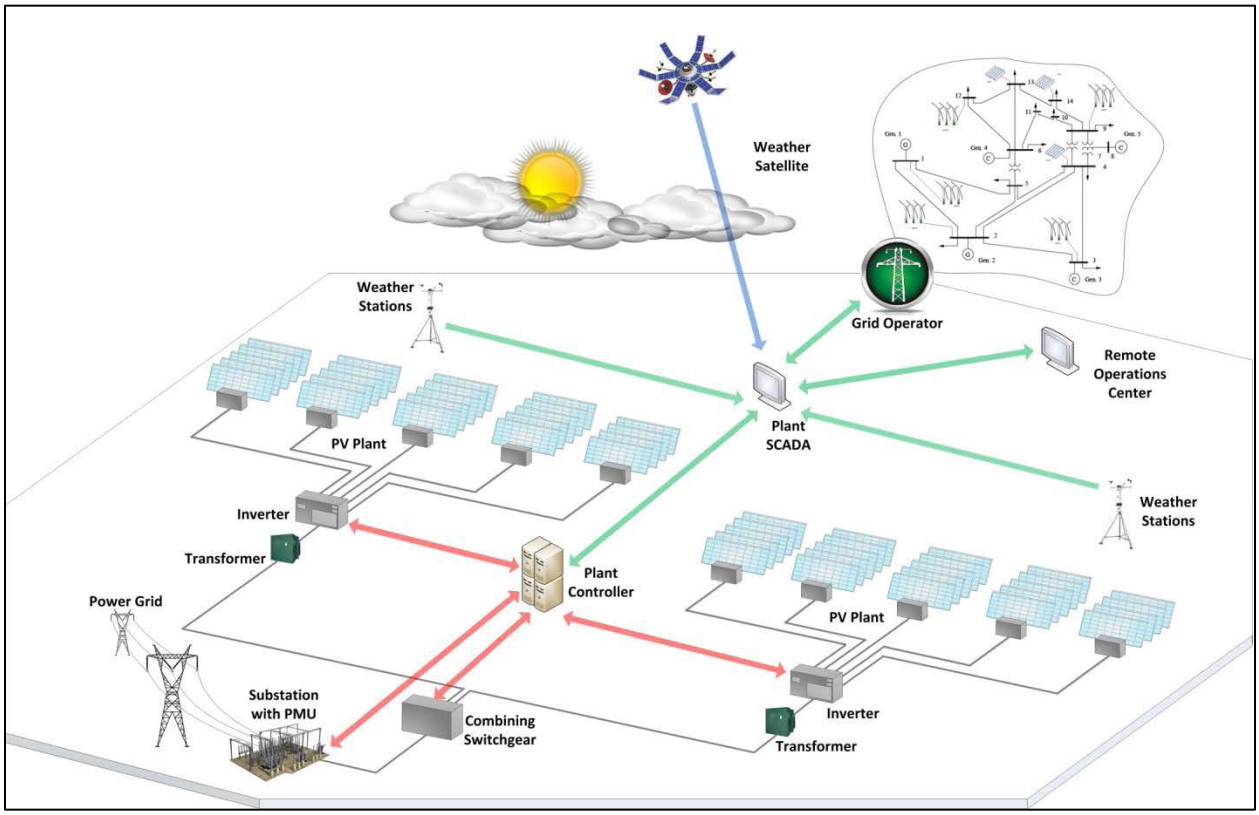
A.2 CONCEPTUAL SOLAR ENERGY FACILITY

This section describes the typical components that make up a utility-scale PV solar system. Definitions below are specific to the type of development that is likely to be seen in a solar development, such as those expected to occur under the seven proposed Esmeralda projects; however, these definitions are not specific to any particular development, and they are not intended to be prescriptive of how development must occur. **Figure A-2**, below, shows a conceptual diagram of components of a typical utility-scale PV solar facility.

Figure A-2. Components of a Typical Utility-Scale PV Power Plant



Source: Gevorgian and O'Neill 2016

A.2.1 Facility Design

Solar field and battery storage

Photovoltaic panel array

PV cells convert light into electricity using semiconductor materials. Individual cells are connected together to form panels or modules. A number of panels installed together form an array. Solar arrays are installed on a site using mounting structures. These systems typically consist of metal, vertical pylons or support members that are driven into the ground or installed into concrete bases, horizontal racks, or table frames; mounting brackets attach the panels to the racks.

Solar panels generate the most electricity when the collection face of the panel is directly perpendicular to the sun. There are three common types of mounting brackets—stationary, single-axis tracking, and dual-axis tracking—that take various approaches to try to maximize generation. Stationary mounting

brackets are a rigid connection between the panel and rack; they are typically designed to hold the panel at an angle that matches the annual average sun angle at midday at the mounting latitude. Stationary systems have a lower cost and require less maintenance than single- or dual-axis tracking systems; however, they generate less electricity in the morning and afternoon and toward the summer and winter solstices; this is because the sun angle is farther from the ideal collection angle at those times (Marsh 2022).

Single-axis tracking systems use a powered mechanism to adjust the angle of the panels on one axis, typically tracking the sun as it moves from east to west during the day. These systems improve efficiency in the morning and afternoon compared with stationary systems, but they do not compensate for north–south seasonal shifts in the sun's angle. These systems have a higher initial cost than stationary systems. The powered mechanism and pivot points require periodic maintenance, and they are less reliable than stationary systems. Some manually adjustable semi-stationary, single-axis tracking systems allow for periodic adjustments to keep the angle of the panel closer to the sun angle following north–south seasonal shifts in the sun's angle. While these systems require workers to physically adjust the system angle on a monthly or quarterly schedule, they cost less and are more reliable than powered single-axis trackers.

Dual-axis trackers use a powered mechanism to automatically adjust the angle of the panels to follow the sun on two axes, accounting for both the east to west movement of the sun each day and the north to south changes associated with seasonal movements. These systems generate more electricity than stationary or single-axis tracking systems, but they also have the highest initial cost and require more maintenance.

Alternating current and direct current collection systems

The electricity generated from the solar panels in the form of direct current (DC) is collected from PV modules through one or more combiner boxes and conveyed to an inverter station where the DC is converted to alternating current (AC). Inverter stations are generally in the middle of each solar block. A medium-voltage transformer converts the output of the inverter to a medium voltage (typically 34.5 kV). Medium-voltage transformers connect to a collection system that delivers energy to the on-site substation. At the on-site substation, power is stepped up with a high-voltage transformer(s) for delivery to the electrical grid. Depending on the project design and part of the collection system, power may be transported using cables located underground, in an above-grade conduit, or overhead.

Battery storage system

The energy storage system consists of self-contained battery storage modules placed in racks, along with converters; switchboards; inverters; transformers; controls; and integrated heating, ventilation, and air conditioning units. All are enclosed in one or more buildings or in prefabricated metal containers. These energy storage systems allow some energy from the PV array to be stored during times of lower demand for electricity, and then sent to the grid at times when solar production is reduced or when demand for electricity is higher.

Infrastructure and ancillary systems

Access road configurations and types of new roads

Access roads vary based on the geotechnical study results and the site and facility design, construction, and O&M requirements. Where feasible, existing roads on the site are used to reduce new disturbance. Typically, access ways are constructed of graded, compacted earth; however, they can be constructed or

stabilized using gravel, aggregate, asphalt, or concrete to control dust or in areas subject to flooding or where the soil type does not allow for good compaction. A stabilized entrance/exit is usually constructed to clean dirt and debris from vehicle wheels prior to exiting the construction area.

For the proposed projects, access roads from the site's entrance/exit to the laydown area would be sized and constructed to allow trucks to deliver supplies and materials. These roads are typically 20 to 25 feet wide but may be wider in turns and corners; turnaround areas would be constructed for larger vehicles. Within solar fields, access roads approximately 20 feet wide would be placed every 500 to 1,800 feet across the solar field, depending on the project design. These roads would be graded and compacted to facilitate use by two-wheel-drive vehicles. Spur roads would typically be 12 feet wide and may be bladed to remove vegetation and rocks. Where necessary, 20-foot-wide maintenance roads would be constructed within the 250-foot-wide ROW for the generation interconnect (gen-tie) transmission line.

Types and sizes of O&M facilities that may be utilized

O&M facilities may include an O&M building, parking area, and other associated facilities, such as aboveground water storage tanks, a septic system, a security gate, signage, and flagpoles. The sizes of these facilities depend on the PV array size and expected maintenance needs. Sizes are detailed in the individual project plans.

Types and configurations of fencing and security that may be installed

Fencing installed around solar facilities is typically chain-link fencing that is 6 to 10 feet tall with barbed wire frequently installed at the top. Fencing would be installed around facilities while assuring access for multiple use within the planning area, including for off-highway vehicles and events. Access gates would also be provided to allow maintenance vehicle access to the equipment. Fencing would be installed around substations. Solar facilities could also employ security measures such as cameras, motion sensors, intrusion detection systems, and on-site security personnel.

Drainage systems that could need to be implemented

The projects' designs will include a review of existing stormwater drainage patterns, which will inform project grading plans. Any erosion during construction would be controlled by implementing a stormwater pollution prevention plan, as required by the Nevada Department of Environmental Protection, Bureau of Water Pollution Control for projects disturbing more than 1 acre.

Water supply and storage options and unit quantities, if applicable

For the proposed projects, water leased or purchased from either a public or private entity could require changes in place of use, manner of use, and point of diversion approved by the Nevada State Engineer, depending on the status of the existing rights. Water for construction could be obtained under temporary change applications. Operational water would likely require a permanent change application approval by the Nevada State Engineer. The applicants would contact the holders of water rights in the basin; after reaching any agreements to procure water from such holders, the applicants would file applications with the Nevada State Engineer for any needed changes in place of use, manner of use, or point of diversion.

The PV technology proposed for these projects would not require water to generate electricity. During operations, water use would be primarily for PV array washing, with the potential for use in periodic dust control, maintenance applications, and O&M facilities. The water used for module cleaning is not anticipated to require disposal due to the extremely high evaporation rate at the sites. A commercially

permitted supplier would supply the water to be used for panel cleaning. Water would be purchased from a public or private entity; the water would be trucked in on an as-needed basis or trucked in and stored in on-site tanks. It is also possible that water could be sourced from new well locations within the solar facility boundary.

Transmission systems

The number and potential configuration of substations

For the proposed projects, AC voltage from the inverter stations would be delivered through underground or overhead cables to the project collector substation. At the project collector substation, the voltage would be stepped up from the typical collection voltage of 34.5 kV to a transmission voltage of 230 kV, 345 kV, or 525 kV, depending on the project design, using one or several transformers to prepare the transmission line to connect to the grid at the substation. Each facility would generally have one substation but potentially up to two. On-site substation(s) typically include step-up transformers, breakers, buswork/conductors, protective relaying, a microwave tower, a control house or control enclosure, metering equipment, and associated substation equipment. The power output from the project collector substation would flow through a 230 kV, 345 kV, or 525 kV isolation switch onto a single-circuit line to the point of interconnection.

Containment measures for all substation equipment would be implemented in accordance with the US Environmental Protection Agency's (EPA's) requirements (40 CFR 112) and all applicable codes required by the local, state, and federal governing authorities. The transformer containment area would be lined with an impermeable membrane covered with gravel; it would include a drain with a normally closed drain valve. Transformers would be provided with secondary oil containment equal to 110 percent of the volume of oil present in the transformer in addition to the volume of rainwater for a 25-year, 24-hour rainfall event.

Gen-tie lines' distances, types, and size ranges that could be needed

The projects would require the construction of a 230 kV, 345 kV, or 525 kV gen-tie line to the planned Esmeralda Substation. A gen-tie line consists of a connection circuit and a fiber-optic telecommunications system for interconnection to the utility transmission grid system at the planned Esmeralda Substation.

The projects would interconnect to existing transmission systems. The tie-in points would be along the proposed Greenlink West project, using the shortest reasonable path to interconnect to the adjacent substation. The interconnection would allow the purchase of renewable energy generated by the project under power purchase agreements.

A.2.2 Construction

Site preparation—generally how mobilization, site preparation, and vegetation clearing may occur

For the proposed projects, a licensed professional surveyor would conduct a land survey of the project site and stake the construction area, as needed, before construction begins. Typically, a construction entrance site access road and laydown area for storage and equipment are constructed first. Next, equipment and supplies are brought in, water storage is constructed or installed, and site fencing and security measures are installed.

Site preparation to smooth the surface for the solar array and other equipment would be conducted at this stage. Some projects could use the techniques of mowing or "disk and roll" (using rubber-tired tractors with disking equipment and drum rollers to remove vegetation and smooth the area) to work existing vegetation into the underlying surface soils, where feasible. Conventional grading could be used for other projects or in areas where mowing or disk and roll are not suitable. Drainage controls are typically also installed at this stage. Vegetation in other areas could be mowed to the height required for site maintenance and fire risk management.

Temporary use areas

Temporary use areas, sometimes called laydown or mobilization areas, would be used for storage of construction supplies and parking for workers and construction vehicles. These areas also would be used for temporary equipment needed during construction, such as mobile-trailer construction offices, temporary water service and holding tanks for fire water supply, temporary construction power, portable toilets, and tool sheds or containers. The areas are typically bladed to remove vegetation and level the contours. Based on the soil conditions, gravel or other materials may be placed if there are concerns about excessive dust or muddy conditions occurring. Topsoils, if present, and removed vegetation can be stockpiled for use in reclamation, or they can be worked into the topsoil layers. Once construction is complete, the area could be reclaimed and revegetated with native vegetation, or it could be converted to use as part of the operational facility.

Estimated gravel and aggregate needs

The quantities of construction materials required for the projects, such as gravel, aggregate (or road base), asphalt, and concrete, depend on the geotechnical analysis and final arrangements and layouts. These layouts would be part of the detailed design, and the material requirements would be estimated at that stage in the projects.

PV solar array assembly and construction methods and sequencing

PV arrays are typically constructed of metal, vertical pylons or support members that are driven into the ground or installed into poured concrete piers. Horizontal racks or table frames connect to the vertical support members, creating a near-horizontal mounting surface. Mounting brackets of other mounting systems attach the solar panels to the racks. The support members, racks, and mounting system are installed first, with solar panels installed either immediately following as assembly progresses or later after the entire rack and mounting system are complete. Projects may use a phased approach where blocks or rows of PV arrays are completed and brought online one at a time, or the entire solar field may be constructed at once before being brought online.

Electrical collection and transmission system construction methods and sequencing

For these Esmeralda projects, electrical construction would consist primarily of the following elements:

- Equipment—All electrical equipment would be installed, including DC combiner boxes, power conversion station shelters (including inverters), transformers, circuit breakers, disconnect switches, switchgear and distribution panels, lighting, communication equipment, control equipment, and supervisory control and data acquisition (SCADA) equipment.

- Cables—All cables necessary to energize the project equipment would be installed, including instrument control wiring. High-, medium-, and low-voltage cables could be routed via cable trays, above-grade conduits, below-grade conduits in duct banks, or overhead structures.
- Grounding—All equipment and structures would be grounded, as necessary. Within the solar field, an appropriate grounding system would be engineered and constructed to maintain personnel safety and protect equipment.
- Telecommunications—Multiple communication systems would be required for the project to properly operate, including T1 transmission line, fiber optics, microwave systems, and telephones. All communications would be installed during electrical construction.

Substation construction methods

The on-site substations would be constructed based on applicable electrical safety codes. On-site substations are typically fenced separately to provide increased security around the medium- and high-voltage electrical equipment. To install a grounding system and the foundations for transformers and metal structures, the substation area could be excavated to a depth of approximately 10 feet. The area would be backfilled, compacted, and leveled followed by application of 6 inches of aggregate rock base. Equipment, including the transformers; breakers; buswork; metal, dead-end structures; and a prefabricated control house or other housing, would be installed to house the electronic components required of the substation equipment.

Site stabilization, protection, and reclamation in temporary disturbance areas

To prevent increased dust and erosion around the construction site and to comply with Esmeralda County dust-control requirements, appropriate erosion- and dust-control measures would be implemented for both the solar facilities and the gen-tie facilities. The project applicants would prepare a site rehabilitation and restoration plan that would document erosion- and dust-control measures to be implemented, including:

- Soil stabilization measures to prevent soil from being eroded by stormwater runoff
- Establishment of temporary laydown areas on level ground
- Avoidance of blading in laydown areas, where feasible
- Minimization and control of dust generated during construction by applying water or BLM-approved palliatives, or both

Soil stabilization measures would include best management practices (BMPs) to protect the soil surface by covering or binding soil particles. Depending on the site preparation technique, organic matter could be worked into the upper soil layers or mulched on-site and redistributed into the fill (except under equipment foundations, trenches, and roadways) to aid in dust control. Construction contractors would also develop and implement an erosion-control plan for each project and incorporate measures required by regulatory agency permits and contract documents, as well as other measures selected by the contractor. The contractor would design project-specific BMPs to protect the soil surface from erosion; the BMPs would be included in the project stormwater pollution prevention plan.

Temporary disturbance areas would have any facilities and equipment removed. Soils compacted by use would be broken up, if necessary. Any stockpiled topsoils would be placed on the area, which would then be reseeded with an approved seed and plant mix.

Water source and storage options for construction, including unit quantities, if appropriate

Water requirements would vary by project; estimates vary from 307 to 4,600 acre-feet of water during project construction for construction-related activities, including dust control, soil compaction, worker consumption, and fire safety. Water would be purchased from either a public or private entity. The water would be trucked in on an as-needed basis or trucked in and stored in on-site tanks. It is also possible that water could be sourced from new well locations within the solar facility boundary.

Types of dust and stormwater control available

The fugitive dust-control plan would be prepared in compliance with Nevada Department of Environmental Protection air quality regulations. This plan would describe measures to minimize fugitive dust emissions during construction and operations. A stormwater pollution prevention plan would also be prepared that would outline protocols to control stormwater runoff. Appropriate water-erosion and dust-control measures would be implemented to prevent an increased dust and sediment load to ephemeral washes around the construction site and to comply with Esmeralda County dust-control requirements. Dust during construction would be controlled and minimized by applying water or BLM-approved palliatives, or both.

Construction power options

Construction power would likely be provided by a temporary connection to the existing distribution service in the area. Alternatively, generators could be used to provide temporary construction power.

Workforce sizes, typical schedules, and housing accommodations that could be used

Construction would generally occur between 5:00 a.m. and 5:00 p.m., Monday through Friday, but could occur 7 days a week. Additional hours could be necessary to make up schedule deficiencies or to complete critical construction activities. For instance, during hot weather, it could be necessary to start work earlier (as early as 3:00 a.m.) to avoid work during high ambient temperatures. Also, construction could require some nighttime activity for installation; refueling equipment; staging material for the following day's construction activities; service or electrical connection; or inspection, quality assurance/control, and testing activities. Nighttime activities would be performed with temporary lighting. Some activities could require periods of construction activities 24 hours per day, 7 days per week.

During the construction period, typical construction traffic would consist of trucks transporting construction equipment and materials to and from the site, and management and construction employee vehicles. Most construction workers would commute daily to the jobsite from within a 90-minute commute area that includes the communities of Goldfield, Tonopah, Dyer, and Hawthorne. Prior to the start of construction, the project applicant would prepare a traffic management plan to address project-related traffic.

Construction of each project is expected to take between 12 and 36 months. Daily trips during construction of the project would be generated by delivery of equipment and supplies and the commuting of the construction workforce. The number of workers expected on the site during each project's construction would vary over the construction period and by project. All project-related parking would be on-site during construction.

A.2.3 Operations and Maintenance

The methods of O&M, including inspections and hazardous material and battery disposal, that could be implemented

Inspections—Inspections of facility components would occur following a set schedule developed by the operator. Additional inspections could occur, as needed, due to exceptional circumstances.

Water use—After construction is complete, the annual water consumption during operations is expected to range from 10 to 120 acre-feet per project, depending on the facility size for each project, for use in panel washing, dust control, and employee consumption. The projects would not require processed water for panel washing and dust control; however, projects with O&M facilities could require potable water for employee consumption. The main consumption of water during operation would be for panel washing and occasional dust control. The applicants would prepare a water quality management plan that would include measures that the applicant would take to minimize the impacts on water quality from operations, including measures for erosion and sediment control, flood control, and stormwater monitoring and response.

Workforce—Administrative and management personnel, plant operators, maintenance technicians, and site security would be required for the ongoing operation of a solar plant. The number of personnel would vary based on the size of the plant and workforce decisions made by individual solar operators.

Hazardous materials and emergency response—The applicants would develop an emergency response plan that presents the results of a comprehensive facility hazard analysis and, for each identified hazard, a response plan. The emergency response plan would assign roles and actions for on-site personnel and responders; it would also designate assembly areas and response actions. Any hazardous materials on the site would be handled, stored, and disposed of in accordance with applicable laws and regulations. Waste from the sites would be recycled or disposed of in an approved facility.

Typical equipment that could be used

O&M would require the use of vehicles and equipment, including trucks for panel washing and crane trucks for minor equipment maintenance. Additional maintenance equipment used occasionally could include forklifts; manlifts; chemical application equipment for weed abatement; and large, heavy equipment, including cranes. Pickup trucks would be in daily use on the sites. At designated intervals, typically every 10 to 15 years, major equipment maintenance would be performed; this could require heavy equipment to be transported to the site.

Proposed development

To consider the impacts of the proposed solar developments in the area around the Esmeralda Substation, information about those developments is necessary. **Section A.4** discusses the proposed projects and facilities and outlines the total amount of disturbance and resources associated with the combined developments, based on existing information regarding the proposed solar facilities.

A.2.4 Decommissioning

Facility removal and reclamation

At the end of all PV arrays' facility life, structures, equipment, and infrastructure would be removed from the site and disposed of or recycled in the manner specified in the approved decommissioning,

abandonment, and site reclamation plan. Graded areas would be regraded, if necessary, to match the topography of the surrounding area. All disturbed areas would then be revegetated using an approved seed and plant mix.

Therefore, decommissioning details would be developed and provided to the BLM at the time permanent closure is closer and more information is available. The BLM would require the applicants to submit a decommissioning, abandonment, and site reclamation plan. The plan would include all activities required to dispose of or to store all hazardous and toxic materials and chemicals associated with the project and outline a recycling strategy for applicable components. This plan would discuss all currently applicable laws, ordinances, regulations, and standards associated with the safe storage or disposal of these materials.

A.3 REASONABLY FORESEEABLE DEVELOPMENT

A.3.1 Proposed Facilities

The information presented below is based on preliminary planning for the proposed solar developments making up the Esmeralda 7 project. The information and details described below may change as plans evolve in response to site-specific National Environmental Policy Act analyses; engineering designs; or changes in company objectives, solar technologies, power market conditions, or other issues not foreseeable at this stage. The timelines for construction would vary by project with estimates of 18 to 36 months. The timing of project approvals and availability of the construction contractors and workforce would also differ by project. It is assumed that full buildout of all projects could be completed within 5 years from the record of decision for the EIS/resource management plan amendment. Based on the 5-year buildout, 845 workforce personnel could be anticipated within the planning area at any given time.

Lone Mountain Solar

The Lone Mountain Solar facility would consist of an up to 1 GW AC solar PV power-generation facility and an up to 500 MW battery energy storage system (BESS) on approximately 8,350 acres of BLM-administered lands. Additional ancillary features associated with the Lone Mountain Solar facility would include a DC collection system, power conditioning system, on-site substation, meteorological stations, fiber-optic installation, O&M buildings, laydown yards, and site fencing. The proposed development would also include construction of a 230 kV overhead gen-tie transmission line that would connect to the Esmeralda Substation along NV Energy's proposed Greenlink West 525 kV transmission line.

Nivloc Solar

The Nivloc Solar facility would consist of an approximately 500 MW AC solar PV energy-generation facility and 500 MW BESS on approximately 8,280 acres of BLM-administered lands. Additional ancillary features associated with the Nivloc Solar facility would include an O&M building, control building, collection system, power conditioning system, on-site substation, water storage tank, drainage control, access roads, site fencing, and laydown areas. The proposed development would also include construction of a 230 kV overhead gen-tie transmission line that would connect to the Esmeralda Substation along NV Energy's proposed Greenlink West 525 kV transmission line.

Smoky Valley Solar

The Smoky Valley Solar facility would consist of an approximately 1 GW AC solar PV energy-generation facility and a 1 GW BESS on approximately 4,890 acres of BLM-administered lands. Additional ancillary features associated with the Smoky Valley Solar facility would include an O&M building, inverters and

transformers, an on-site substation, a SCADA system, access roads, site fencing, and laydown areas. The proposed development would also include construction of a 230 kV overhead gen-tie transmission line that would connect to the Esmeralda Substation along NV Energy's proposed Greenlink West 525 kV transmission line.

Red Ridge 1 Solar

The Red Ridge 1 Solar facility would consist of an up to 600 MW AC solar PV power-generation facility and 600 MW BESS on approximately 6,190 acres of BLM-administered lands. Additional ancillary features associated with the Red Ridge 1 Solar facility would include access roads, an on-site project substation, collector lines, communication systems infrastructure, fiber-optic installation, O&M buildings, laydown yards, and site fencing. The proposed development would also include construction of a 525 kV single- or double-circuit gen-tie transmission line that would connect to the Esmeralda Substation along NV Energy's proposed Greenlink West 525 kV transmission line. Both overhead and underground options are being considered for the gen-tie line.

Red Ridge 2 Solar

The Red Ridge 2 Solar facility would consist of an up to 600 MW AC solar PV power-generation facility and a 600 MW BESS on approximately 6,860 acres of BLM-administered lands. Additional ancillary features associated with the Red Ridge 2 Solar facility would include access roads, an on-site project substation, collector lines, communication systems infrastructure, fiber-optic installation, O&M buildings, laydown yards, and site fencing. The proposed development would also include construction of a 525 kV single- or double-circuit gen-tie transmission line that would connect to the Esmeralda Substation along NV Energy's proposed Greenlink West 525 kV transmission line. Both overhead and underground options are being considered for the gen-tie line.

Gold Dust Solar

The Gold Dust Solar facility would consist of an up to 1.5 GW AC solar PV power-generation facility and a 1 GW BESS on approximately 16,720 acres of BLM-administered lands. Additional ancillary features associated with the Gold Dust Solar facility would include a DC collection system and power conditioning system, energy storage system, meteorological stations, administrative and maintenance buildings, communication systems infrastructure, drainage control structures, site fencing, a 10-foot firebreak outside the perimeter fence, access roads, and laydown areas. The proposed development would also include construction of a 525 kV or 345 kV overhead gen-tie transmission line that would connect to the Esmeralda Substation along NV Energy's proposed Greenlink West 525 kV transmission line.

Esmeralda Energy Center

The Esmeralda Energy Center facility would consist of an approximately 1 GW AC solar PV power-generation facility and 1 GW BESS on approximately 8,360 acres of BLM-administered lands. Additional ancillary features associated with the Esmeralda Energy Center would include inverter stations, a SCADA system, an on-site substation, access roads, site fencing, O&M buildings, laydown areas, and collection lines. The proposed development would also include construction of a 525 kV overhead gen-tie transmission line that would connect to the Esmeralda Substation along NV Energy's proposed Greenlink West 525 kV transmission line.

A.3.2 Proposed Solar Facilities Development

Based on preliminary planning, the details and size of various solar facility components that would be developed within the planning area are summarized below in **Table A-1**. The information and details described in this table may change as plans evolve during the planning process. Estimates for the maximum development scenario were derived using the best available information from the current plans of development and updates for each project. Where estimates were unknown, the averages of other similar project disturbances were extrapolated.

Table A-1. Foreseeable Development by Component or Facility

Solar Field and Battery Storage	Estimates for Maximum Development[1]
PV panel arrays (MW)	6,200
BESS (MW)	5,200
Infrastructure and Ancillary Systems	—
Site sizes (acres)	59,650
Disturbed areas on the sites (acres)	48,351
Access roads and solar field roads (acres)	445
Gen-tie roads (acres)	154
PV modules (acres)	39,039
Battery storage system (acres)	393
On-site substations (acres)	252
O&M facilities (acres)	141
Gen-tie structure areas (acres)	283
Gen-tie ROW/easements (acres)	803
Fencing (linear feet)	1,471,599
Gen-tie line distance (miles)	35
Construction (Temporary Disturbance)	—
Temporary (laydown) use areas (acres)	292
Temporary roads (acres)	147
Temporary gen-tie disturbances (acres)	409
Water use (acre-feet)	10,457
Construction workforce (number of workers)	4,225
Construction timeline (years)	5
Operation and Maintenance	—
O&M workforce (average number of full-time workers)	75
Long-term water use (acre-feet per year)	424

[1]Total for all Esmeralda 7 projects combined

Sources: Transcon Environmental Inc. 2021a, 2021b; Boulevard Associates LLC 2021; CG Western Renewables III LLC 2021; Gold Dust Solar LLC 2021; Nivloc Solar Energy LLC 2021; US Solar Assets 2021. Additional/updated estimates were submitted to the BLM by project applicants in July 2023.

Source for project area/ROW acres: BLM GIS 2023

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